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# **The valuation relevance of ESG dimensions:**

*An empirical analysis of  
STOXX<sup>®</sup> Europe 600 index*

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I hereby declare that the work submitted is mine and that where I have made use of another's work, I have attributed the source(s) according to the Regulations set in the Student's Handbook.

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## **Abstract**

This dissertation was written as part of the MSc in International Accounting, Auditing and Financial Management at the International Hellenic University.

This study attempts to broaden our horizons in understanding whether there are any actual value creators among the multiple dimensions which compose the rating in ESG performance. Extant literature presents contradictory findings and questions the direction of the causality of the positive association between firm value and CSR performance. While other researchers focus basically on one dimension of CSR, namely the environment, we embrace a more aggregate approach and explore multiple dimensions concerning the corporate social governance performance of a company. Furthermore, this is the first study to our knowledge that examines whether there is a relation between the effective tax rate and the environmental, social, or financial performance.

I provide an empirical analysis to corroborate my research by utilizing a sample of 1.429 firm-year observations of European corporations and by employing a linear-price model that correlates the market value of equity and the different aspects of ESG combined score. The findings of this study support that ESG performance has market valuation implications, while some ESG dimensions are more statistically significant than others. In addition, descriptive statistics evidence that energy-intensive industries, which are more strictly regulated, are more incentivized and perform better in particular ESG areas, such as resources use, emissions management, community impact and workforce safety and advancement.

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*Keywords: Corporate Social Responsibility (CSR); Stakeholder theory; Agency theory; Environmental Social Governance (ESG) performance; Market valuation*

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## 1. Introduction

Reporting in companies has been reconsidered after emerging of new concepts, Sustainability and Corporate Social Responsibility (CSR). Investor analysts seem to be in favour of companies that promote engaging in CSR investments and adopt integrating reporting. There are many frameworks towards which companies may report publicly their economic, environmental, and social impacts.

We are witnessing a worldwide wave of reforms, where EU<sup>1</sup>, OECD, UN PRI, GRI drive the evolution of taxation and sustainability reporting. The global business landscape is changing drastically due to external forces, such as the elimination of resources, the energy transition, the future demographics (resulting in an ageing workforce), the internet of things, the planet under pressure (UN Global Compact, 2019). These mega-trends are inevitably formulating the business environment into sustainability terms. Across the European continent, companies are witnesses of impacts triggered by climate change, scarce resources, geopolitics, evolution of digital technologies (such as AI<sup>2</sup> robotics).

The forerunner of sustainability reports was the environmental report, which was first published in the late 1980s by chemical companies. By the time ethical investing became a new trend, tobacco corporations were keen on adopting non-financial reporting. During the past two decades, the propensity prevails in many organizations to prepare a sustainability report in an annual basis. Corporate Sustainability Reporting (CSR) has its roots in the “Triple Bottom Line”, whose main pillars appear to be the economic, environmental, and social. A true sustainability report would consider the impacts on future generations, so it would be referred to the firm’s performance in respect of its interaction with the physical and social environment, including all kind of firm’s stakeholders.

Since 2001, European Commission recommended the disclosure of environmental issues in annual reports for all companies under 4th and 7th Company Law Directives (78/660/EEC, 83/349/EEC) to enhance comparability and transparency (EU, 2001).

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<sup>1</sup> EU Non-Financial Reporting Directive 2014/95/EU (Directive)

<sup>2</sup> AI - Artificial Intelligence

European Survey of Corporate Social Responsibility Reporting in 2018 (P&R Square and Erik van Buuren, 2018) researched the level of non-financial reporting among 341 largest firms from 9 European Indices<sup>3</sup> and concluded that 96% of them issue CSR reports. This is the result of the introduction of new government reporting regulation and stock exchanges listings conditions, regardless the voluntary character of reporting. Surprisingly, 58% of the sample managed to reflect their corporate responsibility performance into the UN Sustainability Development Goals (SDGs), despite the short notice since the UN's framework was launched.

Energy sector, utilities at large, consumer staples and materials sector comprise of firms that have realized the importance of transparent reporting in value creation for the stakeholders and thus, have become the leaders embracing CSR reporting (P&R Square and Erik van Buuren, 2018). Climate change is the leading topic in sustainability agenda and therefore the energy sector ought to be a pioneer in non-financial reporting. These companies provide absolute data especially concerning GHG Emissions and energy use. Meaning that for a firm to be able to report is a precondition that it manages and measures effectively its resources. Moreover, according to GlobeScan (Europe CSR White Paper, 2019), the manufacturing sector is a fundamental pillar of the EU economy<sup>4</sup>, since EU is the world's largest exporter of manufactured goods and a leader in respects of high-quality products. The recognition of the magnitude of the manufacturing sector in the EU creates a major impact worldwide. Thus, it is crucial for European companies to transit into sustainable growth in a faster pace – and basically de-carbonize their operations. On the contrary, Information Technology, Financials and Real Estate sectors comprise of firms that provide less publicly available information.

The business world struggles to make the connection between their activities and SDGs. The focus on short-termism regarding value creation for shareholders may be a cause that justifies such deviation. A key to overleap this gap would be the interpretation of SDGs into actual business opportunities that would enhance value in companies

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<sup>3</sup> FTSE (UK), CAC (France), DAX (Germany), MIB (Italy), IBEX (Spain), AEX (Netherlands), BEL (Belgium), PSI (Portugal), SMI (Switzerland)

<sup>4</sup> Manufacturing sector in EU is representing 22,1 % of employment. It is estimated that 1 out of 11 companies in EU were manufacturing companies in 2014 (data retrieved from GlobeScan 2019)

(GlobeScan, 2019). In other words, it is the notion of Balance Score Card<sup>5</sup> (BSC). Balanced scorecard has been characterized from its opponents as the managerial equivalent of Stakeholder theory (Jensen M., 2001). 21st century companies' most valuable assets are basically the intangibles. If companies fail to measure their most important assets, they are probably not managing them that well. That is the motivation for implementing BSC, which is another proof that non-financial information needs to be considered and reported. In many cases, we may not be able to translate everything into financial terms, but we can possibly quantify them.

BSC aims to overcome the limitations of other management tools that focus only to financial measures. Financial statements depict the fair performance of the company, but they are based on past events. Tangible and financial assets could be measured using other tools. However, the same tools shall not be applied for the intangibles. If we cannot measure something, we cannot value it. However, there are prior studies criticizing the objective of BSC and whether it is indeed applicable. According to BSC managers would measure and report four perspectives: customer, internal process, financial, and innovation/ learning.

One major flaw of the Balanced scorecard is that it is not a single dimensional measurement of managers' performance or in other words, the existence of a single-valued objective. Based on Jensen's view, it is impossible to maximize simultaneously more than one dimension, because targeting increasing one dimension will occur at the expense of another one. Managers should make trade-offs between conflicting interests. They should be encouraged to maximize one aggregate score which would be linked to their contribution to the firm. Only the process of creating the BSC might add value by locating the value-drivers. Jensen ends up that BSC serves other purposes than evaluating performance. Jensen M. (2001) agrees with the originators of BSC in two points. First, BSC is a tool which assists managers to pinpoint the value creators in firm. Second, it teaches them how to manage those value drivers. However, the challenge for them is to specify the trade-offs among the multiple dimensions of performance to avoid conflicts, confusion and lack of focus. Lastly, Jensen M. (2001) concludes that the term

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<sup>5</sup> In the early 90s, the Balanced Scorecard (BSC) was initially introduced as a management tool for profit organizations by R.S. Kaplan and D.P. Norton (Kaplan, Norton 1992).

“balance” should be replaced with the term “organizational scoreband”, as it better describes something that gives a score.

Managers might be sceptical on BSC, but they are fond of Stakeholder theory for plenty of reasons. They have personal short-term interests, they pursue their own goals at the expense of shareholders and lastly, without specific criteria cannot be evaluated for their performance. Therefore, stakeholder theory increases agency costs by expanding the authority of executives and cancels the firm’s internal control systems. Friedrich von Hayek stresses that there is a human psyche approach which explains why people are attracted by Stakeholder theory. It is due to people’s inherited evolutionary attachment to the small group (family), participation in micro-cosmos and macro-cosmos, as well as people’s innate sense of altruism and solidarity. Nevertheless, no stakeholder would ever be fully satisfied if it is for the firm to survive.

It is impressive the fact that among the largest economies worldwide, we spot also MNEs instead of just countries. Thus, this study examines the behaviour of those corporations towards the corporate governance laws and regulations and towards the CSR voluntary guidelines. CSR/ Sustainability/ Non-financial reporting is supposed to take place to mediate the different interests and demands of various stakeholders and to ensure transparent information disclosure.

Do CSR mechanisms, create value and increase company’s performance? Good Corporate Governance (CG) should protect stakeholders’ rights meaning that CG is dealing with the agency problem – how to assure financiers that they get a return on their financial investment (Shleifer and Vishny, 1997). Consequently, corporations with good CG in consecutive years would eventually increase their value. According to Deminor Rating (Amsterdam, 2003) firms in Europe with “good governance” earned 3% more profit. Moreover, board diversity appears to pay off, since firms (market cap more than \$10b) with at least one woman on the board outperformed their peers by an average 5% (Credit Suisse Group, 2015).

