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THE IMPACT OF CORPORATE GOVERNANCE AND CORPORATE SOCIAL  
RESPONSIBILITY ON A FIRM'S FINANCIAL PERFORMANCE: THE CASE OF THE  
WORLD'S MOST PROFITABLE COMPANIES

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*Master in Management*

Supervisor:

Prof. Pedro Fontes Falcão, Professor Auxiliar Convidado, Departamento de Marketing,  
Operações e Gestão Geral, ISCTE Business School

September, 2021



BUSINESS  
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## **Glossary**

CEO = Chief Executive Officer

CFP = Corporate Financial Performance

CG = Corporate Governance

CSR = Corporate Social Responsibility

EBITDA = Earnings Before Interest, Taxes, Depreciation and Amortization

ESG = Environmental, Social, Governance

EV = Enterprise Value

EV/EBITDA = Enterprise Multiple

IRRC = Investor Responsibility Research Center

OLS = Ordinary Least Squares

RBV = Resource-Based View

RET = Stock Return

ROA = Return on Assets

ROE = Return on Equity

ROS = Return on Sales

UK = United Kingdom

USA = United States of America

## Resumo

Nos últimos anos, tem sido detetado um crescimento das práticas de Responsabilidade Social Corporativa devido ao aumento das expectativas dos consumidores sobre temas ambientais. Embora exista a procura do mercado por produtos derivados de empresas que partilhem os mesmos valores que os seus consumidores, será que existem evidências que comprovem a conexão entre as práticas estratégicas de uma organização e a melhoria direta do seu desempenho? Seguindo a lacuna identificada na literatura sobre este tema, partindo de uma amostra de 100 empresas escolhidas a partir da *Fortune 500*, pretende-se com esta dissertação estabelecer a correlação entre *Corporate Governance* e Responsabilidade Social Corporativa com o respetivo desempenho financeiro. Após a recolha e análise dos dados correspondentes a um intervalo de 5 anos, foi comprovado que há uma conexão positiva entre os dois conceitos e o desempenho financeiro das organizações nesta amostra, quando medido por uma das métricas. Dentro do conceito de CSR, os componentes ambientais demonstraram ter o maior impacto no conceito geral. E, além disso, a *Corporate Governance* demonstrou estar positivamente dependente da Responsabilidade Social Corporativa.

**Palavras-Chave:** *Corporate Governance*; Responsabilidade Social Corporativa; *Desempenho*; *Estratégia*; *Fortune 500*.

### **JEL Classification System:**

G34: Mergers; Acquisitions; Restructuring; Corporate Governance

M14: Corporate Culture; Diversity; Social Responsibility



## **Abstract**

In recent years, there has been a growth of Corporate Social Responsibility practises due to the increase of consumers' expectations on environmental topics. Even though there is the demand of the market for products derived from companies that share the same values as its consumers, are there any evidences that prove that the connection between an organization's strategic practises will directly lead to a performance improvement? Following the gap within the literature on exploring this theme, starting from a sample of 100 companies gathered from the *Fortune 500*, this dissertation intends to establish the correlation between Corporate Governance and Corporate Social Responsibility with firms' financial performance. After collecting and analysing the data within a 5 years range, it has been proven that there is a positive connection between the two concepts and the organizations' financial performance in this sample, when measured by one of the metrics. Within the concept of CSR, the Environmental components have proven a higher impact on the overall concept. And, additionally, Corporate Governance has demonstrated to be positively dependent on Corporate Social Responsibility.

**Keywords:** *Corporate Governance; Corporate Social Responsibility; Performance; Strategy; Fortune 500.*

### **JEL Classification System:**

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## **1. Introduction**

### **1.1) Contextualization**

Even though the concepts of Corporate Governance and Corporate Social Responsibility exist for decades, in recent years they have further proved their relevance and their several implications in today's context. Since they were initially formulated, both concepts have been evolving along with the adjustment of corporate and consumers' expectations, creating meaningful change in the society.

Throughout the last years, there was an increase in the number of companies concerned with the application of Corporate Social Responsibility practises in their business. This fact comes attached with the growing concern from the consumers for environmental and social causes, appreciating companies that are willing to step up for these global problematics. According to a Deloitte (2020) study, there is awareness and focus on societal issues, prioritizing people and sustainability over profits, by generations X and Z, before and especially after periods of uncertainty as in the 2020 pandemic crisis.

Which started as a legal obligation for firms, it became a new business strategy applied along the supply chain of multiple organizations for instance in the design of the product, its packaging and in its end-of-life process (Barari et al., 2012). Furthermore, this change from the organizations' side brought implications within the corporate spectrum namely in the investments cluster. As the priorities were adjusted, investors also started to take into consideration ESG reports when considering their investment in a company or in a group of companies. When discussing long-term investments, an organization that owns a set of aligned ESG practices has proven to have a better financial impact when compared to others (Morgan Stanley, 2020).

Due to the rise of this new green consciousness, customers search for options of products that are attached to these companies instead of the regular non-concerned ones. In fact, surveys have proven that customers are actually willing to pay more to obtain this type of products. When purchasing eco-friendly apparel products the customers' willingness to pay influences positively their purchase intentions (Kumar et al., 2021). Following this angle, several studies (Saeidi et al., 2015; Herrera, 2017; Flammer et al., 2017) have reached the conclusion that for a company to remain in the market along with its competitors, it will have to implement practises that take into account eco-friendly and social causes in order to attain competitive advantage in its market segment.

This new perspective becomes mandatory as part of a company's business strategy, therefore creating the need for organizations to adapt themselves to this new demand of the market. The rise of eco-friendly behaviour among organizations is directly attached with the

long-term benefits that come with this implementation (Kumar et al., 2021). Chen, Ignatius, Sun, Zhou, Marra and Demirbag (2018) mention the connection established between the consumers' eco-friendly awareness and the design of these sustainable products. As it was proven by previous researchers, the existence of a strong corporate environmental mindset is expected to increase the demand for the company's products. Additionally, the academics direct attention to the positive and significant impact a green and social strategy may bring into the brand's competitiveness, its image and on its sustainable development, three crucial aspects ultimately decisive for the company's long term growth.

Reducing a company's carbon footprint, improving labour policies and volunteering within the community can be all considered Corporate Social Responsibility initiatives. Multinationals such as *Coca-Cola* and *Google* aim to reduce their carbon footprint by making changes in their supply chain and reducing the levels of energy used (Coca-Cola Company, 2021; Google, 2021). Simultaneously, *Starbucks* intends to apply measures such as the diversification of its workforce and to provide new job opportunities by hiring veterans and refugees. In line with these practises, the group has also expanded this mindset over its products, production and surrounding communities (Starbucks Coffee Company, 2021).

Due to their resource availability, firms can bring a positive impact not only for the customers and employees, but also for the society itself, having a positive social impact. Thanks to this corporate perspective and logical reasoning, there was the interest and need of correlating the topic of corporate sustainability with the internal functioning of a company due to the limited literature regarding this theme.

Even with the implementation of control mechanisms, Corporate Governance sometimes may fail in preventing cases of financial malpractices. Several corporate scandals have arisen due to the intentional manipulation of financial statements for purposes as theft and the fudging of financial results as a way to improve them. Cases as *Enron*, *WorldCom* and even at national level the open investigation of *Banco Espírito Santo* have highlighted the pertinence of understanding with more detail how a firm runs internally to ensure transparency and a well-functioning organization (Bhagat et al., 2019; Bhaskar et al., 2019). By ensuring the right internal management, scandals will be avoided and trust within the market will grow exponentially.

When discussing the topic of corporate objectives, we can say that the aim of an organization is ultimately to achieve the maximization of its value. Corporate governance's practises help to ensure not only a fair, transparent and well-functioning market, but also to guarantee an efficient management behind every single organization. Nevertheless, there are divergent views on the proper application of the concept within an organization. While some academics share the opinion that the purpose of the concept of Corporate Governance should

focus on the stakeholders' interests, others present arguments for having as its focus point the shareholders (Letza et al., 2008).

The measures currently implemented have suffered many changes since they were initially created. The adaptation of these practises came along with the course of history after periods of high uncertainty as the 2008 financial crisis and with the change of the population's perspectives and mindsets. Initially formulated back in the 70's, today the concept of Corporate Governance highlights policies related with board diversity which are seen by many countries as a concerning topic to be implemented by corporations and settled in place as a priority (Harjoto et al., 2015).

An effective management process is critical for the success of every company. To attain a higher corporate value, there is the need of being aware of the internal and external interests of the stakeholders (Worokinasih et al., 2020). On one hand, it is essential for the organization to have a board of directors which take into consideration the interests of the multiple stakeholders that belong and add value to the company. On the other hand, the company needs to keep in mind what is the consumers' demand and the evolution of their expectations. It is the combination of both processes that we intend to explore with more detail in this dissertation, ultimately making an attempt to improve and adapt the current business plans due to the change of the society's perceptions on organizations' business strategies.

## **1.2) Purpose and Research Problematic**

There has been an evolution of the number of studies developed on Corporate Governance and Corporate Social Responsibility due to the importance of these topics, as prior evidences have been shown and pointed out in the contextualization. Focusing on the relevance that these concepts bring to today's business context, this paper has the intention of expanding and verifying several hypotheses addressing the issues that may come attached with these promising concepts' problematics and implications.

While most of the prior studies focused on only one industry or on a random sample, this dissertation chose its sample based on the premise that companies with a larger size will tend to invest more in CSR practises. Therefore, the focus group was selected according to the companies' total assets. By exploring this spectrum, a more focused attention will be given to the actions that have been put into place by larger organizations. It will be possible to detect a growth or a regression within a range of 5 years and confirm if the initial premise was correct. Additionally, after an extended analysis of the existing papers related to these two concepts, a gap was detected. Even though there are several papers conducted concerning these two topics, there is a lack of studies developing the relationship and its implications of Corporate Governance, Corporate Social Responsibility and Corporate Financial Performance.

Taking into consideration the existing literature gap, the aim of this dissertation can be formulated as the exploration of the relationship established between Corporate Social Responsibility practises and Corporate Governance structures and subsequent comparison with the financial performance of the organizations, which were selected as the sample of this paper. Based on the purpose settled, the main question to be answered after developing and conducting this dissertation (commonly known as its research problematic) can be summarized as the following: *is a positive link established between CSR practises and Corporate Governance structures of an organization able to lead to a higher financial performance?*

### **1.3) Research Questions and Objectives**

The external environment of a business is consistently changing, the reason for existing the continuous necessity for companies to push themselves forward and keep innovating. This dissertation focuses on this necessity and aims to be a refreshing research in the strategy field. It will provide updated findings, mention current implications and it focuses on a theme, which has proven to be relevant to the business context we currently find ourselves in. Plus, the theme covered has proven its potential growth in a medium and long-run timeline, another additional reason to explore it and prove its implications by using the data we have currently available.

Complementing the decision of developing this theme, CSR has become an emergent strategy implemented by many organizations. A more recent study on the topic would be important to further explore the growth and development of this matter over the recent years. As it will be further explained in the concept's literature, CSR effects are reflected in a long-run spectrum so including data from recent years it is crucial for the analysis related with this concept over time. Nevertheless, studies have been conducted to explore the connection between CG or CSR with its corporate financial performance, but there is limited research on the relationship between both concepts and CFP, the reason behind the decision of the selection and development of the theme in this dissertation.

The objectives of the paper can be summarized as the following: Confirm the connection between CG and CFP; Prove the link between CSR and CFP; Identify the segment of CSR (Environmental or Social) responsible for the higher impact on the overall performance of the concept for the organizations of this sample; Demonstrate the connection of these segments with the financial performance of the selected companies; Detect the link established among the concepts of CG and CSR and its corporate implications for future applications on a company's business strategy; Establish a connection between the concepts of CSR and CG with a company's financial performance; And, confirm if the premise that CSR increases with the firm's size is verified.

Attached to these objectives, the research questions define can be described as:

- *Is a high financial performance positively correlated with the implementation of CSR practises?;*
- *Is a low financial performance positively correlated with the implementation of a poor CG group of proceedings?;*
- *Does the application of social responsibility activities have a positive impact on the governance of a company?;*
- *In today's business context, does Corporate Governance depend on social responsibility practises to achieve positive results in its financial statements?.*

#### **1.4) Dissertation's Structure**

In the next pages, it will be presented the literature review allusive to the theme which will allow the reader to get acquainted with studies already conducted, subsequent results and conclusions obtained. The literature review was divided according to the features of each concept (CG and CSR) to provide a contextual framework of both in separate and, moreover, it tackles their connection. After this chapter, the methodology of this dissertation will be presented with the aim of introducing the research method chosen to conduct this paper. The results and their discussion will be raised over page 24, ending with the conclusions along with its limitations and suggestions for future studies in the area. The bibliography and the annexes referred along the dissertation can be consulted between pages 46 and 88.

## **2. Literature Review**

### **2.1) Corporate Governance**

The concept of Corporate Governance exists for several years now, but recently it has gained more attention thanks to cases of mismanagement and fraudulent activities (Schmidt et al., 2006; Bernile et al., 2016).

Corporate governance can be defined as the aggregation of the relationships within the company, namely its board and stakeholders and it is responsible for aligning all stakeholders' interests within an organization. By applying CG measures, it helps to create confidence in the company and to promote an efficient functioning of the market (OECD, 2004). In a more recent study, Gulati (2020) details that Corporate Governance is the group of rules that assures the stakeholders' interests when the environment, either internal or external, of the business is disturbed.

Associated with Corporate Governance literature, different theories have been established as the agency theory and the principal-principal conflict. First postulated by Adam Smith and further expanded, agency theory focuses on the link between owners (or also called the principal) and managers (or the agents) (Zogning, 2017).

In line with this perspective, two new concepts emerge in the literature: the principal-agent conflict and the principal-principal conflict. The concepts are distinct accordingly with the entity who prioritizes their own interest above the others. In the principal-agent conflict, managers tend to give priority to their interests instead of the owners (Gulati et al., 2020). Contrarily, Renders (2012) explains the concept of principal-principal conflict as the exploitation of the firm's control from the main shareholders side as a way to achieve private benefits, which is common in emerging economies (Renders et al., 2012; Abid et al., 2014).

Exploring Corporate Governance can bring several positive implications into the literature of the concept. As mentioned in the beginning of the chapter, it is interesting from a corporate point of view for instance the scandals that may emerge in economic crises periods and cases of great public opinion. In addition, this development leads to learning more about the challenges that are attached to the separation of ownership and control, study initially developed by Berle and Means (1932). The detachment of these two are the reason for the existence of corporate conflicts as we saw previously: the principal-agent and the principal-principal conflict (Ngwu, 2017).

In the next sub-chapters, we will explore more about Corporate Governance, namely the models which are associated with this concept, its dimensions and its relationship with corporate financial performance.

### 2.1.1) CG Models

With the postulation of the concept of CG, there was the need to create models to categorize the most efficient and effective measures for each case. Nowadays, researchers highlight two models: the Anglo-American (also called Anglo-Saxon model) and the Continental-European model.

The Anglo-American or shareholder model is typically used in Anglo-American countries such as the UK and the USA. The shareholder theory has as its main purpose the maximization of the shareholder wealth (Danielson et al., 2008). Shareholders should base their decisions on the ultimate financial impact their decisions may bring to the company, since the purpose of the company is to increase its profits (Smith, 2003; Friedman, 1970). Following this concept, the model is distinguished for its low shareholders' concentration and by a less complex ownership structure due to strict regulations in place in these countries. Usually, there are more companies publicly traded, so investors tend to spread their investment in more than one firm. Thus, commonly in these companies a larger amount of shares means a larger monetary investment (Ooghe et al., 2002). Due to all its features, the Anglo-American model is described as market-based (Ciftci et al., 2019).

The Continental-European model (also known as the stakeholder model) is most common in Germany and in Latin countries. The stakeholder theory can be defined as the group of relationships within the company's members or groups (also called stakeholders) that influence the firm and who are responsible for the value creation (Freudenreich et al, 2019). The stakeholders may vary depending on the type of business, but typically, it includes the company's employees, suppliers, competitors and communities among others elements (Sontaite-Petkeviciene, 2015). In this model, firms tend to be smaller therefore to attain a larger capital investment, the share percentage needs to be larger as opposed to what happens in Anglo-American companies. By consequence, firms have a higher number of shareholders and a more complex owning structure, but at the same time, it allows a closer relationship between the company and its shareholders which can be beneficial for both parties (Ooghe et al., 2002). Consequently, the Continental-European is relationship-based (Ciftci et al., 2019).

Besides the different business contexts they are inserted, Cernat (2004) claims that the models can be divided according to two categories: capital-related and labour-related components. According to this author, the first category is intended for variables such as the ownership structure and the role of banks unlike the labour-related, which concerns variables like employee influence and labour organizations (*Table 1*).

As an example, when analysing the ownership structure according to the perspective of both models, some differences can be spotted. In the Anglo-Saxon model, this influence is described as disseminated and a high importance is given to dividends. When on the



Continental model, the banks are the majority of the firm’s shareholders. In addition, the role played by the stock exchange on the models is also divergent. Opposed to what happens in the Continental model, the Anglo-American model relies on the stock exchange as part of its corporate financial fund (Cernat, 2004).

Table 1: Comparison between the Anglo-Saxon model and the Continental model taking into consideration Capital-related and Labour-related categories (Cernat, 2004).

Aspects	Anglo-Saxon	Continental
<b>Labour-Related</b> - Co-operation between social partners - Labour organizations - Labour market flexibility - Employee influence	Conflictual or minimal contact  Fragmented and weak  Poor internal flexibility; high external flexibility Limited	Extensive at national level  Strong, centralized unions  High internal flexibility; Lower external flexibility  Extensive through works councils and co-determination
<b>Capital-Related</b> - Ownership structure - Role of banks - Family-controlled firms - Management boards - Market for corporate control - Role of stock exchange	Widely dispersed ownership; Dividends prioritized.  Banks play a minimal role in corporate ownership  General separation of equity holding and management  One-tier board  Hostile takeovers are the “correction mechanism” for management failure  Strong role in corporate finance	Banks and other corporations are major shareholders; Dividends are less prioritized  Important both in corporate finance and control  Family ownership important only for small and medium sized enterprises  Two tier boards; Executive and supervisory responsibility separate  Takeovers restricted  Reduced

According to Aguilera and Jackson (2003), the concept of CG cannot be looked over by using only bipolar typologies since there are several differences between countries for them to be applied properly. Therefore, the authors developed a model (Figure 1) which divides Corporate Governance in three dimensions: capital, labour and management - a firm’s three main stakeholders groups.

In the dimension capital, it is included the stakeholders that detain property rights or the ones responsible for investing financially in the company. Contrarily, the labour dimension highlights the important role of employees due to its frequent omission in the literature. Employees as active stakeholders have the ability to control not only the firm’s resources, but also to have an impact in the decision-making process. At last, management regards the strategic role played by managers in a firm, which can be distinguished in two main dimensions: having autonomous or committed managers. Autonomous managers have more

freedom in making decisions, whereas committed managers depend more on the company in the decision-making process (Aguilera et al., 2003).

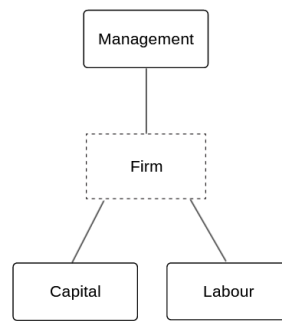


Figure 1: Corporate Governance Dimensions (Adapted from Aguilera et al., 2003)

### 2.1.2) CG and Financial Performance

Several studies have been conducted over the past few years with the aim to prove the connection between the concept of Corporate Governance and a firm's financial performance. In order to prove this positive link, there are some common variables that have been considered such as the board size, the board composition and the CEO duality - a board's structure.

When it comes to the board size, for example, some authors believe that a larger board will promote its members to share their expertise as a way to achieve the best decisions for the company, making it harder for the CEO to dominate. Others support the idea that a smaller board can reduce the chance of free-riding and achieve better levels of effectiveness since it is easier to coordinate the problems that need to be fixed (Kyereboah-Coleman et al., 2008; Hermalin et al., 2003).

Regarding if the directors should be external to the company or internal, there are also controversial opinions. While an internal director possesses more information and knowledge about the company, external directors can bring a new perspective into the firm. Even though insiders can be more capable to evaluate top management decisions, some authors make reference to the ties these directors can have to the CEO. Ties can compromise their decisions' effectiveness leading to cases of opportunism (Baysinger et al., 1990). According to Dahya and McConnell (2007), in a study conducted in the UK, the introduction of outside directors has been proven to bring an improvement of firms' operating performance.

At last, it is often considered if the CEO and the position as Chairman of the Board should be together or separate. Duality is the name commonly used to define the situation where the CEO owns both roles. Opposed to that, when the two roles are separated is called unitary leadership (Brickley et al., 1997; Antoniadis et al., 2004). Fama and Jensen (1983) argue that

when the role of decision management and decision control relies on only one person, it restricts the board' effectiveness. In addition, large organizations will be able to diminish their agency costs when separating the two roles and avoid conflicts of interest (Brickley et al., 1997; Fama et al., 1983).

Some other variables are taken into consideration when analysing the topic of Corporate Governance for instance ownership costs (dividends) and ownership dispersion. In a study developed by Paniagua, Rivelles and Sapena (2018), it was proven that these two variables are negatively correlated with a firm's financial performance. Other academics also analysed variables such as gender, the board's educational background, the previous board experience (Bernile et al., 2016) and board independence (Bhagat et al, 2019).

To analyse these Corporate Governance effects, several measures have been formulated over time. There are indexes such as the one developed by Gompers, Ishii and Metrick (2003) that attribute equal weight to compiled provisions. In this index, it is taken into account 24 CG provisions gathered by the Investor Responsibility Research Center (IRRC). Contrarily, there are authors like Bebchuk (2009) that recognize that some of these provisions do not have the same weight and, in addition, they can be correlated which is important to be taken into account (Bhagat et al, 2019).

Based on the previous facts and arguments presented by several academics over the years regarding the concept of CG and its effects, the first hypothesis of this paper can be formulated as the following:

*Hypothesis 1:* Corporate Governance is positively correlated with corporate financial performance.

## **2.2) Corporate Social Responsibility**

In the early 1950's, Corporate Social Responsibility was seen as a social responsibility rather than the concept that we associated it with today. Only after many decades of attempting to define this concept, it started to be correlated with themes such as corporate social performance and business ethics theory (Carroll, 1999).

Today, CSR can be seen as a group of policies put into practise in a company's strategy and operations, in order to protect the society's interests instead of having in mind only the business owners' concerns (Carroll, 2016).

From the moment that Corporate Social Responsibility started to be seen as an emergent business strategy, environmental issues became more easily solved moving towards a more sustainable society (Lu et al., 2020). Authors such as Agyemang (2017) and Flammer (2017) share the opinion that by implementing Corporate Social Responsibility as a business strategy,

it may allow companies to achieve long-term growth and competitive advantage among its competitors.

In the CSR literature, some academics defend the positive connection between this concept and the stakeholder theory. These two concepts are correlated due to their role towards society and the communities, however with different action plans (Figure 2). On one hand, stakeholder theory tends to focus its efforts on the area where the company operates and its surroundings. On the other hand, Corporate Social Responsibility moves towards a broader target like a cause outside the company’s business spectrum (Freeman et al, 2017).

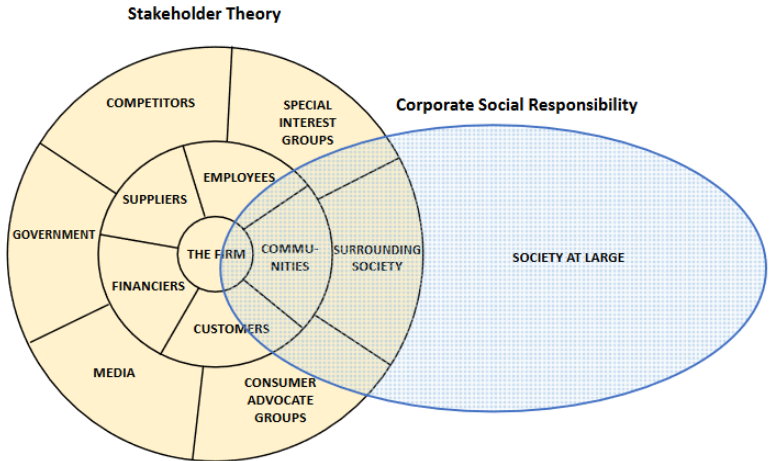


Figure 2: Relationship between Stakeholder Theory and CSR (Freeman et al, 2017)

CSR became an emergent business strategy put into practise by several firms due to the demand for social action, environmental response and transparency. Several studies have proved the positive connection between CSR and corporate reputation. Due to this link, it has become even more important to have a structured CSR plan in order to build the expected company’s reputation (Sontaite-Petkeviciene, 2015). With the appropriate strategy aligned with its mission and objectives, companies will be able to develop a green corporate mindset which will help them to boost their corporate image (Lu et al., 2020).

To distinguish the CSR concept and its implications, in the following pages we will have the opportunity to comprehend dimensions such as the Corporate Social Responsibility pyramid, the motives and benefits behind the concept and its connection with corporate financial performance similar to the former chapter structure.

## 2.2.1) CSR Pyramid

As a way to recognize the role of businesses towards society, the academic Carroll (2016) developed a four-part definitional framework of CSR or, as it is commonly known, the pyramid of Corporate Social Responsibility.

