

Louvain School of Management

**Leader gender and ESG challenges:
Influence on communication, performance
and investors' reaction.**

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A handwritten signature in blue ink, appearing to be 'Léa Laudy', written in a cursive style.

Abstract

This master thesis analyses the extent to which gender in leadership impacts corporate ESG communication and investor reaction, based on a sample of 416 US companies and 1,667 CSR reports published between 2007 and 2020. The results show that women adopt a transformational style of communication and give more importance to the social dimension, while men are more concerned with the governance dimension. No significant results show any short- or medium-term influence of the communication style of ESG dimensions or ESG performance on investor reaction. This work highlights the link between gender, sustainable communication and finance and suggests that the form of ESG discourse is a strategic issue still little understood and used by markets.

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1. Introduction

In recent decades, companies have been facing increasing pressure from stakeholders, to demonstrate their financial performance but also their commitment to the environment, social and governance dimensions (ESG). The rise of sustainability issues has led to regulatory developments, such as the CSRD directive in Europe, followed by a change in corporate governance and communication strategies. In this context, the role of leaders is essential. Indeed, company directors play a key role in defining companies' ESG strategies, in terms of defining initiatives, prioritising ESG dimensions and communicating them. The literature shows that leadership is not neutral, the gender of the leader influences his or her leadership style, communication style and relations with stakeholders.

In this framework, a research question emerges: *“How does the gender of the company's leaders influence the priority and the communication of the different dimensions of ESG standards? More specifically, does it influence the investors' reaction in the decision to finance the company's?”*.

Our analysis is based on a sample of 416 US companies and 1,667 CSR reports published between 2007 and 2020. We used multiple linear regression models to test hypotheses relating to the effects of gender on the prioritization of ESG dimensions as well as the communication style used in the reports, but also their impact on investor reaction. Our findings reveal that the gender has a partial influence on the communication style and the prioritization of the ESG dimension. Finally, the analysis of investor reaction, measured through the abnormal cumulative returns (CAR), does not show that any communication style, ESG communication or ESG performance generates a significant financial response.

This research makes a relevant contribution to the academic literature for several reasons. Firstly, it improves our understanding of gender in corporate governance addresses an emerging and underexplored subject, by highlighting the influences of male and female managers on communication style, communication of ESG dimensions and the overall ESG performance.

In addition, this study mobilises several theoretical frameworks by linking theories on leadership, communication, and investors theories with sustainable management. By demonstrating that the personal characteristics of leaders, precisely gender for this research, influence not only strategic decisions but also the way in which CSR commitments are communicated, and therefore also impact investors reaction.

In terms of methodology, this research proposes a rigorous quantitative methods combined with textual analyses, enabling to objectify communication styles and precisely measure the place given to environmental, social and governance dimensions in companies' CSR discourses and reports.

Lastly, this study questions the real effectiveness of companies' CSR communications to investors. By finding no significant reaction from U.S. financial markets to variations in communication styles or ESG content, it highlights a gap between growing expectations in terms of sustainability and real considerations of ESG criteria in investment decisions. This paves the way for further research into the credibility of CSR communication and the conditions for genuine, sustainable commitment on the part of the financial market.

In short, this research offers a new perspective on governance, gender and sustainability, by highlighting that women's leadership is not limited to symbolic representation, but can structure differently the way companies design and communicate their ESG commitments.

The paper is structured as follows: it begins with the literature review, followed by the formulation of hypotheses. Then comes the methodology, with a presentation of the different variables and the method used. The empirical results are presented and discussed, allowing the identification of the limitations of the study and recommendations for future research, before concluding with a general conclusion.

2. Literature review

2.1. Overview of the literature

Since the beginning of the industrial era, a company's performance has been measured based on financial criteria (Knight, 1921). However, given the urgency of the environmental crisis, persistent social inequalities and growing shareholder demand for transparency, this traditional approach has certain limitations. It is within this context that a new, more sustainable vision for companies has emerged, embodied in corporate social responsibility (CSR) and the integration of environmental, social and governance criteria (ESG). This change was initially a voluntary commitment on the part of companies but has gradually been transformed into a more demanding regulatory framework, such as the Corporate Sustainability Reporting Directive (CSRD) directives in Europe (Latapi Agulo, Johannsdottir, & Davidsdottir, 2019).

At the forefront of this transformation are company's leaders, whose role is no longer limited to simply maximising profit but now extends to implementing a strategy focused on sustainability and responsibility. It is in this framework that this research is being carried out, as corporate governance is becoming essential to the development, dissemination, and management of ESG commitments.

The first section of this literature review will look at new corporate perspectives on environmental, social and governance (ESG) challenges, as well as the legal framework and its consequences. We will then analyse how leaders play a key role in shaping these new priorities.

The second part will define leadership and use the Upper Echelon Theory to explore how personal characteristics, particularly gender, directly influence strategic decisions taken within a company. We will see that men and women adopt different governance strategies.

In the third section, we will discover that these different leadership styles between men and women can have a direct influence on the prioritisation of ESG criteria. We will focus on the importance of communicating ESG performance and initiatives, which is a real

strategic element for companies. We will also discuss how gender influences communication style and how this affects the reception of a company's messages.

Finally, in the last section, given the growing importance of ESG criteria and the increasing demand from investors and shareholders for greater transparency in terms of the corporate social responsibility of companies, we will analyse how the communication style of men and women on ESG commitments influences investor perception and reaction.

2.2. The evolution of the non-financial standards

Traditionally, the financial approach has been preferred for analysing and measuring the performance of a company or organisation (Knight, 1921), but in recent years a new approach has been gaining ground. The emergence of the extra-financial approach goes hand in hand with a growing interest and concern for sustainable development and the need to rethink the way companies operate and consume. From the 19th and 20th century, rapid economic growth and industrialisation had negative impacts on the environment, but also on working conditions. This has led to a growing social awareness of environmental issues, social inequalities, and abuses of power and unethical practices. In response to the need to reconcile the economic and financial objectives of companies with their social and environmental responsibilities, the concept of corporate social responsibility (CSR) was born. Corporate Social Responsibility seeks to combine economic performance with ethical social measures and a reduction in environmental impact by integrating responsible governance while having a sustainable impact on the day-to-day companies' activities (Latapi Agulo, Johannsdottir, & Davidsdottir, 2019).

Today, faced with the challenges of sustainable development, it has become essential for companies to favour social and environmental criteria into their strategy. Solutions exist for integrating these issues, but their consideration at European level really took off in 2001, when the European Union defined Corporate Social Responsibility (CSR) in its Green Paper. It describes CSR as the voluntary integration of enterprises of social and environmental concerns in their business operations and in their interaction with their stakeholders (Primec & Belak, 2022).

Over the years, the European regulatory framework has gradually been strengthened, moving from a voluntary approach to legal obligations in 2024 for certain major economic players. It is in this context that the corporate sustainability reporting directive (CSRD) emerged and marks a crucial step in corporate. This EU directive requires the companies concerned to publish detailed reports on their environmental, social and governance (ESG) impact, with the objectives of making non-financial information transparent and reliable, harmonise practices through the Non-Financial Reporting Directive (NFRD) and finally fight against greenwashing by imposing a mandatory audit of extra-financial data (Primec & al., 2022).

From a voluntary approach (CSR) to a legal obligation (CSRD), an analytical framework for assessing the performance of companies has emerged. The voluntary disclosure of non-financial information on the environment, society, and governance (ESG) is a fast-growing and increasingly important topic that has attracted a great amount of attention from academic researchers and financial market players in recent years. ESG is a framework used to measure a company's non-financial performance in the environmental, social and governance categories. ESG was created in 2004 by the former Secretary General of the United Nations, Kofi Annan (UN Global Compact, 2004). Environmental, social and governance (ESG) criteria have become an integral part of assessing a company's value. ESG dimensions focus on the evaluation of company performance by investors, an analysis grid for the financial markets (Primec & al., 2022).

The first criteria of ESG standards is the environmental criteria which consider a company's impact on the planet. The priority is given to the company's climate footprint, its greenhouse, gas emissions, and its overall carbon footprint. But ESG does not stop at a company's impact on the climate. Other elements to be measured and considered are water pollution, water use and air pollution. Companies must also report on their land use practices, which have an impact on deforestation and biodiversity. Finally, a company's recycling policy and whether it has a circular economic model also has an impact on its score (Gebhardt, Thun, Seefloth, & Zülch, 2023).

The social criteria captures impact of a company on its employees, consumers and communities in which it operates (Gebhardt & al., 2023). Employee and worker practices, health and safety standards, mental health, customer success and community relations are included in this criterion (UN Global Compact, 2004). Companies also report on equity issues, including the integration of diversity and gender equality (Gebhardt & al., 2023).

The governance criteria concerns the management of a company, executive remuneration, audits, internal controls, and shareholders' rights (Gebhardt & al., 2023). The composition of the board, executive remuneration guidelines, accountability and disclosure practices, and management of corruption and bribery issues are all factors that can influence a company's governance rating (UN Global Compact, 2004).

2.3. The role of corporate leadership in shaping ESG priorities

Environmental challenges, resource scarcity and societal concerns have profoundly altered the way companies think about their strategy and governance. Historically, the role of the business leaders and the Board of Directors (BOD) was focused on maximising shareholder value. However, since the beginning of the 21st century, a new, more social approach has emerged, broadening the responsibilities of management to include stakeholder expectations and environmental issues (Chams & Alsagheer, 2017). Under increasing pressure from governments, investors and communities, companies can no longer limit themselves to financial results. They must now integrate social and environmental dimensions into their strategy. This transformation implies restructuring at several levels, among executives, boards of directors and management teams (Zivkovic, 2022).

The commitment of the leaders is essential to translate sustainability commitments into concrete action. The new objective is to directly influence organisational cultures, strategic decisions, and employee commitment to sustainable initiatives. This requires a transformation of organisational practices and a change in behaviour at all levels of the company. Thus, managers must act individually and collectively to support sustainable economic, environmental, and social systems (Zivkovic, 2022).

However, for the implementation of sustainable practices to be effective, the managers must not only be motivated by legal obligations, ESG dimensions or the company's reputation, but must also be anchored in a desire to align its strategy with a sustainable objective and a long-term vision (Chams & al., 2017). A company leader committed to sustainability, must disseminate transparency, ethics, and social responsibility throughout the organisation by developing a corporate culture (Zivkovic, 2022). The establishment of this type of culture inside the company needs an implementation of responsible leadership, which favours an approach based on fairness, ethics, and respect for stakeholders. It is therefore essential for leaders to create a working environment where can be developed the expression of sustainability values, by encouraging diversity of opinion and actively involving employees in defining and implementing CSR strategies on both long-term decision-making and day-to-day operations (Chams & al., 2017).

While managers play a leading role in the adoption and implementation of ESG strategies, the Board of Directors also holds a key role in implementing ESG commitments. According to N. Chams and J. Garcia-Blandon, boards that encourage ethical practices, transparency and responsible performance make a significant contribution to companies' societal and environmental performance (Chams & Garcia-Blandon, 2019). In addition, the composition of the BOD is a key factor in the implementation of sustainability initiatives in companies. Research by S. Zivkovic highlights that the board must actively participate in the implementation of a corporate culture that promotes ethical practices, transparency, and governance performance. Furthermore, the paper shows that the composition of the BOD is a key factor in the implementation of sustainability. In fact, a board showing great diversity in terms of gender, education, cultural origins, etc. encourages greater involvement in CSR practices. Finally, a board with a high number of directors is linked to environmental and social performance (Zivkovic, 2022).

2.4. Leadership style and gender: a theoretical framework

To analyse the influence of managers on strategic decisions, we use the theoretical framework of the Upper Echelon Theory developed by Hambrick and Mason. This theory postulates that the personal characteristics of managers - such as their values, experience, or gender, directly influence the strategic choices made by companies (Hambrick &

Mason, 1984). Although gender was not included in the initial version of the theory, recent work has incorporated it to improve our understanding of governance dynamics (Bekos & Chari, 2023). The inclusion of this variable makes it possible to examine how gender influences leadership and corporate governance (Dwiri & Okatan). Leadership is a relational and contextual dynamic based on the recognition of the leader by the other members (Winston & Patterson, 2023). These differences in leadership between male and female can have an impact on the way ESG priorities are defined and implemented in organisations.

Leadership is influenced by the characteristics of the manager. Donald C. Hambrick and Phyllis A. Mason, through the 'Upper Echelon Theory', explain that an organisation's results are predicted by the characteristics of its managers. This theory explains that each manager brings to the decision-making process his or her own cognitive base and a set of values derived from his or her experiences and personality, which serve to filter strategic situations. Hambrick and Mason describe a 'perceptual screen' which filters the way managers perceive their environment. These cognitive biases have a direct impact on the way managers perceive a company's strategy and, consequently, directly affect their decision-making, which is influenced not only by objective facts but also by the way they see and interpret these facts (Hambrick & al., 1984).

The Upper Echelon Theory suggests that managers' cognitive base and values are reflected in observable characteristics such as age, education, functional background, and other career experiences such as organisational tenure and aspirations. The theory emphasizes seven key demographic variables that can be used to predict strategic outcomes: age, functional background, career experiences, education, socioeconomic background, financial position, and the heterogeneity of these characteristics within a firm's top management team (Hambrick & al., 1984).