The structure of this study unfolds as follows: Beginning with the literature review which outlines the main contradictory applied theories, continuing with the hypotheses’ development and data analysis. The upcoming section provides the empirical results in accordance with the literature discussed previously. Lastly, the theoretical and practical issues are raised in the conclusions part, alongside with the limitations facing this study.



## **2. Literature Review and Hypothesis Development**

### ***2.1 Basic concepts and prior studies analyzing them***

#### **2.1.1 CSR initiatives are reckoned as firm-value creator or firm-value destroyer?**

Many researchers, scholars, analysts beg the question of whether corporate sustainability performance enhances the financial performance of an organization. There is a vivid debate with worthwhile arguments from both sides. However, the results to date are inconclusive.

Extant studies question the actual impact of CSR investments in the financial performance of a firm. Post and Waddock (1995) in an effort to convince those wondering how it is possible by spending resources without gaining anything tangible in return to create wealth; they stress out that intangible assets (positive moral capital, goodwill), also, have value. Rindova and Fombrum (1998) pinpoint that although reputation per se has no value in pecuniary terms, reputational capital because of CSR initiatives has economic value, since these actions potentially enhance shareholders' wealth.

For decades, the main purpose of a corporation was to maximize returns to shareholders. As mentioned by Friedman M. in 1962, "In free economy, there is only one social responsibility of business, to use its resources and engage in activities to increase its profits as long as it stays within the rules of the group". Later, Friedman (1970) in the New York Times Management suggested that CSR investments may be regarded as an irresponsible way of using corporate resources. Other researchers supported that they assumed CSR expenditures as "doing well by doing good" (Fombrum, 2005; Servaes & Tamayo, 2013). Campbell (2007) posits that it is deterrent for the firms to act in a socially responsible way while there is the imperative of wealth maximization. In recent years, there are still economists that express their scepticism about CSR initiatives. Analysing the cost and benefits of undertaking a CSR investment project by applying the traditional financial NPV (Net Present Value), usually indicates to reject it (McWilliams and Siegel, 2001). NPV method fails to take into consideration the value of flexibility for strategic reasons created by certain investments. Albasteki et

al. (2019) is referred to the Exxon Valdez incident<sup>6</sup> to support the value of flexibility. Specifically, Exxon saved the cost of CSR investment, but lost the flexibility to respond in a company's dramatic failure and lost more than \$8 billion (penalties, liability, reputation damage). Failure to contribute to the goal of shareholders' maximization value.

### 2.1.2 Stakeholder theory versus Shareholders value maximization theory

Freeman R.E. and Velamuni R. introduced the "Stakeholder theory"<sup>7</sup> through an article titled "New approaches to CSR" in 1984. That new philosophy aimed to equilibrate the pursuit of wealth with a commitment to ethical values. Deng et al. (2013) separated the two opposing perspectives: the stakeholder value maximization view, and the shareholder expense view. The shareholder expense view proposes that executives engage in CSR activities to satisfy the needs of other stakeholders in the expense of shareholders (New York Times Magazine, 1970; Friedman, 1970; Pagano & Volpin, 2005; Cronqvist et. al, 2009). Jensen opposes Stakeholder theory and presumes that it leaves managers empowered to spend resources, while they bear the credits and shareholders bear only the costs. The overinvestment view propose that CSR expenses aim to intensify managers' reputation and could be an example of an agency cost of equity. Overinvestment in CSR might, as well, satisfy the demands of shareholders that are willing to do some societal good. Friedman (1962) posited that "philanthropic agent" is an insufficient means of charity and better delegated to individual shareholders rather than corporations. The overinvestment view is deemed as an alternative of agency theory.

Corporations ought to disclose information that assist different stakeholders with conflict of interest, to engage with firm's decision-making process; but, simultaneously without conveying commercially sensitive information. Managers are reluctant in sharing information deemed as too confidential that could trigger the competitors. By employing the term "investor capitalism", Zajac et al. (2004) referred to a model of

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<sup>6</sup> The Exxon Valdez oil spill triggered in Alaska (1989) when Exxon Valdez, an oil tanker struck Prince William Sound's Bligh Reef, which resulted in huge damage to the marine environment.

<sup>7</sup> Stakeholders defined as "any identifiable group or individual who can affect the achievement of an organization's objectives, or is affected by the achievement of an organization's objectives" (Freeman and Reed, 1983)

economic allocation of resources. While managers engage with CSR investments, considerable agency costs are incurred. The “investor capitalism” model propose the capital allocation to be assumed by investors. According to Atkinson and Galaskiewicz (1988) firms with low levels of CEO ownership are more generous in charitable giving. From another perspective, managers would increase disclosure. Inevitably, there is a risk information gap as correctly was noted by the ICAEW<sup>8</sup>.

Legitimacy theory could explain why entities choose to make voluntary disclosures. It supports that companies have the tendency to legitimize their activities through disclosures (CSR reports, environmental reports, additional non-compulsory) to manipulate the firm’s relations with society (Cho & Patten, 2007).

Several studies conducted on dividends, presume that dividend changes are depicted in the future cash flows of the firm (John and Williams, 1985). Basically, dividend policy signals manager’s confidence. In accounting, dividends represent the most characteristic form of signalling theory. Based on Verrecchia’s view (2001), firms that aim to signal a “good corporate citizens” profile will increase disclosure. Gunawardena et al. (2019), through their theoretical study, invoked that corporate reputation affects subsequent financial performance of firms, since corporate reputation signals trustworthiness of a firm. This encloses a psychological assessment, based on totally subjective assessments of experiences, and a priori signals. Signalling theory aims to eliminate information asymmetry between the insiders and outsiders of a firm. As accurately stated by Afzal et al. (2008), when different parties of a transaction have different intel, information asymmetry exists. Differentiation of individuals in respect of ownership and control inevitably leads to information asymmetry between executives and shareholders (Francis J., 1995). In signalling theory, the fundamental elements are the signaller (insider, manager), the receiver and the signal itself (mainly insights that convey positive messages). According to Connelly et al. (2011) signals may be categorized<sup>9</sup> as intent signals, camouflage signals and need signals. A remedy for eliminating information asymmetry would be disclosing more as a means of increased transparency between the insiders (firm) and the outsiders (stakeholders). Then

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<sup>8</sup> ICAEW – Institute of Chartered Accountants of England and Wales

<sup>9</sup> Intent signals- indicate future actions that are crucial for receiver’s actions; camouflage signals- conceal contingent liability; need signals- communicate requirements (Connelly et al., 2011)

investors would be informed for future costs that might be occurred. However, managing and measuring emissions must be done beforehand and it is made at the expense of shareholders. Another example is the signalling theory of covenants where the acceptance of stricter covenants is a signal of strong future performance (Demiroglu and James, 2010).

According to “rational economic man” theory, all individuals’ actions are driven by self-interest and thus, it is rational that managers will act in a manner to increase their wealth. In previous decades, corporate governance failure and earnings management led to major scandals (e.g. Enron, Parma, WorldCom). Xie et al. (2003) analysed the role of sub-committees and especially the presence of an audit committee and its composition and concluded that companies with accounting errors omitted to have internal control in the sense of an audit committee.

Based on the agency theory, there is an inherent conflict between the interests of the principals and the agents. Managers might not present fairly the financial statements of the company for self-interest purposes. Furthermore, this situation creates information asymmetry which leads investors to non-optimal investment decisions (Kothari et al., 2016).

Political economy theory introduces the Legitimacy-Stakeholder theory. Legitimacy theory promotes that disclosures (such as CSR reports, environmental reports, or other non-compulsory disclosures) are used for strategic reasons by the firms to gain public acceptance and to align with community expectations (empirical studies of Patten, 1992; Brown and Deegan; 1998). On the other side, Stakeholder theory should not be reckoned as a separate theory but as a different perspective within the political-economy framework. Basically, explains that managers shall provide more detailed information to stakeholders to eliminate the risk of being dismissed, so earnings management actions are less possible to take place.

### 2.1.3 Corporate Social Responsibility (CSR) – Corporate Citizenship

CSR is controversial in the sense that it has a wide variety of definitions due to the multiple interests of a broader group of stakeholders represented. *“Being socially responsible means not only fulfilling legal expectations, but also going beyond compliance and investing more into human capital, the environment and the relations*

*with stakeholders*” (European Commission, 2001: Promoting a European Framework for Corporate Social Responsibility). Hill et al. (2007) define CSR as the economic, legal, moral, and philanthropic actions of firms that influence the quality of life of relevant stakeholders. The definition given by the World Bank Council for Sustainable Development is *“the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large”*.

#### 2.1.4 CSR Sustainability Reporting: moving from voluntary to mandatory Disclosure

First attempt of voluntary sustainability reporting dates to the decades 1960s and 1970s. The Netherlands and France were among the pioneer countries of voluntary social disclosures. “Social and ethical performance” was driving the ethical investment funds in the U.S. and UK during the 1980s.