According to this conceptual work, CSR can be divided into four levels: economic, legal, ethical and philanthropic responsibilities, each one placed in a specific position (*Figure 3*). A company's economic influence is a condition that must be met in a competitive market. Therefore, the economic level is the base of the pyramid since without a strong economic support and sustain business, a company cannot undertake any other expectations. Creating value is a requirement by society. The author also states that a business has the obligation to comply with laws and regulations defined by the society, making it a legitimate business - the legal responsibilities. Moving to the ethical responsibilities, a business is expected to operate by ethical principles thereby acting fairly even when the established laws do not cover the matter. By doing this, the business is expected to avoid disrupting its stakeholders. Finally, a company embraces activities (physical, financial or by providing human resources) that are good for the society. These actions can be voluntary or discretionary and they are not related with either the legal and ethical actions. By this, it can be said that the philanthropic responsibilities are desired by society (Carroll, 2016).



Figure 3: Carroll's CSR Pyramid (Carroll, 2016)

With a few changes since it was initially created back in 1991, Carroll's CSR pyramid was the model that became a reference in the Corporate Social Responsibility literature. Although some critics are made to this system, namely the fact that the author did not take into consideration the internal environment of the business. Moreover, it is not a universal model

and it has not been proven to have the same implications for a non-American sample (Nalband et al, 2014).

### **2.2.2) CSR Motives and Benefits**

Either when a company reacts to a CSR initiative or acts proactively, it is believed that firms are being pushed to engage in these activities in order to meet certain social expectations from its stakeholders such as customers and competitors. By doing this, companies implement CSR practises as strategic targets which in the end leads to a significant social impact (Aguilera et al., 2005; Porter et al., 2006).

Each company applies CSR in its business structure differently. Factors as the size of the organization, its industry, the business culture and its exposure to risks, are responsible for a firm to decide its CSR actions, which can be focused on a specific sector or on a larger segment (McWilliams et al., 2000). According to Aguilera, Ganapathi, Rupp and Williams (2005), taking into account the organization perspective, the CSR motives can be defined as three main ones: instrumental, relational and moral according to the interest beside each motive.

Following this last paper, the instrumental motive focuses on the individual self-interest. When a company promotes CSR practises as a way to promote fairness, its employees will promote these practises since they believe it goes accordingly with their own outcomes/interests. Concerning the relational motive, when employees feel they can trust in the company they work for and feel they are treated fairly, the individuals tend to behave in a beneficial way towards the firm. CSR will likely encourage positive relationships within the company and between the organization and its community. At last, the moral motives target moral and ethical principles. There are certain moral standards that are common within the society which individuals stand up for, even if there is not an economic benefit behind it. Employees will seek to belong to a company ruled by principles and standards they identified with and be involved in causes which are relevant to them (Aguilerra et al., 2005).

Corporate social responsibility can bring several benefits attached when applied in a firm's business context regardless of the initial motives that may be behind it. Barnett and Salomon (2006) state the advantages of the application of CSR practises as the easier access to resources, to more qualified employees as well as the ability to easily market its products and services. The benefits may also include the creation of unexpected business opportunities and being a source of competitive advantage for the company. Weber (2008) also makes reference to the benefits of Corporate Social Responsibility. The author mentions them as five main ones: the positive impact on the corporate image and reputation; the effect on the employees both its motivation, hiring and continuity in the company; the cost saving attached to the replacement of some materials as part of the business strategy; the increase of the firm's

revenue due to the rise of sales and its market share; and the reduction of CSR-related risk or its management.

Along with the benefits that CSR may bring to companies, it is also important to mention the wider effects that a sustainable business strategy leads to. According to a study developed by Škare and Golja (2014), the existence of companies with CSR business strategies proved to have a significant positive effect on their country's economic growth. Due to this connection, it was possible to reach the conclusion that countries that highly promote CSR are able to achieve higher growth rates.

### **2.2.3) CSR and Financial Performance**

Similar to chapter 2.1.2, there is no consensual answer about the link between CSR with a firm's financial performance. While some academics have proved the existence of a positive relationship, others reached a negative connection or no connection at all (Galant et al., 2017). Wang (2017), for example, proved a positive connection between these two concepts when analysing CSR outcomes. Moreover, Cho, Chung and Young (2019) explain that the studies where a negative connection is confirmed, usually it is due to the premise of economic responsibility as the main company's obligation.

Neoclassical economics believed that CSR practises would only bring extra costs instead of increasing the value for the stakeholders, making companies lose their competitive advantage (Friedman, 1970). However, many authors over time have contradicted this assumption even if the concept of Corporate Social Responsibility is society-oriented and corporate financial performance is aligned towards the organization. From the resource-based view (RBV) perspective, the application of CSR practises can be seen as a strategy that allows the creation of value, ultimately leading to the firm's competitive advantage (Torugsa et al., 2012).

CSR may influence financial performance through factors like access to capital and firms' reputation. If companies have a higher CSR awareness, they will be able to improve their reputation. By consequence, it will be easier for them to have access to capital, leading to an increase of their financial performance. The opposite can be said when it comes to firms with less CSR commitment. These organizations' stakeholders won't be so aware of its operations, so access to capital and reputation will decrease and, as a result, their financial performance (Agyemang et al., 2017). A correlation based on the agency theory was also established, when taking into consideration the corporate role of managers. When pursuing their own interests managers may invest too much on CSR practises. As a result, the company's costs increase and there is a reduction of corporate performance (Cho et al., 2019).

Considering all the studies developed and evidences presented, our second hypothesis is defined as follows:

*Hypothesis 2:* Corporate Social Responsibility is positively correlated with corporate financial performance.

CSR is a non-consensual concept, therefore data is usually reduced, non-financial and it lacks legal compulsory (Galant et al., 2017). Despite the extensive literature developed over the concept of CSR, how to measure it was always a controversial topic. Several methods have been proposed, but always with limitations.

Turker (2009) suggests the use of the employees' perspective through the use of an elaborate scaling process. While Hou (2019) collects the CSR data of his study through the count of the number of times a firm receives the annual award of CSR excellence on the top two leading commercial magazines in Taiwan. Nevertheless the most common method to evaluate the impact of this concept, is to rely on the use of indexes, where all the points covered by social responsibility practises are included (Nekhili et al., 2017; Adnan et al., 2018).

The indexes used compile the data collected from the companies' annual reports. When evaluating CSR effects, this concept is divided into two categories: the environment performance and the social performance of the business. Each category is posteriorly divided into sections for instance in the company's workforce and its product responsibility (Anser et al., 2020; Nie et al., 2019). Several indexes are available to be utilized for research purposes, but commonly academics tend to choose the ESG score (Taylor et al., 2018; Shabbir et al., 2020). The use of this score allows researchers to have access to the necessary data to conduct their analysis and investors to base their decisions, since it covers the three components (Environment, Social and Governance) and it distinguishes them between each other. Furthermore, the score includes several data points within each category per example data related with CO2 emissions and wasted water (Wang et al., 2017).

From the literature collected from the Corporate Social Responsibility dynamics, the third hypothesis was developed as it follows:

*Hypothesis 3:* The Environmental and Social components have a different impact on Corporate Social Responsibility effects.

*Hypothesis 3.1:* The Environmental components have a higher impact on Corporate Social Responsibility than the Social components.



*Hypothesis 3.2:* The Social components have a higher impact on Corporate Social Responsibility than the Environmental components.

### **2.3) Relationship between CG and CSR**

Among all the available literature, we can find that some academics strive to expand models related with the connection between Corporate Social Responsibility and corporate financial performance, while others focus on establishing the link between the business and the environment that surrounds it (Ibrahim et al., 2003). Due to the impact of CSR on firms' risks and profitability, we consider it important to mention in this literature the line of research that has been developed over time on the relationship between Corporate Governance and Corporate Social Responsibility.

To prove the connection of these two concepts, Rao and Tilt (2015) tried to determine the influence of the board diversity of a company and its CSR practises. The authors took into consideration aspects such as the board independence, age diversity and the directors' occupational background on CSR. Other studies such as the one developed by Naser and Hassan (2013) make reference to topics such as the ownership structure, the company's size, the location of the head office and the industry type as relevant when analysing this matter. And, furthermore, Said, Zainuddin and Haron (2009) have proven the existence of a positive and significant relationship between Corporate Governance features (government ownership, ownership concentration and audit committee) with the level of Corporate Social Responsibility in companies publicly listed in Malaysia.

While exploring the role of inside and outside directors on board members' corporate social responsiveness, Ibrahim and Angelidis (1995) realized that outside directors have the tendency to be more conscious of the society's needs and less economically guided. In addition, outside directors cultivate more the ethical aspect within the company when compared to internal directors, an important reason to diversify a company's board (Ibrahim et al., 2003).

Contrary to the board independence just mentioned, age diversity is a factor only proven to be relevant by some academics. Hafsi and Turgut (2013) proved, contrary to the expectations initially settled, that age has a negative effect on social performance. With this study, the authors were able to reach the conclusion that due to the age difference, issues as the implementation of CSR practises within the firm may be more difficult to conciliate within the board.

Regarding the directors' occupational background, Ibrahim, Howard and Angelidis (2003) proved the importance of considering this variable as relevant since, in their paper, they were able to test its positive impact on social performance. The higher the occupational background

of the members of a company's board, the greater will be the level of social performance (Rao et al., 2015).

Even if companies are not responsible for establishing the regulations behind their operations, they are the ones responsible for setting their own business strategies and the use of the firms' resources for a purpose such as the implementation of CSR practises. Following all the arguments demonstrated, the fourth and fifth hypotheses can be formulated as:

*Hypothesis 4:* Corporate Governance and Corporate Social Responsibility are positively correlated.

*Hypothesis 5:* Corporate Governance is positively dependent on Corporate Social Responsibility features.

### 3. Methodology

This chapter is divided into the study's sample, its variables' definition and the research model chosen to conduct this dissertation having as its final purpose the acceptance or rejection of the hypotheses formulated in the preceding chapter.

#### 3.1) Sample

To conduct the analysis, the sample selected consists of the 100th most profitable companies in the year of 2019 listed on the *Fortune 500*. This study focused on the data concerning the selected companies in the timeframe between 2015 and 2019, due to the lack of data relative to the year of 2020 and due to the pandemic effects that could distort the analysis. To determine the list of companies part of the testing group, the ranking of the *Fortune 500* for the year of 2019 was generated accordingly with the value of their total assets, which can be seen discriminated over *Annex A*. The decision of choosing the ranking based on the organizations' total assets instead of their yearly revenue was intended to mitigate biased results when studying the concept of corporate financial performance.

The *Fortune 500* is a ranking by the Fortune magazine responsible for compiling a list of the most profitable companies in the United States based on their total revenue per year among other variables. It is also important to make reference that this ranking includes both private and public companies and that the data collected to produce it is publicly available (Fortune, 2021). Even though the use of a ranking that only aggregates companies based on the U.S. could be a limitation, this spectrum was chosen due to the influence that United States' companies have on the global economy. The United States is the largest economy and one of the countries where global economic activity is located (Buckley et al., 2015). Due to its global impact, we decided it would be important to develop a study based on organizations setted in this world power as the focus of the dissertation.

There were included companies from different industries such as in the communications, energy and in the financials segment (*Annex A1*). This will allow us to have a significant number of companies from different areas that have implemented different Corporate Social Responsibility practises and trace for a pattern. On *Table 2*, it can be checked the number of firms selected according to their type of industry.

Along with the firms' annual reports, the Thomson Reuters Eikon was the database chosen to gather and extract the data since this platform is responsible for collecting one of the largest amounts of financial markets' data in the world. When using Eikon, a particular attention was given to the ESG data framework. After collecting the data, to achieve the results of the paper which will be presented in the next chapter, it was used the statistics tool *IBM SPSS Statistics*.

Table 2: Sample Description by Industry

Industry	Count	Industry	Count
Communications	7	Financials	22
Consumer Discretionary	8	Health Care	14
Consumer Staples	14	Industrials	14
Energy	10	Materials	1
Technology	9	Utilities	1
Total			100

### 3.2) Variables

#### 3.2.1) Independent Variables

When generating the model of this study, both concepts (Corporate Governance and Corporate Social Responsibility) were the basis for the independent variables formulation. To collect the data regarding these two concepts, as it was previously mentioned, the main resource used was the data collection from the ESG score reports.

The Environmental, Social and Governance (ESG) data is a segment within the Eikon database responsible for aggregating more than 450 metrics and able to gather more than 80% of the global market data. It is commonly used in the literature since it takes into account ESG information disclosed by firms (per example on Correa-Garcia et al., 2020 and on Shabbir et al., 2020). Moreover, it is relevant to mention that the scores take into account the company's size and industry as well as transparency, reducing the risk of biases (Refinitiv, 2020).

This score is divided into 3 main pillars: the Environmental, the Social and the Governance segment. Within the Environment pillar, there are 68 metrics from the categories of emission, innovation and resource use (*Annex B*). In opposition, the Social pillar compiles the community, human rights, product responsibility and workforce as its four categories, which are represented by 62 metrics (*Annex C*). And, at last, the Governance segment includes the company's CSR strategy, management and shareholders, spread by 56 metrics (*Annex D*).

To measure Corporate Social Responsibility, we followed the study of Wang and Sarkis (2017) and divided this concept into its Environment component and in its Social component, creating the respective variables: CSRENV and CSRSOC. Since the ESG score already acted in accordance with this format, it was possible to select all the data points included in these two pillars in the analysis. To achieve it, the data points were used in the form of combined scores and categorized according to their values following the Eikon structure (*Annex E*).

Due to the extensive CG literature currently available, there is a wide range of cited variables as relevant in the concept's related studies. Most of the academics only consider a limited amount of variables such as the board size (Correa-Garcia et al., 2020), the ownership concentration variable (Paniagua et al., 2018), the board's gender (Fuente et al., 2017) and

the board member independence (Pekovic et al., 2020). While others also incorporated the directors' educational background (Katmon et al., 2019), the percentage of external directors (Fuente et al., 2017) and the dividends (Paniagua et al., 2018) within the analysis. Instead of generating a model only featuring a restricted number of governance characteristics and, by consequence, creating a limitation to the study, a general variable (CGT) aggregating all Corporate Governance's categories was created. The data for this new variable was extracted from the ESG score as well, since it is able to provide data points related with Corporate Governance features for the companies under analysis. Similar to the variables related to Corporate Social Responsibility referred earlier, the data concerning CG was also used in the form of a combined score.

### **3.2.2) Dependent Variable**

The dependent variable of this study is the corporate financial performance (PERF), that is, the financial growth of the firms listed in the sample chosen. To evaluate this variable, there were two main measures selected: the ROA and the EV/EBITDA. The metrics were possible to attain due to the data gathered from the firm's annual reports, which were inserted in the platform Eikon subsequently to its publication.

Our first measure, ROA or Return on Assets, is an accounting based measure which means that the risk of bias via manipulation is reduced. In addition, it does not take into consideration past performance contrarily to other measures (Reverte, 2009) and its calculation is possible through the ratio between operating income and total assets. Accordingly to Wang and Sarkis (2017), by determining the ROA of a company, it makes it possible to compare it to other companies despite its operating size. Nevertheless, obtaining the value of a company's ROA allows a better understanding of its financial performance, since a higher ROA demonstrates a higher financial performance. Even though this is a very common measure used in the literature (per example by Esteban-Sanchez et al., 2017; Kabir et al., 2017; Wang et al., 2017; Reverte, 2009), there are academics that believe that the ROA is a short-term performance indicator as well as profitability which does not make it a good financial performance measure (Pekovic et al., 2020).

To further account for an organization's financial performance, the second proxy used is the metric EV/EBITDA, also called enterprise multiple. This variable can be defined as the enterprise value of an organization when divided by its earnings before its interests, taxes and depreciation. This variable is commonly used by investors when considering a merger or an acquisition and it takes into consideration the industries the firms are inserted into. Firms in a high growth industry are expected to have a higher enterprise multiple value. Unlike other measures, the EV allows a more accurate estimation of the market value since it includes the

companies' debt in its estimation. And, the EBITDA, even though it is not considered a financial metric, is very commonly used given that it enables the direct comparison of companies' profitability. When using the enterprise multiple, it is possible to mitigate discrepancies between the level of companies' capital structure, taxation as well as fixed asset accounting due to the incorporation of the EBITDA within the ratio (Bianconia et al., 2019; Bang et al., 2019). The incorporation of this metric as the second financial variable allows to test its effects and usability when studying the impacts of CSR and CG, since it is not commonly used in the literature of these two themes.

The second metric initially chosen to account for financial performance was the Tobin's Q, a market-based measure which can be deduced by the sum of the market value of equity and the total liability, minus the deferred tax expense, all divided by the total assets. Pekovic and Vogt (2020) refer that Tobin's Q is able to block accounting manipulations and, furthermore, that CSR's effects tend to happen in a medium/long-run spectrum making the use of Tobin's Q necessary for measuring companies' long-term expected growth. However, when collecting the data for the organizations of the sample, in an initial state the metric Tobin's Q was not available in the data platform chosen. In a second attempt to attain this variable, it was done a simulation of its value by collecting the parameters of the formula previously described. Unfortunately, the parameter of the market value of equity which was required to calculate the Tobin's Q value, was not available. Other attempts were made to calculate this metric by recurring to other definitions, but none of them were successful.

Regardless of the fact that we only considered these two proxies, other academics consider alternative indicators as also relevant when checking financial performance. Kabir and Thai (2017) resort to both Tobin's Q and ROA, however they also included ROE (Return on Equity), ROS (Return on Sales) and Stock Return (RET). While Paniagua, Rivelles and Sapena (2018) only used ROE to measure its financial growth. The reason behind our choice is attached with the lack of consistency of different measures within the literature. Ultimately, it was taken into consideration the focus of the paper, the other variables analysed throughout the model as well as the originality of this paper among the existing ones.

### **3.2.3) Control Variables**

With the aim of reducing the probability of biased results in the paper, three control variables were defined: the companies' size, their leverage and their industry. The choice of these variables was based on findings from previous authors. There were authors that also considered as control variables in their studies, dimensions such the firms' assets or its variation (Paniagua et al., 2018; Pekovic et al., 2020), revenue growth (Wang et al., 2017)

and/or the firms' profitability (Pekovic et al., 2020). Nevertheless, when considering the objectives established, only the three variables mentioned were contemplated in this paper.

The company's size (FSIZE) is one of the most common control variables between studies related to CG and CSR. By adding it to the models, it allows to mitigate the size heterogeneity between firms from the same sample (Wang et al., 2017). Acknowledging the size of companies, it supports the control of economies of scale (Pekovic et al., 2020). Additionally, smaller companies may not have access to resources so easily to invest in the application of CSR practises, when compared to companies with larger dimensions (Esteban-Sanchez et al., 2017). To obtain this variable, the natural logarithm of total assets (Fuente et al., 2017) was computed after collecting the values that regard the firms' total assets via Eikon in the years under analysis.

Leverage (LEVRG) is the second control variable and it can be obtained by calculating the leverage ratio debt to asset, that is, the ratio between total debt and total assets (Correa-Garcia et al., 2020; Bianconia et al., 2019). A higher leverage ratio translates in a higher financial risk and, by consequence, in a worse financial performance (Wang et al., 2017). In addition, a higher leverage ratio can limit the company to explore new businesses, which will decrease its corporate financial performance (Pekovic et al., 2020). According to Katmon, Mohamad, Norwani and Farooque (2019), previous studies have proven that there is a positive relationship established between leverage and CSR which comes to justify the need to include leverage as a control variable.

As a result of the selection of the sample of this paper as the 100th most profitable companies according to their total assets, there is a wide variety of different industries contemplated in the analysis. Under these circumstances, the last control variable of this study aims to account for the industry of these organizations. When considering industry as a variable, some information related to CSR can be taken into consideration such as the aim of the CSR disclosure. Some organizations might use CSR due to their non-environmental business activity, while others might use CSR as a business strategy to promote their products (Katmon et al., 2019). Since the study does not focus on a unique industry, we decided not to rely on the use of dummy variables as it was done in the study developed by Correa-Garcia, Garcia-Benau and Garcia-Meca (2020). Therefore, to account for this variable each organization received a number between 1 and 10 according to their industry.

### 3.2.4) Description of Variables

Table 3: Summary of the Variables

Independent Variables	Dependent Variables	Control Variables
CSRENV, Environment Disclosure score	Return on Assets (ROA)	Companies' Size
CSRSOC, Social Disclosure score	EV/EBITDA	Leverage
CGT; Governance Disclosure score		Industry

### 3.3) Research Model

Based on previous studies conducted when analysing the effects of CSR and CG (per example in Harjoto et al., 2015; Paniagua et al., 2018), we conducted this analysis by using a multiple linear regression and accounting its parameters via an OLS regression. Since the sample did not include data from the year of 2020, there was not the need to include a moderator variable to control for the pandemic crisis.

With all the variables previously defined and explained (also compiled in *Table 4*), the model can be formulated as the following:

$$\text{Model: } \text{PERF}_{it} = \beta_0 + \beta_1 * \text{CSRENV}_{it} + \beta_2 * \text{CSRSOC}_{it} + \beta_3 * \text{CGT}_{it} + \beta_4 * \text{FSIZE}_{it} + \beta_5 * \text{LEVRG}_{it} + \beta_6 * \text{INDUST}_{it} + \epsilon_{it}$$

Table 4: Variables' Description

Variable	Description
<b>PERF</b>	Variable that measures companies' financial performance in year t, through ROA and EV/EBITDA;
<b>CSRENV</b>	Corporate Social Responsibility Environmental Performance in year t, by the ESG Environmental score;
<b>CSRSOC</b>	Corporate Social Responsibility Social Performance in year t, by the ESG Social score;
<b>CGT</b>	Corporate Governance Performance in year t, by the ESG Corporate Governance score;
<b>FSIZE</b>	Firm's Size by the natural logarithm of total assets in year t;
<b>LEVRG</b>	Leverage by using leverage ratio debt to asset in year t.
<b>INDUST</b>	Industry by its type using a scale from 1 to 10;
<b>ε</b>	Firm-specific errors



## 4. Results and Discussion

This chapter aims to explore with detail either the descriptive and the econometric analysis of the paper, which ultimately will allow the clarification of the research questions and the objectives initially established in the introduction of this dissertation. This section is divided into 2 parts: the descriptive statistics of the variables and an explanatory analysis of the correlations stipulated according to the targets.

### 4.1) Descriptive Statistics

The sample of this dissertation consists in 100 companies selected with the purpose of exploring the relationship of CG and CSR with the organizations' financial performance, as it was already stated in the methodology. However, when collecting the data to develop the paper, from the 100 group of companies 13 were excluded due to the lack of ESG reports on the platform *Eikon*.

The absence of the ESG reports may be connected with the lack of business strategies based on Corporate Social Responsibility practises. From the set of these 13 organizations, 8 belong to the financials' industry, 1 to the industrials', 3 to the consumer staples' and 1 to the energy's industry. Resulting from this exclusion, the first result of the paper can be drawn as: 13% of the organizations that are inserted in the sample lack an ESG-based business strategy or lack the existence of indicators on their reports associated with this problematic. Additional details concerning the firms removed from the analysis can be verified over *Annex A2*.

Our descriptive statistics analysis focuses on 8 variables. From these 8 variables, 4 are inserted in the category of qualitative variables and the remaining 4 in the quantitative segment (*Annex F*). To clarify the variables, on *Table 5, 6 and 7*, it can be found a summary of the descriptive statistics' variables used. On these tables, the statistics of the respective variables can be checked accordingly with their mean, minimum, maximum and their standard deviation.

From the content displayed in *Table 5*, it can be seen that the three variables associated with the ESG score (CSRENV, CSRSOC and CGT) share the same value for their minimum value (equal to 1) and their maximum value (equal to 12). However, the variables have distinct values when examining the respective mean and standard deviation. The value associated with the Environmental score (CSRENV) allows us to conclude that this variable owns the highest mean from the set of these three, with the value of 4,9379. The second highest mean is attributed to the Corporate Governance variable (CGT) with a mean of 4,8483, followed by the Social score (CSRSOC) with a mean equal to 4,3540. The same hierarchical order is observed in terms of their standard deviation. The values attributed are respectively 3,0417 for the CSRENV, 2,68551 to the CGT and 2,5124 for the CSRSOC.

Table 5: Descriptive Statistics of the ESG related Variables

	Minimum	Maximum	Mean	Std. Deviation
CSRENV	1,00	12,00	4,9379	3,0417
CSRSOC	1,00	12,00	4,3540	2,5124
CGT	1,00	12,00	4,8383	2,6855

Concerning the descriptive statistics of the variables responsible for measuring the firms' size, leverage and industry, it was possible to check that the first variable presents a mean equal to 5,0055 and a standard deviation of 0,5631. Moreover, the firms' size variable has a minimum value of 3,656 and a maximum value of 6,429. Regarding the leverage, it can be observed that the mean has a value equal to 7,0911, a minimum of 1,10 and a maximum value of 346,19. By looking at *Table 6*, it is possible to understand that this variable is responsible for owning not only the higher maximum value, but also it possesses the highest standard deviation with the value of 19,7682. At last, the variable responsible for accounting the firms' industry has a minimum value of 1 and a maximum of 10. Additionally, the mean associated to this variable is 5,03 and its standard deviation is 2,383. Furthermore, it is important to make reference to the variable that measures the timeframe of the samples' data. For this variable, the mean has the value of 3, a minimum value of 1, a maximum value of 5 and a standard deviation of 1,416.