Although Donald C. Hambrick and Phyllis A. Mason do not explicitly mention gender as a characteristic influencing managerial leadership (Hambrick & al., 1984). A recent study of G. Bekos and S. Chari have extended the research on the subject and incorporated the gender as an observable characteristic influencing governance and strategic decisions.

Therefore, the CEO's leadership may also be influenced by his or her gender (Bekos & al., 2023).

According to the Social Role Theory developed by A. Eagly describes how gender expectations and stereotypes influence the behaviour of men and women in society, particularly in work and leadership. In her view, society expects a man to have an agentic character, showing steadiness, power, superiority, and self-confidence. On the contrary, women are expected to have a communal character, showing more emotion, benevolence, helpfulness, compassion, interpersonal sensitivity, and gentleness. These expectations have a major influence on behaviour and career opportunities, consequently, influence the perception of leadership and strategic decisions in companies (Eagly, 1987).

Leaders have historically been men, whereas women, because of their position in society, have always found it more difficult to rise to positions of leadership (Dwiri & Okatan, 2021). Women are subject to historical gender discrimination, which limits their access to senior management positions. This discrimination manifests itself both in formal processes such as recruitment, promotion and pay, and in informal processes such as isolation and persistent stereotyping. The glass ceiling illustrates the invisible barrier preventing women from progressing up the hierarchy, with a greater impact at higher levels. What's more, those who manage to break through this barrier are often placed high-risk positions, a phenomenon known as the glass cliff, which reinforces negative stereotypes. However, when women finally reach management positions, they gain in influence and confidence, reducing their marginalisation within companies (Macarie & Moldovan, 2012).

In their article, B. Dwiri and K. Okatan use Social Role Theory to demonstrate that gender significantly influences the exercise and perception of leadership. Their research reveals a positive correlation between gender diversity and organisational performance: companies with more women in management positions have better financial results and higher operational quality. Leadership styles differ according to gender: men tend to be more task-oriented and operationally efficient, while women favour democratic and relational leadership, based on collaboration and inclusion. The article uses two styles of

leadership to differentiate men and women in management: transformational leadership and transactional leadership (Dwiri & al., 2021).

- Transformational leadership

The first one, transformational leadership is based on inspiring and empowering employees to achieve a long-term vision. It fosters creativity and a good working climate. Transformational leaders inspire and motivate their teams by focusing on future needs and helping them to develop. This style has a positive impact on employee commitment, motivation, and satisfaction. Women are more likely to use this type of leadership and are often perceived as more engaging and inspiring than men (Dwiri & al., 2021).

This type of management is based on four dimensions. The first is idealised influence, which explains that the leader serves as a role model and embodies the values of the organisation. Then we have inspirational motivation, where the leader must inspire his teams to always give their best. The third dimension is intellectual stimulation, where the leader encourages innovation and the challenging of ideas. Finally, the last dimension is individual consideration: the leader supports each member of his team according to his specific needs. The impact of this type of leadership is often associated with positive business results, particularly in terms of innovation and employee engagement (Jian & Fairhurst, 2016).

- Transactional leadership

The second leadership style is the transactional leadership. This leadership style is based on a more formal and hierarchical approach, where the leader uses rewards and sanctions to motivate his or her employees. It is based on the authority and rules of the organisation. This model works well in stable and predictable environments, where efficiency is the priority. The transactional leader sets precise objectives and expects strict compliance with the instructions (Dwiri & al., 2021).

This leadership style is based on 3 components, the first of which is contingent reward. Under this component, the leader motivates by promising rewards in exchange for performance. Then we have active management by exception, which describes the active monitoring of errors and the intervention of the leader before a problem occurs. The final

component is passive management by exception, where the leader only intervenes once a problem has arisen (Jian & al., 2016). This style of leadership is more common in men and can be effective in contexts where structure and discipline are essential. However, it is less flexible and does not always encourage innovation (Dwiri & al., 2021).

B. Dwiri and K. Okatan explains that a leader's effectiveness is measured by his ability to produce measurable results, his management of relations with employees and stakeholders, and the way he/she adapts his/her leadership to the needs of the organisation. The quality of the relationship between the leader and his or her team is a key factor in this effectiveness. Transformational leadership is based on a balance of power that is more participative than transactional leadership, placing the emphasis on motivation and recognition, which create a positive and motivating work environment that boosts satisfaction and commitment of the employees. Women are perceived as better change leaders, thanks to their higher propensity for transformational leadership, which has a positive influence on organisational dynamics and employee perceptions (Dwiri & al., 2021).

2.5. The influence of gender on the implementation and communication of ESG initiatives

- Gender influence on the implementation of ESG initiatives

A key component of the leader role is decision-making. Decision-making is the act of choosing between several courses of action when faced with a problem (Dwiri & al., 2021). The aim is to solve the problem by translating the choice made into a behaviour or sequence of actions (Allain, 2013). Decision-making by women and men takes different forms. Women prefer decisions based on cooperation and communication, thus fostering a climate of trust and better team integration. Men, on the other hand, focus more on immediate results, with less emphasis on interpersonal relationships. Consequently, a diversity of decision-making styles can be an asset to a company, balancing purposeful and collaborative approaches (Dwiri & al., 2021), which is relevant in the context of ESG initiatives.

In their paper, C. Glass, A. Cook and A. R. Ingersoll (2015) show that women executives have a positive impact on corporate social responsibility (CSR), both socially and environmentally. In fact, companies run by women invest more in protecting the environment. Greater gender diversity would also improve the quality of sustainable reporting. Regarding, women leaders attach greater importance to the social performance of their companies. They have a positive influence on inclusiveness and equality and are more committed to tackling social injustice (Glass, Cook & Ingersoll, 2015).

Women, who are often associated with qualities such as ethics, empathy, and compassion, are more sensitive to collective well-being, which encourages greater commitment to the environment, social issues and positive impact investments. They also attach greater importance to moral issues, transparency, and the fight against fraud (Dawar & Singh, 2016). In addition, their aversion to risk leads them to adopt preventive strategies to deal with the growing consequences of unsustainable practices, such as sanctions or additional financial costs (Yahya, 2023). In terms of governance, their presence on boards encourages communication, participative leadership, and involvement in decision-making, particularly on ethical and sustainable issues, through more active participation in meetings and better transmission of values internally (Saeed, Riaz & Liedong, 2022).

However, even if we could conclude that women would be much more inclined to introduce and prioritise ESG dimensions than men, R. Manita and al. indicate that there is no significant difference between men and women in the management of environmental, social and governance criteria. Although women are often associated with more responsible management, the reality can vary from company to company and from context to context (Manita & al., 2018).

- Gender impacts on communication of ESG initiatives

The difference in ESG prioritisation is in the disclosure and communication of a company's ESG commitments. This section explores the communication of a company's ESG initiatives, looking at the credibility of the messages as well as market trust, messages perception and stakeholders' responses.

Efficient communication of ESG commitments has become an essential strategic pillar for companies and help to strengthen transparency, ensure stakeholder confidence, and meet new the regulatory requirements such as the CSRD (Corporate Sustainability Reporting Directive) in Europe. Responsible communication is not limited to highlighting a few specific initiatives but is part of a real commitment to sustainability and consistency. This approach aims to reduce negative externalities, combat greenwashing, unite employees around a common project and encourage sustainable behaviour among consumers (Center for Sustainability and Excellence, 2025). An essential factor in the successful reception of a company's CSR messages is the level of confidence or scepticism the consumers and investors have towards the company. This credibility shapes consumers/investors' expectations regarding the company's behaviour. According to F.E. Bown et al. six elements influenced these perceptions: transparency, the relevance of shared information, objectivity, messages consistency and tone (Bown, Fetscherin, Painter & Raghavendra, 2024).

To communicate successfully on the ESG dimensions, it is first necessary to be transparent, by publishing clear and verifiable information on the actions taken and their impact (Center for Sustainability and Excellence, 2025). It is important to set concrete and measurable objectives to demonstrate a progressive and realistic commitment. It is essential to align communication with the company's values to avoid contradictions that could compromise the company's credibility (Giri, 2004). The message must also be adapted to each target audience, for example, sharing information about investment and profitability to shareholders, social impact to consumers and well-being to employees. Finally, it is essential to avoid exaggeration and adopt a humble attitude to the challenges ahead (Center for Sustainability and Excellence, 2025).

The way messages are communicated is shaped by the leaders' communication style, which can be influenced by his or her gender (Giri, 2004). This makes it particularly relevant to examine how gender impacts communications and the distinctions that arise from it. Just like leadership styles, men's and women's communication styles differ. Although these differences are not absolute and communication is unique to everyone, they can influence the way in which companies approach the disclosure of their ESG objectives (Merchant, 2012).

Women use communication as a means of creating connections and relationships, which is why they tend to be more empathetic, inclusive, and encouraging cooperation and active listening. Women are also more attentive in discussions and express their emotions more, which makes them more authentic. Women are better communicators, but their moderate approach may be perceived due to negative stereotypes as a lack of confidence (Merchant, 2012).

Men at contrary, are more likely to favour a more direct, assertive, and performance-oriented style, often preferring more competitive and strategic communication. They are perceived as more assertive, which may reinforce their credibility. But their overall approach of communication may seem less collaborative (Merchant, 2012).

We examined, earlier in this research, two leadership styles: transformational leadership, which is used more by women leaders and describes a leader who motivates and inspires employees beyond self-interest for the good of the group, and transactional leadership which is more used by men leader and describes a leadership based on a system of rewards and corrections (Jian & al., 2016). According E-R Crews, M. Brouwers and J. C. Visagie, these two styles of leadership styles affect the communication styles. The result of their research shows that transformational leaders use a clear, structured, well-thought-out communication that improve performance, satisfaction, and goal alignment. The transformational leaders tend to also encourage innovation, even if it is a positive intent it can be seen as too emotional giving too much anxiety and tension. Conversely transactional leaders' communication tends to be result-focused, direct, clear, and less emotionally, this type of communication reduces misunderstandings and conflict (Crews & al., 2019).

Research by Bown & al. showed that female spokespersons tended to elicit less scepticism from interlocutors than their male counterparts. Their study also highlights the fact that consumers are more likely to believe in the sincerity of CSR initiatives when the spokesperson has a gender aligned with the consumer. This phenomenon can be explained by the Credibility theory, which suggests that women are perceived as more credible than men when speaking about CSR engagement (Bown & al., 2024). Female

spokespeople are seen as more trustworthy and less likely to exaggerate CSR statements, making their messages more persuasive. The markets are more likely to be influenced by discourses when they view the messenger as both competent and dependable, and women are judged to be as more credible in the context of ESG disclosure (Harjoto, Laksama & Lee, 2020).

Equity markets tend also to react positively to speeches when they are published by women, which may demonstrate a higher expectation of transparency and sincerity among female leaders. Additionally, because women leaders remain underrepresented in top management position, those who reach a top position are perceived as particularly competent, which builds consumer and investor confidence. Conversely, in situations where confidence needs must be restored after a crisis, male leaders are perceived as more credible, making them more in rebuilding consumers/investors' trust (Bown & al., 2024).

Based on this existing literature, it seems essential to analyse how the gender of the leader influences not only the content of sustainable commitments, but also their communication. This research proposes a first hypothesis divided into three sub-hypotheses analysing the influence of gender on the communication style used in ESG discourse, the influence of gender on the communication of the different ESG dimensions and finally the influence of gender on ESG performance.

Hypothesis 1.1.: The leader's gender influences the communication styles adopted in a company's CSR reports.

Hypothesis 1.2.: The leader's gender influences the communication of the different ESG dimensions.

Hypothesis 1.3.: The leader's gender influences the ESG performance of the company.

2.6. Investors reactions to leaders' gender and ESG implementation and communications

According to the shareholder theory, corporate governance has been guided by the shareholders theory, which explains that a company's main responsibility is to maximise

shareholder value. This theory was introduced by Milton Friedman (1970), who stated that “corporate social responsibility is to increase profits”. Company directors are the agents of shareholders and must focus their efforts on maximising profitability and stock market value (Friedman, 1970).

A shareholder, also known as stockholder, is a person who holds at least one share in a company. Being a shareholder of a company confers certain rights and responsibilities including voting rights, access to financial information and receiving dividends when profits are made and distributed. They may be owners, but they are not necessarily involved in the life of the company daily, which is the duty of the CEO and the company manager (Jensen & Mecking, 1976).

Initially, shareholders were wealthy individuals or influential families who invested in companies to share in the profits. During the period of industrialisation, the need for greater amounts of capital led shareholders to become key financial players for the industry. This view has dominated corporate governance for decades, particularly with the rise of financial capitalism and the financialization of companies. Over time, globalisation and financial market increased investors' expectations towards companies requiring transparency and communication (Hoffmann, Tietz & Hammann, 2018). However, with the evolution of corporate objectives and the rise of ESG criteria, shareholder theory is now being challenged, shifting towards new corporate objectives such as responsible governance and sustainable finance. This has led to a higher demand for transparency and communication between shareholders and companies (Barko, Cremers & Renneboog, 2022).