An environmental disaster (Exxon Valdez, 1989) triggered the development of the “CERES10/ Valdez Principles” which was comprised of a set of guidelines focus on environmental issues. Public outcry over the environmental damage of the Exxon Valdez oil spill incentivized as well as the establishment of GRI. In 1997, the Global Reporting Initiative (GRI) was founded by the United Nations Environment Program (UNEP) and the CERES as a response to the public outcry for the urgency for corporate transparency. In 2000, the first version of GRI Guidelines was launched which provided the first global framework for sustainability reporting. It was eventually integrated in 2016 into the GRI Sustainability Reporting Standards.

In the meantime, the United Nations Conference on Sustainable Development (known as “Rio+20”) took place in Rio, 2012. The conference resulted in a political document under the name “Future We Want-Outcome document<sup>11</sup>”, which includes measures and guidance of implementing sustainable development.

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<sup>10</sup> CERES – Coalition for Environmentally Responsible Economies. Ceres’ mission is building a sustainable future for people and for the planet while transforming the economy. Today, “Ceres Investor Network” comprise of more than 175 institutional investors, managing over \$29 trillion in assets. Examples of Ceres’ initiatives are the “Global Investor Coalition on Climate Change”, “Climate Action 100+” and “The Investor Agenda”. (<https://www.ceres.org> 2020)

<sup>11</sup> Future We Want-Outcome document – (full text can be found here: <https://sustainabledevelopment.un.org/index.php?menu=1298>)

The Great Recession of 2007-2009 along with all corporate scandals increased insecurity, lack of trust and sectors even self-regulated. According to Ioannou and Serafeim (2015), more intensive sustainability reporting was requested as investors in capital markets esteemed ESG data into their valuation models.

By the mid-2000s, a new phrase substitutes the term “CSR”, which was under the label “corporate sustainability”. Meaning that companies ought to be sustainable in a sense that they are prospering within a healthy environment and society. Sustainability reporting is not only the provision to a range of stakeholders of information about the performance of an entity. But also, how the entity interacts with its physical and social environment, including information in terms of workforce, local and overseas communities, and use of natural resources. Social reporting and environmental reporting are components of sustainability reporting. Sustainable development has best described in Brundtland Report (1987), *“Ensuring the needs of today’s world are met while at the same time ensuring that the ability for future generations to meet their own needs is not compromised.”*

#### 2.1.5 Corporate Governance (CG) and the UK CG Code

According to the definition provided by UK CG Code (2012) *“Corporate governance is the system by which companies are directed and controlled”*.

In July 2018, FRC<sup>12</sup> published the revised “UK Corporate Governance Code”, whose goal was to enhance the importance of non-financial reporting with matters that impact the long-term company’s performance. The set of Principles in the Code emphasizes the importance of implementing CG<sup>13</sup> practices that promote long-term sustainable success.

The 2018 Guidance focuses in 5 main pillars of CG; Board Leadership and Company Purpose; Division of Responsibilities; Composition, Succession and Evaluation; Audit, Risk, and Internal Control; Remuneration. Each pillar comes along with principles and provisions.

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<sup>12</sup> FRC – Financial Reporting Council

<sup>13</sup> CG – Corporate Governance

### 2.1.6 Risk Management, Socially Responsible Investment (SRI) & Socially Responsible Corporate Behavior

Based on Albasteki et al. (2019) views, the environmental risk and social risk led to the emergence of CSR. More and more organizations felt the pressure to align with the concept of “triple bottom line” (social, environmental, economic) or “3Ps” (people, planet, profit). Prior studies conclude that the higher the SCR performance of a firm, the lower the financial risk occurred (Orlitzky M. et al., 2001). Similarly, Bowman (1980) states that CSR assimilates business risk as the outcome of the new culture adopted, which averse any business threat.

SRI movement gained advocates, especially in Europe. It rapidly evolved from the ethical view towards investments into engaging CSR ratings in analysts’ valuation models. In 2003, the UNEP Finance Initiative ratified an *“agreement among analysts in which environmental, social, and corporate governance issues affect the long-term shareholder value”*.

Campbell (2007) realized that the definition of a socially responsible corporate behaviour would vary depending on the point of view of each stakeholder. For instance, employees reckon as a socially responsible corporation the one that cares about the health and safety of its workforce. So, the definition is adjustable based on the perspective of the stakeholders that is referred to. The CSR score might differ dramatically for different definitions.

### 2.1.7 Evidence from prior studies

Lys et al. (2015) strongly support that most of the literature wrongly assumed the direction of the causality of the positive association between CSR expenditures and future performance. The results of the empirical study demonstrate that the positive relation is more likely due to signalling of CSR expenditures. Their main argument was that when a firm assumes strong future financial performance, then it is more likely to invest in CSR initiatives. Management’s insight (e.g., private intel of a breakthrough) could impact the direction of the causality. Once more we witness the effect of information asymmetry. They examined 3 hypotheses regarding why firms would undertake CSR initiatives: charity hypothesis, investment hypothesis, signalling hypothesis.

According to Campbell J. (2007), social responsibility of a firm may be affected by the general financial position of the firm, the economic circumstances in which firm operates, and the level of competition.

Deng X. et al. (2013) evidenced that mergers with high CSR acquirers are completed in shorter periods and are less likely to fail.

Gunawardena et al. (2019) summarized at least five factors that have been tested in association with a firm's financial performance: corporate social responsibility (Cochran et al. 2014), social responsibility (Barnett et al., 2006), board composition (Dalton et al., 1998), corporate social/environmental performance (Orlitzky et al., 2003), balanced scorecard implementation (Davis & Albright, 2004).

Campbell J. (2007) provides a theoretical approach which specifies the conditions for a firm to behave in a socially responsible manner. This approach is the institutional theory of corporate social responsibility, when institutional mechanisms<sup>14</sup> are in place may influence corporate behaviour that focuses on short-termism.

Waddock and Graves (1997) provided a regression analysis with multidimensional gauge of CSR, which found a link with a positive sign between CSR and corporate financial performance.

Results of prior empirical studies are inconsistent with the shareholder value maximization view, suggesting that firms satisfying plenty stakeholders' interests, they are enhancing the long-term profitability and thus, maximizing the shareholders' wealth (Deng X. et al., 2013).

Jensen M. (2001) is one of the strongest opponents of Stakeholder theory, whose roots lies at sociology, organizational behaviour, politics of special interests and managerial self-interest view. Stakeholder theory best depicts the self-interest of managers, who become unaccountable for their decisions, because they take account of interests of all stakeholders. Moreover, according to Jensen "firm value" is not only the value of equity, but also the sum of values of every financial claim of the company including debt, contingent claims, and equity.

Ghoul S. et al. (2011) after an empirical analysis using a large sample of 2.809 U.S. firms reached to three main conclusions. First, firms with better CSR scores demonstrate

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<sup>14</sup> Institutional mechanisms, such as public and private regulation, presence of NGOs, organized dialogues among firms and stakeholders (Campbell J., 2016)



cheaper equity financing. Likewise, prior research denotes that effective corporate governance causes elimination of information asymmetry, thus become less risky for the investors and lower cost of equity (Botosan, 1997; Hail and Leuz, 2006; Chen et al., 2009). Firms with better environmental performance, are realised higher bond yields and thus, having easier access to debt financing (Sharfman and Fernando, 2008). Cost of equity or internal rate of return depicts the market's perception of firm's riskiness and investors' required rate of return on corporate investments. Second, CSR investments targeting improving employee relations, environmental performance, and product characteristics contribute to reducing firm's cost of equity. Third, firms comprised in two particular "sin industries" (tobacco and nuclear power) face increased cost of equity. To summarize, these findings evidence that socially responsible behaviour prove to have lower risk and higher valuation.

Goss A. and Roberts G. (2010) examined the effect of CSR on the cost of bank loans and found that lenders treat different firms based on their CSR strengths and concerns. Using a sample of 3.996 loans to U.S. firms, Goss et al. (2010) reached the conclusion that lenders incentivize firms to amend CSR concerns by postulating higher yield spreads to borrowers with worst CSR scores. In addition, lenders do not appreciate CSR initiatives that likely add no value – known as "greenwash". After all, banks are primarily interested in the borrower's ability to meet its loan liabilities. According to risk mitigation view, firms with higher CSR ratings, have lower idiosyncratic risk and thus, lower returns but, higher market to book value (Galema et al., 2008; Lee and Faff, 2009). So, when banks perceive less risk, they are willing to provide more attractive loan covenants to corporations with socially responsible behaviour. The presence of institutional shareholders equals with amplified monitoring which allows lower spreads (Roberts and Yuan, 2010). Goss et al. (2010) suggest that CSR concerns do matter and are priced by banks when they are composing the loan contract terms, the increased risk depicted with higher spreads.

Liao et al. (2014) through their empirical study, examined 329 of the largest companies in the UK and concluded that there is significant positive association between gender diversity and disclosures of GHG emissions. Similarly, the existence of an environmental committee shows a propensity to be more transparent from an

ecological perspective. However, the board independence is not associated with the tendency of GHG disclosure.