Table 6: Descriptive Statistics of the Control Variables and the Timeframe Variable

	Minimum	Maximum	Mean	Std. Deviation
Firm's Size	3,656	6,429	5,0055	0,5631
Leverage	1,10	346,19	7,0911	19,7682
Industry	1	10	5,03	2,383
Timeframe	1	5	3	1,416

With respect to the variables used to measure the financial performance of the organizations of the sample, it was possible to conclude that the Return on Assets presents lower values when compared to the metric EV/EBITDA. This measure has a minimum value of (0,0614) and a maximum value of 0,4152, while the ratio EV/EBITDA has a minimum value of 3,31 and a maximum value of 194,18 (the second highest value in the category of the variables' maximum values). When comparing the mean and the standard deviation of these variables, it is also interesting to understand that the Return on Assets, similar to the previous data, presents a lower mean (equal to 0,0632) and a lower standard deviation (equal to 0,5754), while the metric EV/EBITDA has a mean of 12,2595 and a standard deviation of 11,0510 (*Table 7*).

Table 7: Descriptive Statistics of the Financial Performance Variables

	Minimum	Maximum	Mean	Std. Deviation
ROA	(0,0614)	0,4152	0,0632	0,5754
EV/EBITDA	3,31	194,18	12,2595	11,0510

With the purpose of conducting a thorough interpretation of the variables, the analysis of the qualitative variables was divided accordingly with their type. For the qualitative nominal variables which include the industry and the timeframe, on *Annex F.1*, it can be found a pie chart for the data of each variable along with the respective table of frequencies. By observing the pie chart of the timeframe, it is possible to check that the data through the years is the same since all the years were contemplated in the analysis. Regarding the pie chart of the industry variable, it is possible to observe some discrepancies. The number is higher for companies inserted in the Health Care and in the Financials sector with 16,09% each. And, the percentage is lower and equal to 1,15% for the industry sector of Utilities and Materials.

Similarly, for the qualitative ordinal variables (where the variables associated with the ESG score are inserted, CSRENV, CSRSOC and CGT), on *Annex F.2*, it can be found a representative bar chart to the respective variable as well as the corresponding table of frequencies. The Environmental score bar chart proposes a higher compilation of results of the companies with a score rated in the segment of "A-" in the period analysed. In an opposite way, a lower number of results are inserted in the ranking of "D+" and "D". By looking at the Social score bar chart, it can be seen a higher number of results in the segment "B+", but with a difference of only 4 units from the segment "A-". In this graph, the lower values are concentrated on the ranking of "C" and "D". Similar to the Environmental score, on the chart representative of Corporate Governance the higher values are also centered on the "A-" and the lower on the "D" segment.

For the analysis of the quantitative variables (Firm's Size, Leverage, ROA and EV/EBITDA), it was used a statistics table including the measures of distribution Skewness and Kurtosis. This table can be found on *Annex F.3*. From the data gathered, the four variables have proven values above zero for both the Skewness and the Kurtosis. These results have led us to conclude, even though they have differences between each other, all the variables present a leptokurtic and positively skewed (there is a longer tail on the right side) distribution.

Moreover, with the aim of complementing the analysis of the variables, it was included six histograms to account for some of the details concerning the ESG related variables. On *Annex F.4*, it can be found 3 of the histograms. In this section, the histograms present the evolution of the scores of these three variables over the timeframe chosen for this study. The *Annex F.5* focuses on the variables' scores according to the industry they are inserted in.

From the observation of the first three histograms, several important assumptions can be made. In the histogram that analyses the Environmental score versus the years, it can be

detected a decrease of the number of companies with an Environmental score classification of “D-” from 2015 to 2019. Moreover, there was a reduction of the number of organizations with the score of “B” and the number of organizations doubled in the segment of “B-”. When comparing the year of 2015 and the year 2019 in terms of the score “A-”, there was an increase of only 6 companies in the range of 5 years while the number for the score of “A+” remained almost constant through the years. Overall, there was an improvement of the Environmental score in the timeframe used in this dissertation.

Concerning the Social score, there was a notorious increase in the amount of firms with a score of “A-”. In the scope of 5 years, 9 companies improved for this score level and there was a decrease of 5 companies with the classification of “B+”. In addition, it was also spotted a growth from 7 to 17 companies in the level “A”, the reduction from 15 to 7 in the classification of “B” and the elimination of the level “D” from the year 2017 forward.

In the end, after generating the histogram for the Corporate Governance score versus the years of the paper, it was observed an improvement from 6 to 13 organizations in the level of “C+” and a deterioration of 5 organizations in the level “B-”. Additionally, in the classification of “A”, it was detected an increase of 6 companies and a decrease of 7 companies with the score of “A-” in the timeframe used. Nevertheless, when exploring the number of companies inserted in the Corporate Governance score classification of “A+” in 2015 and the number in 2019, it was observed that the number doubled from 3 to 6.

In the second part of this segment of the analysis, it was crossed the ESG related variables with the industry they are inserted into. Within the Environmental score with classification of “A+” as well as “A”, in the range of the 5 years, the higher number of organizations are focused on the Financials’ industry. On the opposite, in the classification of “A-” there is a majority of companies in the industries of Consumer Staples, Industrials and Technology. The organizations inserted in the level “D+” were mainly in the Financials and in the Health Care industry. Moreover, in the level “D”, there is a focus in the Energy and in the Industrials segments and in the level “D-” in the industry of Energy, Financials, Health Care and Technology. In the remaining classification scores, the industries are dispersed which did not allow us to reach any major assumptions.

When checking the industries within the Social score, there is a focus of companies with classification of “A+” in the Technology segment, in the “A” level in the Health Care and in the “A-” in the Financials segment. It was spotted a tendency in the level “B+” and “B” since in both levels, the higher number of companies is focused on the Industrials industry. Furthermore, the level “C” and the level “D+” are centred on the Energy industry. Finally, on level “D-”, companies are located mainly in the Materials’ segment.

Ultimately, on the Corporate Governance score histogram, it was detected that in the classification of “A+” organizations were focused on the Consumer Staples and in the

Technology. In addition, in the level “A”, companies were mainly located in the Industrials and in the Consumer Staples. There is a higher number of firms that belong to the Health Care industry on the levels “B +” and “B”. In the classification of “D-”, the higher number of firms is concentrated in the Energy sector.

## 4.2) Explanatory Analysis

Due to its length, the econometric analysis of this dissertation was divided into 3 parts. In the first segment, the model defined in the methodology was explored and the results were discussed. Based on these results along with additional testing, the hypotheses previously formulated on the literature review were analysed and proved to be accepted or rejected. Finally, on the third segment of this subchapter the analysis of the residuals associated to both econometric models was conducted.

### 4.2.1) Multiple Linear Regression Analysis

To conduct the econometrics analysis of this paper, a multiple linear regression analysis was conducted. The aim of this segment is to gather the information needed to accept or reject the dissertation’s hypotheses and to answer the research problematic: *is a positive link established between CSR practises and Corporate Governance structures of an organization able to lead to a higher financial performance?*. Since there are two different measures used in this paper to account for the organizations’ financial performance (ROA and EV/EBITDA), the model was run two times, one for each variable (*Annex G*). To assess the effect of each regression model, the coefficients were estimated from the respective regression models.

$$\text{Model 1) } \hat{R}OA = 0,316 - 0,001 * CSRENV - 0,007 * CSRSOC + 0,002 * CGT - 0,042 * FSIZE - (8,444 * 10^{-6}) * LEVRG - 0,003 * INDUST$$

Table 8: Model 1's Coefficient Interpretation

$\beta$	$\beta$ 's Interpretation
$\hat{\beta}_0 = 0,316$	Estimated value of the Return on Assets if all the explanatory variables would assume the value zero;
$\hat{\beta}_1 = -0,001$	An increase of one unit in the Environmental score leads, on average, to a decrease of 0,001 in the value of a company's Return on Assets, if all other predictors are fixed;
$\hat{\beta}_2 = -0,007$	An increase of one unit in the Social score leads, on average, to a decrease of 0,007 in the value of a company's Return on Assets, if all other predictors are fixed;
$\hat{\beta}_3 = 0,002$	An increase of one unit in the Corporate Governance score leads, on average, to an increase of 0,002 in the value of a company's Return on Assets, if all other predictors are fixed;
$\hat{\beta}_4 = -0,042$	An increase of one unit in the Firm's Size leads, on average, to a decrease of 0,042 in the value of a company's Return on Assets, if all other predictors are fixed;

$\beta$	$\beta$ 's Interpretation
$\hat{\beta}_5 = -0,000008444$	An increase of one unit in the Leverage leads, on average, to a decrease of 0,000008444 in the value of a company's Return on Assets, if all other predictors are fixed;
$\hat{\beta}_6 = -0,003$	An increase of one unit in the Industry leads, on average, to a decrease of 0,003 in the value of a company's Return on Assets, if all other predictors are fixed;

$$\text{Model 2) } EB\_EBITDA = -11,388 + 0,060 * CSRENV - 0,027 * CSRSOC + 0,027 * CGT + 4,863 * FSIZE + 0,015 * LEVRG - 0,130 * INDUST$$

Table 9: Model 2's Coefficient Interpretation

$\beta$	$\beta$ 's Interpretation
$\hat{\beta}_0 = -11,388$	Estimated value of the EV/EBITDA if all the explanatory variables would assume the value zero;
$\hat{\beta}_1 = 0,060$	An increase of one unit in the Environmental score leads, on average, to an increase of 0,060 in the value of a company's EV/EBITDA, if all other predictors are fixed;
$\hat{\beta}_2 = -0,027$	An increase of one unit in the Social score leads, on average, to a decrease of 0,027 in the value of a company's EV/EBITDA, if all other predictors are fixed;
$\hat{\beta}_3 = 0,027$	An increase of one unit in the Corporate Governance score leads, on average, to an increase of 0,027 in the value of a company's EV/EBITDA, if all other predictors are fixed;
$\hat{\beta}_4 = 4,863$	An increase of one unit in the Firm's Size leads, on average, to an increase of 4,863 in the value of a company's EV/EBITDA, if all other predictors are fixed;
$\hat{\beta}_5 = 0,015$	An increase of one unit in the Leverage leads, on average, to an increase of 0,015 in the value of a company's EV/EBITDA, if all other predictors are fixed;
$\hat{\beta}_6 = -0,130$	An increase of one unit in the Industry leads, on average, to a decrease of 0,130 in the value of a company's EV/EBITDA, if all other predictors are fixed;

The interpretation of the coefficients of each model leads to several conclusions regarding the relationship established between the variables of the models and their respective dependent variables. Following the order of the analysis, on *Model 1*, it can be checked that an increase of the metric ROA implicates an increase of the Corporate Governance score (*Table 8*). This result allows us to *accept the first Hypothesis* formulated in the literature review. When the corporate financial performance is the metric Return on Assets, Corporate Governance is positively correlated with an organization's financial performance. Concerning the relationship between the financial metric and the variables CSRENV and CSRSOC, it has been proven a decrease of these two metrics when there is an increase of the ROA. *Hypothesis 2 is rejected*, the CSR is not positively correlated with an organization' financial performance when measured by ROA.

By following *Table 9*, it is possible to check that on *Model 2* an increase of the financial metric EV/EBITDA translates in the increase of the variable CGT similarly to the results obtained in the first model. By consequence, *Hypothesis 1 is also confirmed for this second metric*. Regarding the CSR related variables, the two variables have proven different effects when there is an increase of the financial performance metric of Model 2. As it can be checked on the respective regression model, an increase of the EV/EBITDA causes an increase of the

Environmental score and a decrease of the Social score. To account for the effects of the EV/EBITDA on the CSR, it needs to be taken into account both variables. By combining these two scores, it can be concluded that an increase of the financial metric will lead to an increase of the CSR practices of an organization. Based on this result, *Hypothesis 2 can be stated as confirmed.*

#### **4.2.2) Regression: Complementary Analysis**

To consider the results obtained from the model, before the models were estimated, a few aspects of the multiple linear regression models were analysed. In a first stage, it was necessary to assess the validity of the model by using the ANOVA test. The hypotheses of this test were as follows:  $H_0) \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$ ;  $H_1) \exists \beta_i \neq 0, i=1,2,3,4,5,6$ . From the output gathered for Model 1, it was checked that  $\text{Sig} = 0,000 < \alpha = 0,05$  which rejected  $H_0$ . This result allowed us to understand that the independent variables are explanatory and useful when studying ROA as a metric of the organizations' financial performance and, as such, *Model 1 is valid.* The same test was conducted for the second model, which revealed that  $\text{Sig} = 0,007 < \alpha = 0,05$ . Since  $H_0$  was rejected, *Model 2 was also considered as valid.*

In a second part of analysis, the value of the coefficient of determination (R Square) was estimated and further interpreted in order to understand the proportion of the dependent variable that is explained by the independent variables. When checking the R Square of the Model 1, it is possible to conclude that the  $R^2$  is equal to 0,194, this is 19,4% of the variability of the performance when measured by the Return on Assets is explained by the set of independent variables defined in the linear regression model. On Model 2, the R Square is equal to 0,045, this is 4,5% of the variability of the performance when measured by the EV/EBITDA is explained by the set of independent variables defined in the multiple linear regression model. From this output, since the *R Square is higher for the first model*, it indicates that *Model 1 fits better the observations of this sample.*

Another important aspect explored was the adjusted R Square. For Model 1, this parameter proved to have the value of 18,1%. This result allows us to conclude that the percentage of Return on Assets variance explained by the Model 1 is corrected for the increase in complexity from adding additional predictors reaching 18,1%. For Model 2, the value of the adjusted R Square is 3%. It can be assumed that the percentage of EV/EBITDA variance explained by the model is corrected for the increase in complexity from adding additional predictors reaching 3%. Considering that the models contain the same number of independent variables, it can be concluded that in *Model 2 the number of predictors that are not significantly relevant is higher*, they are not adding value to the model in analysis.

The analysis was extended, and it was measured *Model 1* coefficients' significance. Firstly, it was analysed the coefficient of  $\beta_0$  and further along the remaining  $\beta$ 's. The hypotheses set to test the coefficient of  $\beta_0$  were the following:  $H_0: \beta_0 = 0$ ;  $H_1: \beta_0 \neq 0$ . From the output of the testing conducted, it was possible to check that  $\text{Sig} = 0,000 < \alpha = 0,05$ , meaning that  $H_0$  is rejected. *The Y intercept is significantly different from zero.* Regarding the hypotheses to test for the coefficient of  $\beta_i$  can be formulated as:  $H_0: \beta_i = 0$ ;  $H_1: \beta_i \neq 0$ ,  $i=1,2,3,4,5,6$ . The output of this test can be observed over *Table 10*.

*Table 10: Interpretation of the coefficients' testing – Model 1*

$\beta$	Description of the results
$\beta_1$	Since $\text{Sig} = 0,604 > \alpha = 0,05$ $H_0$ is not rejected, the coefficient of Environmental score can be assumed as zero.
$\beta_2$	Since $\text{Sig} = 0,000 < \alpha = 0,05$ $H_0$ is rejected, the coefficient of Social score is significantly different from zero.
$\beta_3$	Since $\text{Sig} = 0,135 > \alpha = 0,05$ $H_0$ is not rejected, the coefficient of Corporate Governance score can be assumed as zero.
$\beta_4$	Since $\text{Sig} = 0,000 < \alpha = 0,05$ $H_0$ is rejected, the coefficient of the Firm's Size is significantly different from zero.
$\beta_5$	Since $\text{Sig} = 0,950 > \alpha = 0,05$ $H_0$ is not rejected, the coefficient of Leverage can be assumed as zero.
$\beta_6$	Since $\text{Sig} = 0,004 < \alpha = 0,05$ $H_0$ is rejected, the coefficient of Industry is significantly different from zero.

Following the logic of the analysis of *Model 2*, it was tested the coefficient of  $\beta_0$  proving that  $\text{Sig} = 0,080 > \alpha = 0,05$ , which indicated that  $H_0$  is not rejected. *The Y intercept is zero.* The results of the remaining coefficients' tests can be summarized in *Table 11*.

*Table 11: Interpretation of the coefficients' testing – Model 2*

$\beta$	Description of the results
$\beta_1$	Since $\text{Sig} = 0,848 > \alpha = 0,05$ $H_0$ is not rejected, the coefficient of Environmental score can be assumed as zero.
$\beta_2$	Since $\text{Sig} = 0,946 > \alpha = 0,05$ $H_0$ is not rejected, the coefficient of Social score can be assumed as zero.
$\beta_3$	Since $\text{Sig} = 0,913 > \alpha = 0,05$ $H_0$ is not rejected, the coefficient of Corporate Governance score can be assumed as zero.
$\beta_4$	Since $\text{Sig} = 0,000 < \alpha = 0,05$ $H_0$ is rejected, the coefficient of the Firm's Size is significantly different from zero.
$\beta_5$	Since $\text{Sig} = 0,615 > \alpha = 0,05$ $H_0$ is not rejected, the coefficient of Leverage can be assumed as zero.
$\beta_6$	Since $\text{Sig} = 0,591 > \alpha = 0,05$ $H_0$ is not rejected, the coefficient of Industry can be assumed as zero.

To sum up, it was incorporated the linear association between independent and dependent variables by using a Pearson correlation. This metric allowed us to explore the intensity and direction of the linear association between the variables. The values of the correlations established and their interpretation can be found summarized on *Tables 12 and 13*.



Table 12: Linear Association between variables of Model 1

Variables	Pearson Correlation	Type of Association
CSRENV * CSRSOC	r = 0,778	Strong and positive linear association
CSRENV * CGT	r = 0,393	Moderate linear association
CSRENV * INDUST	r = 0,045	Weak linear association
CSRENV * LEVRG	r = (0,50)	Strong and negative linear association
CSRENV * FSIZE	r = (0,299)	Strong and negative linear association
CSRENV * ROA	r = (0,125)	Strong and negative linear association
CSRSOC * CGT	r = 0,501	Moderate linear association
CSRSOC * INDUST	r = 0,007	Weak linear association
CSRSOC * LEVRG	r = (0,005)	Weak linear association
CSRSOC * FSIZE	r = (0,239)	Strong and negative linear association
CSRSOC * ROA	r = (0,188)	Strong and negative linear association
CGT * INDUST	r = (0,80)	Strong and negative linear association
CGT * LEVRG	r = (0,013)	Weak linear association
CGT * FSIZE	r = (0,008)	Weak linear association
CGT * ROA	r = (0,065)	Weak linear association
INDUST * LEVRG	r = 0,099	Weak linear association
INDUST * FSIZE	r = (0,033)	Weak linear association
INDUST * ROA	r = (0,120)	Strong and negative linear association
LEVRG * FSIZE	r = 0,036	Weak linear association
LEVRG * ROA	r = (0,027)	Weak linear association
FSIZE * ROA	r = (0,352)	Weak linear association

Table 13: Linear Association between variables of Model 2

Variables	Pearson Correlation	Type of Association
CSRENV * CSRSOC	r = 0,778	Strong and positive linear association
CSRENV * CGT	r = 0,393	Moderate linear association
CSRENV * INDUST	r = 0,045	Weak linear association
CSRENV * LEVRG	r = (0,50)	Strong and negative linear association
CSRENV * FSIZE	r = (0,299)	Strong and negative linear association
CSRENV*EV_EBITDA	r = (0,061)	Weak linear association
CSRSOC * CGT	r = 0,501	Moderate linear association
CSRSOC * INDUST	r = 0,007	Weak linear association
CSRSOC * LEVRG	r = (0,005)	Weak linear association
CSRSOC * FSIZE	r = (0,239)	Strong and negative linear association
CSRSOC*EV_EBITDA	r = (0,032)	Weak linear association
CGT * INDUST	r = (0,80)	Strong and negative linear association
CGT * LEVRG	r = (0,013)	Weak linear association
CGT * FSIZE	r = (0,008)	Weak linear association
CGT * EV_EBITDA	r = 0,029	Weak linear association
INDUST * LEVRG	r = 0,099	Weak linear association
INDUST * FSIZE	r = (0,033)	Weak linear association
INDUST * EV_EBITDA	r = (0,044)	Weak linear association
LEVRG * FSIZE	r = 0,036	Weak linear association
LEVRG * EV_EBITDA	r = 0,030	Weak linear association
FSIZE * EV_EBITDA	r = 0,176	Moderate linear association

Even though the two models present different values when exploring their variables' Pearson correlations, some conclusions can be drawn. In a first stage, when analysing the correlations established between variables common to both models, it can be checked that the *Environmental score and the Social score present a high value of this metric*. This result implies

that when one of the variables' values increases, the other one is expected to increase as well. Additionally, from this testing, the relationship between the Environmental score with the control variables Leverage and Firm's size has proven to be strong and negative which may contradict some of the results expected. While a higher leverage value is related to a higher financial risk reducing the possibility of investing in Environmental practises, *the association between the CSRENV and the FSIZE seems to be contradictory*. According to the results, when the Environmental score increases the firm size is expected to decrease contradicting the expectations of this dissertation. The variable CSRSOC has also proved a strong negative correlation with the control variable that measures the firms' size, following the same logic and, moreover, the variable CGT with the control variable for the firms' industry.

When checking the association between the variables related with the CSR concept and the concept of CG, a moderate linear association was detected confirming that the two concepts are correlated. Thus, *Hypothesis 4 can be defined as confirmed*.

Concerning the correlations observed between the independent variables and the dependent variables, the results were contradictory when comparing both models. While the variables CSRENV, CSRSOC and CGT present a weak linear association with the metric EV/EBITDA in Model 2, the same does not happen on Model 1. In the first model, the financial measure ROA proved a strong and negative linear association with the CSR related variables and a weak linear association with the CG variable. This first result translates into the conclusion that when there is an increase of the companies' financial performance via ROA, there is a decrease of the organizations' CSR scores - *confirming the rejection of Hypothesis 2* for this variable.

In order to enquire if *Hypothesis 5* is confirmed or rejected, an experimental model (Model 3) where the dependent variable is replaced by the CGT variable was developed. Following this logical reasoning, the model can be defined as:

$$\text{Model 3: } CGT_{it} = \beta_0 + \beta_1 * CSRENV_{it} + \beta_2 * CSRSOC_{it} + \beta_3 * FSIZE_{it} + \beta_4 * LEVRG_{it} + \beta_5 * INDUST_{it} + \varepsilon_{it}$$

The validity of the model was checked via the ANOVA test as it can be checked over *Annex G*. The hypotheses were  $H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$ ;  $H_1: \exists \beta_i \neq 0, i=1,2,3,4,5,6$ . Since  $Sig = 0,000 < \alpha = 0,05$ ,  $H_0$  is rejected and the model can be considered as valid.

$$\text{Model 3: } CGT_{it} = -1,641 + 0,056 * CSRENV_{it} + 0,501 * CSRSOC_{it} + 0,913 * FSIZE_{it} - 0,001 * LEVRG_{it} - 0,092 * INDUST_{it} + \varepsilon_{it}$$

After estimating the model, some conclusions were possible to be drawn. For instance, through this model it can be gathered that when the Corporate Governance score assumes the role of dependent variable, an increase of its value will increase the value of the Environmental score of an organization along with its Social score. After this statement, *Hypothesis 5 is assumed to be confirmed* for the sample of this paper. From this test, it is also interesting to analyse that an increase of the Corporate Governance, will directly increase the firm's size and a decrease of its leverage which acts according to the expected.

#### 4.2.3) Measures of Association

It was included in the analysis measures of association to confirm some of the results already attained. This part of the analysis was divided accordingly with the type of variables, namely between two qualitative variables, between a qualitative variable and a quantitative variable and between two quantitative variables (*Annex H*).

On *Table 14*, the associations between the qualitative variables are summarized. From this table, it is observed that the Environmental score and the Social score have the strongest associated when compared to the ESG score variables. We can state that these two variables have a strong direct association, which complements the results already obtained in the previous sub-chapter. Opposed to this last conclusion, the relationship between the Environmental score and the Corporate Governance score is weaker, that is, these variables have a weak direct association. And, concerning the link between the Social score and the Corporate Governance score, it can be concluded that there is a moderate direct association.

*Table 14: Measures of Association between Qualitative Variables*

Variable 1	Variable 2	Measure of Association	Type of Variables	Value
CSRENV	CSRSOC	Spearman Correlation	Ordinal * Ordinal	$r^S = 0,670$
CSRENV	CGT	Spearman Correlation	Ordinal * Ordinal	$r^S = 0,228$
CSRSOC	CGT	Spearman Correlation	Ordinal * Ordinal	$r^S = 0,311$

To understand the existence of correlations between a qualitative and a quantitative variable and the respective measure used, the analysis is schematized on *Table 15*. In the first stage of the analysis, it was tested the possible correlation between the ESG score variables and the performance measure ROA. From these tests, all the variables proved a negative correlation with the respective financial performance metric. All the variables have a weak inverse association with ROA, the opposite result to when they are accounted for in the two models. Secondly, it was measured the association between these variables, but with the second performance metric (EV/EBITDA). From this second analysis, the results differed. A

weak direct association was proven between the Corporate Governance and the EV/EBITDA. And, furthermore, the Environmental and Social variables proved a weak inverse association.

Table 15: Measures of Association between a Qualitative and a Quantitative Variable

Variable 1	Variable 2	Measure of Association	Type of Variables	Value
CSRENV	ROA	Spearman Correlation	Ordinal * Metric	$r^S = (0,078)$
CSRSOC	ROA	Spearman Correlation	Ordinal * Metric	$r^S = (0,202)$
CGT	ROA	Spearman Correlation	Ordinal * Metric	$r^S = (0,102)$
CSRENV	EV/EBITDA	Spearman Correlation	Ordinal * Metric	$r^S = (0,141)$
CSRSOC	EV/EBITDA	Spearman Correlation	Ordinal * Metric	$r^S = (0,088)$
CGT	EV/EBITDA	Spearman Correlation	Ordinal * Metric	$r^S = 0,069$

In the end, on Table 16, it is possible to check the correlation established between two quantitative variables: ROA and EV/EBITDA. These two measures have proven a negative relationship, allowing us to assume a weak inverse association between both.