Financial communication is an essential aspect of the relationship between a company and its shareholders. It refers to a set of strategies and practices used by a company to communicate with their shareholders and investors. The main objectives are to ensure the transparency and regulatory compliance, attract investors by demonstrating financial stability and growth prospects, managing company reputation, and finally influencing the decisions of the shareholders and investors to stabilize or increase the share value (Hoffmann & Straub, 2025).

Financial communication can be extended to CSR communication, as both involve the disclosure of strategic information to stakeholders, in particular investors and shareholders. This type of communication is better known as non-financial communication or ESG reporting and with the increasing number of investors that include ESG criteria in their investment decision, companies are now required to communicate on their commitment to sustainable development, environmental and social management, and corporate governance. (Hockerts, & Moir, 2004).

Investors' interest in ESG criteria has transformed the traditional and historical investment approach, changing business model and financial mechanisms. Companies that prioritise sustainability benefit from increased value creation, as investors use the ESG criteria to reduce risks, identify growth opportunities and enhance both efficiency and profitability (Hockerts, & al., 2004).

Since ESG practices have become a central element in investors' strategies for financing companies. Investors are looking for companies committed to sustainable, ethical and environmentally friendly practices. ESG data makes it easier to assess company performance. That is why investors assess companies based on the three primary criteria of ESG. They check the impact of the companies on climate change, resource efficiency and ecological sustainability. But that's not all, they look at the impact on society through criteria such as diversity, inclusion, employee well-being and ethical labour practices and finally they control the governance practices mainly in terms of corporate leadership, executive remuneration, board diversity and responsiveness to shareholders concerns (Rounok, Qian & Alam, 2023).

Clear and effective communication on these issues plays a crucial role in the decision-making of market players, particularly investors and shareholders. Transparent and well-structured communication influence investors' decision-making and improves the overall perception of the company's long-term stability and viability. Institutional investors and banks prefer to finance companies perceived as responsible, as they are less exposed to regulatory risks, scandals, and boycotts (Ernst, Kunz & Fischer, 2025).

The motivation behind this trend is related to several factors such as financial interest, competition, business strategy and markets perception. Investments aligned with ESG criteria are considered more dependable, stable, and secure. In addition, these initiatives

have a direct impact on stock market valuations, as effective disclosure reduces investor uncertainty and stabilizes share prices. In this sense, a well-designed CSR communications strategy goes beyond simply meeting stakeholder expectations: it becomes a powerful tool for building trust and improving a company's financial performance (Zheng, 2024).

As previously discussed, in this thesis, CSR disclosure is influenced by the leader's gender, which in turn shapes the stakeholder's perception. According to Y. AlJanaidi, female leadership style improves may improve disclosure quality, as they are seen as more ethical, transparent, socially responsible and responsive to stakeholders than their male counterpart. In fact, their leadership style tends to be more cautious and ethical, which enhances and reinforces confidence and the relationship with shareholders (AlJanadi, 2025).

However, despite these findings, negative stereotypes are persistent, and some investors may still trust male leaders more associating them with superior financial and business management skills (Eagly & Carli, 2007). Furthermore, women are seen as most risk-averse and perceived as less likely to engage in excessive risk-taking, which can affect their decision-making and be seen as a lack of authority and therefore negatively influenced the shareholders and investor trust (AlJanadi, 2025).

Nevertheless, this trend is evolving as ESG values emphasize diversity and inclusion in corporate governance. CSR communication aligns with leadership styles traditionally associated with women, promoting ethics, inclusion, and sustainability. Research supports this, showing that female CEOs are more likely to implement ambitious CSR strategies and communicate these initiatives effectively, building stakeholder trust (Glass & al., 2016).

After demonstrating the importance of communicating ESG performance and initiatives, and the influence of gender on communication style and message reception, this section focuses on communication and relations with the investors. According to the shareholders theory, historically the company's primary mission was to maximise shareholder value (Friedman, 1970). However, this paradigm is increasingly being challenged in favour of a more responsible and inclusive approach, integrating societal

and environmental expectations (Hoffmann & al., 2018). In this new context, ESG communication is becoming a strategic tool, not only for attracting financing, but also for establishing the legitimacy and credibility of companies. The role of the company's CEO becomes decisive, as his or her leadership style and communication style have a major influence on how investors perceive the company (Center for Sustainability and Excellence, 2025). The style of communication and the way in which ESG dimensions are communicated, whether environmental, social, or governance-related, can influence investor confidence and commitment. Similarly, a company's actual ESG performance could improve investor reactions. To verify these reflections, this research proposes a second hypothesis divided in three sub-hypotheses to analyse these dynamics of influence.

Hypothesis 2.1.: The communication styles influence investors' reaction.

Hypothesis 2.2.: The communication of the different ESG dimensions influences investors' reaction.

Hypothesis 2.3: The ESG performance enhances investors' reaction.

3. Methodology

3.1. Data

For this study, we collected company-level accounting data from COMPUSTAT, which provides detailed financial information on North American companies listed on the stock exchange since the 1950s. Stock market data was taken from the CRSP database (Center for Research in Security Prices). Analyst forecasts, in particular the number of analysts (NoA), are taken from the IBES database (Institutional Brokers' Estimate System), which groups together financial analysts' estimates of the future earnings of listed companies.

Information on the gender composition of boards of directors comes from the ExecuComp database, which provides detailed data on company directors, including their remuneration and other demographic characteristics.

Finally, ESG reports are collected from various online sources, such as CSRwire.com, CorporateRegister.com, GlobalReporting.org, SocialFunds.com, BusinessWire.com, as well as the companies' own websites.

3.2. Analytical strategies

This study explores the relationships between the gender composition of boards of directors, the communication style of companies in their CSR reports, the communication of environmental, social and governance dimensions, the ESG performance and the reaction of investors. Our approach consists of studying three hypotheses tested using linear multiple regressions.

The first hypothesis is made up of three sub-hypotheses. The first sub-hypothesis examines the impact of gender on the communication style used in CSR reports. The dependent variables for this test are the transformational and transactional communication styles, identified using text mining on CSR reports and transformed into logarithms to correct the skewness, and the independent variable is the number of women and the number of men on boards of directors.

$$\text{Transactional} = \beta_0 + \beta_1 \cdot \text{NbFemale} + \beta_2 \cdot \text{NbMale} + \beta_3 \cdot \text{SIZE} + \beta_4 \cdot \text{Industry} + \beta_5 \cdot \text{Year} + \beta_6 \cdot \text{BUSsegment} + \beta_7 \cdot \text{Geosegment} + \beta_8 \cdot \text{ROA} + \beta_9 \cdot \text{Tobin} + \beta_{10} \cdot \text{NoA} + \beta_{11} \cdot \text{NbWords} + \varepsilon$$

$$\text{Transformational} = \beta_0 + \beta_1 \cdot \text{NbFemale} + \beta_2 \cdot \text{NbMale} + \beta_3 \cdot \text{SIZE} + \beta_4 \cdot \text{Industry} + \beta_5 \cdot \text{Year} + \beta_6 \cdot \text{BUSsegment} + \beta_7 \cdot \text{Geosegment} + \beta_8 \cdot \text{ROA} + \beta_9 \cdot \text{Tobin} + \beta_{10} \cdot \text{NoA} + \beta_{11} \cdot \text{NbWords} + \varepsilon$$

The second sub-hypothesis assesses the influence of gender on the communication of the environmental, social and governance dimensions separately in CSR reports. The dependent variables are the scores on ESG criteria, identified using text mining and transformed into logarithms to avoid skewness. The independent variable, as for the first sub-hypothesis, remains the total number of men and women on boards of directors.

$$\text{Environment} = \beta_0 + \beta_1 \cdot \text{NbFemale} + \beta_2 \cdot \text{NbMale} + \beta_3 \cdot \text{SIZE} + \beta_4 \cdot \text{Industry} + \beta_5 \cdot \text{Year} + \beta_6 \cdot \text{BUSsegment} + \beta_7 \cdot \text{Geosegment} + \beta_8 \cdot \text{ROA} + \beta_9 \cdot \text{Tobin} + \beta_{10} \cdot \text{LEV} + \beta_{11} \cdot \text{RD} + \beta_{12} \cdot \text{NoA} + \beta_{13} \cdot \text{NbWords} + \varepsilon$$

$$\text{Social} = \beta_0 + \beta_1 \cdot \text{NbFemale} + \beta_2 \cdot \text{NbMale} + \beta_3 \cdot \text{SIZE} + \beta_4 \cdot \text{Industry} + \beta_5 \cdot \text{Year} + \beta_6 \cdot \text{BUSsegment} + \beta_7 \cdot \text{Geosegment} + \beta_8 \cdot \text{ROA} + \beta_9 \cdot \text{Tobin} + \beta_{10} \cdot \text{LEV} + \beta_{11} \cdot \text{RD} + \beta_{12} \cdot \text{NoA} + \beta_{13} \cdot \text{NbWords} + \varepsilon$$

$$\text{Governance} = \beta_0 + \beta_1 \cdot \text{NbFemale} + \beta_2 \cdot \text{NbMale} + \beta_3 \cdot \text{SIZE} + \beta_4 \cdot \text{Industry} + \beta_5 \cdot \text{Year} + \beta_6 \cdot \text{BUSsegment} + \beta_7 \cdot \text{Geosegment} + \beta_8 \cdot \text{ROA} + \beta_9 \cdot \text{Tobin} + \beta_{10} \cdot \text{LEV} + \beta_{11} \cdot \text{RD} + \beta_{12} \cdot \text{NoA} + \beta_{13} \cdot \text{NbWords} + \varepsilon$$

The last sub-hypothesis of the first hypothesis will explore the influence of the gender on the ESG performance. We will use as the dependent variable, the ESG score calculated by the MSCI and the independent variables are the number of male and female in the boards.

$$\text{ESGscore} = \beta_0 + \beta_1 \cdot \text{NbFemale} + \beta_2 \cdot \text{NbMale} + \beta_3 \cdot \text{SIZE} + \beta_4 \cdot \text{Industry} + \beta_5 \cdot \text{Year} + \beta_6 \cdot \text{BUSsegment} + \beta_7 \cdot \text{Geosegment} + \beta_8 \cdot \text{ROA} + \beta_9 \cdot \text{Tobin} + \beta_{10} \cdot \text{LEV} + \beta_{11} \cdot \text{RD} + \beta_{12} \cdot \text{NoA} + \beta_{13} \cdot \text{NbWords} + \varepsilon$$

The second hypothesis is divided in three sub-hypotheses, the first one focuses on the effect of communication on investor reaction, measured by cumulative abnormal returns (CAR) over different time windows (1, 2, 5 and 60 days). For the communication styles, the transformational and transactional variables used also in hypothesis 1, are the independent variables in this equation.

$$CAR1 = \beta_0 + \beta_1 \cdot Transactional + \beta_2 \cdot Transformational + \beta_3 \cdot SIZE + \beta_4 \cdot LIQUID + \beta_5 \cdot NoA + \beta_6 \cdot MOMENTUM + \beta_7 \cdot SURPRISE + \beta_8 \cdot ROA + \beta_9 \cdot Tobin + \beta_{10} \cdot LEV + \beta_{11} \cdot Industry + \beta_{12} \cdot year + \beta_{13} \cdot NbWords + \beta_{14} \cdot BUSsegment + \beta_{15} \cdot GEOsegment + \varepsilon$$

$$CAR2 = \beta_0 + \beta_1 \cdot Transactional + \beta_2 \cdot Transformational + \beta_3 \cdot SIZE + \beta_4 \cdot LIQUID + \beta_5 \cdot NoA + \beta_6 \cdot MOMENTUM + \beta_7 \cdot SURPRISE + \beta_8 \cdot ROA + \beta_9 \cdot Tobin + \beta_{10} \cdot LEV + \beta_{11} \cdot Industry + \beta_{12} \cdot year + \beta_{13} \cdot NbWords + \beta_{14} \cdot BUSsegment + \beta_{15} \cdot GEOsegment + \varepsilon$$

$$CAR5 = \beta_0 + \beta_1 \cdot Transactional + \beta_2 \cdot Transformational + \beta_3 \cdot SIZE + \beta_4 \cdot LIQUID + \beta_5 \cdot NoA + \beta_6 \cdot MOMENTUM + \beta_7 \cdot SURPRISE + \beta_8 \cdot ROA + \beta_9 \cdot Tobin + \beta_{10} \cdot LEV + \beta_{11} \cdot Industry + \beta_{12} \cdot year + \beta_{13} \cdot NbWords + \beta_{14} \cdot BUSsegment + \beta_{15} \cdot GEOsegment + \varepsilon$$

$$CAR60 = \beta_0 + \beta_1 \cdot Transactional + \beta_2 \cdot Transformational + \beta_3 \cdot SIZE + \beta_4 \cdot LIQUID + \beta_5 \cdot NoA + \beta_6 \cdot MOMENTUM + \beta_7 \cdot SURPRISE + \beta_8 \cdot ROA + \beta_9 \cdot Tobin + \beta_{10} \cdot LEV + \beta_{11} \cdot Industry + \beta_{12} \cdot year + \beta_{13} \cdot NbWords + \beta_{14} \cdot BUSsegment + \beta_{15} \cdot GEOsegment + \varepsilon$$