Multiple studies examine the firm's performance under the scope of embracing CSR initiatives. The results of these studies are divisive, either CSR investments are reckoned as value enhancing or as value destroying.

On a positive point of view, Feldman et al. (1997) formulates that investors perceive as less risky the firms that are environmentally more sensitive. It is not a surprise that expected returns for "sin" stocks are higher, due to increased litigation risk. Brammer S. et al. (2006) using a sample of 451 companies in the U.K. concluded that firms with higher social performance ratings are inclined to achieve lower returns. They used three measures of socially responsible behaviour: community, environmental and employee performance. The employee and environmental indicators are negatively associated with returns. It is noticeable that some industrial sectors care more about their environmental performance, due to the potential environmental impact (such as utilities and resources, power generation, chemicals). Others pay greater attention to their community performance, due to brand reputation being vital for their business. Among the worst performers appear to be information technology, general industrials, cyclical consumer goods sectors (Brammer et al., 2006). Brammer et al. conclude that CSR activities considered as paradigm in some sectors are deemed as wasteful in others.

Research papers since 1994 evidence that capital markets employ environmental disclosure or "unbooked" liabilities to evaluate a firm's risk profile (Blacconiere and Patten, 1994; Campbell et al., 1998).

Voluntarily practices meliorating ESG behaviour might have a positive effect on firm value by attracting talented employees (Turban and Greening, 1997). Similarly, Guenster et al. finds a positive relationship between firm value and environmental performance. Another study reaches the conclusion that CSR and corporate financial performance are positively associated (Orlitzky et al., 2003).

Margolis et al. (2007) perceived CSR as activities that might positively contribute towards firm's earnings. Furthermore, there is a positive valuation impact on corporate social performance according to Jiao (2010). Based on Adams et al. (2010) corporate governance practices might have an impact on firm value.

On the other side, Hamilton et al. (1993) evidence that the excess returns of mutual funds characterized as “socially responsible” have no divergence compared with the conventional mutual funds. In addition, Brammer et al. (2006) find that firms with better social performance realize lower returns. It is important to note that the sample examined for the time span 2002-2003, where equity markets were misjudging CSR initiatives – CSR top performing firms were linked to negative abnormal returns, the exact opposite for bad-performers.

No evidence that CSR engagements affect firm’s financial performance is the outcome of another study (Nelling and Webb, 2009). The negative effects on firm value might also occur due to compliance costs (e.g., Chow, 1983; Bushee and Leuz, 2005). Eccles et al. (2014) notably mentioned that preparation costs or revealing of competitively sensitive information within the framework of sustainability disclosure laws, might decrease firm value. The same study shows that sustainable corporations outperform their peers with lower sustainability profiles.

Ioannou I. and Serafeim G. (2014) examined through a sample of firms located in 4 countries (China, Denmark, Malaysia, South Africa), where disclosures were mandated prior 2011, the effect of sustainability disclosure regulations on firms’ disclosure policy. Mandatory reporting laws and regulations urge companies to improve ESG practices and disclosures.

In another study, Ioannou I. and Serafeim G. (2014) analysed a sample of 3,500 companies for a time span of 15 years so as to explore the effect of CSR scores on analysts’ assessments regarding the firm’s future financial performance. The findings indicate that in early 1990s, analysts issued pessimistic recommendations for firms with high CSR ratings. This is due to the perception that CSR is more like an agency cost and deemed as serving managerial interests rather than shareholders’ objectives.

However, firms are assessed more optimistically over time and especially by the high-status analysts. Ioannou I. and Serafeim G. (2014) through their study presumed that agency theory was weakened as stakeholder orientation gained momentum by investors and analysts. A variety of factors conducted to the agency theory to be obsolete, namely NGO activity, SRI, and consumer awareness.

## **2.2 Hypothesis development**

Inferring from the accounting literature, the market valuation of different aspects of ESG performance has been under the scope of study of many researchers. The results were vague, and the contradictory theories could not prevail over each other. To elaborate this view, many of these studies acknowledge the relationship between financial performance and environmental performance or between financial performance and the employment of corporate governance mechanisms, but they are questioning the direction of this relation.

Extant literature makes inferences about the reverse causality problem on the association between firm value and CSR (Waddock & Graves, 1997; Teoh et al., 1999; McWilliams & Siegel, 2000; Jiao, 2010).

Based on empirical evidence of a sample of firms listed on the Stockholm stock exchange, Hassel L. et al. (2005) inferred that environmental performance has a negative influence on the market value of firms. One possible explanation could be that market is short-term oriented and investors punish firms with environmental consciousness.

Hassel L. et al. (2005) distinguish prior studies at two main streams: the cost-concerned school and the value creation school. The results of their study evidence that environmental investments depict only increased costs which lead to decreased earnings and lower market values. Alongside with other research that evidence the negative association between environmental performance and market value (Jaggi and Freedman, 1992; Walley and Whitehead, 1994). The opposite approach, the value creation school, posits that environmental efforts represent a way to gain competitive advantage that will improve the shareholders' returns in the future. The above relationship is expected to be positive (Konar and Cohen, 2000; Dowell et al., 2000).

Do corporations that avoid environmental risks and seize the environmental opportunities manage to create shareholder value in the long run? This study focuses on the impact of specific dimensions that composes the environmental pillar score according to Thomson Eikon database. The effort of companies to reduce resources use, such as energy, water, or materials, and instead employing eco-efficient solutions; their commitment in reducing environmental emission throughout their operational processes; and their innovativeness in designing eco-friendly products and technologies

are the three elements that this study examines. Hence, the first hypothesis under examination is the following:

*Hypothesis 1: The environmental performance of STOXX® Europe 600 index components (companies), in terms of resource use, emission and environmental innovation, is positively related to their market valuation.*

Liao et al. (2015) through their study examining the impact of corporate board's characteristic (gender diversity, board independence, environmental committee) on the voluntary disclosure of GHG<sup>15</sup> emissions in accordance with the Carbon Disclosure Project report, posit that agency theory is inadequate to explain GHG-reporting propensity. Stakeholder theory is more valid in explaining the firm's ability to balance financial and non-financial targets and compromise stakeholders with conflicting needs through for instance a board with "good governance" traits.

The second hypothesis development is based on exploring a possible association between good corporate governance practices and firm value creation. The goal of CG initiatives is to generate shareholder value in the long term through best management practices that create incentives at all-organizational levels while safeguarding organization's and investors' interests. The existence of female directors on the BoD, the level of independency on the BoD, the duality of CEO and chairman, the presence of corporate governance board committee or the presence of a CSR committee are the aspects under examination in value creation for the company.

*Hypothesis 2: The corporate governance performance of STOXX® Europe 600 index components (companies), in terms of board diversity, board independency, CEO/Chairman duality and the existence of CSR or CG committee, is positively related to their market valuation.*

The third hypothesis focuses on the societal performance of companies and whether their actions that have an impact on society, affect the market valuation. The social pillar score is comprised of firm's capability to create trustworthy and loyal relations with its workforce, customers, and society. This study examines whether firm's respect towards fundamental human rights conventions, business ethics; firm's commitment towards

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<sup>15</sup> GHG – Greenhouse gas emissions

protecting public health, producing quality goods and services; and firm's effectiveness towards health, safety and development of its workforce play a vital role in generating firm value.

*Hypothesis 3: The social performance of STOXX® Europe 600 index components (companies), in terms of workforce satisfaction, human rights respect, community commitment, and product responsibility is positively related to their market valuation.*

This is the first study to our knowledge that examines whether there is a relation between the effective tax rate and the environmental, social, or financial performance. Tax could be regarded as part of the CSR in the sense that through taxation corporations contribute to society. In the context of "good governance" firms ought to establish mechanisms integrating responsible tax behaviour and tax transparency. Corporations should not only comply with laws and regulations while tax planning, but also not use artificial structures that may be legal but unethical. Clotfelter (1985) and Navarro (1988) among other researchers, while investigating the topic of corporate philanthropy, concentrated on tax law and any applicable provisions for deducting charitable contributions. Campbell (2004) admitted that tax law is an important institutional mechanism that may cause an impact in corporate behaviour. However, the results are inconclusive. The fourth hypothesis examines whether there is any interaction between the different aspects of CSR performance measurement and the effective tax rate. A high effective tax rate imposed in firms might negatively contribute to their efforts of being environmentally and socially responsible.

*Hypothesis 4: The environmental and social performance of STOXX® Europe 600 index components (companies), is negatively associated with an imposed high effective tax rate.*

### **3. Data and Method**

#### ***3.1 Sample selection and data sources***

The STOXX® Europe 600 is a stock index constituted by European stocks. This index comprises of a fixed number of 600 components (corporations) stem from 17 European countries (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland,

United Kingdom). The STOXX 600 is deemed for European companies as the equivalent of S&P 500, which is for U.S. firms. We considered that we could employ in our sample these 600 companies from 10 sectors, because they appear to be large, mid, and small capitalization corporations and that would provide variety in our sample.