Table 16: Measures of Association between two Quantitative Variables

Variable 1	Variable 2	Measure of Association	Type of Variables	Value
ROA	EV/EBITDA	Pearson Correlation	Metric * Metric	$r = (0,099)$

To assess the veracity of Hypothesis 3, it was conducted a Chi-Square test between the two variables that define the concept of Corporate Social Responsibility: CSRENV and CSRSOC. The requirement of this test that needs to be verified is that *at least 80% of the cells need to have an expected count greater than 5*. On a first stage, the expected count was greater than 80%, which did not allow us to make any valid conclusions. To correct this, allowing the test to be valid, the levels of the variables' categories were reduced from 12 to 4 (aggregating the score in the levels of "A", "B", "C" and "D"), which was not enough. Moreover, only two levels were defined for both variables (ESG score Classification of "A" and "B"; ESG score Classification of "C" and "D") leading to a 100% expected count greater than 5.

After verifying the condition, the test was valid to be used and interpreted. The hypotheses of the Chi-Square test can be formulated as: H<sub>0</sub>) No relationship exists between the two variables; H<sub>1</sub>) There is a significant relationship established between the two variables. From the output collected, it was possible to check H<sub>0</sub> was rejected ( $\text{Sig}=0,000 < \alpha = 0,05$ ), proving the existence of a significant relationship between the variables CSRENV and CSRSOC.

To understand the relationship of these two variables, an interpretation of the output obtained in the cross tabulation was made (*Annex H*). From the firms inserted in the Environmental score category classification of the "A" and "B", in the timeframe selected, 97,3% are also inserted in the Social score category of "A" and "B". Concerning the firms inserted in the Social score category classification of the "A" and "B", in the timeframe of the study, 87,6% are inserted in the Environmental score category classification of "A" and "B".

From the firms inserted in the Environmental score category classification of the “C” and “D”, in the timeframe of the study, 45,5% are also inserted in the Social score category classification of “C” and “D”. And, regarding the firms inserted in the Social score category classification of the “C” and “D”, in the timeframe of the study, 12,4% are also inserted in the Environmental score category classification of “C” and “D”. Therefore, 76,8% of the population is placed in the Environmental and Social score category classification of the “A” and “B” and 23,2% of the population is placed in the Environmental and Social score category classification of the “C” and “D”. This analysis allows us to conclude that the Environmental score, due to its higher values in both categories, presents a higher impact on the overall concept of CSR. *Hypothesis 3.1 is confirmed and, as a result, Hypothesis 3.2 is rejected.*

**4.2.4) Normality and ANOVA testing**

To further examine the effects between the variables of this dissertation, additional testing was conducted by using the ANOVA. For being able to conduct this test, a few assumptions need to be made. In a first instance, the variables have to be Normally distributed, which was assessed in a distinct segment. The sample has to be independent, this is, the variables that constitute the testing sample cannot be correlated and, additionally, the variables’ variance needs to assume the same value, which was tested by running the Levene’s test.

With the aim to evaluate the variables’ normality, the goodness-of-fit tests used were the Shapiro-Wilk and the Kolmogorov-Smirnov (*Annex I*). With these tests, it was possible to examine the existence or lack of a Normal distribution before conducting the remaining tests. The output obtained from these tests can be found schematized on *Table 17*.

*Table 17: Summary of the Normality tests*

Test	Variables	Output
1A	CSRENV* CSRSOC	The variables X7 and X8, which represent the performance of the Environmental score of the companies with a Social classification score of “C+” and “C”, assume a Normal distribution.
2A	CSRENV* CGT	Only the variable X10, which represents the performance of the Environmental score of the companies with a Corporate Governance classification score of “D+”, assumes a Normal distribution.
3A	CSRSOC* CGT	The variables X1, X10 and X11, which represent the performance of the Social score of the companies with a Corporate Governance classification score of “A+”, “D+” and “D”, assume a Normal distribution.
4A	CSRSOC* CSRENV	The variables X10 and X11, which represent the performance of the Social score of the companies with an Environmental classification score of “D+” and “D”, assume a Normal distribution.
5A	CGT* CSRENV	The variables X10 and X11, which represent the performance of the Corporate Governance score of the companies with an Environmental classification score of “D+” and “D”, assume a Normal distribution.

Test	Variables	Output
6A	CGT* CSRSOC	The variables X1, X8, X10 and X11, which represent the performance of the Corporate Governance score of the companies with a Social classification score of "A+", "C", "D+" and "D", assume a Normal distribution.
7A	ROA* CSRENV	The variables X1, X10 and X11, which represent the financial performance of the Return of Assets of the companies with an Environmental classification score of "A+", "D+" and "D", assume a Normal distribution.
8A	ROA* CSRSOC	The variables X1, X8, X9, X10, X11 and X12, which represent the financial performance of the Return of Assets of the companies with a Social classification score of "A+", "C", "C-", "D+", "D" and "D-", assume a Normal distribution.
9A	ROA*CGT	The variables X1, X2, X10, X11 and X12, which represent the financial performance of the Return of Assets of the companies with a Corporate Governance classification score of "A+", "A", "D+", "D" and "D-", assume a Normal distribution.
10A	EV_EBITDA* CSRENV	The variables X5, X7, X9 and X10, which represent the financial performance of the EV/EBITDA of the companies with an Environmental classification score of "A+", "A", "D+", "D" and "D-", assume a Normal distribution.
11A	EV_EBITDA* CSRSOC	The variables X1, X5, X8, X9, X10 and X12, which represent the financial performance of the EV/EBITDA of the companies with a Social classification score of "A+", "B", "C", "C-", "D+" and "D-", assume a Normal distribution.
12A	EV_EBITDA* CGT	The variables X1, X5, X9, X10, X11 and X12, which represent the financial performance of the EV/EBITDA of the companies with a Corporate Governance classification score of "A+", "B", "C", "C-", "D+", "D" and "D-", assume a Normal distribution.

After conducting the Normality tests, it was possible to determine the variables that assumed a Normal distribution and exclude the ones that did not for the rest of the analysis. The description of the tests performed for the ANOVA already take into account the variables that proved a Normal distribution, thereby excluding the remaining ones from the analysis. The connections that were explored in this segment of the dissertation totalized twelve tests and can be divided into 2 groups: the correlations between the three variables associated with the ESG score and the association between each ESG related score and the two variables responsible for measuring the firms' financial performance. To the extension of this test (*Annex J*), the tests and the respective results are summarized on *Tables 18 and 19*.

To conduct the ANOVA test, as it was previously mentioned, the Levene's test needs to be run to inquire about the equality of variances or lack of it. When the equality of variances is guaranteed, the ANOVA was used. Otherwise, in the case of differences within the variances, the test applied was the Welch. When significant differences were spotted, according to the test two other tests were conducted. In the tests where the ANOVA was used, to explore the pairs responsible for the significant differences, the test used was the Scheffe's. For the Welch tests, the Games-Howell was the test chosen with that purpose.

In the case of Test 12B, after conducting the Games-Howell, it was not possible to identify any significant pairs even though the Welch proved the existence of at least one pair. To overcome this issue, an additional testing was run to identify the significant pairs: a Kruskal-

Wallis test. On *Table 20*, the description of the pairs or group of pairs that differ within the sample of the tests are displayed.

*Table 18: Output gathered from the ANOVA analysis: ESG related variables connections*

Test	Variables	Output
1B	CSRENV*CSRSOC	Did not present any significant differences.
2B	CSRENV*CGT	It was not possible to conduct any testing.
3B	CSRSOC*CGT	Presented significant differences.
4B	CSRSOC*CSRENV	Did not present any significant differences.
5B	CGT*CSRENV	Did not present any significant differences.
6B	CGT*CSRSOC	Presented significant differences.

*Table 19: Output gathered from the ANOVA analysis: ESG and Financial Variables*

Test	Variables	Output
7B	ROA*CSRENV	Did not present any significant differences.
8B	ROA*CSRSOC	Presented significant differences.
9B	ROA*CGT	Presented significant differences.
10B	EV_EBITDA*CSRENV	Presented significant differences.
11B	EV_EBITDA*CSRSOC	Did not present any significant differences.
12B	EV_EBITDA*CGT	Presented significant differences.

*Table 20: ANOVA Analysis - Pairs of variables presenting significant differences*

Test	Pairs Significant Different
3B) CSRSOC*CGT 6B) CGT*CSRSOC	The population of companies with a Corporate Governance score classification of "A+" and a Corporate Governance score classification of "D+"; Corporate Governance score classification of "A+" and a Corporate Governance score classification of "D". The population of companies with a Social score classification of "A+" and Social score classification of "D+"; Social score classification of "A+" and Social score classification of "D"; Social score classification of "C" and Social score classification of "D+"; Social score classification of "C" and Social score classification of "D".
8B) ROA*CSRSOC 9B) ROA*CGT	The population of companies with a Social score classification of "A+" and Social score classification of "C"; Social score classification of "A+" and Social score classification of "C-"; Social score classification of "A+" and Social score classification of "D+"; Social score classification of "A+" and Social score classification of "D"; Social score classification of "A+" and Social score classification of "D-". The populations of companies with a Corporate Governance score classification of "A+" and a Corporate Governance score classification of "D-".

Test	Pairs Significant Different
10B) EV_EBITDA*CSRENV	The populations of companies with an Environmental score classification of “B” and an Environmental score classification of “C-“; Environmental score classification of “C+” and an Environmental score classification of “C-”.
12B) EV_EBITDA*CGT	The populations of companies with an Corporate Governance score with Classification of “C” and Corporate Governance score with Classification of “D-“; Corporate Governance score with Classification of “C” and Corporate Governance score with Classification of “D”; Corporate Governance score with Classification of “B” and Corporate Governance score with Classification of “B-“; Corporate Governance score with Classification of “B” and Corporate Governance score with Classification of “D-“; Corporate Governance score with Classification of “B” and Corporate Governance score with Classification of “D”; Corporate Governance score with Classification of “B+” and Corporate Governance score with Classification of “D-“; Corporate Governance score with Classification of “B+” and Corporate Governance score with Classification of “D”; Corporate Governance score with Classification of “A” and Corporate Governance score with Classification of “D-“; Corporate Governance score with Classification of “C+” and Corporate Governance score with Classification of “D-“; Corporate Governance score with Classification of “A-” and Corporate Governance score with Classification of “D-“.

#### 4.2.5) Inferential Analysis

To check the validity of the model for the population the study focuses on, and not only the sample, we need to infer about the theoretical model (*Annex K*). Considering errors assume unknown values, to evaluate all their parameters we used their estimates (the residuals). The three main aspects that need to be checked when analyzing the theoretical model are: if there is a linear relationship between the independent and the dependent variables as well as an error component ( $\epsilon$ ); the errors of the model need to be independent, assume a Normal distribution, a mean equal to zero and a constant variance; and, the multicollinearity can not be verified within the model.

While the first parameter was assumed to be verified, to assess if the residuals assume a *Normal distribution on Model 1*, a goodness-of-fit test was performed (Kolmogorov-Smirnov) defining the hypotheses of this testing as: H<sub>0</sub>) Residuals assume a Normal distribution; H<sub>1</sub>) Residuals do not assume a Normal distribution. When the output was analysed, the condition was not verified. Although, since the sample is considered to be larger ( $n=388>30$ ), by applying the Central Limit Theorem, this condition can be assumed as verified.

Following the criteria previously defined, to evaluate if residuals have *mean zero*, the statistics of the residuals (which can be found over *Annex J*) proved this condition was verified. Additionally, it was tested if the residuals assume a *constant variance*. To infer this assumption, it conducted a Breusch-Pagan test and built a scatterplot representative of the sample. The hypotheses of the test formulated were defined as H<sub>0</sub>: The residuals tested for homoscedasticity and H<sub>1</sub>: The residuals tested for heteroscedasticity. In the test,  $Sig=0,672 > \alpha=0,05$  allowing us to conclude that H<sub>0</sub> is not rejected, that is, the residuals present homoscedasticity. The assumption is confirmed.



Regarding the *residuals' independence*, this parameter was not inferred since this study does not take into account a chronological order. To assess for the *multicollinearity*, two parameters were analysed: the tolerance and the VIF. When analysing the tolerance of a model, it is considered that if the parameter assumes higher values, the better since the lower the Coefficient of Determination. Since all the variables of Model 1 assume values above 0,1, it can be assumed there is no multicollinearity. Moreover, the VIF is responsible for accounting the amount of variance of the coefficients' estimators that are inflated due to the presence of multicollinearity. Following this reasoning, the lower the values of the VIF, the better. Since the values of the VIF independent variables are lower than 10, it can be assumed there is no multicollinearity. The two metrics verified the condition.

Following the logic of the inferential analysis conducted for the Model 1, the same process was managed for *Model 2*. To evaluate if the residuals assume a *Normal distribution*, the test Kolmogorov-Smirnov was developed with the hypotheses of  $H_0$ : Residuals assume a Normal distribution and  $H_1$ : Residuals do not assume a Normal distribution. Similarly to Model 1, the condition was not verified. However, this condition can be assumed as verified due to the use of the Central Limit Theorem as well ( $n=387 > 30$ ).

Similar to Model 1, the *mean* of the residuals was performed by developing the residuals' statistics. By analysing the output of this table on *Annex J*, the mean proved to assume the value of zero verifying the condition. The third point tested was if residuals have a *constant variance*. To achieve that goal, it was used a Breusch-Pagan test with the following hypotheses:  $H_0$  being the residuals tested for homoscedasticity and  $H_1$  the residuals tested for heteroscedasticity. From the output of this assessment,  $H_0$  was not rejected confirming the condition to be verified within this testing since  $\text{Sig}=0,657 > \alpha = 0,05$ .

The evaluation of the *residuals' independence* was not assessed since in the data of this paper was not relevant the chronological order as it was explained for Model 1. At last, the *multicollinearity* was not verified within the model proving the condition stated previously. The values of the tolerance of Model 2 assumed values above 0,1, proving there is no multicollinearity. And, the VIF was proved to have no multicollinearity, since the values of the independent variables are lower than 10.

The verification of these criteria allows to ensure that *both models are valid for the purpose of this study* and, as so, *their conclusions are also valid* and should be taken into consideration.

## 5. Conclusions and Recommendations

### 5.1) Conclusions

The themes of Corporate Governance and Corporate Social Responsibility have been topics commonly studied in the last decades due to relevant applications and implications in the market. When analysing the previous papers developed, a gap was found within the literature. Prior studies were conducted in order to confirm a positive connection between Corporate Governance and an organization's financial performance (Esteban-Sanchez et al., 2017; Paniagua et al., 2018; Singh et al., 2018). And, similarly, Corporate Social Responsibility and Corporate Financial Performance have been tested with the purpose of determining the origin of their connection (Reverte, 2009; Mallin et al., 2014; Theodoulidis et al., 2017). However, the possible relationship between the concepts of Corporate Governance and Corporate Social Responsibility and posterior connection with an organization's financial performance was not explored. With the purpose of filling this literature gap, this dissertation was developed considering 100 companies selected from the *Fortune 500*.

From the analysis of some of the previous studies, many contradictory conclusions and limitations have been drawn. When attempting to study the effects of Corporate Governance as a mechanism on the CSR investment, Pekovic and Vogt (2020) reached the conclusion that CSR had no impact on organizations' financial performance. When attempting to prove the connection between Corporate Social Responsibility and Corporate Financial Performance having as moderators the factors of corporate image and customer satisfaction, Ali, Danish, and Asrar-ul-Haq (2020) found a positive link. Additionally, the reduced number of features used when accounting for Corporate Governance, the metrics used when testing for Corporate Financial Performance and Corporate Social Responsibility, as well as the focus in a specific industry are just a few examples of common limitations. When conducting the analysis, some of these limitations were excluded or mitigated, which allowed us to reach some relevant conclusions. Firstly, when checking the concepts of Corporate Governance and Corporate Financial Performance, it was possible to confirm the existence of a positive connection between the two concepts for the two different financial metrics used. The same assumption was also proven for the relationship between Corporate Social Responsibility and Corporate Financial Performance, but only when the metric used to account for financial performance was EV/EBITDA. When testing this assumption via ROA, the hypothesis was rejected.

Since there were two distinct scores related to CSR (Environmental and Social Score), the study decided to explore with more detail if the impact of both was equal. It was possible to conclude that, for the sample used, the Environmental Score proved a higher impact than the Social Score. This result confirms the overall tendency of firms to align their corporate goals

with the markets' new expectations as has been pointed out by prior papers (Ali et al., 2020; Gürlek et al., 2017).

At last, concerning the connection between the concepts of Corporate Governance and Corporate Social Responsibility, the two variables proved to be positively correlated. Moreover, Corporate Governance proved to be positively dependent on Corporate Social Responsibility. When there is an improvement of the Corporate Social Responsibility score of an organization, its Corporate Governance score is also expected to increase. So, by investing in one, an organization will directly impact the other.

Respecting the evolution of the ESG scores over time, there has been spotted an overall improvement of the three related variables. These results allowed us to conclude that the organizations of the sample have been improving their scores over the years, which translates that the respective score and its evolution is being taken into consideration in the decision-making process.

From the analysis of the type of industry according to the respective score level, on the Environmental Score, it was detected a higher concentration of companies in the level "A" in the Financials' industry and a concentration with the classification of "A-" in the Industrials and Technology. For the Social Score, a higher number of companies was detected in the Financials sector with the score of "A-" and in the level "B+" on the Industrials. At last, on the Corporate Governance score with a classification of "A-", there is a focus of organizations in the industries of Financials, Industrials and Consumer Staples. In this segment of the paper, the results proved a tendency within the higher level of the Environmental, Social and Corporate Governance score. When observing the category level A ("A+", "A", "A-"), it was detected a higher number of companies inserted in the Financials industry, which contains companies from the banking and insurance sectors. This outcome might be related with the services sector and the flexibility of organizations to adapt their business in order to meet some of the criterias, when compared to other industries such as the Energy sector.

As part of our analysis, beyond developing the necessary testing in order to check the hypotheses formulated, some meaningful correlations were detected namely the correlations between the Environmental score and the Social score. These two variables showed a high Pearson Correlation value, proving that when one of the variables increases its value, the second one is expected to increase along. This connection was also proven when checking the Spearman Correlation value between the two variables. Moreover, the Environmental score proved to have a strong and negative value with the control variable Leverage, which can be explained by the existence of a higher financial risk when there is an increase of a firm's leverage. The negative association between the Environmental and Social Score with firms' size contradicts the premise that the investment in CSR practises increases along with the organizations' growth. Additionally, the Environmental score and the Corporate Governance

score proved a weak direct association. This result is contradictory, since when conducting the same test, the Social score and the Corporate Governance score proved a moderate direct association. From these two tests, it is possible to conclude that when testing the association between the CSR components, a stronger association was detected between the Social score and the Corporate Governance score.

With regard to the remaining correlations, the three ESG related variables proved the existence of a weak inverse association with ROA. EV/EBITDA proved a weak direct association with Corporate Governance and a weak inverse association with the Environmental and Social score. From these results, it was possible to verify that only Corporate Governance has a direct, but weak, association with one of the metrics. The remaining associations proved that when the financial metrics increase, the scores are expected to decrease which contradicts the results. Although, since the associations were weak, this factor was not taken into consideration as a critical one into this dissertation's analysis. Furthermore, ROA and EV/EBITDA, when accounted by the Pearson Correlation, demonstrated a weak inverse association, proving that when one increases the other is expected to decrease. Once again, since it is a weak association, it did not have an additional impact on the conclusions already taken from this study.

The use of the Normality and the ANOVA testing allowed us to conclude about the existence or lack of significant differences between the means of the variables chosen. From this analysis, it was possible to identify that 6 out of the 12 tests conducted presented significant differences when comparing the equality of their averages. As one example, by conducting the ANOVA, it was possible to detect if the average of the Social Score is equal for the Corporate Governance Score classifications. Ultimately, it was reached the conclusion that for the population of companies with a Corporate Governance score classification of "A+" and a score classification of "D+" as well as for the population of Corporate Governance score classification of "A+" and a score classification of "D" significant differences between the means of these variables were spotted in terms of the average of the Corporate Governance Score. Subsequent to its realization, this segment did not contribute any additional points to the research. However, as it does not refute any of the points mentioned above, it remained in the results' chapter as an additional test.

After conducting the necessary testing to accept or reject the hypotheses established for this study, we were able to answer the research question initially formulated for this dissertation: *Is a positive link established between CSR practises and Corporate Governance structures of an organization able to lead to a higher financial performance?*. From the data collected, it was possible to conclude that when the financial performance metric used is the EV/EBITDA (Model 2), there is a positive connection between both concepts and an organizations' financial performance. The same was not verified when the financial metric was

ROA. When analysing the effects of these variables, on Model 1, due to the negative link between Corporate Social Responsibility and Corporate Financial Performance, the research question was disproved.

## **5.2) Contributions, Limitations and Future Research**

By conducting this dissertation, several contributions were possible to be gathered for both an academic purpose as well as for a practical application. In the academic level, the link between the concepts of CG and CSR with a company' financial performance was possible to be proven for one of the metrics used. In addition to this new perspective inserted into the literature, the study was based on a wide sample and on a current timeframe excluding the pandemic factor. When measuring the concept of Corporate Financial Performance, the choice relied on the use of financial metrics (ROA and EV/EBITDA) instead of market based metrics (Tobin's Q) and, a different metric was used (EV/EBITDA) when compared to the metrics adopted in prior studies. Moreover, a unique model was formulated and used proving its validity and applicability in a real-life context.

From the conclusions gathered, in a practical context, it is possible to confirm the growth of CSR practises in the organizations identified as the most profitable in the years analysed. This outcome can be associated, as it has been proven, to the direct and positive connection between CSR and organizations' financial performance. Additionally, from the evidences collected, it is also possible to conclude the impact of Corporate Governance related decisions on not only Financial Performance, but also on the dependence of CSR to this concept. For this reason, organizations can improve their Corporate Social Responsibility score with the aim of increasing their Corporate Governance score. Although, even after checking that the Environmental Score has the most impact on the overall CSR concept, the Social Score proved a higher association with Corporate Governance. In the moment of investing in CSR, to have the highest impact in CG, an investment into practises related to the Social Score should be considered as better when compared to Environmental actions.

When analysing this paper, a few limitations can be pointed out. Our first limitation is related to the lack of data from the year of 2020, which was not available for most of the companies when the study was conducted. Nevertheless if the values would be considered into the sample, the paper would need to take into consideration the pandemic as a moderator variable to reduce the risk of biased results. Furthermore, another relevant aspect is that Corporate Social Responsibility is an abstract concept therefore difficult to be accepted by all and to be measured with precision.

The sample included companies from the *Fortune 500* which means it only covered companies based on the US, which leads us to our first suggestion for a future research on

the theme. Other papers should be conducted for firms according to their headquarters location or region, per example. In addition, a second recommendation would be to include the years of 2020 and 2021 to analyse a new trend that might be associated with the pandemic crisis. Finally, CSR related strategies have proven to be on the rise among organizations. Following this reasoning, a future research should be conducted in order to explain if the future saturation of the market with these types of strategies will become a feature that organizations will be obligated to meet instead of a differentiation criteria.