The second sub-hypothesis looks at the influence of the communication of the environmental, social and governance dimension in the CSR report on the investors' reaction, with the dependent variables being the abnormal cumulative return (CAR1, 2, 5 and 60) and the independent variables being the environmental, social and governance variables. For the third sub-hypothesis, we finally test how ESG performance enhances the investors' reaction by using the abnormal cumulative return as the dependent variables and the ESG score given by the MSCI as the independent variables.

$$CAR1 = \beta_0 + \beta_1 \cdot Environment + \beta_2 \cdot Social + \beta_3 \cdot Governance + \beta_4 \cdot ESGscore + \beta_5 \cdot SIZE + \beta_6 \cdot LIQUID + \beta_7 \cdot MOMENTUM + \beta_8 \cdot ROA + \beta_9 \cdot Tobin + \beta_{10} \cdot LEV + \beta_{11} \cdot SURPRISE + \beta_{12} \cdot Industry + \beta_{13} \cdot year + \beta_{14} \cdot NbWords + \beta_{15} \cdot GEOsegment + \beta_{16} \cdot BUSsegment + \beta_{17} \cdot RD + \varepsilon$$

$$CAR2 = \beta_0 + \beta_1 \cdot Environment + \beta_2 \cdot Social + \beta_3 \cdot Governance + \beta_4 \cdot ESGscore + \beta_5 \cdot SIZE + \beta_6 \cdot LIQUID + \beta_7 \cdot MOMENTUM + \beta_8 \cdot ROA + \beta_9 \cdot Tobin + \beta_{10} \cdot LEV + \beta_{11} \cdot SURPRISE + \beta_{12} \cdot Industry + \beta_{13} \cdot year + \beta_{14} \cdot NbWords + \beta_{15} \cdot GEOsegment + \beta_{16} \cdot BUSsegment + \beta_{17} \cdot RD + \varepsilon$$

$$CAR5 = \beta_0 + \beta_1 \cdot Environment + \beta_2 \cdot Social + \beta_3 \cdot Governance + \beta_4 \cdot ESGscore + \beta_5 \cdot SIZE + \beta_6 \cdot LIQUID + \beta_7 \cdot MOMENTUM + \beta_8 \cdot ROA + \beta_9 \cdot Tobin + \beta_{10} \cdot LEV + \beta_{11} \cdot SURPRISE + \beta_{12} \cdot Industry + \beta_{13} \cdot year + \beta_{14} \cdot NbWords + \beta_{15} \cdot GEOsegment + \beta_{16} \cdot BUSsegment + \beta_{17} \cdot RD + \varepsilon$$

$$CAR60 = \beta_0 + \beta_1 \cdot Environment + \beta_2 \cdot Social + \beta_3 \cdot Governance + \beta_4 \cdot ESGscore + \beta_5 \cdot SIZE + \beta_6 \cdot LIQUID + \beta_7 \cdot MOMENTUM + \beta_8 \cdot ROA + \beta_9 \cdot Tobin + \beta_{10} \cdot LEV + \beta_{11} \cdot SURPRISE + \beta_{12} \cdot Industry + \beta_{13} \cdot year + \beta_{14} \cdot NbWords + \beta_{15} \cdot GEOsegment + \beta_{16} \cdot BUSsegment + \beta_{17} \cdot RD + \varepsilon$$

3.3. Variables description

For this study, we identified a set of main variables directly related to our research hypotheses, as well as a set of control variables designed to isolate the specific effects of the main variables by considering other factors likely to influence the results.

- Main Variables

First, we defined the variables for the communication styles, transformational (*Transformational*), used mainly by women, and transactional (*Transactional*), used mainly by men. To identify them, we created and used groups of keywords associated with each style for text mining based on companies' CSR reports (Table 1). The scores obtained are transformed into logarithms (log +1) to correct the asymmetry of the distributions.

For gender, we calculated the total number of women and men sitting on the boards of directors of the various companies to create two variables measuring the number of women (*NbFemale*) and the number of men (*NbMale*).

We use environmental (*Environment*), social (*Social*) and governance (*Governance*) variables in our tests, obtained in the same way as the communication style variables. They are extracted from ESG reports using text mining based on groups of keywords (Table 2), and once the scores have been obtained, they are transformed into logarithms ($\log+1$) to avoid skewness. These variables serve also as indicators of communication, capturing the extent to which these dimensions are mentioned in the texts.

We use a variable showing the ESG score (*ESGscore*) for each company. This score is given by MSCI (Morgan Stanley Capital International), one of the world's leading ESG rating agencies. It is an assessment of a company's ability to manage the risks and opportunities associated with ESG criteria compared with its peers in the same sector. The scores range from AAA, the best, to CCC, the worst (MSCI, 2025). In the database, the ESG score is measured on a scale from one to ten. Contrary to the environmental, social and governance variables, this variable does not rely solely on the CSR reports and is not released at the same period.

Finally, we measure the reaction of investors using the variables *CAR1*, *CAR2*, *CAR5* and *CAR60*, which represent the cumulative abnormal return after the release of the CSR reports at 1, 2, 5 and 60 days. These variables are computed on the basis of the Fama and French three-factor model calibrated to the estimation window of 315 days to 62 days before the date of publication of the CSR reports.

- Control Variables

The inclusion of control variables in regression models is essential to isolate the effect of independent variables on the dependent variable. They help to reduce estimation bias by taking account of other factors likely to influence the dependent variable.

The first control variable is the logarithm of the number of words in the CSR reports (*NbWords*), which controls the length of the text. This is essential because longer reports may contain more keywords, thus affecting the scores obtained by text mining.

Then we have control variables that measure the effects of the size and structure of the companies studied. We have included company size, measured by the logarithm of total assets at the end of a year. We use two control variables for business segments (*BUSsegment*) and geographical areas (*GEOsegment*), which are measured by a logarithm of the number of business segments and a logarithm of the number of geographical segments. We then used the year (*year*) in which the CSR reports were published to control for any temporal effects that might influence the variables dependent on the three hypotheses. Finally, we have the board size (*BoardSize*), which represents the number of board members per company and measure by making the sum of the number of male and female in the database. By using these control variables in our tests, we can reduce the effects of the structural and temporal characteristics of the companies of the variables studied and ensure that the results are not biased by organizational differences.

For financial variables, we use a variable to measure the profitability: the return on assets (*ROA*), which measures how efficiently a company uses its assets to generate profits. We have the firm's Tobin's Q on the year of release of the CSR report (*Tobin*) which is a variable comparing the market value of a company to the replacement value of its assets. A high Tobin may indicate high growth expectations. We use the debt ratio (*LEV*), which measures the proportion of debt in a company's financial structure. We also look at R&D spending with a variable (*RD*) that takes this type of expenditure into account. The inclusion of these control variables is justified to neutralize the effect of performance and financial structure.

Finally, we have variables that control the effects of the market and analysts. First, we have the liquidity (*LIQUID*), which measures the number of shares traded divided by the total number of shares outstanding for the same year. The momentum (*MOMENTUM*), which represents the one-year cumulative abnormal return from the trading day window, where the event is the ESG reporting date. The surprise variable (*SURPRISE*) measures the gap between the actual results and the expectations of the analysts, which are two variables also used to see the effects on investors' reaction. The last control variable used is the number of analysts (*NoA*) which is the natural logarithm of one plus the number of the financial analysts at the end of the same year. In other words, this variable measures the number of financial analysts following a company, which can influence market reaction as wider coverage can lead to faster dissemination of information. The inclusion

of these types of variables, makes it possible to control companies' information environment and market effects, which can bias the perceived impact of ESG reports.

4. Results

4.1. Descriptive statistics

The population studied includes 416 US companies over the period from 2007 to 2020. The total number of CSR report included in the database is 1,667. Regarding the main variables, the number of board members is on an average 4.2 people with a total population of 851 women and 6143 men.

As for the communication styles, the transactional variable has a mean of 4.55 and the transformational variable has a mean of 5.14 (Table 3). The scores are relatively high indicating more engaged communication on ESG issues.

The three dimensions separately have a similar distribution, with first the environment with an average of 5.09, followed by the social dimension with a mean of 3.82 and governance dimension with a mean of 3.69 (Table 3). We can see that the market reaction, represented by the variables CAR1, CAR2, CAR5 and CAR60 have averages close to zero, as expected for abnormal returns (Table 3).

For the control variables, the SIZE variable, which measures the size of the company, is highly dispersed, with a minimum of 219 and a maximum of 268 million, suggesting great diversity in company size. This diversity is also found in the BUSsegment and GEOsegment variables, where there is also great diversity in the sectors of activity and the geographical areas in which the companies operate. Control variables on financial performance, such as ROA, Tobin, LEV and RD, show companies with varied financial profiles, as we can see (Table 4).

We also produced a graph showing a correlation matrix to visualise the correlations between all the variables, main and control. On the horizontal and vertical axes, we have all the variables, and the colours indicate the correlation: very dark blue indicates a high positive correlation, dark red indicates a high negative correlation and white or light areas indicate a correlation close to 0, so little or no correlation between variables (Table 5).

We can observe on this matrix in Table 5 that there is a strong positive correlation between the communication variables; transformational, transactional, environmental,

social, governance, which can be expected as we used the same methods to extract them. This shows that ESG dimensions and communication styles are often presented together in reports. These five variables are also strongly positively correlated with the number of words in CSR reports, which is expected. We can also see that there is a strong positive correlation between the communication variables and the number of males and the number of females in the boards.

Regarding the board size, we observe on Table 5 that there is a strong positive correlation between the number of males and the board size, almost a correlation of 1. Similarly, there is also a positive correlation between the size of the boards and the number of females, but weaker. As the board size variable is constructed by making the sum of the number of females and the number of males, we have a perfect multicollinearity between these variables, therefore it is not statistically appropriate to include them simultaneously in the same regression model.

We have also the variables CAR1, 2, 5, 60 which are correlated with each other, which is expected as they measure similar stock market reactions to the publication of CSR reports (Table 5).

Among the environmental, social and governance variables, as well as the communication style, whether transformational or transactional, and the financial variables (ROA, Tobin, LEV, and RD), we observe low correlations, close to zero, suggesting that ESG scores are not linked to financial performance. We see also that between the financial variables there is a low correlation (Table 5).

We can also see on Table 5 that the control variables measuring the market and analyst effects (MOMENTUM, NoA, LIQUID and SURPRISE) are weakly correlated between the. And between these market variables and the variables corresponding to the different ESG communication, ESG score and the two communication styles, transformational and transactional, have a low correlation, close to zero, suggesting that the ESG initiatives highlighted and the communication style has no real impact on these market variables.

4.2. Presentation of the results

To assess the link between the leader's gender, the communication style used in CSR reports, ESG performance and investor reaction, we carried out a series of multiple linear regression analyses based on our hypothesis. In this section, we will find the results of our testing.

- Hypothesis 1

Hypothesis 1.1. The leader's gender influences the communication styles adopted in company's CSR reports.

For this first sub-hypothesis, the objective is to test whether gender has an influence on the communication style used by companies in CSR reports.

We first test the influence of gender on the transactional style, for which we did not observe on Table 6 any significant results for the number of women and men. However, we can see that certain industries have a significant effect: the extractive industry tends to use a more transactional style, while the financial, pharmaceutical, retail and service industries tend to use this style of communication less in their CSR reports. Finally, we can see that Tobin's Q is also negatively significant, suggesting that companies perceived as performing better economically use a less transactional style.

As for the results for the transformational style, we can see that it is positively significant for both women and men, although the effect for women is stronger than for men, suggesting greater use of this style by women. Then we see that certain industries such as computers, food and pharmaceuticals are significant and have a positive effect, suggesting that they use a more transformational style in their ESG reporting (Table 6).

The year variable is also highly significant and has a positive effect, suggesting that the use of this style in reports increases with the years. Finally, the NoA variable is also highly significant and has a positive effect, suggesting that the more analysts follow the company the more it will use a transformational communication style in these CSR reports (Table 6).

The global quality of the two models is quite good with a R-Squared of 0.862 for the transactional style and of 0.907 for the transformational style. And in the two cases, the models are highly significant ($F\text{-statistic} < 0.001$), indicating that the independent variables allow to explain a great part of the variation of the two communication styles (Table 6).

For this test, we can see that gender plays a significant role in the use of transformational communication style in CSR reports, but not the use of the transactional style. We were also able to observe that women tend to use a more transformational communication style as well as some industries. The time also plays a key role with a positive effect over the years. Finally, the number of analysts following a company tends to increase the use of transformational communication in CSR reports, suggesting a strategic response to external visibility.

Hypothesis 1.2.: The leader's gender influences the communication of the different ESG dimensions.

Hypothesis 1.3.: The leader's gender influences the ESG performance of the company.

For the second sub-hypothesis, the objective is to test the influence of the gender on the communication of the environmental, social and governance dimensions. To do so, we tested the influence of the number of female and the number of male members of the different boards on the environmental, social and governance variables.