The data used in this study were collected from two main sources. Accounting information and stock prices were obtained from the Amadeus database. This database provides comparable financial data for the largest 550,000 European public and private firms. The environmental, social and governance information were gathered from Thomson Reuters Refinitiv Eikon. Refinitiv provides ESG scores for more than 10,000 corporations globally by considering more than 450 ESG metrics. ESG data originate from firms' annual reports, CSR reports, websites, NGO websites and stock exchange filings. ESG Combined score (ESGC) is calculated using a subset of 186 metrics under the three main pillars: Environmental (resource use, emissions, innovation), Social (workforce, human rights, community), Governance (management, shareholders, CSR strategy) and Controversies across the main pillars (e.g., scandal, lawsuits, fines, legislation disputes).

**Table 1**

Sample selection process

	<b>Firm/ year obs.</b>
<b>Initial sample:</b> All STOXX <sup>®</sup> Europe 600 companies for the period 2015-2019	3000
<b>Less</b> companies from Financials industry (ICB code 8000) for the period 2015-2019	720
<b>Sub-total</b>	2280
<b>Initial</b> number of observations collected by Amadeus database and Thomson Reuters Refinitiv Eikon database for companies with existing both financial and ESG data for at least one year of the period 2015-2019	1849
<b>Less</b> observations with missing or negative book value of equity	20
<b>Less</b> observations with missing earnings data	2
<b>Less</b> observations with missing financial or ESG data for any year of the period 2015-2019 (company for years<5)	402
<b>Final Sample</b>	<b>1425</b>

All financial institutions and financial services, banks, insurance companies and real estate are excluded from our sample (namely, financial industry under ICB code 8000) due to the special treatment in assets and liabilities of this industry which might impact the association between accounting figures and market value (Dahmash et al., 2009). Thus, our sample resulted in 456 companies in total. The analysis is under the fiscal years 2015-2019. Hence, the sub-total initial sample would constitute of 2.280 firm-year observations. Companies without complete financial or ESG data either in Amadeus or in Thomson Reuters Refinitiv Eikon database were eliminated, which resulted in 1.849 firm-year observations. Twenty observations were withdrawn due to missing or

negative book value of equity, two were eliminated due to missing earnings data and lastly, 402 were withdrawn because our sample was unbalanced due to missing years of observations for specific firms. The final sample utilized in this research includes 1.429 firm-year observations (Table 1).

Table 2 and Table 3 represent the composition of firms per industry and per country, respectively in our sample. According to Lund (2007), the energy-intensive sectors are basically Oil & Gas, Basic Materials, Industrials and Utilities. Therefore, our sample consists of corporations which belong in one of these industries by 44,91%. Consequently, our sample appears to be balanced regarding the energy-intensive and non-energy-intensive firms. Thus, extreme ESG policies and strategies applicable by firms with increased emissions for instance will not drive regression analysis to one or another direction.

**Table 2**

Sample composition: Firms per industry (ICB-Code Classification)

<b>Industry (SuperSector)</b>	<b>Firm/Year Obs</b>	<b>Unique firms</b>	<b>% firms per industry</b>
Oil & Gas			4,21%
<i>Energy</i>	55	11	
<i>Oil &amp; Gas</i>	5	1	
Basic Materials			4,91%
<i>Chemicals</i>	70	14	
Industrials			30,53%
<i>Basic Resources</i>	60	12	
<i>Construction and Materials</i>	70	14	
<i>Industrial Goods and Services</i>	305	61	
Consumer Goods			14,74%
<i>Automobiles and Parts</i>	45	9	
<i>Food, Beverage and Tobacco</i>	95	19	
<i>Personal Care, Drug and Grocery Stores</i>	70	14	
Health Care			12,28%
<i>Health Care</i>	175	35	
Consumer Services			16,49%
<i>Consumer Products and Services</i>	95	19	
<i>Retail</i>	45	9	
<i>Media</i>	50	10	
<i>Travel and Leisure</i>	45	9	
Telecommunications			6,32%
<i>Telecommunications</i>	90	18	
Utilities			5,26%
<i>Utilities</i>	75	15	
Technology			5,26%
<i>Technology</i>	75	15	
<b>Total</b>	<b>1.425</b>	<b>285</b>	<b>100,00%</b>



**Table 3**Sample composition: Firms per country (STOXX<sup>®</sup> Europe 600)

	<b>Country</b>	<b>Firm/Year Obs</b>	<b>Unique firms</b>	<b>% firms per industry</b>
AT	Austria	15	3	1,05%
BE	Belgium	20	4	1,40%
CH	Switzerland	125	25	8,77%
DE	Germany	150	30	10,53%
DK	Denmark	75	15	5,26%
ES	Spain	60	12	4,21%
FI	Finland	70	14	4,91%
FR	France	250	50	17,54%
GB	United Kingdom	440	88	30,88%
IE	Ireland	15	3	1,05%
IT	Italy	30	6	2,11%
LU	Luxemburg	0	0	0,00%
NL	the Netherlands	30	6	2,11%
NO	Norway	35	7	2,46%
PL	Poland	0	0	0,00%
PT	Portugal	15	3	1,05%
SE	Sweden	95	19	6,67%
	<b>Total</b>	<b>1.425</b>	<b>285</b>	<b>100,00%</b>

### 3.2 Empirical models

This study aims to examine whether firm value is affected by the level of firm's total ESG performance, environmental performance and by the use of certain corporate governance mechanisms (such as the level of board's independency, CEO & Chairman duality, presence of female executives in BoD, existence of corporate governance committee or CSR sustainability committee). This is the first study that considers the level of ESG controversies and the impact on firm value. ESG controversies score is based on 23 controversy topics that are linked with one dimension of the three main pillars (environment, social, governance). A negative event occurred, the bad publicity and the media pressure would influence the ESG controversies score and thereafter, the market valuation.

Following extant studies, we employ a linear price-level model that associates the firm's market value of equity (MVE) with its book value of equity (BVE) and earnings per share (EPS). This model was used by researchers to test the value relevance of environmental performance (such as Hassel et al., 2005) or the value relevance with GHG emissions (for instance, Baboukardos & Rimmel, 2014; Siekkinen, 2016; Fazzini and Dal Maso, 2017).

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + \epsilon_{it}$$

The above variables are deflated by the number of common shares outstanding (Dimitropoulos, Asteriou, Kousenidis and Leventis, 2013). While using a model on a per-share basis, it is produced less biased and more consistent estimations of coefficients' p-values (Lang, Ready and Wilson, 2006; Barth and Clinch, 2009).

Moreover, we are using as controls variables: Size, LEV, and Risk. Variable Size is the logarithm of total assets and captures the size effects (Berk, 1995). Concerning the level of leverage of firms, the result of ratio debt to equity is represented in variable LEV (Lins, 2003). We use as our last control variable Risk which is proxied by the ratio book to market value as Fama and French (1992) suggested. The model is further expanded by employing as our main variable of interest ENV\_PilScr. Below is presented "Model 1" which examines the first hypothesis:

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3ENV\_PilScr_{it} + a_4Size_{it} + a_5LEV_{it} + a_6Risk_{it} + \epsilon_{it} \text{ (Model.1)}$$

Coefficient  $a_3$  estimates the market valuation of environmental performance of corporations and is expected to have a positive sign and be significantly different from zero. The following modification in "Model 1.i" is as to further investigate the dimensions of Environmental Pillar score and detect which of those dimensions play the most significant role in firm valuation concerning environmental aspects.

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3ResUse_{it} + a_4Ems_{it} + a_5EnvInv_{it} + a_6Size_{it} + a_7LEV_{it} + a_8Risk_{it} + \epsilon_{it} \text{ (Model.1i)}$$

In order to test the second hypothesis, we substitute our main variable of interest (ENV\_PilScr) with the one stand for the governance evaluation measure (GOV\_PilScr) as follows:

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3GOV\_PilScr_{it} + a_4Size_{it} + a_5LEV_{it} + a_6Risk_{it} + \epsilon_{it} \text{ (Model.2)}$$

We, then, modify "Model 2" to examine the five selected criteria (female on BoD, independent board members, CSR committee, sustainability committee, CEO/ Chairman duality) that impact the result of governance score and derive with the most significant.

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3FeBoD_{it} + a_4CGC_{it} + a_5IndBMs_{it} + a_6CEOChSep_{it} + a_7CSR\_SustCom_{it} + a_8Size_{it} + a_9LEV_{it} + a_{10}Risk_{it} + \epsilon_{it} \text{ (Model.2i)}$$

“Model 3” presents an alteration of the base model, where the main variable of interest is the social performance score. It examines the third hypothesis. We expect a positive sign and be significantly different from zero.

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3SOC\_Pil_{it} + a_4Size_{it} + a_5LEV_{it} + a_6Risk_{it} + \varepsilon_{it} \text{ (Model.3)}$$

Modification of “Model 3” is employed to examine which among the four dimensions (workforce, human rights, community, product responsibility) that formulate the firm’s social performance score is driving upwards its market value the most.