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## 7. Annexes

### Annex A: Sample used in the Analysis

#### A.1) Sample selected for the paper

<b>Ranking</b> Source: <i>Fortune 500</i>	<b>Company's Name</b> Source: <i>Fortune 500</i>	<b>Country</b> Source: <i>Fortune 500</i>	<b>Sector</b> Source: <i>Bloomberg</i>	<b>Industry</b> Source: <i>Fortune 500</i>
1	Walmart	U.S.	Consumer Staples	General Merchandisers
2	Exxon Mobil	U.S.	Energy	Petroleum Refining
3	Apple	U.S.	Technology	Computers
4	Berkshire Hathaway	U.S.	Financials	Insurance: Property and Casualty
5	Amazon	U.S.	Consumer Discretionary	Internet Services and Retailing
6	UnitedHealth Group	U.S.	Health Care	Health Care: Insurance and Managed Care
7	McKesson	U.S.	Health Care	Wholesalers: Health Care
8	CVS Health	U.S.	Health Care	Health Care: Pharmacy and Other Services
9	AT&T	U.S.	Communications	Telecommunications
10	AmerisourceBergen	U.S.	Health Care	Wholesalers: Health Care
11	Chevron	U.S.	Energy	Petroleum Refining
12	Ford Motor	U.S.	Consumer Discretionary	Motor Vehicles & Parts
13	General Motors	U.S.	Consumer Discretionary	Motor Vehicles
14	Costco Wholesale	U.S.	Consumer Staples	General Merchandisers
15	Alphabet	U.S.	Communications	Internet Services and Retailing
16	Cardinal Health	U.S.	Health Care	Wholesalers: Health Care
17	Walgreens Boots Alliance	U.S.	Consumer Staples	Food and Drugstores
18	JPMorgan Chase	U.S.	Financials	Megabanks
19	Verizon Communications	U.S.	Communications	Telecommunications
20	Kroger	U.S.	Consumer Staples	Food and Drugstores
21	General Electric	U.S.	Industrials	Industrial Machinery Diversified
22	Fannie Mae	U.S.	Financials	Financials
23	Phillips 66	U.S.	Energy	Energy
24	Valero Energy	U.S.	Energy	Petroleum Refining
25	Bank of America	U.S.	Financials	Megabanks
26	Microsoft	U.S.	Technology	Computer Software
27	Home Depot	U.S.	Consumer Discretionary	Specialty Retailers
28	Boeing	U.S.	Industrials	Aerospace & Defense
29	Wells Fargo	U.S.	Financials	Banks: Commercial and Savings
30	Citigroup	U.S.	Financials	Megabanks
31	Marathon Petroleum	U.S.	Energy	Petroleum Refining
32	Comcast	U.S.	Communications	Entertainment
33	Anthem	U.S.	Health Care	Health Care: Insurance and Managed Care
34	Dell Technologies	U.S.	Technology	Computers
35	DuPont de Nemours	U.S.	Materials	Chemicals



36	State Farm Insurance	U.S.	Financials	Insurance: Property and Casualty (Mutual)
37	Johnson & Johnson	U.S.	Health Care	Pharmaceuticals
38	IBM	U.S.	Technology	Information Technology Services
39	Target	U.S.	Consumer Staples	General Merchandisers
40	Freddie Mac	U.S.	Financials	Diversified Financials
41	United Parcel Service	U.S.	Industrials	Delivery
42	Lowe's	U.S.	Consumer Discretionary	Specialty Retailers
43	Intel	U.S.	Technology	Semiconductors and Other Electronic Components
44	MetLife	U.S.	Financials	Insurance: Life and Health
45	Procter & Gamble	U.S.	Consumer Staples	Soaps and Cosmetics
46	United Technologies	U.S.	Industrials	Aerospace and Defense
47	FedEx	U.S.	Industrials	Delivery
48	PepsiCo	U.S.	Consumer Staples	Consumer Food Products
49	Archer Daniels Midland	U.S.	Consumer Staples	Food Production
50	Prudential Financial	U.S.	Financials	Insurance: Life and Health
51	Centene	U.S.	Health Care	Health Care: Insurance & Managed Care
52	Albertsons	U.S.	Consumer Staples	Food & Drug Stores
53	Walt Disney	U.S.	Communications	Entertainment
54	Sysco	U.S.	Consumer Staples	Wholesalers: Food and Grocery
55	HP	U.S.	Technology	Computers
56	Humana	U.S.	Health Care	Health Care: Insurance and Managed Care
57	Facebook	U.S.	Communications	Interactive Media and Services
58	Caterpillar	U.S.	Industrials	Construction and Farm Machinery
59	Energy Transfer	U.S.	Energy	Pipelines
60	Lockheed Martin	U.S.	Industrials	Aerospace and Defense
61	Pfizer	U.S.	Health Care	Pharmaceuticals
62	Goldman Sachs Group	U.S.	Financials	Megabanks
63	Morgan Stanley	U.S.	Financials	Megabanks
64	Cisco Systems	U.S.	Technology	Network and Other Communications Equipment
65	Cigna	U.S.	Health Care	Health Care: Pharmacy and Other Services
66	AIG	U.S.	Financials	Insurance: Property and Casualty (Stock)
67	HCA Healthcare	U.S.	Health Care	Health Care: Medical Facilities
68	American Airlines Group	U.S.	Industrials	Airlines
69	Delta Air Lines	U.S.	Industrials	Airlines
70	Charter Communications	U.S.	Communications	Telecommunications
71	New York Life Insurance	U.S.	Financials	Insurance: Life and Health
72	American Express	U.S.	Financials	Consumer Credit Card and Related Services
73	Nationwide	U.S.	Financials	Financial Services & Insurance
74	Best Buy	U.S.	Consumer Discretionary	Specialty Retailers
75	Liberty Mutual Insurance Group	U.S.	Financials	Insurance: Property and Casualty (Stock)
76	Merck	U.S.	Health Care	Pharmaceuticals

77	Honeywell International	U.S.	Industrials	Electronics
78	United Airlines Holdings	U.S.	Industrials	Airlines
79	TIAA	U.S.	Financials	Insurance: Life and Health
80	Tyson Foods	U.S.	Consumer Staples	Food Production
81	Oracle	U.S.	Technology	Computer Software
82	Allstate	U.S.	Financials	Insurance: Property and Casualty
83	World Fuel Services	U.S.	Energy	Energy
84	Massachusetts Mutual Lide Insurance	U.S.	Financials	Insurance: Life and Health
85	TJX	U.S.	Consumer Discretionary	Specialty Retailers
86	ConocoPhillips	U.S.	Energy	Mining, Crude-Oil Production
87	Deere	U.S.	Industrials	Construction and Farm Machinery
88	Tech Data	U.S.	Technology	Wholesalers: Electronics and Office Equipment
89	Enterprise Products Partners	U.S.	Energy	Pipelines
90	Nike	U.S.	Consumer Discretionary	Apparel
91	Publix Super Markets	U.S.	Consumer Staples	Retail
92	General Dynamics	U.S.	Industrials	Aerospace and Defense
93	Exelon	U.S.	Utilities	Electric and Gas Utilities
94	Plains GP Holdings	U.S.	Energy	Pipelines
95	3M	U.S.	Industrials	Chemicals
96	AbbVie	U.S.	Health Care	Pharmaceuticals
97	CHS	U.S.	Consumer Staples	Food Production
98	Capital One Financial	U.S.	Financials	Consumer Credit Card and Related Services
99	Progressive	U.S.	Financials	Insurance: Property and Casualty
100	Coca-Cola	U.S.	Consumer Staples	Beverages

## A.2) Companies excluded from the sample Sample selected for the analysis

Ranking	Company	Country	Sector	Industry
#22	Fannie Mae	U.S.	Financials	Financials
#36	State Farm Insurance	U.S.	Financials	Insurance: Property and Casualty (Mutual)
#40	Freddie Mac	U.S.	Financials	Diversified Financials
#46	United Technologies	U.S.	Industrials	Aerospace and Defense
#52	Albertsons	U.S.	Consumer Staples	Food & Drug Stores
#59	Energy Transfer	U.S.	Energy	Pipelines
#71	New York Life Insurance	U.S.	Financials	Insurance: Life and Health
#73	Nationwide	U.S.	Financials	Financial Services & Insurance
#75	Liberty Mutual Insurance Group	U.S.	Financials	Insurance: Property and Casualty (Stock)
#79	TIAA	U.S.	Financials	Insurance: Life and Health
#84	Massachusetts Mutual Lide Insurance	U.S.	Financials	Insurance: Life and Health
#91	Publix Super Markets	U.S.	Consumer Staples	Retail
#97	CHS	U.S.	Consumer Staples	Food Production

## Annex B: Categories of the ESG score: Environmental segment

1) Environment		Source: ESG score, EIKON
<b>1.1) Resource Use</b>		
Resource Reduction Policy	Renewable Energy Use Ratio	
Policy Water Efficiency	Renewable Energy Supply	
Policy Energy Efficiency	Total Renewable Energy To Energy Use in million	
Policy Sustainable Packaging	Total Renewable Energy Direct	
Policy Environmental Supply Chain	Renewable Energy Purchased	
Resource Reduction Targets	Renewable Energy Produced	
Targets Water Efficiency	Renewable Energy Use	
Targets Energy Efficiency	Cement Energy Use	
Environment Management Team	Coal produced (Raw Material in Tonnes) Total	
Environment Management Training	Green Buildings	
Environmental Materials Sourcing	Total Water Use / Million in Revenue \$	
Toxic Chemicals Reduction	Water Withdrawal Total	
Total Energy Use / Million in Revenue \$	Fresh Water Withdrawal Total	
Energy Use Total	Water Recycled	
Energy Purchased Energy Produced Direct	Environmental Supply Chain Management	
Indirect Energy Use	Environmental Supply Chain Monitoring	
Electricity Purchased	Env Supply Chain Partnership Termination	
Electricity Produced	Land Environmental Impact Reduction	
Grid Loss Percentage		
<b>1.2) Emissions</b>		
Policy Emissions	Waste Recycled Total	
Targets Emissions	Waste Recycling Ratio	
Emission Reduction Target Percentage	Hazardous Waste	
Emission Reduction Target Year	Waste Reduction Initiatives	
Biodiversity Impact Reduction	e-Waste Reduction	
Estimated CO2 Equivalents Emission Total	Total Water Pollutant Emissions / Million in Revenue \$	
CO2 estimation method	Water Discharged	
Total CO2 Emissions /Million in Revenue \$	Water Pollutant Emissions	
CO2 Equivalent Emissions Total	ISO 14000 or EMS	
CO2 Equivalent Emissions Direct, Scope 1	EMS Certified Percent	
CO2 Equivalent Emissions IndirectScope2	Environmental Restoration Initiatives	
CO2 Equivalent Emissions Indirect, Scope 3 To Revenues	Staff Transportation Impact Reduction	
USD in million	Accidental Spills To Revenues USD in million	
CO2 Equivalent Emissions Indirect,Scope 3	Accidental Spills	
Carbon Offsets/Credits	Environmental Expenditures Investments	
Emissions Trading	Environmental Expenditures	
Cement CO2 Equivalents Emission	Environmental Provisions	
Climate Change Commercial Risks Opportunities	Environmental Investments Initiatives	
Flaring Gases To Revenues USD in million	Self-Reported Environmental Fines To Revenues in million	
Flaring Gases	Self-Reported Environmental Fines	
Ozone-Depleting Substances To Revenues USD in million	Environmental Partnerships	
Ozone-Depleting Substances	Internal Carbon Pricing	
NOx and SOx Emissions Reduction	Internal Carbon Price per Tonne	
NOx Emissions To Revenues USD in million	Policy Nuclear Safety	
NOx Emissions		
<b>1.3) Innovation</b>		
Environmental Products	Labeled Wood	
Eco-Design Products	Organic Products Initiatives	
Revenue from Environmental Products	Product Impact Minimization	
Percentage of green products	Take-back and Recycling Initiatives	
Total Env R&D / Million in Revenue	Products Recovered to Recycle	
Environmental R&D Expenditures	Product Environmental Responsible Use	
Noise Reduction	GMO Products	
Fleet Fuel Consumption	Agrochemical Products	
Hybrid Vehicles	Agrochemical 5 % Revenue	
Fleet CO2 Emissions	Animal Testing	
Environmental Assets Under Mgt	Animal Testing Cosmetics	
ESG Assets Under Management	Animal Testing Reduction	
Equator Principles	Renewable/Clean Energy Products	
Equator Principles or Env Project Financing	Water Technologies	
Environmental Project Financing	Sustainable Building Products	
Nuclear	Real Estate Sustainability Certifications	
Nuclear Production	Fossil Fuel Divestment Policy	
Labeled Wood Percentage		

## Annex C: Categories of the ESG score: Social segment

<b>2) Social</b>		Source: ESG score, EIKON
<b>2.1) Workforce</b>		
Health & Safety Policy	Total Injury Rate Employees	
Policy Employee Health & Safety	Accidents Total	
Policy Supply Chain Health & Safety	Contractor Accidents	
Training and Development Policy	Employee Accidents	
Policy Skills Training	Occupational Diseases	
Policy Career Development	Employee Fatalities	
Policy Diversity and Opportunity	Contractor Fatalities	
Targets Diversity and Opportunity	Lost Days / Million Working Days	
Employees Health & Safety Team	Lost Time Injury Rate Total	
Health & Safety Training	Lost Time Injury Rate Contractors	
Supply Chain Health & Safety Training	Lost Time Injury Rate Employees	
Supply Chain Health & Safety Improvements	Lost Working Days	
Employees Health & Safety OHSAS 18001	Employee Lost Working Days	
HSMS Certified Percentage	Contractor Lost working Days	
Employee Satisfaction	HIV-AIDS Program	
Salary Gap	Average Training Hours	
Salaries and Wages from CSR reporting	Training Hours Total	
Net Employment Creation	Training Costs Total	
Number of Employees from CSR reporting	Training Costs Per Employee	
Trade Union Representation	Internal Promotion	
Average Employee Length of Service	Management Training	
Turnover of Employees	Supplier ESG training	
Voluntary Turnover of Employees	Employee Resource Groups	
Involuntary Turnover of Employees	BBBEE Level	
Announced Layoffs To Total Employees	Minorities Employees Percentage	
Announced Layoffs	Asian - Minorities Employees Percentage	
Gender Pay Gap Percentage	Black or African American - Minorities Employees Percentage	
Women Employees	Hispanic or Latino - Minorities Employees Percentage	
New Women Employees	White - Minorities Employees Percentage	
Women Managers	Other - Minorities Employees Percentage	
HRC Corporate Equality Index	Minorities Managers Percentage	
Flexible Working Hours	Asian - Minorities Managers Percentage	
Day Care Services	Black or African American - Minorities Managers Percentage	
Employees With Disabilities	Hispanic or Latino - Minorities Managers Percentage	
Employee Health & Safety Training Hours	White - Minorities Managers Percentage	
Injuries To Million Hours	Other - Minorities Managers Percentage	
Total Injury Rate Total	Minorities Salary Gap	
Total Injury Rate Contractors		
<b>2.2) Human Rights</b>		
Human Rights Policy	Fundamental Human Rights ILO UN	
Policy Freedom of Association	Human Rights Contractor	
Policy Child Labor	Ethical Trading Initiative ETI	
Policy Forced Labor	Human Rights Breaches Contractor	
Policy Human Rights		
<b>2.3) Community</b>		
Policy Fair Competition	Lobbying Contribution Amount	
Policy Bribery and Corruption	Employee Engagement Voluntary Work	
Policy Business Ethics	Corporate Responsibility Awards	
Policy Community Involvement	Product Sales at Discount to Emerging Markets	
Improvement Tools Business Ethics	Diseases of the Developing World	
Whistleblower Protection	Crisis Management Systems	
OECD Guidelines for Multinational Enterprises	Critical Country 1	
Extractive Industries Transparency Initiative	Critical Country 2	
Donations / Million in Revenue	Critical Country 3	
Donations Total	Critical Country 4	
Community Lending and Investments	Critical Country 5	
Political Contributions		
<b>2.4) Product Responsibility</b>		
Policy Customer Health & Safety	Gambling 5% Revenues	
Policy Data Privacy	Tobacco	
Policy Cyber Security	Tobacco Revenues	
Policy Responsible Marketing	Tobacco 5% Revenues	
Policy Fair Trade	Alcohol Retailing	
Product Responsibility Monitoring	Tobacco Retailing	
Quality Mgt Systems	Armaments	
ISO 9000	Armaments Revenues	
Six Sigma and Quality Mgt Systems	Armaments 5% Revenues	
QMS Certified Percent	Nuclear 5% Revenues	
Customer Satisfaction	Pornography	
Product Access Low Price	Contraceptives	
Healthy Food or Products	Obesity Risk	

Revenues from Healthy Food or Products  
Embryonic Stem Cell Research  
Retailing Responsibility  
Alcohol  
Alcohol Revenues  
Alcohol 5% Revenues  
Gambling  
Gambling Revenues

Cluster Bombs  
Anti-Personnel Landmines  
Abortifacients  
Firearms  
Pork Products  
Revenues from Pork Products  
Animal Well-being

## Annex D: Categories of the ESG score: Government segment

<b>3) Government</b>		Source: ESG score, EIKON
<b>3.1) Management</b>		
Board Functions Policy	Board Gender Diversity, Percent	
Corporate Governance Board Committee	Board Specific Skills, Percent	
Nomination Board Committee	Average Board Tenure	
Audit Board Committee	Non-Executive Board Members	
Compensation Board Committee	Independent Board Members	
Board Structure Policy	Strictly Independent Board Members	
Policy Board Size	CEO-Chairman Separation	
Policy Board Independence	CEO Board Member	
Policy Board Diversity	Chairman is ex-CEO	
Policy Board Experience	Board Member Affiliations	
Policy Executive Compensation Performance	Board Individual Re-election	
Policy Executive Compensation ESG Performance	Board Member Membership Limits	
Policy Executive Retention	Board Member Term Duration	
Compensation Improvement Tools	Executive Compensation Policy	
Internal Audit Department Reporting	Executive Individual Compensation	
Succession Plan	Total Senior Executives Compensation To Revenues in million	
External Consultants	Total Senior Executives Compensation	
Audit Committee Independence	Highest Remuneration Package	
Audit Committee Mgt Independence	CEO Compensation Link to TSR	
Audit Committee Expertise	Executive Compensation LT Objectives	
Audit Committee NonExecutive Members	Sustainability Compensation Incentives	
Compensation Committee Independence	Shareholders Approval Stock Compensation Plan	
Compensation Committee Mgt Independence	Board Member Compensation	
Compensation Committee NonExecutive Members	Board Member LT Compensation Incentives	
Nomination Committee Independence	Board Cultural Diversity, Percent	
Nomination Committee Mgt Independence	Executive Members Gender Diversity, Percent	
Nomination Committee Involvement	Chief Diversity Officer	
Nomination Committee NonExecutive Members	Executives Cultural Diversity	
Board Attendance	Minorities Board Percentage	
Number of Board Meetings	Asian - Minorities Board Percentage	
Board Meeting Attendance Average	Black or African American - Minorities Board Percentage	
Committee Meetings Attendance Average	Hispanic or Latino - Minorities Board Percentage	
Board Structure Type	White - Minorities Board Percentage	
Board Size More Ten Less Eight	Other - Minorities Board Percentage	
Board Size		
Board Background and Skills		
<b>3.2) Shareholders</b>		
Shareholder Rights Policy	Supermajority Vote Requirement	
Policy Equal Voting Right	Golden Parachute	
Policy Shareholder Engagement	Limited Shareholder Rights to Call Meetings	
Different Voting Right Share	Elimination of Cumulative Voting Rights	
Equal Shareholder Rights	Pre-emptive Rights	
Voting Cap	Company Cross Shareholding	
Voting Cap Percentage	Confidential Voting Policy	
Minimum Number of Shares to Vote	Limitation of Director Liability	
Director Election Majority Requirement	Shareholder Approval Significant Transactions	
Shareholders Vote on Executive Pay	Fair Price Provision	
Public Availability Corporate Statutes	Limitations on Removal of Directors	
Veto Power or Golden share	Advance Notice for Shareholder Proposals	
State Owned Enterprise SOE	Advance Notice Period Days	
Anti Takeover Devices Above Two	Written Consent Requirements	
Poison Pill	Expanded Constituency Provision	
Poison Pill Adoption Date	Litigation Expenses To Revenues in million	
Poison Pill Expiration Date	Litigation Expenses	
Unlimited Authorized Capital or Blank Check	Non-audit to Audit Fees Ratio	
Classified Board Structure	Auditor Tenure	
Staggered Board Structure		
<b>3.3) CSR Strategy</b>		
CSR Sustainability Committee	SDG 4 Quality Education	
Integrated Strategy in MD&A	SDG 5 Gender Equality	
Global Compact Signatory	SDG 6 Clean Water and Sanitation	
Stakeholder Engagement	SDG 7 Affordable and Clean Energy	
CSR Sustainability Reporting	SDG 8 Decent Work and Economic Growth	
GRI Report Guidelines	SDG 9 Industry, Innovation and Infrastructure	
CSR Sustainability Report Global Activities	SDG 10 Reduced Inequality	
CSR Sustainability External Audit	SDG 11 Sustainable Cities and Communities	
CSR Sustainability External Auditor Name	SDG 12 Responsible Consumption and Production	
ESG Reporting Scope	SDG 13 Climate Action	
ESG Period Last Update Date	SDG 14 Life Below Water	
UNPRI Signatory	SDG 15 Life on Land	
SDG 1 No Poverty	SDG 16 Peace and Justice Strong Institutions	



**Annex E: ESG score: Classification by Eikon (Refinitiv, 2020).**

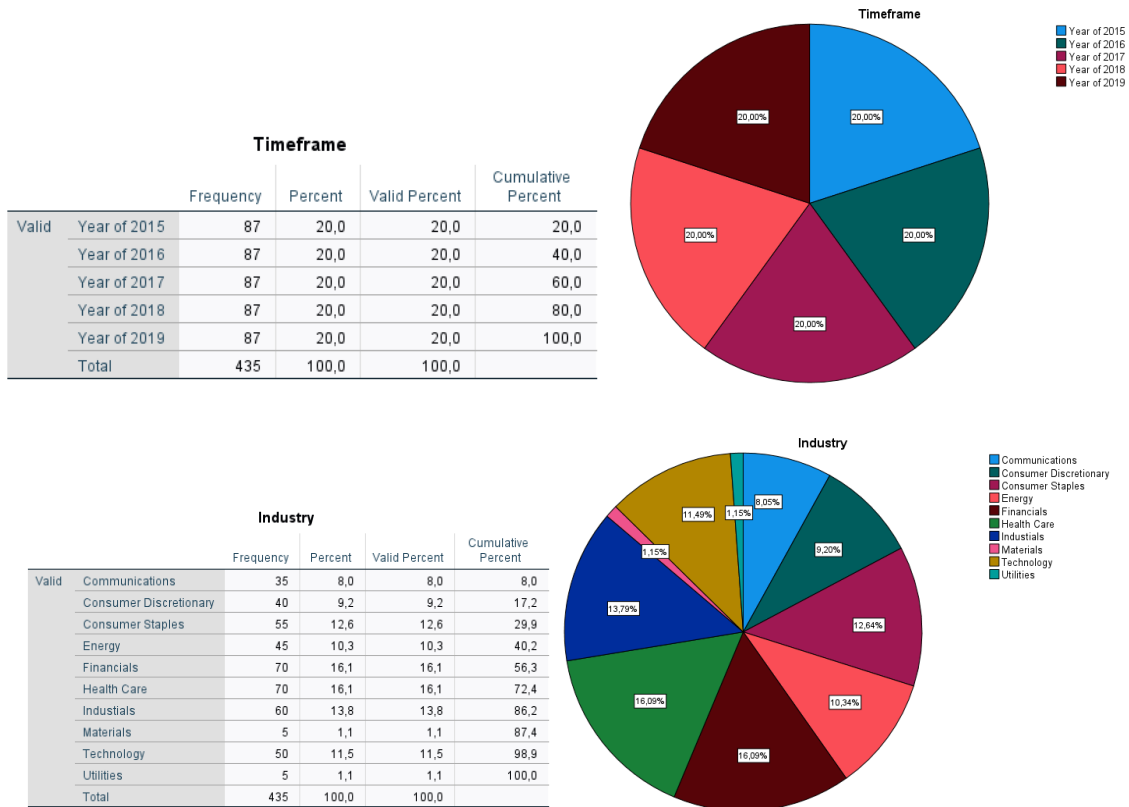
<b>ESG score Range</b>	<b>Classification</b>
$0,0 \leq \text{score} \leq 0,083333$	D -
$0,083333 < \text{score} \leq 0,166666$	D
$0,166666 < \text{score} \leq 0,250000$	D+
$0,250000 < \text{score} \leq 0,333333$	C-
$0,333333 < \text{score} \leq 0,416666$	C
$0,416666 < \text{score} \leq 0,500000$	C+
$0,500000 < \text{score} \leq 0,583333$	B-
$0,583333 < \text{score} \leq 0,666666$	B
$0,666666 < \text{score} \leq 0,750000$	B+
$0,750000 < \text{score} \leq 0,833333$	A-
$0,833333 < \text{score} \leq 0,916666$	A
$0,916666 < \text{score} \leq 1$	A+



## Annex F: Description of the Variable used in the data analysis

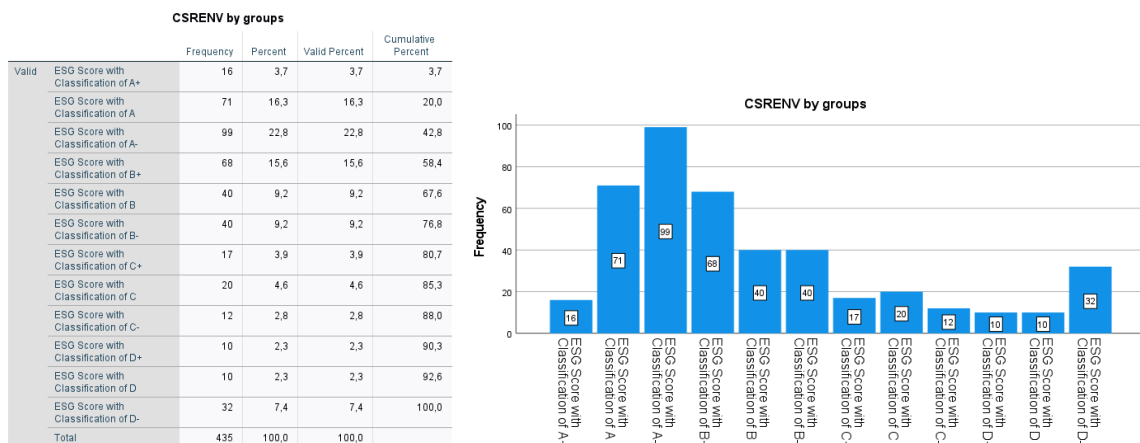
### F.1) Qualitative: Nominal Variables

Variables under analysis: Industry and Timeframe

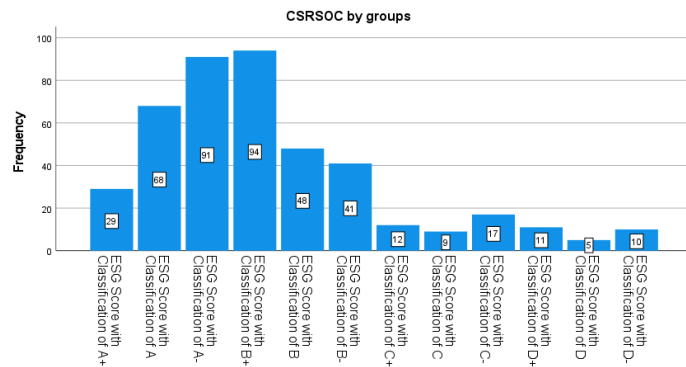


### F.2) Qualitative: Ordinal Variables

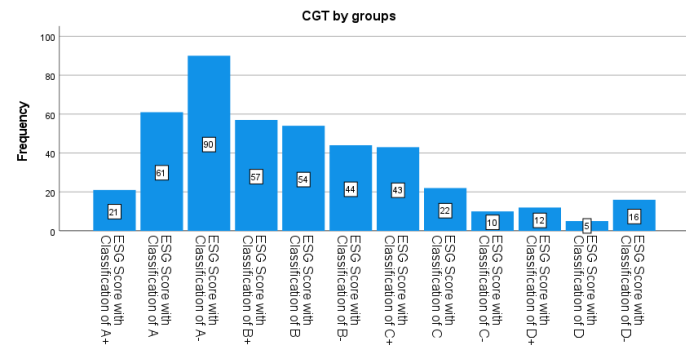
Variables under analysis: CSRENV, CSRSOC and CGT



Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	ESG Score with Classification of A+	29	6,7	6,7	6,7
	ESG Score with Classification of A	68	15,6	15,6	22,3
	ESG Score with Classification of A-	91	20,9	20,9	43,2
	ESG Score with Classification of B+	94	21,6	21,6	64,8
	ESG Score with Classification of B	48	11,0	11,0	75,9
	ESG Score with Classification of B-	41	9,4	9,4	85,3
	ESG Score with Classification of C+	12	2,8	2,8	88,0
	ESG Score with Classification of C	9	2,1	2,1	90,1
	ESG Score with Classification of C-	17	3,9	3,9	94,0
	ESG Score with Classification of D+	11	2,5	2,5	96,6
	ESG Score with Classification of D	5	1,1	1,1	97,7
	ESG Score with Classification of D-	10	2,3	2,3	100,0
	Total	435	100,0	100,0	



Valid		Frequency	Percent	Valid Percent	Cumulative Percent
	ESG Score with Classification of A+	21	4,8	4,8	4,8
	ESG Score with Classification of A	61	14,0	14,0	18,9
	ESG Score with Classification of A-	90	20,7	20,7	39,5
	ESG Score with Classification of B+	57	13,1	13,1	52,6
	ESG Score with Classification of B	54	12,4	12,4	65,1
	ESG Score with Classification of B-	44	10,1	10,1	75,2
	ESG Score with Classification of C+	43	9,9	9,9	85,1
	ESG Score with Classification of C	22	5,1	5,1	90,1
	ESG Score with Classification of C-	10	2,3	2,3	92,4
	ESG Score with Classification of D+	12	2,8	2,8	95,2
	ESG Score with Classification of D	5	1,1	1,1	96,3
	ESG Score with Classification of D-	16	3,7	3,7	100,0
	Total	435	100,0	100,0	

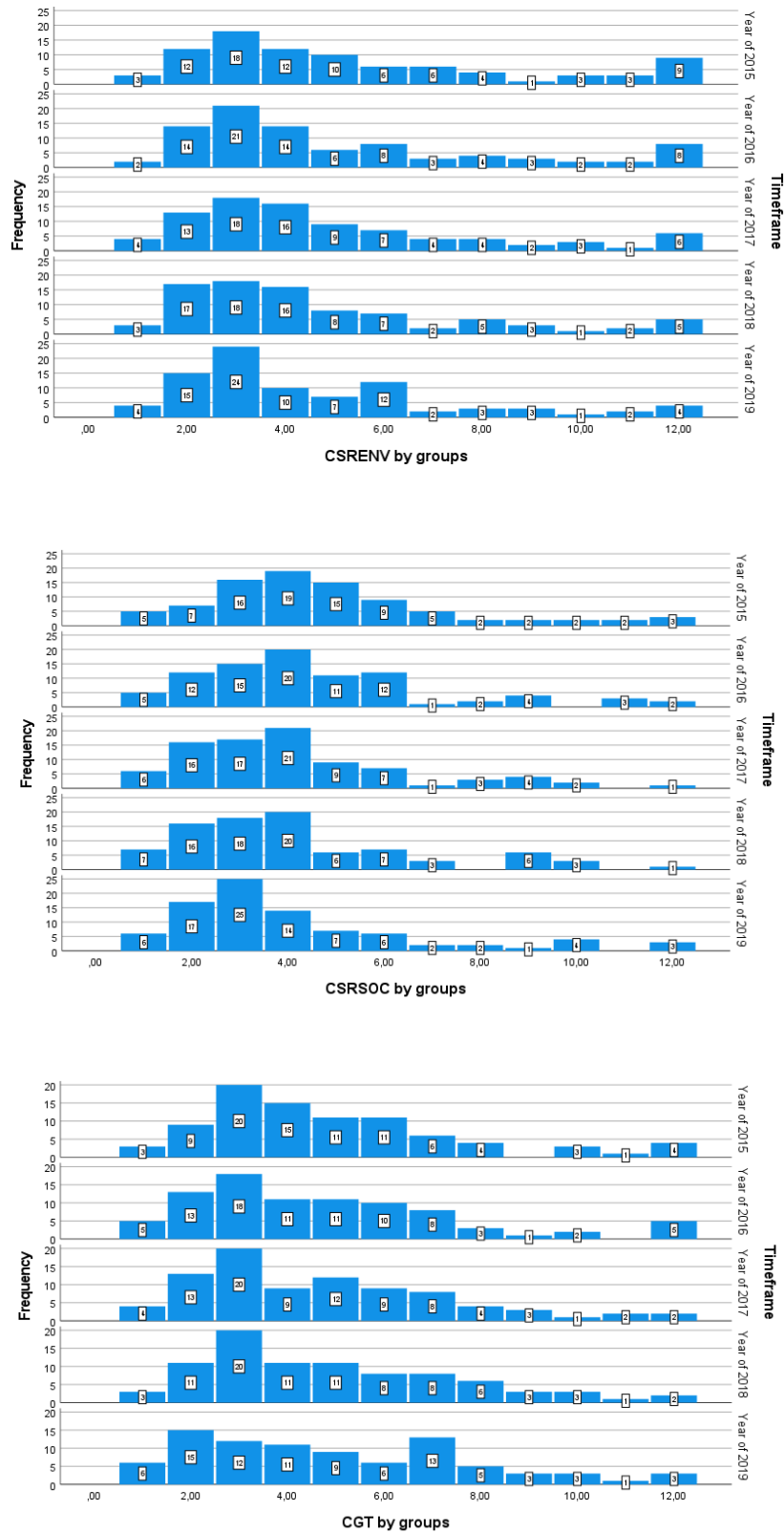


### F.3) Quantitative Variables

Variables under analysis: Firm's Size, Leverage, ROA and EV/EBITDA

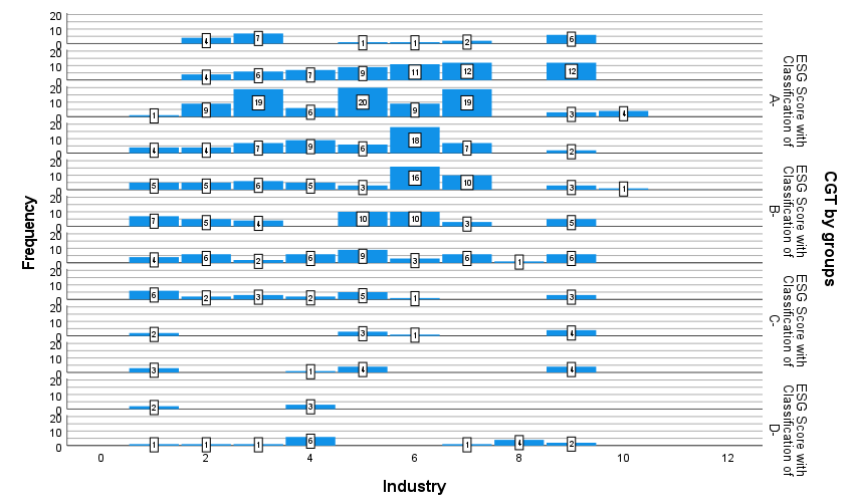
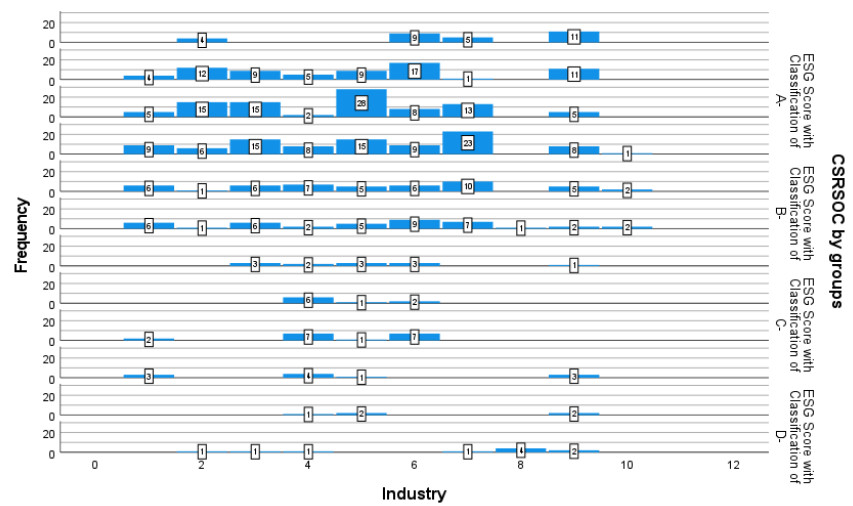
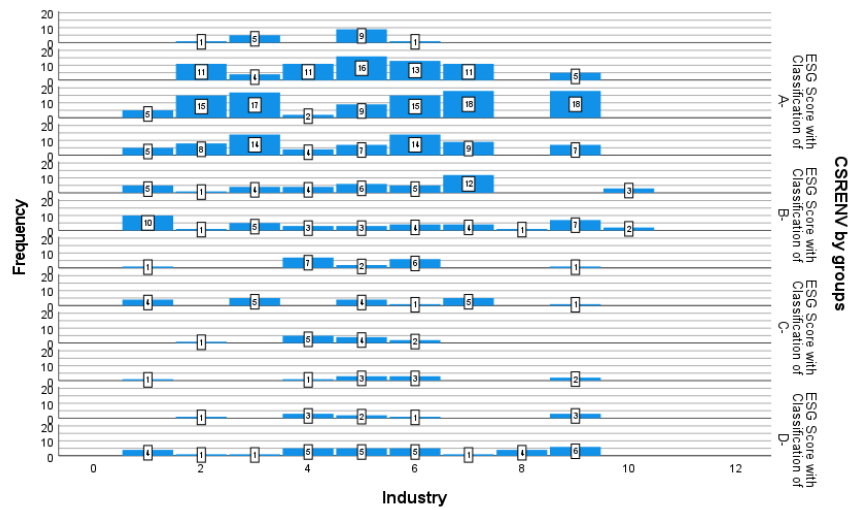
		Firm's Size	Leverage (Debt to Asset)	Return to Assets	Ratio EV/EBITDA
N	Valid	435	391	432	431
	Missing	0	44	3	4
Mean		5,00547	7,0911	,063208	12,2595
Std. Deviation		,563049	19,76822	,0575403	11,05102
Skewness		,548	13,787	1,738	10,907
Std. Error of Skewness		,117	,123	,117	,118
Kurtosis		,234	225,963	5,625	171,457
Std. Error of Kurtosis		,234	,246	,234	,235
Range		2,773	345,09	,4766	190,87
Minimum		3,656	1,10	-,0614	3,31
Maximum		6,429	346,19	,4152	194,18
Percentiles	25	4,61300	2,4900	,024950	7,7500
	50	4,91700	3,4000	,053500	10,4800
	75	5,31100	6,0100	,087750	13,5900

#### F.4) Evolution of the ESG score related variables by using the variable Timeframe



Subtitle: 1) ESG Classification score of "A+"; 2) ESG Classification score of "A"; 3) ESG Classification score of "A-"; 4) ESG Classification score of "B+"; 5) ESG Classification score of "B"; 6) ESG Classification score of "B-"; 7) ESG Classification score of "C+"; 8) ESG Classification score of "C"; 9) ESG Classification score of "C-"; 10) ESG Classification score of "D+"; 11) ESG Classification score of "D"; 12) ESG Classification score of "D-".

### F.5) Distribution of the ESG score related variables by using the variable Industry



Subtitle: 1) Communications' Industry; 2) Consumer Discretionary's Industry; 3) Consumer Staples' Industry; 4) Energy's Industry; 5) Financials' Industry; 6) Health Care's Industry; 7) Industrials' Industry; 8) Materials' Industry; 9) Technology's Industry; 10) Utilities' Industry.

## Annex G: Multiple Linear Regression

### Model 1)

#### 1.1) Linear Association between Independent and Dependent Variables

		Correlations						
		CSRENV by groups	CSRSOC by groups	CGT by groups	Industry	Leverage (Debt to Asset)	Firm's Size	Return to Assets
CSRENV by groups	Pearson Correlation	1	,778**	,393**	,045	-,050	-,299**	-,125**
	Sig. (2-tailed)		,000	,000	,351	,323	,000	,010
	N	435	435	435	435	391	435	432
CSRSOC by groups	Pearson Correlation	,778**	1	,501**	,007	-,005	-,239**	-,188**
	Sig. (2-tailed)	,000		,000	,881	,929	,000	,000
	N	435	435	435	435	391	435	432
CGT by groups	Pearson Correlation	,393**	,501**	1	-,080	-,013	-,008	-,065
	Sig. (2-tailed)	,000	,000		,095	,803	,869	,179
	N	435	435	435	435	391	435	432
Industry	Pearson Correlation	,045	,007	-,080	1	,099	-,033	-,120*
	Sig. (2-tailed)	,351	,881	,095		,051	,490	,013
	N	435	435	435	435	391	435	432
Leverage (Debt to Asset)	Pearson Correlation	-,050	-,005	-,013	,099	1	,036	-,027
	Sig. (2-tailed)	,323	,929	,803	,051		,481	,600
	N	391	391	391	391	391	391	388
Firm's Size	Pearson Correlation	-,299**	-,239**	-,008	-,033	,036	1	-,352**
	Sig. (2-tailed)	,000	,000	,869	,490	,481		,000
	N	435	435	435	435	391	435	432
Return to Assets	Pearson Correlation	-,125**	-,188**	-,065	-,120*	-,027	-,352**	1
	Sig. (2-tailed)	,010	,000	,179	,013	,600	,000	
	N	432	432	432	432	388	432	432

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

#### 1.2) R Square and Adjusted R Square

##### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,441 <sup>a</sup>	,194	,181	,0522522

a. Predictors: (Constant), Industry, CSRENV by groups, Leverage (Debt to Asset), Firm's Size, CGT by groups, CSRSOC by groups

b. Dependent Variable: Return to Assets

#### 1.3) Assessing model's validity

##### ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,251	6	,042	15,296	,000 <sup>b</sup>
	Residual	1,040	381	,003		
	Total	1,291	387			

a. Dependent Variable: Return to Assets

b. Predictors: (Constant), Industry, CSRENV by groups, Leverage (Debt to Asset), Firm's Size, CGT by groups, CSRSOC by groups

#### 1.4) Interpretation of the model's estimates

##### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,316	,030		10,662	,000
	CSRENV by groups	-,001	,001	-,038	-,520	,604
	CSRSOC by groups	-,007	,002	-,318	-4,167	,000
	CGT by groups	,002	,001	,080	1,499	,135
	Firm's Size	-,042	,006	-,362	-7,432	,000
	Leverage (Debt to Asset)	-8,444E-6	,000	-,003	-,063	,950
	Industry	-,003	,001	-,133	-2,862	,004

a. Dependent Variable: Return to Assets

## 1.5) To measure model's coefficients significant

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,316	,030		10,662	,000
	CSRENV by groups	-,001	,001	-,038	-,520	,604
	CSRSOC by groups	-,007	,002	-,318	-,4167	,000
	CGT by groups	,002	,001	,080	1,499	,135
	Firm's Size	-,042	,006	-,362	-,7,432	,000
	Leverage (Debt to Asset)	-,8,444E-6	,000	-,003	-,063	,950
	Industry	-,003	,001	-,133	-,2,862	,004

a. Dependent Variable: Return to Assets

## Model 2)

### 2.1) Linear Association between Independent and Dependent Variables

**Correlations**

		CSRENV by groups	CSRSOC by groups	CGT by groups	Industry	Leverage (Debt to Asset)	Firm's Size	Ratio EV/EBITDA
CSRENV by groups	Pearson Correlation	1	,778**	,393**	,045	-,050	-,299**	-,061
	Sig. (2-tailed)		,000	,000	,351	,323	,000	,210
	N	435	435	435	435	391	435	431
CSRSOC by groups	Pearson Correlation	,778**	1	,501**	,007	-,005	-,239**	-,032
	Sig. (2-tailed)	,000		,000	,881	,929	,000	,502
	N	435	435	435	435	391	435	431
CGT by groups	Pearson Correlation	,393**	,501**	1	-,080	-,013	-,008	,029
	Sig. (2-tailed)	,000	,000		,095	,803	,869	,550
	N	435	435	435	435	391	435	431
Industry	Pearson Correlation	,045	,007	-,080	1	,099	-,033	-,044
	Sig. (2-tailed)	,351	,881	,095		,051	,490	,366
	N	435	435	435	435	391	435	431
Leverage (Debt to Asset)	Pearson Correlation	-,050	-,005	-,013	,099	1	,036	,030
	Sig. (2-tailed)	,323	,929	,803	,051		,481	,556
	N	391	391	391	391	391	391	387
Firm's Size	Pearson Correlation	-,299**	-,239**	-,008	-,033	,036	1	,176**
	Sig. (2-tailed)	,000	,000	,869	,490	,481		,000
	N	435	435	435	435	391	435	431
Ratio EV/EBITDA	Pearson Correlation	-,061	-,032	,029	-,044	,030	,176**	1
	Sig. (2-tailed)	,210	,502	,550	,366	,556	,000	
	N	431	431	431	431	387	431	431

\*\* . Correlation is significant at the 0.01 level (2-tailed).

### 2.2) R Square and Adjusted R Square

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,213 <sup>a</sup>	,045	,030	11,41295

a. Predictors: (Constant), Industry, Firm's Size, Leverage (Debt to Asset), CGT by groups, CSRENV by groups, CSRSOC by groups

b. Dependent Variable: Ratio EV/EBITDA

### 2.3) Assessing model's validity

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2343,591	6	390,598	2,999	,007 <sup>b</sup>
	Residual	49497,028	380	130,255		
	Total	51840,619	386			

a. Dependent Variable: Ratio EV/EBITDA

b. Predictors: (Constant), Industry, Firm's Size, Leverage (Debt to Asset), CGT by groups, CSRENV by groups, CSRSOC by groups

## 2.4) Interpretation of the model's estimates

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-11,388	6,481		-1,757	,080
	CSRENV by groups	,060	,314	,015	,192	,848
	CSRSOC by groups	-,027	,391	-,006	-,068	,946
	CGT by groups	,027	,250	,006	,110	,913
	Firm's Size	4,863	1,226	,210	3,967	,000
	Leverage (Debt to Asset)	,015	,030	,025	,503	,615
	Industry	-,130	,243	-,027	-,537	,591

a. Dependent Variable: Ratio EV/EBITDA

## 2.5) To measure model's coefficients significant

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-11,388	6,481		-1,757	,080
	CSRENV by groups	,060	,314	,015	,192	,848
	CSRSOC by groups	-,027	,391	-,006	-,068	,946
	CGT by groups	,027	,250	,006	,110	,913
	Firm's Size	4,863	1,226	,210	3,967	,000
	Leverage (Debt to Asset)	,015	,030	,025	,503	,615
	Industry	-,130	,243	-,027	-,537	,591

a. Dependent Variable: Ratio EV/EBITDA

## Model 3) Experimental Model to Account for Hypothesis 5

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	772,494	5	154,499	27,897	,000 <sup>b</sup>
	Residual	2132,207	385	5,538		
	Total	2904,701	390			

a. Dependent Variable: CGT by groups

b. Predictors: (Constant), Industry, CSRENV by groups, Leverage (Debt to Asset), Firm's Size, CSRSOC by groups

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1,641	1,325		-1,238	,216
	CSRENV by groups	,056	,065	,061	,859	,391
	CSRSOC by groups	,501	,076	,462	6,631	,000
	Firm's Size	,913	,248	,167	3,679	,000
	Leverage (Debt to Asset)	-,001	,006	-,005	-,123	,902
	Industry	-,092	,049	-,082	-1,867	,063

a. Dependent Variable: CGT by groups

## Annex H: Measures of Association

### Measures of Association: Between Two Qualitative Variables

ENV \* SOC = Ordinal \* Ordinal = Spearman Correlation

			CSRENV by groups	CSRSOC by groups
Spearman's rho	CSRENV by groups	Correlation Coefficient	1,000	,670**
		Sig. (2-tailed)	.	,000
		N	435	435
	CSRSOC by groups	Correlation Coefficient	,670**	1,000
		Sig. (2-tailed)	,000	.
		N	435	435

\*\* . Correlation is significant at the 0.01 level (2-tailed).

ENV \* GOV = Ordinal \* Ordinal = Spearman Correlation

			CSRENV by groups	CGT by groups
Spearman's rho	CSRENV by groups	Correlation Coefficient	1,000	,228**
		Sig. (2-tailed)	.	,000
		N	435	435
	CGT by groups	Correlation Coefficient	,228**	1,000
		Sig. (2-tailed)	,000	.
		N	435	435

\*\* . Correlation is significant at the 0.01 level (2-tailed).

SOC \* GOV = Ordinal \* Ordinal = Spearman Correlation

			CSRSOC by groups	CGT by groups
Spearman's rho	CSRSOC by groups	Correlation Coefficient	1,000	,311**
		Sig. (2-tailed)	.	,000
		N	435	435
	CGT by groups	Correlation Coefficient	,311**	1,000
		Sig. (2-tailed)	,000	.
		N	435	435

\*\* . Correlation is significant at the 0.01 level (2-tailed).

### Measures of Association: Between a Qualitative Variable and a Quantitative Variable

CSRENV \* ROA = Metric \* Ordinal = Spearman Correlation

			CSRENV by groups	Return to Assets
Spearman's rho	CSRENV by groups	Correlation Coefficient	1,000	-,078
		Sig. (2-tailed)	.	,108
		N	435	432
	Return to Assets	Correlation Coefficient	-,078	1,000
		Sig. (2-tailed)	,108	.
		N	432	432



CSRSOC \* ROA = Metric \* Ordinal = Spearman Correlation

**Correlations**

			CSRSOC by groups	Return to Assets
Spearman's rho	CSRSOC by groups	Correlation Coefficient	1,000	-,202**
		Sig. (2-tailed)	.	,000
		N	435	432
	Return to Assets	Correlation Coefficient	-,202**	1,000
		Sig. (2-tailed)	,000	.
		N	432	432

\*\* . Correlation is significant at the 0.01 level (2-tailed).

CGT \* ROA = Metric \* Ordinal = Spearman Correlation

**Correlations**

			CGT by groups	Return to Assets
Spearman's rho	CGT by groups	Correlation Coefficient	1,000	-,102*
		Sig. (2-tailed)	.	,035
		N	435	432
	Return to Assets	Correlation Coefficient	-,102*	1,000
		Sig. (2-tailed)	,035	.
		N	432	432

\*. Correlation is significant at the 0.05 level (2-tailed).

CSRENV \* EV/EBITDA = Metric \* Ordinal = Spearman Correlation

**Correlations**

			CSRENV by groups	Ratio EV/EBITDA
Spearman's rho	CSRENV by groups	Correlation Coefficient	1,000	-,141**
		Sig. (2-tailed)	.	,003
		N	435	431
	Ratio EV/EBITDA	Correlation Coefficient	-,141**	1,000
		Sig. (2-tailed)	,003	.
		N	431	431

\*\* . Correlation is significant at the 0.01 level (2-tailed).

CSRSOC \* EV/EBITDA = Metric \* Ordinal = Spearman Correlation

**Correlations**

			CSRSOC by groups	Ratio EV/EBITDA
Spearman's rho	CSRSOC by groups	Correlation Coefficient	1,000	-,088
		Sig. (2-tailed)	.	,067
		N	435	431
	Ratio EV/EBITDA	Correlation Coefficient	-,088	1,000
		Sig. (2-tailed)	,067	.
		N	431	431

CGT \* EV/EBITDA = Metric \* Ordinal = Spearman Correlation

**Correlations**

			CGT by groups	Ratio EV/EBITDA
Spearman's rho	CGT by groups	Correlation Coefficient	1,000	,069
		Sig. (2-tailed)	.	,151
		N	435	431
	Ratio EV/EBITDA	Correlation Coefficient	,069	1,000
		Sig. (2-tailed)	,151	.
		N	431	431

## Measures of Association: Between a Two Quantitative Variables

ROA \* EV/EBITDA = Metric \* Metric = Pearson

### Correlations

		Return to Assets	Ratio EV/EBITDA
Return to Assets	Pearson Correlation	1	-,099 <sup>*</sup>
	Sig. (2-tailed)		,040
	N	432	430
Ratio EV/EBITDA	Pearson Correlation	-,099 <sup>*</sup>	1
	Sig. (2-tailed)	,040	
	N	430	431

\*. Correlation is significant at the 0.05 level (2-tailed).