For the third hypothesis we look at the influence of the gender on the ESG global performance.

We observed that female leaders are significant and have a positive effect on the social dimension but is not significant for the environmental and governance dimensions (Table 7). They are also highly significant and have a positive effect on the ESG score of the company (Table 8).

Conversely, men have a significant and positive effect on the governance (Table 7) and the ESG score variable (Table 8) but no significant effect on any of the other dimension,

either the environmental, social. The female leaders are highly significant and has a positive effect on the ESG score of the company (Table 8).

The regression models have a quite good global quality, showing that the explicative variables explain well the variation of the dependent variable, except for the ESG score which has a low R-squared. The models are statistically significant (F-statistics < 0.001), indicating that the independent variables contribute significantly to the explanation of the dependent variable (Table 7 & 8).

- Hypothesis 2

The second hypothesis studies first the effect of the communication style, transformational or transactional, then the communication of the ESG dimension separately on the investor's reaction, CAR1, 2, 5, and 60. Finally, we study whether the ESG performance enhance the investors' reaction.

Hypothesis 2.1.: The communication styles influence investors' reaction.

In each model, whether for transformational or transactional communication style, none has a significant effect on the CAR regardless of the period. This suggests that the market doesn't react differently depending on the communication style used by leaders in their CSR reports (Table 9).

However, other control variables such as LIQUID, LEV and the MOMENTUM play a role in CAR1, 2 and CAR60 and their variation. This could indicate that other factors are more important than the communication style in investors' perceptions of ESG announcements (Table 9).

Regarding to the overall quality of the model, we observe that the R-square is low for each model. However, all the models are significant (F-statistic < 0.1), indicating that the independent variables contribute significantly to the explanation of the dependent variables (CAR1, 2, 5 and 60) (Table 9).

Hypothesis 2.2.: The communication of the different ESG dimensions influences investors' reaction.

Hypothesis 2.3: The ESG performance enhances investors' reaction.

Finally, the last two sub-hypothesis of this research focuses, first on the influence of the communication of the ESG dimension in the CSR reports on investors' reaction (CAR). Second, we test how the ESG score enhances the investor reaction (CAR) (Table 10).

Our results show that the communication of the ESG dimensions and the ESG score are not significant overall (Table 10).

Regarding the overall quality of the model, we see that the R-squares are very low, suggesting that the explanatory variables describe very little variance of the dependent variable. However, all models are significant ($F\text{-statistic} < 0.05$), showing that independent variables can explain the dependent variables (Table 10).

4.3. Interpretation of the results

The objective of this study is to analyse the impact of gender on the communication style used in ESG reporting, the ESG communication, as well as on the ESG performance of companies, and to assess how these factors influence the investors' reaction.

The results show that gender significantly influences the transformational communication style, with female leaders using this style more than male leaders. However, no significant gender effect was observed on transactional style. Transformational communication styles also tend to increase over time. We also noticed that this style is more used in CSR reports when the external visibility increases, such as the number of analysts following the company.

In terms of ESG performance, women have a more pronounced effect on the global ESG score, with a significant result for social dimension. Men, on the other hand, have a positive influence on the governance dimension and the ESG score, but weaker than the female leaders. These results suggest different sensitivities according to gender.

Neither communication styles nor ESG scores, environmental, social, governance or ESG score, has a significant effect on the global investor reaction or in the short term or medium term, measured by cumulative abnormal returns (CAR). This indicates that despite more engaged communication or better ESG performance, investors do not

appear to respond differently to these announcements within our sample and study period.

5. Discussions

5.1. Limitations of the research

Despite the rigor of the approach adopted for this research and the robustness of our results, this study has several limitations that it is essential to recognize to interpret the results with nuance.

First, our study is based on reports published between 2007 and 2020 by American companies. At that time, CSR reports were voluntary, so their content was not regulated. Even if it is interesting to study the voluntary communication of companies, we must recognize that there is a bias. Only companies with a strategic interest communicate on their sustainable practices, which may overestimate the real commitment of companies to corporate social responsibility.

Regarding the methodology adopted to define some of our variables, such as communication styles and communication on ESG dimensions, although it is robust for large-scale text analysis, text mining based on groups of keywords remains a simplistic method. It does not capture the meaning of the text in its entirety and may miss the degree of real engagement and emotions in the discourse. In addition, the measurement of words and the lack of contextual analysis can lead to biases in the variables. Other methods such as sentiment analysis, which is a technique for analysing the emotional tone of digital text to identify and interpret the emotions expressed in natural language using statistical tests, better reflect the diversity of styles used.

The variables used to measure market reaction, cumulative abnormal returns (CARs), are a classic measure in finance for capturing the reactions of investors in the short to medium term, more precisely after the announcement of an event, but this has limitations. It assumes an immediate and complete reaction to the new information, whereas in reality some information, such as a company's ESG commitments, can be analysed gradually. The financial markets may also be indifferent to non-financial information.

Finally, although our models incorporate many control variables, certain elements that can influence communications on ESG initiatives have not been included, such as the company's overall strategy, scandals, pressure from local stakeholders, political pressure, or legislations.

5.2. Recommendations for future research

Although this study provides some relevant results on the links between the gender of executives, the style of communication used for ESG messages and investor reaction. Some methodological and contextual limitations were identified and provide new perspectives for future research. This section proposes recommendations for future work, in order to extend the analysis to other regulatory, geographical or socio-cultural contexts. We also suggest adopting other methodologies that would allow new avenues of analysis to be explored using other tools. The goal is to gain a better understanding of how sustainable commitments are constructed, communicated and perceived by stakeholders, whether investors or consumers.

As mentioned, one limitation of this study is that CSR reports published between 2007 and 2020 by companies in the United States were done on a voluntary basis and not legal. Although it is interesting to study the voluntary disclosure of companies and the impact on the reaction of investors. A recommendation for future research would be to replicate this study in a legal context where ESG reporting is mandatory, so that on the one hand we can analyse whether the reporting obligation transforms the communication style used in the reports. The standardization of reports could lead to a standardization of communication, but it can also strengthen the credibility and rigor of these reports. On the other hand, this new study could assess whether investors are becoming more sensitive to mandatory and uniform reporting.

The results show that short to medium term financial market reactions measured with cumulative abnormal returns are not extremely sensitive to the publication of CSR reports. However, there are alternative measures that can also be used to assess investor reaction. In future research, for example, we could study the medium to long-term reaction captured by buy-and-hold abnormal returns (BHAR).

Another point of focus for this recommendation would be to have a more in-depth qualitative analysis of the CSR reports to capture the emotional and implicit dimensions. Indeed, the use of keyword text mining to categorize communication styles into two dimensions, transformational and transactional, is a useful but partial method. Future research on the influences between gender, ESG communication and investor reaction

could employ other types of methods such as sentiment analysis, useful for capturing the emotional dimensions of a text. It would also be interesting to process the text in such a way as to retain only the parts relating to the different ESG dimensions and to analyse precisely the vocabulary and communication used in the sentences or paragraphs mentioning environmental, social or governance aspects separately.

Finally, the unbalanced distribution of male and female CEOs (72 female CEOs vs. 1186 male CEO's) in our sample limited our gender analysis. However, it would be particularly interesting in future research to deepen the impact of CEO on sustainable strategies and communication. This type of function, as seen in the literature review, plays a leading role in the credibility of messages. It would also be relevant to extend the study to other geographical and cultural areas. Beyond the reaction of financial markets, other studies could focus on the impact of gender and communication style on other stakeholders such as consumers, employees, or NGOs.

6. Conclusion

This paper explored the relationship between gender and leadership, communication style and investor response by mobilizing an analytical framework combining statistical methods. Through the study of 416 US companies and 1,667 CSR reports over a period from 2007 to 2020, our findings show that gender partially influences how companies communicate their ESG commitments, as well as the priority given to certain ESG dimensions.

The results show that women on corporate boards are more likely to adopt a transformational style of communication in ESG relationships than men. Women are also more likely to communicate more on social aspects and having a better effect on ESG performance. Conversely, men seem to have a positive effect on communication on the governance in CSR reports and also a positive effect on the ESG performance, but weaker than female leaders. These differences suggest that there is a difference in their ways of communicating on ESG dimensions in CSR reports. Finally, we can see that even if they have a positive effect on the ESG performance, women tend to have better results.

Regarding the analysis of the investor reaction to communication of the ESG dimensions used in CSR reports and the ESG performance, our findings show that these variations in communication or performance do not have a significant effect on investors' reaction and do not generate movement at the level of short-term financial markets. These results raise questions about the real importance that investors attach to sustainable dimensions in their investments, but it also raises questions about the real scope of non-financial communication when it is not done within a legal framework.

For future research, several tracks are recommended, in a first time it would be relevant to reproduce this study in a regulatory context, as in Europe with the CSRD framework law, to assess the effects of a legal framework and leadership type on ESG communication and investor reaction. It would also be interesting to use alternative measures of abnormal cumulative returns to measure the effects of long-term effects reaction, as well as more advanced qualitative approaches to better understand emotional dimensions in ESG relationships. Finally, broadening the study to include other leadership functions such as CEOs, as well as other geographic and cultural contexts would allow for a more

refined analysis of the link between gender, sustainable communication, and financial markets.

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Appendices

Table 1 – Keywords used in the text mining for the Transformational and Transactional variables.

Transformational	Transactional
Vision	Results
Inspire	Performance
Inspiring	Efficiency
Future	KPI
Long-term	ROI
Mission	Target
Purpose	Objective
Innovation	Milestone
Transformation	Cost reduction
Evolve	Growth
Evolving	Strategy
Ambition	Execution
Dream	operations
Progress	Monitor
Together	Discipline
Team	Risk management
Collaboration	structure
Inclusive	Audit
Inclusivity	Reporting
Diversity	Accountability
Belonging	Oversight
Shared goals	Deliverables
Listen	Compliance
Listening	Quarter
Support	Earnings
Respect	Forecast
Engagement	Shareholder value
Care	Profitability
Caring	Market performance
Well-being	
Responsibility	
Empathy	
Ethics	
Community	
Social impact	
Human	
Humanity	

Table 2 – Keywords used in the text mining for the Environmental, Social and Governance variables.

Environmental	Social	Governance
Carbon	Diversity	Board
Emissions	Inclusion	Board diversity
Greenhouse	Equity	Independent director
GHG	DEI	Executive compensation
Climate	Employee wellbeing	Audit committee
Climate change	Well-being	Governance
Renewable	Health and safety	Ethics
Energy	Workplace safety	Compliance
Energy efficiency	Labor rights	Risk management
Solar	Child labour	Anti-corruption
Wind	Fair wages	Anti-bribery
Recycling	Living wage	Code of conduct
Biodiversity	Training	Whistleblower
Sustainability	Human rights	Internal controls
Sustainable	Equal opportunity	Shareholder rights
Environment	Community engagement	Transparency
Pollution	Philanthropy	Data privacy
Water use	Volunteering	Cyber security
Waste	Donations	Corporate governance
Environmental impact	Education	Regulatory compliance
Net zero	Supplier diversity	Tax transparency
Carbon footprint	Gender equality	Stakeholder engagement
Eco-friendly	Women in leadership	Financial disclosure
Deforestation	Mental health	Business ethics
Air quality	Employee benefit	ESG oversight
Natural resources	Workplace culture	Succession planning
Resource efficiency	Employee satisfaction	Fiduciary duty
Supply chain emissions	Non-discrimination	Governance framework
Clean energy	Social impact	Conflict of interest
Carbon neutrality	Inclusive hiring	
Environmental protection	Accessibility	

Table 3 – Descriptive statistics for Main variables

<i>Main Variables</i>	<i>Min</i>	<i>Q1</i>	<i>Median</i>	<i>Mean</i>	<i>SD</i>	<i>Q3</i>	<i>Max</i>
<i>Transformational</i>	0.000	4.510	5.323	5.141	1.243	6.042	7.828
<i>Transactional</i>	0.000	3.828	4.727	4.548	1.288	5.463	7.249
<i>NbFemale</i>	0.000	0.000	0.000	0.512	0.772	1.000	6.000
<i>NbMale</i>	0.000	2.750	5.000	3.700	2.264	5.000	10.000
<i>Environment</i>	0.000	4.442	5.273	5.091	1.305	5.979	8.000
<i>Social</i>	0.000	2.995	4.078	3.824	1.386	4.868	6.667
<i>Governance</i>	0.000	2.708	3.979	3.692	1.471	4.804	6.669
<i>ESG score</i>	0.000	3.730	5.400	5.297	2.228	6.900	10.000
<i>CAR1</i>	-0.191	-0.010	0.000	0.000	0.022	0.010	0.145
<i>CAR2</i>	-0.185	-0.012	0.000	0.001	0.029	0.013	0.227
<i>CAR5</i>	-0.234	-0.021	0.000	0.000	0.041	0.020	0.225
<i>CAR60</i>	-0.610	-0.052	-0.001	-0.001	0.117	0.048	0.641

Table 4 – Statistic descriptive for Control Variables

<i>Variables</i>	<i>Min</i>	<i>Q1</i>	<i>Median</i>	<i>Mean</i>	<i>SD</i>	<i>Q3</i>	<i>Max</i>
<i>Year</i>	2007	2013	2016	2015	3	2018	2020
<i>SIZE</i>	218.83	6700.15	17983.51	72455.91	237729.26	48113.5	2687379.0
<i>BUSsegment</i>	0.000	0.000	1.386	1.496	1.063	2.441	3.433
<i>GEOsegment</i>	0.000	1.098	1.945	1.746	1.038	2.564	3.951
<i>ROA</i>	-29.575	2.769	5.921	6.604	6.280	9.763	34.931
<i>NoA</i>	3.000	11.000	15.000	15.711	7.182	20.000	47.000
<i>Tobin</i>	0.597	1.287	1.761	2.160	1.352	2.540	13.586
<i>LEV</i>	0.000	14.962	26.083	27.400	16.127	37.925	100.095
<i>RD</i>	0.000	0.000	0.474	4.289	7.111	5.396	40.060
<i>LIQUID</i>	0.067	1.325	1.793	2.213	1.536	2.646	20.477
<i>MOMENTUM</i>	-3.365	-0.230	-0.004	-0.011	0.484	0.184	2.281
<i>SURPRISE</i>	-0.180	0.000	0.000	0.001	0.006	0.001	0.047
<i>NbWords</i>	0.693	8.424	9.243	9.058	1.237	9.906	11.709
<i>BoardSize</i>	0.000	4.000	5.000	4.213	2.487	6.000	10.000

Table 5 – Matrix of Correlation with Main and Control Variables.