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3Work\_frc_{it} + a_4HumRights_{it} + a_5Cmnt_{it} + a_6ProdResp_{it} + a_7Size_{it} + a_8LEV_{it} + a_9Risk_{it} + \varepsilon_{it} \text{ (Model.3i)}$$

To complete the tests for our first three hypotheses, we are going to run a final regression analysis using “Model 4” to be ensured that if we add more variables of interest in our initial model, will not be altered neither the magnitude nor the significance of our results.

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3ENV\_PilScr_{it} + a_4SOC\_Pil_{it} + a_5GOV\_PilScr_{it} + a_6ESG\_ContrScr_{it} + a_7Size_{it} + a_8LEV_{it} + a_9Risk_{it} + \varepsilon_{it} \text{ (Model.4)}$$

Finally, our last model (Model 5) examines the fourth hypothesis. Specifically, we will check whether corporations assume high effective tax rate as a deterrent factor while implementing initiatives to boost their environmental and social performance. Model 5 uses an interaction term between ENV\_PilScr and ETR, whereas Model 5i uses an interaction term between SOC\_PilScr and ETR.

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3ENV\_PilScr_{it} + a_4ETR_{it} + a_5(ENV\_PilScr_{it} \times ETR_{it}) + a_6Size_{it} + a_7LEV_{it} + a_8Risk_{it} + \varepsilon_{it} \text{ (Model.5)}$$

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3SOC\_PilScr_{it} + a_4ETR_{it} + a_5(SOC\_PilScr_{it} \times ETR_{it}) + a_6Size_{it} + a_7LEV_{it} + a_8Risk_{it} + \varepsilon_{it} \text{ (Model.5i)}$$

## 4. Findings

### 4.1 Data description

Descriptive statistics for the full sample under examination for all variables used in the regression models are presented in Table 4. We have 1.425 firm-year observations for the fiscal period of 2015-2019. The average share price of a firm in our sample is € 327,59 which appears to be high and is possibly driven by the extreme share price of a particular firm (LINDT & SPRUENGLI REG, €78.607,98). The high standard deviation indicates

that the values tend to spread out in a wide range of values, meaning that we have extreme values. The negative earnings per share indicate losses for some firms of our sample. The variable Loss equals 1 if EPS is negative and we summarize that 87 observations present negative earnings (only 6% of firms in sample).

**Table 4**  
Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
ID_Comp	1.425			1	414
Year	1.425	2017		2015	2019
<b>Main Variables</b>					
MVE	1.425	327,5982	3945,2820	0,9977338	78607,98
BVE	1.425	134,1032	1626,6240	0,0095282	31573,07
EPS	1.425	14,7269	178,1803	-178,8821	3461,5440
<b>Controls (Financial Variables)</b>					
Size	1.414	3,9727990	0,6181192	2.345.384	5,7624
ROE	1.421	0,260103	1,275498	-0,686	24,0990
LEV	1.423	0,906013	1,745039	0	48,7900
Risk	1.425	0,470961	0,3878344	0,001697	3,4430
Loss	1.425			0	1
<b>Variables of Interest (used in Model #1 to Model #5)</b>					
ETR	1.344	0,31315	2,60424	-3,501	95,00
ESG_ComScr	1.425	61,78095	15,92083	3,68	93,72
ENV_PilScr	1.425	63,25508	22,83485	0	98,46
ResUse	1.404	72,43373	24,13803	1,69	99,83
Ems	1.400	71,83326	22,79276	1,47	99,78
EnvInv	1.048	56,49744	25,99001	0	99,84
SOC_PilScr	1.425	70,50064	19,37649	2,08	98,55
Work_frc	1.420	80,82256	16,96604	6,03	99,84
HumRights	1.331	71,09704	25,49294	0,93	99,42
Cmnt	1.419	64,99175	28,42283	0,83	99,88
ProdResp	1.367	69,96029	25,05966	0,5	99,76
GOV_PilScr	1.425	59,96010	20,95734	4,5	98,05
FeBoD	1.425	0,30133	0,11442	0	63,60
CGC	1.415			0	1
IndBMs	1.425	0,64368	0,22295	0	100
CEOChSep	1.425			0	1
CSR_SustCom	1.425			0	1
ESG_ContrScr	1.425	85,84818	26,70448	0,98	100

Another interesting finding is that the sample composes of exceptionally large as well as medium firms considering firm's total assets. The variable Size is the logarithm of total assets, meaning that the smallest firm in our sample has total assets worth € 221,51 million while the largest has € 578,62 billion in total assets. ROE, as a measure of financial performance and profitability of a company, is better comparable among peers. For instance, ROE in technology sector (mainly intangible assets) would be

relatively higher than in utility sector, which is a sector with many assets and debt. Nevertheless, we have an extreme value (RIGHTMOVE GRP, 2.409,90%).

LEV variable is the ratio debt-to-equity and measures the degree to which a firm finances its operations more through debt or equity. The average LEV is less than 1 (0,90) meaning that an average firm in our sample is financing its operations marginally mainly through its own funds. The average Risk is 0,47 which means that the market value of equity is higher than the book value of equity and therefore the company is overvalued, which involves higher risk for the investors. Furthermore, there are observations with extreme values in effective tax rate (ETR). However, the mean is 31,31% which is rational considering that in 2020 the average statutory corporate income tax rate in European countries (EU27) is 21,47%, while in OECD countries and the G7 is 23,51% and 24%, respectively (Tax Foundation, 2020).

Concerning the variables of interest, we notice that low average values are detected in environmental innovativeness and governance pillar score (below 60). Table 5 presents the mean values of ESG pillars and dimensions per country.

**Table 5**  
Mean values of ESG pillars and dimensions per country

Country	ESG CmbScr	ENV Pillar	Resource Use	Emissions	Env. Innov.	SOC Pillar	Work Force	Human Rights	Community	Product Resp.	GOV Pillar	ESG Controv.
AT	64,47	69,84	73,99	83,43	90,29	64,22	78,48	59,95	46,22	75,50	71,62	78,95
BE	64,10	67,49	76,88	65,69	69,44	68,63	71,30	72,52	68,78	60,23	63,81	81,29
CH	61,85	59,76	72,18	72,06	47,37	70,84	77,55	71,92	65,42	72,74	56,35	92,03
DE	60,36	63,95	74,88	71,65	57,18	73,99	84,55	74,41	64,02	75,04	63,10	76,44
DK	61,88	58,16	79,29	58,08	56,19	70,73	77,84	82,33	58,40	63,31	53,60	92,29
ES	69,12	69,69	75,58	80,01	63,73	81,36	89,78	76,41	80,28	78,46	58,13	90,47
FI	68,09	75,38	79,54	80,72	68,94	73,60	79,19	76,12	61,76	71,59	58,71	92,17
FR	64,91	72,67	81,39	84,72	59,77	75,76	87,63	74,61	65,99	76,09	54,83	85,57
GB	57,76	56,85	64,13	66,36	49,99	62,91	78,94	60,60	61,11	63,80	65,48	84,98
IE	38,26	26,30	22,49	33,11	30,41	49,09	47,75	61,33	36,63	58,02	35,91	81,93
IT	65,23	70,62	82,40	71,92	67,28	69,75	82,86	55,87	70,97	72,38	62,27	87,21
NL	63,02	56,44	75,23	62,53	36,92	76,00	76,48	77,59	87,55	66,60	50,98	97,83
NO	65,38	64,81	66,71	72,86	62,21	77,03	82,18	78,22	75,05	69,41	70,74	76,97
PT	71,18	81,95	82,68	86,35	75,14	86,08	90,39	85,24	77,74	86,14	49,81	79,83
SE	63,48	62,90	73,61	65,63	58,89	74,93	74,45	84,35	71,02	68,58	55,68	87,37

We may reach several conclusions while interpreting the graphic illustration of Figure 1, Figure 2, and Figure 3. ESG Combined score is composed by score of 3 pillars (environment, social, governance) and ESG controversies. Countries' average environmental score fluctuates between 60 and 70. Only firms in Portugal and Spain score higher than 80.

Denmark, France, Ireland, the Netherlands, and Portugal lack implementation of corporate governance mechanisms that would boost the relevant score. The

Netherlands' corporations appear to effectively handle any bad reputation or disputes and achieve top score in ESG Controversies.

Issues associated with Work Force appear to play a vital role for companies established in Portugal, Spain, France, Germany, and Italy. Human rights are shielded more by firms in Sweden, Denmark, and Portugal in comparison with firms in Italy, Austria, and Great Britain. Companies in the Netherlands about the communities within they interact, on the contrary with Ireland and Austria showing negligent conduct.

Companies in France, Italy and Portugal are driven by corporate policies which aim to reduce the use of materials, energy, or water. On the opposite, Ireland scores the lowest in resource use dimension. Concerning emissions, which deemed as a heavily regulated area, we ascertain that firms in Austria, France and Portugal are mindful. Austria's firms attained the highest score in environmental innovation, while companies in most countries cannot achieve even a medium score. Nevertheless, we would draw a safer conclusion if our sample of firms were more even in terms of number firms per country (for instance, Ireland's ratings are low, but they are based only in 3 firms).