## Chi-Square Test: CSRENV\*CSRSOC

### CSRENV Categories \* CSRSOC Categories Crosstabulation

CSRENV Categories	ESG Score Classification of A and B	Count	CSRSOC Categories		Total
			ESG Score Classification of A and B	ESG Score Classification of C and D	
	ESG Score Classification of A and B	Count	325	9	334
		Expected Count	284,9	49,1	334,0
		% within CSRENV Categories	97,3%	2,7%	100,0%
		% within CSRSOC Categories	87,6%	14,1%	76,8%
		% of Total	74,7%	2,1%	76,8%
	ESG Score Classification of C and D	Count	46	55	101
		Expected Count	86,1	14,9	101,0
		% within CSRENV Categories	45,5%	54,5%	100,0%
		% within CSRSOC Categories	12,4%	85,9%	23,2%
		% of Total	10,6%	12,6%	23,2%
Total	Count	371	64	435	
	Expected Count	371,0	64,0	435,0	
	% within CSRENV Categories	85,3%	14,7%	100,0%	
	% within CSRSOC Categories	100,0%	100,0%	100,0%	
	% of Total	85,3%	14,7%	100,0%	

### Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	165,579 <sup>a</sup>	1	,000		
Continuity Correction <sup>b</sup>	161,480	1	,000		
Likelihood Ratio	141,374	1	,000		
Fisher's Exact Test				,000	,000
Linear-by-Linear Association	165,199	1	,000		
N of Valid Cases	435				

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 14,86.

b. Computed only for a 2x2 table

## Annex I: Goodness-of-Fit Tests - Shapiro-Wilk and Kolmogorov-Smirnov

Hypothesis for the test:

H<sub>0</sub>: The distribution of X<sub>i</sub> in the population is Normal;

H<sub>1</sub>: The distribution of X<sub>i</sub> in the population is not Normal.

### Test 1A) CSRENV \* CSRSOC

**Tests of Normality**

CSRSOC by groups		Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
CSRENV by groups	ESG Score with Classification of A+	,232	29	,000	,856	29	,001
	ESG Score with Classification of A	,204	68	,000	,912	68	,000
	ESG Score with Classification of A-	,208	91	,000	,894	91	,000
	ESG Score with Classification of B+	,200	94	,000	,866	94	,000
	ESG Score with Classification of B	,157	48	,005	,943	48	,020
	ESG Score with Classification of B-	,162	41	,009	,916	41	,005
	ESG Score with Classification of C+	,241	12	,053	,881	12	,092
	ESG Score with Classification of C	,248	9	,119	,883	9	,167
	ESG Score with Classification of C-	,188	17	,113	,879	17	,030
	ESG Score with Classification of D+	,331	11	,001	,758	11	,003
	ESG Score with Classification of D	,473	5	,001	,552	5	,000
	ESG Score with Classification of D-	.	10	.	.	10	.

a. Lilliefors Significance Correction

### Test 2A) CSRENV \* CGT

**Tests of Normality**

CGT by groups		Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
CSRENV by groups	ESG Score with Classification of A+	,287	21	,000	,678	21	,000
	ESG Score with Classification of A	,245	61	,000	,882	61	,000
	ESG Score with Classification of A-	,156	90	,000	,909	90	,000
	ESG Score with Classification of B+	,173	57	,000	,887	57	,000
	ESG Score with Classification of B	,174	54	,000	,920	54	,001
	ESG Score with Classification of B-	,206	44	,000	,843	44	,000
	ESG Score with Classification of C+	,204	43	,000	,803	43	,000
	ESG Score with Classification of C	,338	22	,000	,730	22	,000
	ESG Score with Classification of C-	,270	10	,038	,834	10	,038
	ESG Score with Classification of D+	,189	12	,200*	,896	12	,142
	ESG Score with Classification of D	,473	5	,001	,552	5	,000
	ESG Score with Classification of D-	,459	16	,000	,568	16	,000

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

## Test 3A) CSRSOC \* CGT

### Tests of Normality

CGT by groups	ESG Score with Classification of	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
CSRSOC by groups	ESG Score with Classification of A+	,178	21	,080	,914	21	,067
	ESG Score with Classification of A	,190	61	,000	,888	61	,000
	ESG Score with Classification of A-	,153	90	,000	,947	90	,001
	ESG Score with Classification of B+	,142	57	,006	,949	57	,017
	ESG Score with Classification of B	,170	54	,000	,934	54	,005
	ESG Score with Classification of B-	,217	44	,000	,865	44	,000
	ESG Score with Classification of C+	,231	43	,000	,869	43	,000
	ESG Score with Classification of C	,281	22	,000	,839	22	,002
	ESG Score with Classification of C-	,269	10	,039	,810	10	,019
	ESG Score with Classification of D+	,239	12	,057	,879	12	,085
	ESG Score with Classification of D	,300	5	,161	,833	5	,146
	ESG Score with Classification of D-	,383	16	,000	,665	16	,000

a. Lilliefors Significance Correction

## Test 4A) CSRSOC \* CSRENV

### Tests of Normality

CSRENV by groups	ESG Score with Classification of	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
CSRSOC by groups	ESG Score with Classification of A+	,289	16	,001	,849	16	,013
	ESG Score with Classification of A	,211	71	,000	,900	71	,000
	ESG Score with Classification of A-	,146	99	,000	,933	99	,000
	ESG Score with Classification of B+	,159	68	,000	,939	68	,002
	ESG Score with Classification of B	,167	40	,006	,908	40	,003
	ESG Score with Classification of B-	,184	40	,002	,933	40	,020
	ESG Score with Classification of C+	,227	17	,020	,872	17	,023
	ESG Score with Classification of C	,243	20	,003	,844	20	,004
	ESG Score with Classification of C-	,316	12	,002	,747	12	,002
	ESG Score with Classification of D+	,159	10	,200 <sup>*</sup>	,887	10	,157
	ESG Score with Classification of D	,281	10	,025	,891	10	,175
	ESG Score with Classification of D-	,166	32	,025	,876	32	,002

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

## Test 5A) CGT \* CSRENV

### Tests of Normality

CSRENV by groups	ESG Score with Classification of	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
CGT by groups	ESG Score with Classification of A+	,294	16	,001	,844	16	,011
	ESG Score with Classification of A	,188	71	,000	,909	71	,000
	ESG Score with Classification of A-	,176	99	,000	,917	99	,000
	ESG Score with Classification of B+	,131	68	,006	,958	68	,023
	ESG Score with Classification of B	,219	40	,000	,911	40	,004
	ESG Score with Classification of B-	,165	40	,008	,897	40	,002
	ESG Score with Classification of C+	,202	17	,065	,871	17	,023
	ESG Score with Classification of C	,188	20	,062	,875	20	,015
	ESG Score with Classification of C-	,171	12	,200 <sup>*</sup>	,850	12	,037
	ESG Score with Classification of D+	,263	10	,049	,884	10	,146
	ESG Score with Classification of D	,174	10	,200 <sup>*</sup>	,929	10	,441
	ESG Score with Classification of D-	,225	32	,000	,827	32	,000

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

## Test 6A) CGT \* CSRSOC

### Tests of Normality

CGT by groups	CSRSOC by groups	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
CGT by groups	ESG Score with Classification of A+	,145	29	,124	,940	29	,102
	ESG Score with Classification of A	,194	68	,000	,915	68	,000
	ESG Score with Classification of A-	,181	91	,000	,943	91	,001
	ESG Score with Classification of B+	,160	94	,000	,948	94	,001
	ESG Score with Classification of B	,167	48	,002	,907	48	,001
	ESG Score with Classification of B-	,162	41	,008	,915	41	,005
	ESG Score with Classification of C+	,347	12	,000	,675	12	,000
	ESG Score with Classification of C	,220	9	,200 <sup>*</sup>	,838	9	,055
	ESG Score with Classification of C-	,185	17	,126	,877	17	,028
	ESG Score with Classification of D+	,235	11	,091	,919	11	,311
	ESG Score with Classification of D	,159	5	,200 <sup>*</sup>	,990	5	,980
	ESG Score with Classification of D-	.	10	.	.	10	.

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

## Test 7A) ROA \* CSRENV

### Tests of Normality

Return to Assets	CSRENV by groups	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Return to Assets	ESG Score with Classification of A+	,367	16	,000	,760	16	,001
	ESG Score with Classification of A	,146	71	,001	,859	71	,000
	ESG Score with Classification of A-	,076	99	,184	,975	99	,056
	ESG Score with Classification of B+	,075	67	,200 <sup>*</sup>	,949	67	,008
	ESG Score with Classification of B	,167	40	,006	,771	40	,000
	ESG Score with Classification of B-	,219	40	,000	,862	40	,000
	ESG Score with Classification of C+	,165	17	,200 <sup>*</sup>	,892	17	,049
	ESG Score with Classification of C	,273	20	,000	,824	20	,002
	ESG Score with Classification of C-	,166	12	,200 <sup>*</sup>	,930	12	,380
	ESG Score with Classification of D+	,221	10	,181	,892	10	,178
	ESG Score with Classification of D	,152	10	,200 <sup>*</sup>	,969	10	,882
	ESG Score with Classification of D-	,138	30	,151	,950	30	,172

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

## Test 8A) ROA \* CSRSOC

### Tests of Normality

Return to Assets	CSRSOC by groups	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Return to Assets	ESG Score with Classification of A+	,110	29	,200 <sup>*</sup>	,957	29	,284
	ESG Score with Classification of A	,141	67	,002	,826	67	,000
	ESG Score with Classification of A-	,161	91	,000	,836	91	,000
	ESG Score with Classification of B+	,096	94	,031	,957	94	,004
	ESG Score with Classification of B	,168	48	,002	,871	48	,000
	ESG Score with Classification of B-	,161	41	,009	,824	41	,000
	ESG Score with Classification of C+	,265	12	,020	,762	12	,004
	ESG Score with Classification of C	,198	9	,200 <sup>*</sup>	,826	9	,040
	ESG Score with Classification of C-	,197	17	,079	,935	17	,268
	ESG Score with Classification of D+	,168	11	,200 <sup>*</sup>	,935	11	,465
	ESG Score with Classification of D	,189	5	,200 <sup>*</sup>	,948	5	,725
	ESG Score with Classification of D-	,155	8	,200 <sup>*</sup>	,975	8	,936

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

## Test 9A) ROA \* CGT

### Tests of Normality

Return to Assets	CGT by groups	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
	ESG Score with Classification of A+	,115	21	,200 <sup>*</sup>	,969	21	,716
	ESG Score with Classification of A	,102	61	,183	,974	61	,218
	ESG Score with Classification of A-	,123	90	,002	,862	90	,000
	ESG Score with Classification of B+	,142	57	,006	,853	57	,000
	ESG Score with Classification of B	,134	54	,016	,889	54	,000
	ESG Score with Classification of B-	,137	44	,038	,885	44	,000
	ESG Score with Classification of C+	,225	42	,000	,753	42	,000
	ESG Score with Classification of C	,210	22	,012	,853	22	,004
	ESG Score with Classification of C-	,273	10	,034	,772	10	,007
	ESG Score with Classification of D+	,182	12	,200 <sup>*</sup>	,922	12	,300
	ESG Score with Classification of D	,248	5	,200 <sup>*</sup>	,869	5	,262
	ESG Score with Classification of D-	,153	14	,200 <sup>*</sup>	,960	14	,717

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

## Test 10A) EV\_EBITDA \* CSRENV

### Tests of Normality

Ratio EV/EBITDA	CSRENV by groups	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
	ESG Score with Classification of A+	,278	16	,002	,784	16	,002
	ESG Score with Classification of A	,186	71	,000	,816	71	,000
	ESG Score with Classification of A-	,331	99	,000	,272	99	,000
	ESG Score with Classification of B+	,108	68	,048	,953	68	,012
	ESG Score with Classification of B	,101	40	,200 <sup>*</sup>	,954	40	,104
	ESG Score with Classification of B-	,220	40	,000	,615	40	,000
	ESG Score with Classification of C+	,109	17	,200 <sup>*</sup>	,983	17	,977
	ESG Score with Classification of C	,262	20	,001	,806	20	,001
	ESG Score with Classification of C-	,169	12	,200 <sup>*</sup>	,883	12	,097
	ESG Score with Classification of D+	,184	10	,200 <sup>*</sup>	,902	10	,231
	ESG Score with Classification of D	,365	10	,000	,534	10	,000
	ESG Score with Classification of D-	,233	28	,000	,819	28	,000

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

## Test 11A) EV\_EBITDA \* CSRSOC

### Tests of Normality

Ratio EV/EBITDA	CSRSOC by groups	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
	ESG Score with Classification of A+	,093	29	,200 <sup>*</sup>	,981	29	,852
	ESG Score with Classification of A	,188	68	,000	,791	68	,000
	ESG Score with Classification of A-	,276	91	,000	,385	91	,000
	ESG Score with Classification of B+	,214	94	,000	,750	94	,000
	ESG Score with Classification of B	,122	48	,073	,953	48	,054
	ESG Score with Classification of B-	,213	41	,000	,703	41	,000
	ESG Score with Classification of C+	,213	12	,140	,786	12	,007
	ESG Score with Classification of C	,319	9	,009	,856	9	,086
	ESG Score with Classification of C-	,116	17	,200 <sup>*</sup>	,979	17	,952
	ESG Score with Classification of D+	,150	11	,200 <sup>*</sup>	,952	11	,672
	ESG Score with Classification of D	,286	5	,200 <sup>*</sup>	,757	5	,035
	ESG Score with Classification of D-	,171	6	,200 <sup>*</sup>	,953	6	,768

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

## Test 12A) EV\_EBITDA \* CGT

### Tests of Normality

CGT by groups		Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Ratio EV/EBITDA	ESG Score with Classification of A+	,142	21	,200*	,933	21	,159
	ESG Score with Classification of A	,377	61	,000	,248	61	,000
	ESG Score with Classification of A-	,224	90	,000	,700	90	,000
	ESG Score with Classification of B+	,205	57	,000	,696	57	,000
	ESG Score with Classification of B	,107	54	,178	,889	54	,000
	ESG Score with Classification of B-	,230	44	,000	,812	44	,000
	ESG Score with Classification of C+	,221	43	,000	,709	43	,000
	ESG Score with Classification of C	,199	22	,023	,759	22	,000
	ESG Score with Classification of C-	,220	10	,185	,908	10	,266
	ESG Score with Classification of D+	,127	12	,200*	,917	12	,259
	ESG Score with Classification of D	,208	5	,200*	,938	5	,651
	ESG Score with Classification of D-	,160	12	,200*	,929	12	,368

\*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

## Annex J: Test of Parametric Hypothesis (ANOVA)

Levene's Test Hypothesis:

$$H_0: \sigma_i^2 = \sigma_j^2$$

$$H_1: \sigma_i^2 \neq \sigma_j^2, i \neq j$$

ANOVA Hypotheses:

$$H_0: \mu_i = \mu_j$$

$$H_1: \exists \mu_i \neq \mu_j; i \neq j;$$

Games-Howell Test Hypotheses:

$$H_0: \mu_i = \mu_j$$

$$H_1: \mu_i \neq \mu_j; i \neq j$$

Scheffe's Test Hypotheses:

$$H_0: \mu_i = \mu_j$$

$$H_1: \mu_i \neq \mu_j; i \neq j$$

### Test 1B) CSRENV \* CSRSOC

Tests of Homogeneity of Variances					ANOVA						
CSRENV by groups		Levene Statistic	df1	df2	Sig.	CSRENV by groups					
							Sum of Squares	df	Mean Square	F	Sig.
	Based on Mean	,656	1	19	,428	Between Groups	15,750	1	15,750	2,019	,172
	Based on Median	,087	1	19	,771	Within Groups	148,250	19	7,803		
	Based on Median and with adjusted df	,087	1	13,698	,773	Total	164,000	20			
	Based on trimmed mean	,622	1	19	,440						

Descriptives									
CSRENV by groups									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
ESG Score with Classification of C+	12	7,2500	3,07852	,88869	5,2940	9,2060	3,00	12,00	
ESG Score with Classification of C	9	9,0000	2,34521	,78174	7,1973	10,8027	6,00	12,00	
Total	21	8,0000	2,86356	,62488	6,6965	9,3035	3,00	12,00	

### Test 3B) CSRSOC \* CGT

Tests of Homogeneity of Variances					Robust Tests of Equality of Means					
CSRSOC by groups		Levene Statistic	df1	df2	Sig.	CSRSOC by groups				
						Statistic <sup>a</sup>	df1	df2	Sig.	
	Based on Mean	7,736	2	35	,002	Welch	52,100	2	11,211	,000
	Based on Median	3,543	2	35	,040	a. Asymptotically F distributed.				
	Based on Median and with adjusted df	3,543	2	21,355	,047					
	Based on trimmed mean	7,244	2	35	,002					

Descriptives									
CSRSOC by groups									
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	
					Lower Bound	Upper Bound			
ESG Score with Classification of A+	21	2,7143	1,34695	,29393	2,1012	3,3274	1,00	6,00	
ESG Score with Classification of D+	12	6,5000	2,74690	,79296	4,7547	8,2453	3,00	11,00	
ESG Score with Classification of D	5	9,0000	1,22474	,54772	7,4793	10,5207	7,00	10,00	
Total	38	4,7368	3,02855	,49130	3,7414	5,7323	1,00	11,00	

Multiple Comparisons							
Dependent Variable: CSRSOC by groups							
Games-Howell							
(I) CGT by groups	(J) CGT by groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval		
					Lower Bound	Upper Bound	
ESG Score with Classification of A+	ESG Score with Classification of D+	-3,78571*	,84568	,001	-5,9976	-1,5738	
	ESG Score with Classification of D	-6,28571*	,62161	,000	-8,1491	-4,4223	
ESG Score with Classification of D+	ESG Score with Classification of A+	3,78571*	,84568	,001	1,5738	5,9976	
	ESG Score with Classification of D	-2,50000	,96374	,051	-5,0076	,0076	
ESG Score with Classification of D	ESG Score with Classification of A+	6,28571*	,62161	,000	4,4223	8,1491	
	ESG Score with Classification of D+	2,50000	,96374	,051	-.0076	5,0076	

\*. The mean difference is significant at the 0.05 level.



## Test 4B) CSRSOC \* CSRENV

### Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
CSRSOC by groups	Based on Mean	,049	1	18	,827
	Based on Median	,041	1	18	,842
	Based on Median and with adjusted df	,041	1	17,713	,842
	Based on trimmed mean	,049	1	18	,828

### ANOVA

CSRSOC by groups		Sum of Squares	df	Mean Square	F	Sig.
Between Groups		6,050	1	6,050	1,253	,278
Within Groups		86,900	18	4,828		
Total		92,950	19			

### Descriptives

CSRSOC by groups		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
ESG Score with Classification of D+		10	6,5000	2,32140	,73409	4,8394	8,1606	4,00	10,00
ESG Score with Classification of D		10	7,6000	2,06559	,65320	6,1224	9,0776	5,00	11,00
Total		20	7,0500	2,21181	,49458	6,0148	8,0852	4,00	11,00

## Test 5B) CGT \* CSRENV

### Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
CGT by groups	Based on Mean	4,714	1	18	,044
	Based on Median	2,294	1	18	,147
	Based on Median and with adjusted df	2,294	1	12,252	,155
	Based on trimmed mean	3,834	1	18	,066

### Robust Tests of Equality of Means

CGT by groups		Statistic <sup>a</sup>	df1	df2	Sig.
Welch		,291	1	12,946	,599

a. Asymptotically F distributed.

### Descriptives

CGT by groups		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
ESG Score with Classification of D+		10	5,5000	3,17105	1,00277	3,2316	7,7684	2,00	12,00
ESG Score with Classification of D		10	6,1000	1,52388	,48189	5,0099	7,1901	3,00	8,00
Total		20	5,8000	2,44088	,54580	4,6576	6,9424	2,00	12,00

## Test 6B) CGT \* CSRSOC

### Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
CGT by groups	Based on Mean	2,375	3	50	,081
	Based on Median	1,734	3	50	,172
	Based on Median and with adjusted df	1,734	3	46,708	,173
	Based on trimmed mean	2,377	3	50	,081

### ANOVA

CGT by groups		Sum of Squares	df	Mean Square	F	Sig.
Between Groups		337,813	3	112,604	29,684	,000
Within Groups		189,669	50	3,793		
Total		527,481	53			

### Descriptives

CGT by groups		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
ESG Score with Classification of A+		29	3,5862	1,80312	,33483	2,9003	4,2721	1,00	7,00
ESG Score with Classification of C		9	5,1111	2,57121	,85707	3,1347	7,0875	2,00	8,00
ESG Score with Classification of D+		11	9,6364	1,28629	,38783	8,7722	10,5005	8,00	12,00
ESG Score with Classification of D		5	8,4000	2,70185	1,20830	5,0452	11,7548	5,00	12,00
Total		54	5,5185	3,15476	,42931	4,6574	6,3796	1,00	12,00

**Multiple Comparisons**

Dependent Variable: CGT by groups  
Scheffe

(I) CSR SOC by groups	(J) CSR SOC by groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
ESG Score with Classification of A+	ESG Score with Classification of C	-1,52490	,74316	,253	-3,6750	,6251
	ESG Score with Classification of D+	-6,05016*	,68968	,000	-8,0455	-4,0548
	ESG Score with Classification of D	-4,81379*	,94312	,000	-7,5423	-2,0852
ESG Score with Classification of C	ESG Score with Classification of A+	1,52490	,74316	,253	-,6251	3,6750
	ESG Score with Classification of D+	-4,52525*	,87541	,000	-7,0579	-1,9926
	ESG Score with Classification of D	-3,28889*	1,08635	,037	-6,4318	-,1460
ESG Score with Classification of D+	ESG Score with Classification of A+	6,05016*	,68968	,000	4,0548	8,0455
	ESG Score with Classification of C	4,52525*	,87541	,000	1,9926	7,0579
	ESG Score with Classification of D	1,23636	1,05049	,710	-1,8028	4,2755
ESG Score with Classification of D	ESG Score with Classification of A+	4,81379*	,94312	,000	2,0852	7,5423
	ESG Score with Classification of C	3,28889*	1,08635	,037	,1460	6,4318
	ESG Score with Classification of D+	-1,23636	1,05049	,710	-4,2755	1,8028

\*. The mean difference is significant at the 0.05 level.

**Test 7B) ROA \* CSRENV**

**Tests of Homogeneity of Variances**

		Levene Statistic	df1	df2	Sig.
Return to Assets	Based on Mean	,492	3	58	,689
	Based on Median	,483	3	58	,696
	Based on Median and with adjusted df	,483	3	55,976	,696
	Based on trimmed mean	,530	3	58	,664

**ANOVA**

	Sum of Squares	df	Mean Square	F	Sig.
Return to Assets					
Between Groups	,003	3	,001	1,402	,251
Within Groups	,045	58	,001		
Total	,048	61			

**Descriptives**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
ESG Score with Classification of C-	12	,053558	,0307192	,0088679	,034040	,073076	,0057	,1072
ESG Score with Classification of D+	10	,034770	,0219850	,0069523	,019043	,050497	,0106	,0846
ESG Score with Classification of D	10	,033440	,0238591	,0075449	,016372	,050508	-,0048	,0784
ESG Score with Classification of D-	30	,036370	,0292536	,0053409	,025447	,047293	-,0250	,0903
Total	62	,038966	,0280252	,0035592	,031849	,046083	-,0250	,1072

**Test 8B) ROA \* CSR SOC**

**Tests of Homogeneity of Variances**

		Levene Statistic	df1	df2	Sig.
Return to Assets	Based on Mean	2,507	5	73	,038
	Based on Median	2,365	5	73	,048
	Based on Median and with adjusted df	2,365	5	65,060	,049
	Based on trimmed mean	2,492	5	73	,039

**Robust Tests of Equality of Means**

	Statistic <sup>a</sup>	df1	df2	Sig.
Return to Assets				
Welch	10,508	5	26,126	,000

a. Asymptotically F distributed.