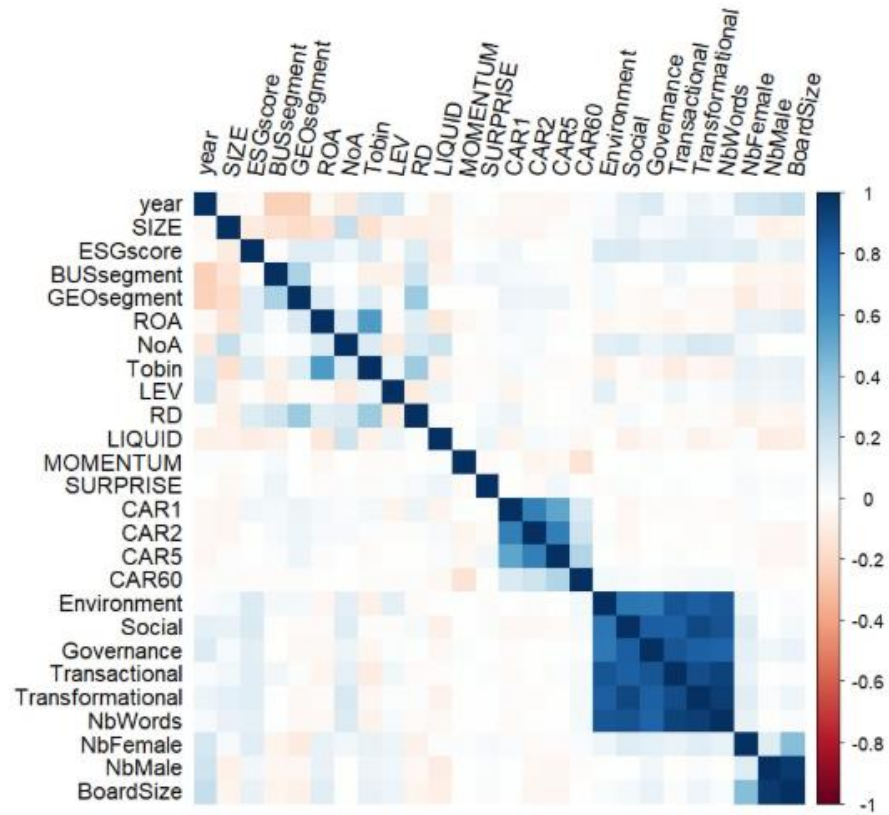


Table 6 – Regression results for the gender variables and communication styles variables.

<i>Variables</i>	<i>Transactional</i>		<i>Transformational</i>	
	Estimate	P-value	Estimate	P-value
<i>(Intercept)</i>	-10.85	0.174	-36.11	0.000***
<i>NbFemale</i>	0.0154	0.337	0.042	0.001**
<i>NbMale</i>	-0.002	0.739	0.013	0.003**
<i>SIZE</i>	0.000	0.685	0.000	0.235
<i>IndustryComputers</i>	-0.074	0.271	0.111	0.038*
<i>IndustryDurable manufacturers</i>	-0.012	0.865	0.000	0.999
<i>IndustryExtractive industries</i>	0.229	0.007**	-0.095	0.166
<i>IndustryFinancial institutions</i>	-0.319	0.000***	0.079	0.179
<i>IndustryFood</i>	-0.061	0.403	0.115	0.049
<i>IndustryInsurance and real estate</i>	0.059	0.510	-0.008	0.903
<i>IndustryMining and Construction</i>	-0.025	0.823	-0.139	0.121
<i>IndustryOthers</i>	0.090	0.793	-0.178	0.518
<i>IndustryPharmaceuticals</i>	-0.220	0.003**	0.188	0.002**
<i>IndustryRetail</i>	-0.181	0.009**	0.026	0.631
<i>IndustryServices</i>	-0.191	0.018*	0.033	0.611
<i>IndustryTextiles, printing and publishing</i>	-0.094	0.253	0.032	0.626
<i>IndustryTransportation</i>	0.039	0.616	-0.053	0.387
<i>IndustryUtilities</i>	-0.016	0.840	-0.093	0.149
<i>Year</i>	0.004	0.392	0.016	0.000***
<i>BUSsegment</i>	0.024	0.064°	0.015	0.147
<i>GEOsegment</i>	0.029	0.056°	0.009	0.419
<i>ROA</i>	0.000	0.885	-0.0004	0.814
<i>Tobin</i>	-0.036	0.002**	-0.008	0.381
<i>NoA</i>	-0.002	0.253	0.006	0.000***
<i>NbWords</i>	0.957	0.000***	0.944	0.000***

Signif. Codes: 0 '***', 0.001 '**', 0.05 '*', 0.1 '°' and 1 ''

Transactional:

Multiple R-squared: 0.864

Adjusted R-squared: 0.862

F-statistic: 432.9 on 24 and 1,635 DF, p-value: 0.000

Transformational:

Multiple R-squared: 0.9074

Adjusted R-squared: 0.906

F-statistic: 667.5 on 24 and 1,635 DF, p-value: 0.000

Table 7 – Regression results for the gender variables and ESG communication variables.

- Environment

<i>Variables</i>	<i>Environment</i>	
	Estimate	P-value
<i>(Intercept)</i>	-12.210000	0.24070000
<i>NbFemale</i>	0.012780	0.06724000°
<i>NbMale</i>	-0.016650	0.42064100
<i>SIZE</i>	0.000000	0.31459900
<i>IndustryComputers</i>	-0.298100	0.00167800**
<i>IndustryDurable manufacturers</i>	-0.164100	0.04560600*
<i>IndustryExtractive industries</i>	-0.188000	0.08990900°
<i>IndustryFinancial institutions</i>	-0.663000	0.00000004***
<i>IndustryFood</i>	-0.318400	0.00073500***
<i>IndustryInsurance and real estate</i>	0.163100	0.15742600
<i>IndustryMining and Construction</i>	-0.005259	0.97098800
<i>IndustryOthers</i>	0.349000	0.42876500
<i>IndustryPharmaceuticals</i>	-0.569600	0.00000041***
<i>IndustryRetail</i>	-0.393200	0.00000921***
<i>IndustryServices</i>	-0.610800	0.00000052***
<i>IndustryTextiles, printing and publishing</i>	0.142800	0.17603100
<i>IndustryTransportation</i>	-0.461100	0.00000369***
<i>IndustryUtilities</i>	0.342400	0.00100700**
<i>Year</i>	0.004558	0.37800800
<i>BUSsegment</i>	-0.000635	0.96934200
<i>GEOsegment</i>	0.063840	0.00069800***
<i>ROA</i>	-0.001632	0.60275000
<i>Tobin</i>	-0.024320	0.11217400
<i>LEV</i>	0.001793	0.09610000°
<i>RD</i>	0.000382	0.91858200
<i>NoA</i>	0.009685	0.00014900***
<i>NbWords</i>	0.894700	0.00000000***

Signif. Codes: 0 '***', 0.001 '**', 0.05 '*', 0.1 '°' and 1 ''

Multiple R-squared: 0.7832

Adjusted R-squared: 0.7797

F-statistic: 226.8 on 26 and 1,633 DF, p-value: 0.000

- Social

<i>Variables</i>	<i>Social</i>	
	Estimate	P-value
<i>(Intercept)</i>	-63.020000	0.00000003***
<i>NbFemale</i>	0.076630	0.00068000***
<i>NbMale</i>	-0.000061	0.99356700
<i>SIZE</i>	0.000000	0.64903100
<i>IndustryComputers</i>	0.166800	0.10620800
<i>IndustryDurable manufacturers</i>	-0.198800	0.02622100*
<i>IndustryExtractive industries</i>	0.118300	0.32705200
<i>IndustryFinancial institutions</i>	0.220900	0.04179000*
<i>IndustryFood</i>	0.085270	0.40569400
<i>IndustryInsurance and real estate</i>	-0.052240	0.67754500
<i>IndustryMining and Construction</i>	-0.395900	0.01202700*
<i>IndustryOthers</i>	-0.465200	0.33295100
<i>IndustryPharmaceuticals</i>	-0.240100	0.04921700*
<i>IndustryRetail</i>	0.080130	0.40530100
<i>IndustryServices</i>	0.002237	0.98425100
<i>IndustryTextiles, printing and publishing</i>	-0.046250	0.68736200
<i>IndustryTransportation</i>	-0.042190	0.69646900
<i>IndustryUtilities</i>	-0.385500	0.00067800***
<i>Year</i>	0.028820	0.00000034***
<i>BUSsegment</i>	0.011690	0.51588100
<i>GEOsegment</i>	0.038210	0.06217400°
<i>ROA</i>	-0.000536	0.87522100
<i>Tobin</i>	0.007435	0.65560900
<i>LEV</i>	-0.003153	0.00725200**
<i>RD</i>	0.011100	0.00639300**
<i>NoA</i>	-0.004990	0.07235300°
<i>NbWords</i>	0.966800	0.00000000***

Signif. Codes: 0 '***', 0.001 '**', 0.05 '*', 0.1 '°' and 1 ''

Multiple R-squared: 0.7719

Adjusted R-squared: 0.7683

F-statistic: 212.6 on 26 and 1,633 DF, p-value: 0.000

- Governance

Variables	Governance	
	Estimate	P-value
<i>(Intercept)</i>	-103.800000	0.00000000***
<i>NbFemale</i>	0.033320	0.24113400
<i>NbMale</i>	0.023970	0.01257100*
<i>SIZE</i>	-0.000000	0.02991400*
<i>IndustryComputers</i>	0.250900	0.05416600°
<i>IndustryDurable manufacturers</i>	0.023540	0.83470100
<i>IndustryExtractive industries</i>	0.323300	0.03395200*
<i>IndustryFinancial institutions</i>	0.255700	0.06187000°
<i>IndustryFood</i>	0.041020	0.75125300
<i>IndustryInsurance and real estate</i>	0.556800	0.00045700***
<i>IndustryMining and Construction</i>	-0.177200	0.37282100
<i>IndustryOthers</i>	-0.160400	0.79140700
<i>IndustryPharmaceuticals</i>	-0.148300	0.33554800
<i>IndustryRetail</i>	0.105200	0.38669900
<i>IndustryServices</i>	-0.054830	0.70146500
<i>IndustryTextiles, printing and publishing</i>	0.077950	0.59101300
<i>IndustryTransportation</i>	0.086660	0.52557900
<i>IndustryUtilities</i>	0.015700	0.91252900
<i>Year</i>	0.048980	0.00000000***
<i>BUSsegment</i>	0.007924	0.72708400
<i>GEOsegment</i>	0.038180	0.13968400
<i>ROA</i>	0.004359	0.31193400
<i>Tobin</i>	-0.029110	0.16658200
<i>LEV</i>	-0.002061	0.16414000
<i>RD</i>	0.007850	0.12628900
<i>NoA</i>	-0.008414	0.01640900*
<i>NbWords</i>	0.964000	0.00000000***

Signif. Codes: 0 '***', 0.001 '**', 0.05 '*', 0.1 '°' and 1 ''

Multiple R-squared: 0.6776

Adjusted R-squared: 0.6725

F-statistic: 132 on 26 and 1,633 DF, p-value: 0.000

Table 8 – Regression results for the gender variables and ESG performance variable.