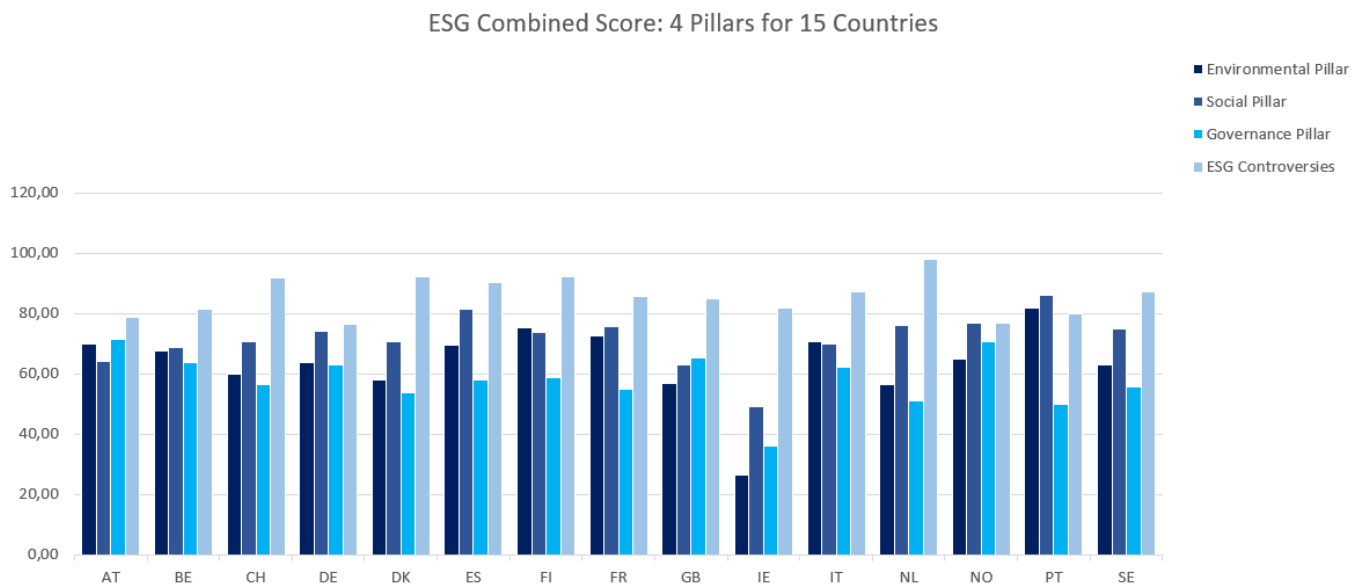


Figure 1: Mean values in ESG Pillars (Environmental, Social, Governance, ESG Controversies) per country

### Social Pillar: Dimensions for 15 Countries

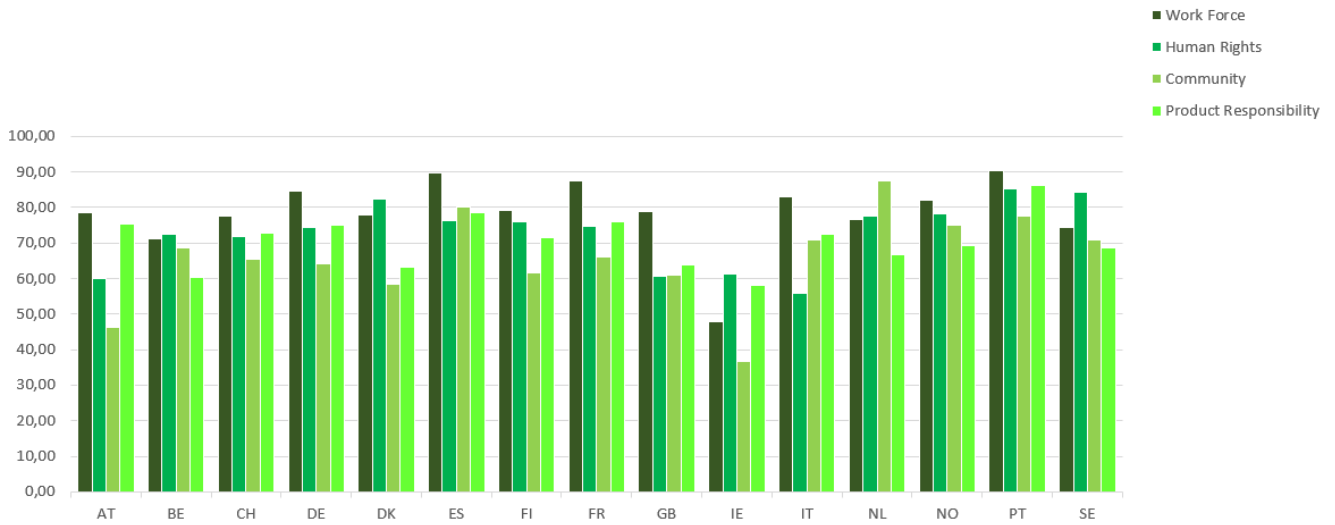


Figure 2: Mean values in Social pillar dimensions (Workforce, Human rights, Community, Product responsibility) per country

### Environmental Pillar: Dimensions for 15 Countries

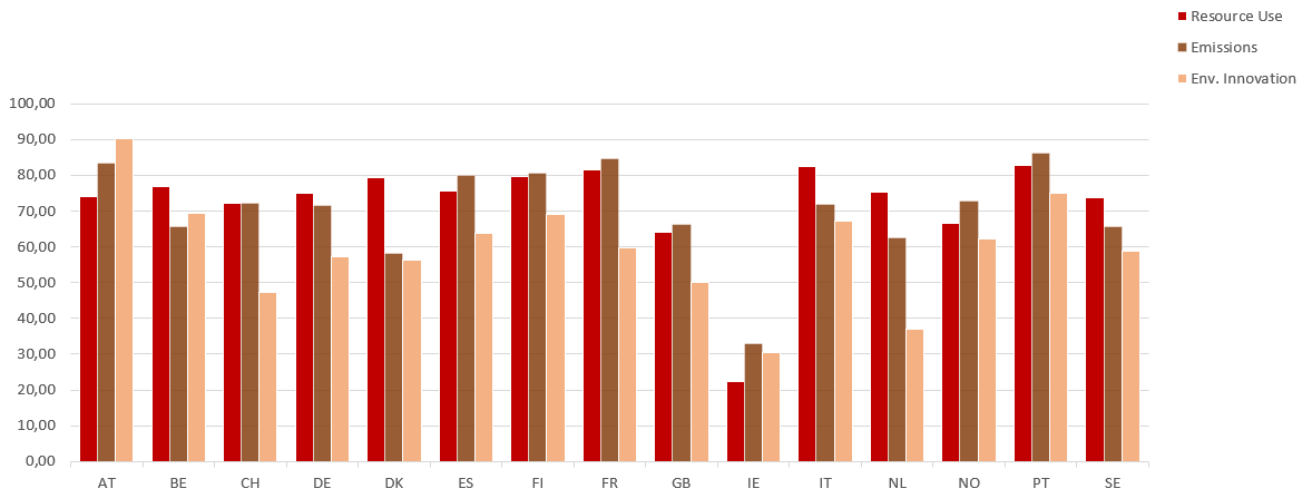


Figure 3: Mean values in Environmental pillar dimensions (Resource use, Emissions, Env. innovation) per country

**Table 6**

Mean, Min, Max values of ESG pillars and dimensions per year

**Mean**

Year	ESG CmbScr	ENV_Pilr	ResUse	Ems	EnvInv	SOC_Pilr	Work_frc	HumRights	Cmnt	ProdResp	GOV_Pilr	ESG CntrScr
2015	59,82	60,45	69,84	69,58	55,67	66,06	79,40	66,70	61,78	67,82	56,86	90,97
2016	60,01	61,90	70,87	70,39	54,86	68,13	81,44	67,34	62,91	69,94	57,29	87,46
2017	61,80	62,83	71,94	71,28	55,80	71,18	81,18	71,04	64,86	70,04	58,04	86,71
2018	64,62	64,34	73,56	72,50	57,41	72,67	80,90	74,04	66,18	70,29	63,33	87,04
2019	62,66	66,75	75,92	75,34	58,65	74,46	81,20	75,58	69,25	71,63	64,28	77,06

**Min**

Year	ESG CmbScr	ENV_Pilr	ResUse	Ems	EnvInv	SOC_Pilr	Work_frc	HumRights	Cmnt	ProdResp	GOV_Pilr	ESG CntrScr
2015	3,68	0,00	1,88	5,00	0,00	2,08	6,03	4,05	1,67	0,50	6,49	1,92
2016	13,15	0,00	1,69	3,57	0,00	4,33	15,16	2,23	2,58	0,62	4,50	1,56
2017	16,22	0,00	2,36	3,13	0,00	6,38	22,39	1,56	2,83	0,60	7,17	1,22
2018	21,95	0,00	2,54	1,47	0,00	14,02	30,47	0,93	0,83	9,23	14,25	1,52
2019	18,23	0,00	2,03	4,37	5,00	16,43	7,03	2,34	1,54	8,75	14,57	0,98