**Descriptives**

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
ESG Score with Classification of A+	29	,096459	,0395214	,0073389	,081425	,111492	,0139	,1589
ESG Score with Classification of C	9	,048422	,0252414	,0084138	,029020	,067824	,0254	,0914
ESG Score with Classification of C-	17	,038559	,0272318	,0066047	,024558	,052560	-,0169	,0786
ESG Score with Classification of D+	11	,050691	,0388627	,0117175	,024583	,076799	-,0085	,1072
ESG Score with Classification of D	5	,037560	,0072521	,0032432	,028555	,046565	,0263	,0453
ESG Score with Classification of D-	8	,026613	,0354219	,0125235	-,003001	,056226	-,0250	,0831
Total	79	,061353	,0430573	,0048443	,051709	,070997	-,0250	,1589

**Multiple Comparisons**

Dependent Variable: Return to Assets  
Games-Howell

(I) CSRSOC by groups	(J) CSRSOC by groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
ESG Score with Classification of A+	ESG Score with Classification of C	,0480364*	,0111648	,004	,013151	,082921
	ESG Score with Classification of C-	,0578998*	,0098733	,000	,028448	,087351
	ESG Score with Classification of D+	,0457677*	,0138261	,038	,001926	,089609
	ESG Score with Classification of D	,0588986*	,0080236	,000	,034574	,083224
	ESG Score with Classification of D-	,0698461*	,0145155	,004	,021269	,118423
ESG Score with Classification of C	ESG Score with Classification of A+	-,0480364*	,0111648	,004	-,082921	-,013151
	ESG Score with Classification of C-	,0098634	,0106964	,935	-,024224	,043951
	ESG Score with Classification of D+	-,0022687	,0144254	1,000	-,048336	,043799
	ESG Score with Classification of D	,0108622	,0090172	,826	-,020390	,042115
	ESG Score with Classification of D-	,0218097	,0150874	,701	-,028521	,072141
ESG Score with Classification of C-	ESG Score with Classification of A+	-,0578998*	,0098733	,000	-,087351	-,028448
	ESG Score with Classification of C	-,0098634	,0106964	,935	-,043951	,024224
	ESG Score with Classification of D+	-,0121321	,0134507	,941	-,055363	,031099
	ESG Score with Classification of D	,0009988	,0073580	1,000	-,022130	,024127
	ESG Score with Classification of D-	,0119463	,0141584	,952	-,036290	,060183
ESG Score with Classification of D+	ESG Score with Classification of A+	-,0457677*	,0138261	,038	-,089609	-,001926
	ESG Score with Classification of C	,0022687	,0144254	1,000	-,043799	,048336
	ESG Score with Classification of C-	,0121321	,0134507	,941	-,031099	,055363
	ESG Score with Classification of D	,0131309	,0121581	,880	-,028053	,054315
	ESG Score with Classification of D-	,0240784	,0171505	,724	-,031173	,079330
ESG Score with Classification of D	ESG Score with Classification of A+	-,0588986*	,0080236	,000	-,083224	-,034574
	ESG Score with Classification of C	-,0108622	,0090172	,826	-,042115	,020390
	ESG Score with Classification of C-	-,0009988	,0073580	1,000	-,024127	,022130
	ESG Score with Classification of D+	-,0131309	,0121581	,880	-,054315	,028053
	ESG Score with Classification of D-	,0109475	,0129367	,949	-,036459	,058354
ESG Score with Classification of D-	ESG Score with Classification of A+	-,0698461*	,0145155	,004	-,118423	-,021269
	ESG Score with Classification of C	-,0218097	,0150874	,701	-,072141	,028521
	ESG Score with Classification of C-	-,0119463	,0141584	,952	-,060183	,036290
	ESG Score with Classification of D+	-,0240784	,0171505	,724	-,079330	,031173
	ESG Score with Classification of D	-,0109475	,0129367	,949	-,058354	,036459

\*. The mean difference is significant at the 0.05 level.

**Test 9B) ROA \* CGT**

**Tests of Homogeneity of Variances**

Return to Assets	Based on	Levene Statistic	df1	df2	Sig.
	Mean	1,769	4	108	,140
	Median	1,732	4	108	,148
	Median and with adjusted df	1,732	4	97,842	,149
	Trimmed mean	1,770	4	108	,140

**ANOVA**

Return to Assets	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	,028	4	,007	3,360	,012
Within Groups	,227	108	,002		
Total	,255	112			

**Descriptives**

Return to Assets	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
ESG Score with Classification of A+	21	,088648	,0424179	,0092564	,069339	,107956	,0030	,1592
ESG Score with Classification of A	61	,057195	,0464697	,0059498	,045294	,069097	-,0614	,1652
ESG Score with Classification of D+	12	,055467	,0624413	,0180253	,015793	,095140	-,0376	,1970
ESG Score with Classification of D	5	,036840	,0406562	,0181820	-,013641	,087321	-,0085	,0790
ESG Score with Classification of D-	14	,036614	,0304093	,0081272	,019056	,054172	-,0250	,0831
Total	113	,059406	,0477468	,0044916	,050507	,068306	-,0614	,1970

**Multiple Comparisons**

Dependent Variable: Return to Assets  
Scheffe

(i) CGT by groups	(j) CGT by groups	Mean Difference (i-j)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
ESG Score with Classification of A+	ESG Score with Classification of A	,0314525	,0116012	,127	-,004908	,067813
	ESG Score with Classification of D+	,0331810	,0165931	,411	-,018825	,085187
	ESG Score with Classification of D	,0518076	,0228172	,279	-,019706	,123321
	ESG Score with Classification of D-	,0520333*	,0158209	,034	,002448	,101619
ESG Score with Classification of A	ESG Score with Classification of A+	-,0314525	,0116012	,127	-,067813	,004908
	ESG Score with Classification of D+	,0017284	,0144803	1,000	-,043655	,047112
	ESG Score with Classification of D	,0203551	,0213301	,922	-,046497	,087207
	ESG Score with Classification of D-	,0205808	,0135885	,682	-,022008	,063170
ESG Score with Classification of D+	ESG Score with Classification of A+	-,0331810	,0165931	,411	-,085187	,018825
	ESG Score with Classification of A	-,0017284	,0144803	1,000	-,047112	,043655
	ESG Score with Classification of D	,0186267	,0244073	,965	-,057870	,095123
	ESG Score with Classification of D-	,0188524	,0180386	,895	-,037684	,075389
ESG Score with Classification of D	ESG Score with Classification of A+	-,0518076	,0228172	,279	-,123321	,019706
	ESG Score with Classification of A	-,0203551	,0213301	,922	-,087207	,046497
	ESG Score with Classification of D+	-,0186267	,0244073	,965	-,095123	,057870
	ESG Score with Classification of D-	,0002257	,0238890	1,000	-,074647	,075098
ESG Score with Classification of D-	ESG Score with Classification of A+	-,0520333*	,0158209	,034	-,101619	-,002448
	ESG Score with Classification of A	-,0205808	,0135885	,682	-,063170	,022008
	ESG Score with Classification of D+	-,0188524	,0180386	,895	-,075389	,037684
	ESG Score with Classification of D	-,0002257	,0238890	1,000	-,075098	,074647

\*. The mean difference is significant at the 0.05 level.

**Test 10B) EV\_EBITDA \* CSRENV**

**Tests of Homogeneity of Variances**

		Levene Statistic	df1	df2	Sig.
Ratio EV/EBITDA	Based on Mean	4,528	3	75	,006
	Based on Median	3,348	3	75	,023
	Based on Median and with adjusted df	3,348	3	31,819	,031
	Based on trimmed mean	4,161	3	75	,009

**Robust Tests of Equality of Means**

Ratio EV/EBITDA		Statistic <sup>a</sup>	df1	df2	Sig.
Welch	5,850	3	22,656	,004	

a. Asymptotically F distributed.

**Descriptives**

Ratio EV/EBITDA	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
ESG Score with Classification of B	40	8,1153	2,82535	,44673	7,2117	9,0188	3,76	15,46
ESG Score with Classification of C+	17	9,3171	2,87276	,69675	7,8400	10,7941	4,32	15,29
ESG Score with Classification of C-	12	15,4942	6,66432	1,92382	11,2599	19,7285	7,33	32,38
ESG Score with Classification of D+	10	11,6830	4,77952	1,51142	8,2639	15,1021	6,07	19,02
Total	79	9,9463	4,63799	,52181	8,9075	10,9852	3,76	32,38

**Multiple Comparisons**

Dependent Variable: Ratio EV/EBITDA  
Games-Howell

(i) CSRENV by groups	(j) CSRENV by groups	Mean Difference (i-j)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
ESG Score with Classification of B	ESG Score with Classification of C+	-,120181	,82766	,478	-,34532	1,0496
	ESG Score with Classification of C-	-,737892*	1,97501	,013	-,13,2276	-,1,5302
	ESG Score with Classification of D+	-,356775	1,57605	,168	-,8,3387	1,2032
ESG Score with Classification of C+	ESG Score with Classification of B	1,20181	,82766	,478	-,1,0496	3,4532
	ESG Score with Classification of C-	-,617711*	2,04611	,041	-,12,1291	-,2,251
	ESG Score with Classification of D+	-,236594	1,66428	,509	-,7,2558	2,5239
ESG Score with Classification of C-	ESG Score with Classification of B	7,37892*	1,97501	,013	1,5302	13,2276
	ESG Score with Classification of C+	6,17711*	2,04611	,041	,2251	12,1291
	ESG Score with Classification of D+	3,81117	2,44652	,424	-,3,0478	10,6701
ESG Score with Classification of D+	ESG Score with Classification of B	3,56775	1,57605	,168	-,1,2032	8,3387
	ESG Score with Classification of C+	2,36594	1,66428	,509	-,2,5239	7,2558
	ESG Score with Classification of C-	-,381117	2,44652	,424	-,10,6701	3,0478

\*. The mean difference is significant at the 0.05 level.

## Test 11B) EV\_EBITDA \* CSR SOC

### Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Ratio EV/EBITDA	Based on Mean	4,455	5	114	,001
	Based on Median	4,040	5	114	,002
	Based on Median and with adjusted df	4,040	5	76,289	,003
	Based on trimmed mean	4,390	5	114	,001

### Robust Tests of Equality of Means

Ratio EV/EBITDA		Statistic <sup>a</sup>	df1	df2	Sig.
Welch		,925	5	25,230	,481

a. Asymptotically F distributed.

### Descriptives

Ratio EV/EBITDA		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
ESG Score with Classification of A+		29	11,3000	3,15941	,58669	10,0982	12,5018	5,42	17,64
ESG Score with Classification of B		48	10,2375	3,81539	,55070	9,1296	11,3454	3,76	20,79
ESG Score with Classification of C		9	9,4644	3,86724	1,28908	6,4918	12,4371	4,32	17,52
ESG Score with Classification of C-		17	11,1953	3,16770	,76828	9,5666	12,8240	5,66	16,86
ESG Score with Classification of D+		11	11,7409	5,04238	1,52033	8,3534	15,1284	5,26	21,27
ESG Score with Classification of D-		6	15,5633	9,13850	3,73078	5,9731	25,1536	4,68	29,28
Total		120	10,9761	4,19983	,38339	10,2169	11,7352	3,76	29,28

## Test 12B) EV\_EBITDA \* CGT

### Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Ratio EV/EBITDA	Based on Mean	3,633	5	108	,004
	Based on Median	3,258	5	108	,009
	Based on Median and with adjusted df	3,258	5	76,806	,010
	Based on trimmed mean	3,485	5	108	,006

### Robust Tests of Equality of Means

Ratio EV/EBITDA		Statistic <sup>a</sup>	df1	df2	Sig.
Welch		3,286	5	22,029	,023

a. Asymptotically F distributed.

### Descriptives

Ratio EV/EBITDA		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
						Lower Bound	Upper Bound		
ESG Score with Classification of A+		21	12,3005	6,55126	1,42960	9,3184	15,2826	3,31	26,58
ESG Score with Classification of B		54	10,0994	3,69454	,50276	9,0910	11,1079	5,08	21,75
ESG Score with Classification of C-		10	12,8300	4,11421	1,30103	9,8869	15,7731	8,19	21,75
ESG Score with Classification of D+		12	14,7317	8,26440	2,38573	9,4807	19,9826	5,12	34,21
ESG Score with Classification of D		5	14,8440	4,32048	1,93218	9,4794	20,2086	10,52	21,27
ESG Score with Classification of D-		12	16,5125	7,69386	2,22103	11,6241	21,4009	4,68	30,64
Total		114	12,1152	5,78978	,54226	11,0409	13,1895	3,31	34,21

### Independent-Samples Kruskal-Wallis Test Summary

Total N	431
Test Statistic	21,537 <sup>a</sup>
Degree Of Freedom	11
Asymptotic Sig. (2-sided test)	,028

a. The test statistic is adjusted for ties.

### Multiple Comparisons

Dependent Variable: Ratio EV/EBITDA

Games-Howell

(I) CGT by groups	(J) CGT by groups	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
ESG Score with Classification of A+	ESG Score with Classification of B	2,20103	1,51543	,696	-2,4676	6,8697
	ESG Score with Classification of C-	-5,2952	1,93299	1,000	-6,4604	5,4013
	ESG Score with Classification of D+	-2,43119	2,78127	,948	-11,2204	6,3580
	ESG Score with Classification of D	-2,54352	2,40355	,886	-11,0735	5,9865
	ESG Score with Classification of D-	-4,21202	2,64135	,611	-12,5102	4,0861
ESG Score with Classification of B	ESG Score with Classification of A+	-2,20103	1,51543	,696	-6,8697	2,4676
	ESG Score with Classification of C-	-2,73056	1,39479	,417	-7,4259	1,9648
	ESG Score with Classification of D+	-4,63222	2,43813	,446	-12,8224	3,5580
	ESG Score with Classification of D	-4,74456	1,99652	,322	-13,6159	4,1268
	ESG Score with Classification of D-	-6,41306	2,27722	,121	-14,0464	1,2202
ESG Score with Classification of C-	ESG Score with Classification of A+	,52952	1,93299	1,000	-5,4013	6,4604
	ESG Score with Classification of B	2,73056	1,39479	,417	-1,9648	7,4259
	ESG Score with Classification of D+	-1,90167	2,71742	,979	-10,6116	6,8082
	ESG Score with Classification of D	-2,01400	2,32937	,945	-10,5974	6,5694
	ESG Score with Classification of D-	-3,68250	2,57403	,709	-11,8968	4,5318
ESG Score with Classification of D+	ESG Score with Classification of A+	2,43119	2,78127	,948	-6,3580	11,2204
	ESG Score with Classification of B	4,63222	2,43813	,446	-3,5580	12,8224
	ESG Score with Classification of C-	1,90167	2,71742	,979	-6,8082	10,6116
	ESG Score with Classification of D	-1,1233	3,07002	1,000	-10,2009	9,9762
	ESG Score with Classification of D-	-1,78083	3,25955	,993	-11,9394	8,3778
ESG Score with Classification of D	ESG Score with Classification of A+	2,54352	2,40355	,886	-5,9865	11,0735
	ESG Score with Classification of B	4,74456	1,99652	,322	-4,1268	13,6159
	ESG Score with Classification of C-	2,01400	2,32937	,945	-6,5694	10,5974
	ESG Score with Classification of D+	,11233	3,07002	1,000	-9,9762	10,2009
	ESG Score with Classification of D-	-1,66850	2,94385	,992	-11,4097	8,0727
ESG Score with Classification of D-	ESG Score with Classification of A+	4,21202	2,64135	,611	-4,0861	12,5102
	ESG Score with Classification of B	6,41306	2,27722	,121	-1,2202	14,0464
	ESG Score with Classification of C-	3,68250	2,57403	,709	-4,5318	11,8968
	ESG Score with Classification of D+	1,78083	3,25955	,993	-8,3778	11,9394
	ESG Score with Classification of D	1,66850	2,94385	,992	-8,0727	11,4097

**Pairwise Comparisons of CGT by groups**

Sample 1-Sample 2	Test	Std. Error	Std.	Sig.	Adj. Sig. <sup>a</sup>
	Statistic		Test		
ESG score with Classification of C-ESG score with Classification of B	8,861	31,505	,281	,779	1,000
ESG score with Classification of C-ESG score with Classification of B+	24,544	31,265	,785	,432	1,000
ESG score with Classification of C-ESG score with Classification of A	30,639	30,978	,989	,323	1,000
ESG score with Classification of C-ESG score with Classification of C+	30,965	32,651	,948	,343	1,000
ESG score with Classification of C-ESG score with Classification of A-	35,583	29,625	1,201	,230	1,000
ESG score with Classification of C-ESG score with Classification of A+	47,452	38,002	1,249	,212	1,000
ESG score with Classification of C-ESG score with Classification of B-	59,955	32,525	1,843	,065	1,000
ESG score with Classification of C-ESG score with Classification of D+	-86,917	44,702	-1,944	,052	1,000
ESG score with Classification of C-ESG score with Classification of C-	-90,400	47,506	-1,903	,057	1,000
ESG score with Classification of C-ESG score with Classification of D-	-133,792	44,702	-2,993	,003	,182
ESG score with Classification of C-ESG score with Classification of D	-139,000	61,713	-2,252	,024	1,000
ESG score with Classification of B-ESG score with Classification of B+	15,683	23,655	,663	,507	1,000
ESG score with Classification of B-ESG score with Classification of A	21,778	23,274	,936	,349	1,000
ESG score with Classification of B-ESG score with Classification of C+	-22,104	25,459	-,868	,385	1,000
ESG score with Classification of B-ESG score with Classification of A-	26,722	21,441	1,246	,213	1,000
ESG score with Classification of B-ESG score with Classification of A+	38,591	32,034	1,205	,228	1,000
ESG score with Classification of B-ESG score with Classification of B-	-51,093	25,297	-2,020	,043	1,000
ESG score with Classification of B-ESG score with Classification of D+	-78,056	39,753	-1,964	,050	1,000
ESG score with Classification of B-ESG score with Classification of C-	-81,539	42,883	-1,901	,057	1,000
ESG score with Classification of B-ESG score with Classification of D-	-124,931	39,753	-3,143	,002	,110
ESG score with Classification of B-ESG score with Classification of D	-130,139	58,228	-2,235	,025	1,000
ESG score with Classification of B+-ESG score with Classification of A	6,095	22,947	,266	,791	1,000
ESG score with Classification of B+-ESG score with Classification of C+	-6,421	25,160	-,255	,799	1,000
ESG score with Classification of B+-ESG score with Classification of A-	11,039	21,086	,524	,601	1,000
ESG score with Classification of B+-ESG score with Classification of A+	22,909	31,797	,720	,471	1,000
ESG score with Classification of B+-ESG score with Classification of B-	-35,411	24,997	-1,417	,157	1,000
ESG score with Classification of B+-ESG score with Classification of D+	-62,373	39,563	-1,577	,115	1,000
ESG score with Classification of B+-ESG score with Classification of C-	-65,856	42,706	-1,542	,123	1,000
ESG score with Classification of B+-ESG score with Classification of D-	-109,248	39,563	-2,761	,006	,380
ESG score with Classification of B+-ESG score with Classification of D	-114,456	58,098	-1,970	,049	1,000
ESG score with Classification of A-ESG score with Classification of C+	-,326	24,803	-,013	,990	1,000
ESG score with Classification of A-ESG score with Classification of A-	-4,944	20,658	-,239	,811	1,000
ESG score with Classification of A-ESG score with Classification of A+	16,813	31,515	,533	,594	1,000
ESG score with Classification of A-ESG score with Classification of B-	-29,315	24,637	-1,190	,234	1,000
ESG score with Classification of A-ESG score with Classification of D+	-56,277	39,336	-1,431	,153	1,000
ESG score with Classification of A-ESG score with Classification of C-	-59,761	42,496	-1,406	,160	1,000
ESG score with Classification of A-ESG score with Classification of D-	-103,152	39,336	-2,622	,009	,576

ESG score with Classification of A-ESG score with Classification of D	-108,361	57,944	-1,870	,061	1,000
ESG score with Classification of C+-ESG score with Classification of A-	4,618	23,092	,200	,841	1,000
ESG score with Classification of C+-ESG score with Classification of A+	16,487	33,161	,497	,619	1,000
ESG score with Classification of C+-ESG score with Classification of B-	28,989	26,711	1,085	,278	1,000
ESG score with Classification of C+-ESG score with Classification of D+	-55,952	40,667	-1,376	,169	1,000
ESG score with Classification of C+-ESG score with Classification of C-	-59,435	43,731	-1,359	,174	1,000
ESG score with Classification of C+-ESG score with Classification of D-	-102,827	40,667	-2,528	,011	,756
ESG score with Classification of C+-ESG score with Classification of D	-108,035	58,856	-1,836	,066	1,000
ESG score with Classification of A--ESG score with Classification of A+	11,869	30,187	,393	,694	1,000
ESG score with Classification of A--ESG score with Classification of B-	-24,371	22,914	-1,064	,288	1,000
ESG score with Classification of A--ESG score with Classification of D+	-51,333	38,280	-1,341	,180	1,000
ESG score with Classification of A--ESG score with Classification of C-	-54,817	41,521	-1,320	,187	1,000
ESG score with Classification of A--ESG score with Classification of D-	-98,208	38,280	-2,566	,010	,680
ESG score with Classification of A--ESG score with Classification of D	-103,417	57,233	-1,807	,071	1,000
ESG score with Classification of A+-ESG score with Classification of B-	-12,502	33,038	-,378	,705	1,000
ESG score with Classification of A+-ESG score with Classification of D+	-39,464	45,076	-,876	,381	1,000
ESG score with Classification of A+-ESG score with Classification of C-	-42,948	47,858	-,897	,370	1,000
ESG score with Classification of A+-ESG score with Classification of D-	-86,339	45,076	-1,915	,055	1,000
ESG score with Classification of A+-ESG score with Classification of D	-91,548	61,984	-1,477	,140	1,000
ESG score with Classification of B--ESG score with Classification of D+	-26,962	40,566	-,665	,506	1,000
ESG score with Classification of B--ESG score with Classification of C-	-30,445	43,637	-,698	,485	1,000
ESG score with Classification of B--ESG score with Classification of D-	-73,837	40,566	-1,820	,069	1,000
ESG score with Classification of B--ESG score with Classification of D	-79,045	58,786	-1,345	,179	1,000
ESG score with Classification of D+-ESG score with Classification of C-	3,483	53,335	,065	,948	1,000
ESG score with Classification of D+-ESG score with Classification of D-	-46,875	50,852	-,922	,357	1,000
ESG score with Classification of D+-ESG score with Classification of D	-52,083	66,304	-,786	,432	1,000
ESG score with Classification of C--ESG score with Classification of D-	-43,392	53,335	-,814	,416	1,000
ESG score with Classification of C--ESG score with Classification of D	-48,600	68,226	-,712	,476	1,000
ESG score with Classification of D--ESG score with Classification of D	5,208	66,304	,079	,937	1,000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.

Asymptotic significances (2-sided tests) are displayed. The significance level is ,050.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

## Annex K: Inferential Analysis

### 1) Model 1

#### 1.1) Evaluate if residuals assume a Normal distribution

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	,115	388	,000	,875	388	,000

a. Lilliefors Significance Correction

#### 1.2) Evaluate if residuals have mean zero

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-,020228	,134972	,066174	,0254453	388
Residual	-,1100468	,3040443	,0000000	,0518456	388
Std. Predicted Value	-3,396	2,704	,000	1,000	388
Std. Residual	-2,106	5,819	,000	,992	388

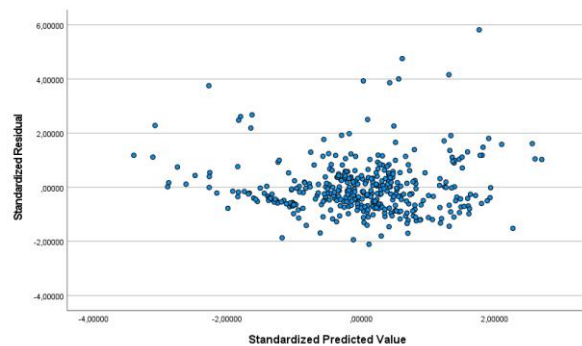
a. Dependent Variable: Return to Assets

#### 1.3) Evaluate if residuals have a constant variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,000	6	,000	,672	,672 <sup>b</sup>
	Residual	,023	381	,000		
	Total	,023	387			

a. Dependent Variable: SqRes

b. Predictors: (Constant), Industry, CSRENV by groups, Leverage (Debt to Asset), Firm's Size, CGT by groups, CSRSOC by groups



#### 1.4) Multicollinearity

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	,316	,030		10,662	,000		
	CSRENV by groups	-,001	,001	-,038	-,520	,604	,386	2,593
	CSRSOC by groups	-,007	,002	-,318	-4,167	,000	,364	2,744
	CGT by groups	,002	,001	,080	1,499	,135	,750	1,334
	Firm's Size	-,042	,006	-,362	-7,432	,000	,893	1,120
	Leverage (Debt to Asset)	-8,444E-6	,000	-,003	-,063	,950	,983	1,017
	Industry	-,003	,001	-,133	-2,862	,004	,975	1,026

a. Dependent Variable: Return to Assets



## 2) Model 2

### 2.1) Evaluate if residuals assume a Normal distribution

**Tests of Normality**

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	,219	387	,000	,450	387	,000

a. Lilliefors Significance Correction

### 2.2) Evaluate if residuals have mean zero

**Residuals Statistics<sup>a</sup>**

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	6,5517	20,0005	12,4428	2,46404	387
Residual	-11,88265	179,15337	,00000	11,32390	387
Std. Predicted Value	-2,391	3,067	,000	1,000	387
Std. Residual	-1,041	15,697	,000	,992	387

a. Dependent Variable: Ratio EV/EBITDA

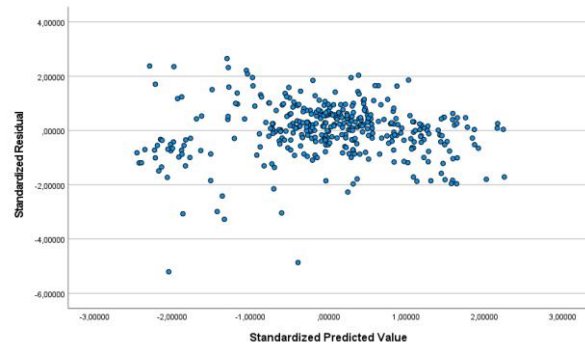
### 2.3) Evaluate if residuals have a constant variance

**ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11109562,89	6	1851593,815	,691	,657 <sup>b</sup>
	Residual	1018146747	390	2679333,544		
	Total	1029256310	386			

a. Dependent Variable: SqRes2

b. Predictors: (Constant), Industry, Firm's Size, Leverage (Debt to Asset), CGT by groups, CSRENV by groups, CSRSOC by groups



### 2.4) Multicollinearity

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-11,388	6,481		-1,757	,080		
	CSRENV by groups	,060	,314	,015	,192	,848	,398	2,515
	CSRSOC by groups	-,027	,391	-,006	-,068	,946	,381	2,628
	CGT by groups	,027	,250	,006	,110	,913	,771	1,297
	Firm's Size	4,863	1,226	,210	3,967	,000	,895	1,118
	Leverage (Debt to Asset)	,015	,030	,025	,503	,615	,984	1,016
	Industry	-,130	,243	-,027	-,537	,591	,970	1,031

a. Dependent Variable: Ratio EV/EBITDA