<i>Variables</i>	<i>ESG Score</i>	
	Estimate	P-value
<i>(Intercept)</i>	80.250000	0.02467000*
<i>NbFemale</i>	0.329400	0.00000364***
<i>NbMale</i>	0.054990	0.02171000*
<i>SIZE</i>	-0.000001	0.00043800***
<i>IndustryComputers</i>	1.371000	0.00002580***
<i>IndustryDurable manufacturers</i>	1.179000	0.00002950***
<i>IndustryExtractive industries</i>	1.434000	0.00016600***
<i>IndustryFinancial institutions</i>	1.069000	0.00176500**
<i>IndustryFood</i>	1.460000	0.00000652***
<i>IndustryInsurance and real estate</i>	1.202000	0.00240400**
<i>IndustryMining and Construction</i>	-0.309200	0.53292100
<i>IndustryOthers</i>	3.411000	0.02424800*
<i>IndustryPharmaceuticals</i>	0.197300	0.60743200
<i>IndustryRetail</i>	1.170000	0.00011700***
<i>IndustryServices</i>	0.402600	0.25930000
<i>IndustryTextiles, printing and publishing</i>	2.158000	0.00000000***
<i>IndustryTransportation</i>	1.006000	0.00318400**
<i>IndustryUtilities</i>	1.540000	0.00001650***
<i>Year</i>	-0.039050	0.02772300*
<i>BUSsegment</i>	-0.214800	0.00015400***
<i>GEOsegment</i>	0.185100	0.00413400**
<i>ROA</i>	0.016810	0.11802800
<i>Tobin</i>	0.079360	0.13067800
<i>LEV</i>	-0.003227	0.38234400
<i>RD</i>	0.037990	0.00304500**
<i>NoA</i>	0.001972	0.82146800
<i>NbWords</i>	0.214000	0.00000079***

Signif. Codes: 0 '***', 0.001 '**', 0.05 '*', 0.1 '°' and 1 ''

Multiple R-squared: 0.1267

Adjusted R-squared: 0.1128

F-statistic: 9,109 on 26 and 1,633 DF, p-value: 0.000

Table 9 – Regression results for the communication style variables and investors' reaction variables.

<i>Variables</i>	<i>CAR1</i>		<i>CAR2</i>	
	Estimate	P-value	Estimate	P-value
<i>(Intercept)</i>	0.308700	0.3763	0.273900	0.5615
<i>Transactional</i>	0.000239	0.8325	0.000205	0.8930
<i>Transformational</i>	0.000786	0.5795	-0.001835	0.3386
<i>SIZE</i>	-0.000000	0.5636	-0.000000	0.4769
<i>LIQUID</i>	-0.000985	0.0139*	0.000321	0.5529
<i>NoA</i>	0.000166	0.0698°	0.000136	0.2701
<i>MOMENTUM</i>	0.000263	0.8115	-0.003565	0.0170*
<i>SURPRISE</i>	-0.021010	0.8121	-0.209400	0.0801°
<i>ROA</i>	0.000012	0.9139	0.000029	0.8456
<i>Tobin</i>	0.000098	0.8507	-0.000370	0.5981
<i>LEV</i>	-0.000081	0.0323*	-0.000031	0.5425
<i>IndustryComputers</i>	0.000469	0.8777	0.002683	0.5147
<i>IndustryDurable manufacturers</i>	0.001576	0.5786	0.007253	0.0588°
<i>IndustryExtractive industries</i>	0.000657	0.8666	0.003488	0.5097
<i>IndustryFinancial institutions</i>	-0.005827	0.0839°	-0.003291	0.4702
<i>IndustryFood</i>	-0.000480	0.8843	-0.002035	0.6485
<i>IndustryInsurance and real estate</i>	-0.000568	0.8881	0.000360	0.9473
<i>IndustryMining and Construction</i>	-0.004502	0.3876	-0.009269	0.1884
<i>IndustryOthers</i>	-0.001433	0.9263	-0.000173	0.9934
<i>IndustryPharmaceuticals</i>	0.001401	0.6834	0.005286	0.2552
<i>IndustryRetail</i>	0.000585	0.8506	0.005660	0.1781
<i>IndustryServices</i>	-0.000090	0.9802	0.000589	0.9050
<i>IndustryTextiles, printing and publishing</i>	0.000913	0.8055	0.002688	0.5918
<i>IndustryTransportation</i>	-0.004078	0.2352	0.000312	0.9465
<i>IndustryUtilities</i>	0.002472	0.4883	-0.000178	0.9705
<i>Year</i>	-0.000148	0.3913	-0.000140	0.5496
<i>NbWords</i>	-0.001462	0.3760	0.001588	0.4770

Signif. Codes: 0 '***', 0.001 '**', 0.05 '*', 0.1 '°' and 1 ''

CAR1:

Multiple R-squared: 0.02383

Adjusted R-squared: 0.008287

F-statistic: 1,533 on 26 and 1,633 DF, p-value: 0.042

CAR2:

Multiple R-squared: 0.02563

Adjusted R-squared: 0.01012

F-statistic: 1,652 on 26 and 1,633 DF, p-value: 0.02072

<i>Variables</i>	<i>CAR5</i>		<i>CAR60</i>	
	Estimate	P-value	Estimate	P-value
<i>(Intercept)</i>	0.691900	0.2951	0.901600	0.6297
<i>Transactional</i>	0.001483	0.4876	-0.003846	0.5247
<i>Transformational</i>	-0.000058	0.9828	-0.005420	0.4759
<i>SIZE</i>	0.000000	0.5007	0.000000	0.8608
<i>LIQUID</i>	0.000432	0.5690	-0.003967	0.0646°
<i>NoA</i>	0.000083	0.6305	0.000061	0.9009
<i>MOMENTUM</i>	-0.003186	0.1275	-0.036030	0.0000***
<i>SURPRISE</i>	0.269500	0.1077	-0.102600	0.8286
<i>ROA</i>	-0.000125	0.5426	-0.000239	0.6805
<i>Tobin</i>	-0.000876	0.3729	-0.001294	0.6420
<i>LEV</i>	-0.000059	0.4102	-0.000121	0.5513
<i>IndustryComputers</i>	-0.005972	0.3005	0.007867	0.6299
<i>IndustryDurable manufacturers</i>	0.002240	0.6767	0.014590	0.3374
<i>IndustryExtractive industries</i>	0.001821	0.8059	0.011460	0.5848
<i>IndustryFinancial institutions</i>	-0.014060	0.0277*	0.010170	0.5735
<i>IndustryFood</i>	-0.006125	0.3272	0.011610	0.5119
<i>IndustryInsurance and real estate</i>	-0.000563	0.9413	0.018510	0.3924
<i>IndustryMining and Construction</i>	-0.012810	0.1944	0.035370	0.2054
<i>IndustryOthers</i>	-0.032190	0.2728	-0.090870	0.2741
<i>IndustryPharmaceuticals</i>	0.002272	0.7269	0.025310	0.1693
<i>IndustryRetail</i>	-0.001561	0.7908	0.029480	0.0769°
<i>IndustryServices</i>	0.001142	0.8686	0.006842	0.7262
<i>IndustryTextiles, printing and publishing</i>	-0.000050	0.9943	0.019200	0.3339
<i>IndustryTransportation</i>	-0.001651	0.7997	-0.007626	0.6787
<i>IndustryUtilities</i>	-0.007472	0.2687	-0.002312	0.9038
<i>Year</i>	-0.000339	0.3005	-0.000487	0.5997
<i>NbWords</i>	-0.001126	0.7188	0.013840	0.1180

Signif. Codes: 0 '***', 0.001 '**', 0.05 '*', 0.1 '°' and 1 ''

CAR5:

Multiple R-squared: 0.02185

Adjusted R-squared: 0.006271

F-statistic: 1,403 on 26 and 1,633 DF, p-value: 0.08572

CAR60:

Multiple R-squared: 0.03609

Adjusted R-squared: 0.02074

F-statistic: 2,351 on 26 and 1,633 DF, p-value: 0.0001455

Table 10 – Regression results for the ESG communication variables, ESG performance variable and investors' reaction variables.

<i>Variables</i>	<i>CAR1</i>		<i>CAR2</i>	
	Estimate	P-value	Estimate	P-value
<i>(Intercept)</i>	0.323600	0.3562	0.343900	0.4675
<i>Environment</i>	0.000586	0.5032	0.001312	0.2664
<i>Social</i>	-0.001244	0.1618	-0.003085	0.0102*
<i>Governance</i>	0.000630	0.3688	0.001069	0.2586
<i>ESGscore</i>	0.000357	0.1610	-0.000215	0.5308
<i>SIZE</i>	0.000000	0.9996	-0.000000	0.5970
<i>LIQUID</i>	-0.000891	0.0244*	0.000263	0.6221
<i>MOMENTUM</i>	0.000249	0.8214	-0.003494	0.0191*
<i>ROA</i>	0.000026	0.8075	0.000036	0.8034
<i>Tobin</i>	0.000194	0.7065	-0.000147	0.8328
<i>LEV</i>	-0.000084	0.0262*	-0.000038	0.4574
<i>SURPRISE</i>	-0.011030	0.9009	-0.187100	0.1179
<i>IndustryComputers</i>	0.001207	0.6927	0.004576	0.2672
<i>IndustryDurable manufacturers</i>	0.001314	0.6460	0.007466	0.0534°
<i>IndustryExtractive industries</i>	0.001340	0.7293	0.005089	0.3302
<i>IndustryFinancial institutions</i>	-0.005058	0.1368	-0.001555	0.7345
<i>IndustryFood</i>	-0.000713	0.8306	-0.001320	0.7693
<i>IndustryInsurance and real estate</i>	-0.002342	0.5627	-0.000988	0.8565
<i>IndustryMining and Construction</i>	-0.004780	0.3594	-0.009628	0.1715
<i>IndustryOthers</i>	-0.002752	0.8592	-0.000363	0.9862
<i>IndustryPharmaceuticals</i>	0.001602	0.6429	0.005686	0.2230
<i>IndustryRetail</i>	0.001160	0.7100	0.007175	0.0885°
<i>IndustryServices</i>	0.000218	0.9527	0.001374	0.7821
<i>IndustryTextiles, printing and publishing</i>	-0.000308	0.9345	0.002487	0.6225
<i>IndustryTransportation</i>	-0.003040	0.3720	0.001809	0.6940
<i>IndustryUtilities</i>	0.001221	0.7349	-0.001460	0.7641
<i>Year</i>	-0.000158	0.3627	-0.000174	0.4574
<i>NbWords</i>	-0.000383	0.7529	0.000948	0.5634

Signif. Codes: 0 '***', 0.001 '**', 0.05 '*', 0.1 '°' and 1 ''

CAR1:

Multiple R-squared: 0.02417

Adjusted R-squared: 0.008022

F-statistic: 1,497 on 27 and 1,632 DF, p-value: 0.04876

CAR2:

Multiple R-squared: 0.02975

Adjusted R-squared: 0.0137

F-statistic: 1,853 on 27 and 1,632 DF, p-value: 0.00497

<i>Variables</i>	<i>CAR5</i>		<i>CAR60</i>	
	Estimate	P-value	Estimate	P-value
<i>(Intercept)</i>	0.682400	0.3036	0.817200	0.6637
<i>Environment</i>	-0.000132	0.9364	0.004331	0.3555
<i>Social</i>	-0.003821	0.0232*	0.000469	0.9216
<i>Governance</i>	0.001974	0.1366	-0.004011	0.2855
<i>ESGscore</i>	0.000369	0.4431	-0.001138	0.4043
<i>SIZE</i>	0.000000	0.3317	-0.000000	0.9921
<i>LIQUID</i>	0.000397	0.5957	-0.004081	0.0544°
<i>MOMENTUM</i>	-0.003132	0.1336	-0.035920	0.0000***
<i>ROA</i>	-0.000137	0.5017	-0.000204	0.7237
<i>Tobin</i>	-0.000826	0.3974	-0.000943	0.7331
<i>LEV</i>	-0.000066	0.3598	-0.000129	0.5256
<i>SURPRISE</i>	0.282800	0.0916°	-0.073370	0.8772
<i>IndustryComputers</i>	-0.005673	0.3262	0.011840	0.4696
<i>IndustryDurable manufacturers</i>	0.001300	0.8101	0.016890	0.2706
<i>IndustryExtractive industries</i>	0.002030	0.7816	0.014500	0.4845
<i>IndustryFinancial institutions</i>	-0.014560	0.0236*	0.016360	0.3690
<i>IndustryFood</i>	-0.006639	0.2926	0.014550	0.4157
<i>IndustryInsurance and real estate</i>	-0.002768	0.7176	0.021480	0.3220
<i>IndustryMining and Construction</i>	-0.013740	0.1636	0.036000	0.1979
<i>IndustryOthers</i>	-0.034080	0.2457	-0.088960	0.2848
<i>IndustryPharmaceuticals</i>	0.001496	0.8190	0.028190	0.1281
<i>IndustryRetail</i>	-0.001749	0.7669	0.033530	0.0450*
<i>IndustryServices</i>	0.000743	0.9150	0.010110	0.6083
<i>IndustryTextiles, printing and publishing</i>	-0.001344	0.8494	0.021460	0.2846
<i>IndustryTransportation</i>	-0.001787	0.7814	-0.004173	0.8191
<i>IndustryUtilities</i>	-0.009547	0.1616	-0.001385	0.9428
<i>Year</i>	-0.000342	0.2983	-0.000429	0.6449
<i>NbWords</i>	0.002127	0.3521	0.004290	0.4624

Signif. Codes: 0 '***', 0.001 '**', 0.05 '*', 0.1 '°' and 1 '°'

CAR5:

Multiple R-squared: 0.0249

Adjusted R-squared: 0.008771

F-statistic: 1,544 on 27 and 1,632 DF, p-value: 0.03709

CAR60:

Multiple R-squared: 0.037

Adjusted R-squared: 0.02106

F-statistic: 2,322 on 27 and 1,632 DF, p-value: 0.0001437

R-script - Code used for statistical and textual analysis

```
# Load required libraries
library(stringr)
library(dplyr)
library(ggplot2)
library(corrplot)

# First step, get the data ready
# Transformational Communication Vocabulary
transformational_keywords <- c(
  # Vision and Inspiration
  "vision", "inspire", "inspiring", "future", "long-term", "mission",
  "purpose", "innovation", "transformation", "evolve", "evolving",
  "ambition", "dream", "progress",

  # Collaboration and Inclusiveness
  "together", "team", "collaboration", "inclusive", "inclusivity", "diversity",
  "belonging", "shared goals", "listen", "listening", "support",
  "respect", "engagement",

  # People-Oriented and Values
  "care", "caring", "well-being", "responsibility", "empathy", "ethics",
  "community", "social impact", "human", "humanity"
)

# Transactional Communication Vocabulary
transactional_keywords <- c(
  # Performance and Efficiency
  "results", "performance", "efficiency", "KPI", "ROI", "target",
  "objective", "milestone", "cost reduction", "growth", "strategy",
  "execution", "operations",

  # Control and Supervision
  "monitor", "discipline", "risk management", "structure", "audit",
  "reporting", "accountability", "oversight", "deliverables", "compliance",

  # Short-Term Focus
  "quarter", "earnings", "forecast", "shareholder value", "profitability",
  "market performance"
)

# Define ESG keywords lists
env_keywords <- c(
  "carbon", "emissions", "greenhouse", "ghg", "climate", "climate change",
  "renewable", "energy", "energy efficiency", "solar", "wind", "recycling",
  "biodiversity", "sustainability", "sustainable", "environment", "pollution",
  "water use", "waste", "environmental impact", "net zero", "carbon footprint",
  "eco-friendly", "deforestation", "air quality", "natural resources",
  "resource efficiency", "supply chain emissions", "clean energy",
  "carbon neutrality", "environmental protection"
)

soc_keywords <- c(
```

```

"diversity", "inclusion", "equity", "dei", "employee wellbeing", "well-being",
"health and safety", "workplace safety", "labor rights", "child labor",
"fair wages", "living wage", "training", "human rights", "equal opportunity",
"community engagement", "philanthropy", "volunteering", "donations",
"education", "supplier diversity", "gender equality", "women in leadership",
"mental health", "employee benefits", "workplace culture", "employee satisfaction",
"non-discrimination", "social impact", "inclusive hiring", "accessibility"
)

gov_keywords <- c(
  "board", "board diversity", "independent directors", "executive compensation",
  "audit committee", "governance", "ethics", "compliance", "risk management",
  "anti-corruption", "anti-bribery", "code of conduct", "whistleblower",
  "internal controls", "shareholder rights", "transparency", "data privacy",
  "cybersecurity", "corporate governance", "regulatory compliance", "tax transparency",
  "stakeholder engagement", "financial disclosure", "business ethics",
  "esg oversight", "succession planning", "fiduciary duty", "governance framework",
  "conflict of interest"
)

# Function to count keyword matches
count_keywords <- function(keywords, text) {
  sum(sapply(keywords, function(k) str_count(text, fixed(k))))
}

# Define path and get list of all .txt files (recursive = TRUE if needed)
folder_path <- "ESGDisclosures"
txt_files <- list.files(path = folder_path, pattern = "\\\\.txt$", full.names = TRUE)

if (length(txt_files) == 0) {
  stop("No .txt files found in the specified directory.")
}

# Initialize results list
results <- list()

# Loop over each file
for (file_path in txt_files) {
  file_name <- basename(file_path)
  message("Processing: ", file_name)

  # Read file safely
  file_text <- tryCatch({
    lines <- readLines(file_path, warn = FALSE, encoding = "UTF-8")
    tolower(paste(lines, collapse = " "))
  }, error = function(e) {
    warning(paste("Failed to read:", file_name, "-", e$message))
    return("")
  })

  # Clean text (basic)
  file_text <- str_replace_all(file_text, "[^[:alnum:]]", " ")

  # Score each category

```

```

total_words <- str_count(file_text, "\\b\\w+\\b")
if (total_words == 0) next

env_score <- log(count_keywords(env_keywords, file_text)+1)
soc_score <- log(count_keywords(soc_keywords, file_text)+1)
gov_score <- log(count_keywords(gov_keywords, file_text)+1)
transac_score <- log(count_keywords(transactional_keywords, file_text)+1)
transf_score <- log(count_keywords(transformational_keywords, file_text)+1)
total_words <- log(total_words+1)
# Add to results
results[[file_name]] <- c(Environment = env_score,
                          Social = soc_score,
                          Governance = gov_score,
                          Transactional = transac_score,
                          Transformational = transf_score,
                          NbWords = total_words)
}

# Convert to data frame
esg_scores <- as.data.frame(do.call(rbind, results), stringsAsFactors = FALSE)
rownames(esg_scores) <- names(results)
rownames(esg_scores) <- gsub("\\.pdf\\.txt$", "", rownames(esg_scores))

# Add Gender
esg_scores[, 'NbFemale'] = NA
esg_scores[, 'NbMale'] = NA
esg_scores[, 'CEOGender'] = NA
esg_scores[, 'BoardSize'] = NA

# Loop over row names
data <- read.csv("execucomp.csv")
for (i in seq_len(nrow(esg_scores))) {
  rowname <- rownames(esg_scores)[i]

  # Extract ticker and year
  parts <- strsplit(rowname, "-")[[1]]
  ticker <- parts[1]
  year <- as.integer(parts[2])

  # Filter data, subset_data contains the board of the company (directors, CEOs, VPs etc.)
  subset_data <- data[data$TICKER == ticker & data$YEAR == year, ]

  # Count number of females in the board for this firm-year
  CEO_gender <- subset_data$GENDER[subset_data$CEOANN == "CEO"]
  female_count <- sum(subset_data$GENDER == "FEMALE", na.rm = TRUE)
  male_count <- sum(subset_data$GENDER == "MALE", na.rm = TRUE)

  # Assign based on threshold (at least 2 females)
  esg_scores$NbFemale[i] <- female_count
  esg_scores$NbMale[i] <- male_count
  esg_scores$BoardSize[i] <- female_count + male_count
  esg_scores$CEOGender[i] <- subset_data$GENDER[match("CEO", subset_data$CEOANN)]
}

```

```

data_CAR <- readRDS("ESGdata.rds")
data_CAR <- data_CAR[, c("Our_Filenames", "year", "ticker.x", "SIZE", "Industry", "ESGscore",
"BUSsegment", "GEOsegment", "ROA", "NoA", "Tobin", "LEV", "RD", "LIQUID", "MOMENTUM",
"SURPRISE", "CAR1", "CAR2", "CAR5", "CAR60"), drop = FALSE]
df <- merge(data_CAR, esg_scores, by.x = "Our_Filenames", by.y = "row.names", all.x = TRUE)

# -----

# Descriptive statistics
message("Number of observations: ", nrow(df))

message("Number of CEO by Gender")
table(df$CEOGender)

message("Number of Females in boards: ", sum(df$NbFemale, na.rm = TRUE))
message("Number of Males in boards: ", sum(df$NbMale, na.rm = TRUE))

message("Number of companies:", length(unique(df$ticker.x)))
message("Period covered:", min(df$year, na.rm = TRUE), " to ", max(df$year, na.rm = TRUE),
"\n")

# Show quartiles, median, mean, sd etc.
custom_summary <- function(x) {
  c(
    Min = min(x, na.rm = TRUE),
    Q1 = quantile(x, 0.25, na.rm = TRUE),
    Median = median(x, na.rm = TRUE),
    Mean = mean(x, na.rm = TRUE),
    SD = sd(x, na.rm = TRUE),
    Q3 = quantile(x, 0.75, na.rm = TRUE),
    Max = max(x, na.rm = TRUE)
  )
}

# Get the summary of all columns
message("Summary of numeric columns")
sapply(df[sapply(df, is.numeric)], custom_summary)

# CORRELATION MAP
cor_matrix <- cor(df[sapply(df, is.numeric)], use = "pairwise.complete.obs")
corrplot(cor_matrix, method = "color", tl.col = "black", tl.srt = 80)

# -----

# FIRST HYPOTHESIS
# Hypothesis 1.1.
control_model <- lm(Transactional ~ NbFemale + NbMale + SIZE + Industry + year +
BUSsegment + GEOsegment + ROA + Tobin + NoA + NbWords, data=df)
summary(control_model)

control_model <- lm(Transformational ~ NbFemale + NbMale + SIZE + Industry + year +
BUSsegment + GEOsegment + ROA + Tobin + NoA + NbWords, data=df)

```

```
summary(control_model)
```

```
# Hypothesis 1.2. and 1.3.
```

```
control_model <- lm(Environment ~ NbMale + NbFemale + SIZE + Industry + year + BUSsegment +
+ GEOsegment + ROA + Tobin + LEV + RD + NoA + NbWords, data=df)
summary(control_model)
```

```
control_model <- lm(Social ~ NbFemale + NbMale + SIZE + Industry + year + BUSsegment +
+ GEOsegment + ROA + Tobin + LEV + RD + NoA + NbWords, data=df)
summary(control_model)
```

```
control_model <- lm(Governance ~ NbFemale + NbMale + SIZE + Industry + year + BUSsegment +
+ GEOsegment + ROA + Tobin + LEV + RD + NoA + NbWords, data=df)
summary(control_model)
```

```
control_model <- lm(ESGscore ~ NbFemale + NbMale + SIZE + Industry + year + BUSsegment +
+ GEOsegment + ROA + Tobin + LEV + RD + NoA + NbWords, data=df)
summary(control_model)
```

```
# SECOND HYPOTHESIS
```

```
# Hypothesis 2.1.
```

```
control_model <- lm(CAR1 ~ Transactional + Transformational + SIZE + LIQUID + NoA +
+ MOMENTUM + SURPRISE + ROA + Tobin + LEV + Industry + year + NbWords, data=df)
summary(control_model)
```

```
control_model <- lm(CAR2 ~ Transactional + Transformational + SIZE + LIQUID + NoA +
+ MOMENTUM + SURPRISE + ROA + Tobin + LEV + Industry + year + NbWords, data=df)
summary(control_model)
```

```
control_model <- lm(CAR5 ~ Transactional + Transformational + SIZE + LIQUID + NoA +
+ MOMENTUM + SURPRISE + ROA + Tobin + LEV + Industry + year + NbWords, data=df)
summary(control_model)
```

```
control_model <- lm(CAR60 ~ Transactional + Transformational + SIZE + LIQUID + NoA +
+ MOMENTUM + SURPRISE + ROA + Tobin + LEV + Industry + year + NbWords, data=df)
summary(control_model)
```

```
# Hypothesis 2.2. and 2.3.
```

```
control_model <- lm(CAR1 ~ Environment + Social + Governance + ESGscore + SIZE + LIQUID +
+ MOMENTUM + ROA + Tobin + LEV + SURPRISE + Industry + year + NbWords, data=df)
summary(control_model)
```

```
control_model <- lm(CAR2 ~ Environment + Social + Governance + ESGscore + SIZE + LIQUID +
+ MOMENTUM + ROA + Tobin + LEV + SURPRISE + Industry + year + NbWords, data=df)
summary(control_model)
```

```
control_model <- lm(CAR5 ~ Environment + Social + Governance + ESGscore + SIZE + LIQUID +
+ MOMENTUM + ROA + Tobin + LEV + SURPRISE + Industry + year + NbWords, data=df)
summary(control_model)
```

```
control_model <- lm(CAR60 ~ Environment + Social + Governance + ESGscore + SIZE + LIQUID +
+ MOMENTUM + ROA + Tobin + LEV + SURPRISE + Industry + year + NbWords, data=df)
summary(control_model)
```

In a context where sustainability expectations continue to rise, this paper explores the influence of the gender of corporate executives on ESG communication, ESG performance and investor reaction. Based on a sample of 416 US companies and 1,667 CSR reports published between 2007 and 2020, this research uses rigorous quantitative and textual analysis to decipher the communication styles used in CSR reports by executives, the prioritisation of ESG dimensions and their reception by the market.

The results reveal that there is a difference in communication style, ESG communication used in CSR reports and a difference in prioritisation of ESG dimensions between male and female executives. Nevertheless, it seems that there is no significant reaction from investors in the short or medium term, either to communication style, ESG communication or to ESG performance.

These results raise questions about the real importance that the financial markets attach to the sustainable dimensions of their investments, but also about the real scope of non-financial communication when it is not part of a legal framework.

This work contributes to academic research by making the link between theories of leadership, gender, communication and investor behaviour around ESG issues, and invites future studies to pursue research in different regulatory contexts, over the long term and across different cultural environments and geographical areas.

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