**Max**

Year	ESG CmbScr	ENV_Pilr	ResUse	Ems	EnvInv	SOC_Pilr	Work_frc	HumRights	Cmnt	ProdResp	GOV_Pilr	ESG CntrScr
2015	90,67	97,57	99,75	99,56	99,73	97,65	99,70	99,42	99,79	99,62	95,87	100,00
2016	91,63	97,91	99,77	99,57	99,75	98,55	99,82	98,98	99,61	99,69	97,22	100,00
2017	91,98	98,46	99,79	99,78	99,77	97,95	99,84	98,91	99,76	99,69	96,80	100,00
2018	92,68	98,36	99,83	99,63	99,81	97,73	99,79	98,81	99,70	99,74	98,05	100,00
2019	93,72	97,90	99,79	99,70	99,84	97,57	99,81	98,91	99,88	99,76	97,93	100,00

Over the years, corporations are struggling to improve their ESG performance and this fact is depicted in Figure 4. There is an increasing tendency in achieving higher ratings in all dimensions during the past 5 fiscal years. It is possible that the diligence and perseverance towards this direction may have been accelerated by investors' community pressure or strict regulations. The only area which lacks this upward trend is the "ESG Controversies", which leads to the assumption that scandals, disputes, or negative publicity have been revealed the past five years.

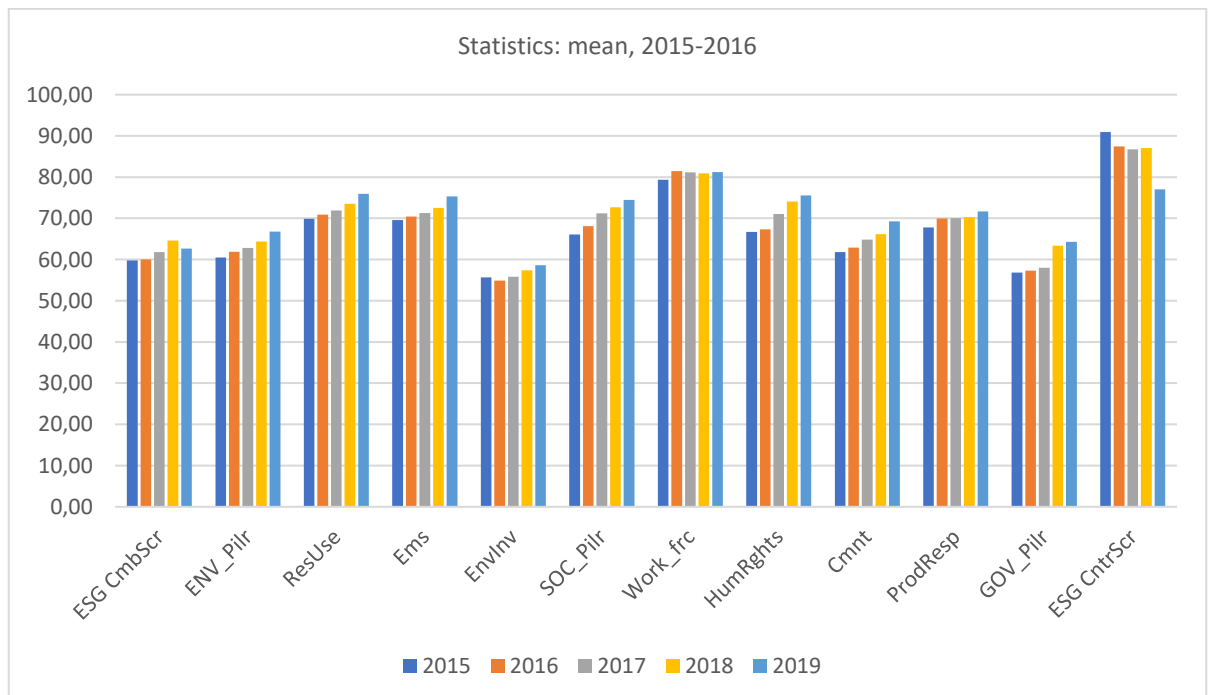




Figure 4: Mean values in ESG pillars and dimensions per year

The energy-intensive sectors (Lund, 2007) present a considerable record of achievements in particular ESG areas. For instance, Basic Resources super-sector has the highest mean score in community dimension. Construction and Materials super-sector has the top value in resources use. Energy sector is cautious about emissions and safety on workplace and such conduct is depicted on the relevant mean ratings which exceed 90.

On the other side, non-energy-intensive firms concentrate their efforts in conquering other areas. For instance, retail sector excels in product responsibility. Automobiles sector has the top mean value in environmental and social pillar in respects of environmental innovation and human rights, respectively. Among sectors with minimum performance in a variety of ESG areas are Travel & Leisure, Technology and Telecommunications. Statistics per industry are presented below in Table 7.

Finally, Table 8 illustrates Pearson's correlation coefficients for all variables. We notice that correlation coefficients among most of the independent variables are much less than 0,80 which suggests that there is no multicollinearity obstacle (Gujarthy, 1995). Nevertheless, results indicate that there are two independent variables with correlation coefficients greater than 0,90 which for a conservative party overpass the rule of thumb. In other words, BVE and EPS are related themselves as well as with the dependent variable, MVE. It is likely to be highly correlated over time for a specific company the book to market value. This cross-observation correlation, which is not related to our research question, might affect the standard errors of our regression analysis. To resolve this problem, we used the well-known "clustered" standard errors, which were corrected for unwanted correlation. Using Stata, we could "robust" standard errors to be corrected for heteroskedasticity. Then, we clustered the standard errors at firm-level. After executing the regression, standard errors have adjusted for 283 clusters in firms. The robust option causes the standard errors to consider issues regarding non-normality and heterogeneity, while coefficient values remain unchanged and only standard errors and t-statistics become different. We run Pearson's correlation coefficients for all variables again and resulted in smaller values than 0,80 for all variables. However, the existence of extreme values in MVE in our sample (e.g., LINDT & SPRUENGLI REG, €78.607) affect

the regression results. We decided we exclude observations with MVE higher than 400€, resulted in less 142 observations.

Table 7. Summary statistics: mean, min, max  
by categories of: SuperSector (Based on ICB-Code Classification)

SuperSector	ESG CmScr	ENV_Pil	ResUse	Ems	EnvInv	SOC_Pil	Work_frc	HumRights	Cmnt	ProdResp	GOV_Pil	FeBoD	CGC	IndBMs	CEOChSep_SustCom	ESG ContScr	
<b>Automobiles and mean</b>	66,14	79,46	82,82	84,97	74,48	81,56	87,52	82,74	71,65	74,22	68,10	0,33	0,33	0,60	0,38	1,00	67,26
<b>Automobiles and min</b>	39,97	41,91	51,98	49,48	31,73	44,66	65,96	35,61	26,56	31,29	19,40	0,14	0,00	0,18	0,00	1,00	1,09
<b>Automobiles and max</b>	86,77	96,51	98,39	98,49	99,52	96,09	98,83	95,45	99,66	97,10	95,34	0,44	1,00	1,00	1,00	1,00	100,00
<b>Basic Resources mean</b>	64,84	78,22	80,30	85,79	68,51	79,74	83,79	78,98	79,03	69,38	70,04	0,25	0,25	0,79	0,05	0,90	64,73
<b>Basic Resources min</b>	35,13	47,58	35,42	47,57	24,14	44,74	34,47	16,41	29,77	17,57	20,23	0,08	0,00	0,45	0,00	0,00	1,85
<b>Basic Resources max</b>	91,00	95,54	99,34	98,89	98,08	96,08	98,84	97,73	99,72	98,00	95,21	0,57	1,00	1,00	1,00	1,00	100,00
<b>Chemicals mean</b>	65,41	63,80	76,29	66,97	52,05	71,13	84,06	69,26	68,82	67,25	68,53	0,31	0,21	0,71	0,21	0,81	91,72
<b>Chemicals min</b>	26,21	12,07	2,32	7,99	24,14	23,95	52,21	6,45	14,74	5,31	26,45	0,13	0,00	0,23	0,00	0,00	3,95
<b>Chemicals max</b>	88,62	96,16	99,72	98,64	99,70	95,38	99,13	95,18	99,13	99,76	97,93	0,50	1,00	1,00	1,00	1,00	100,00
<b>Construction and mean</b>	68,51	74,79	87,18	80,01	65,48	76,18	83,72	82,69	68,31	63,44	52,84	0,27	0,19	0,65	0,46	0,83	92,98
<b>Construction and min</b>	32,94	16,40	44,81	52,04	11,97	38,29	44,19	32,69	0,83	6,35	7,62	0,00	0,00	0,22	0,00	0,00	10,00
<b>Construction and max</b>	89,94	95,89	99,42	99,66	99,43	94,04	99,70	98,11	99,70	99,47	90,75	0,54	1,00	1,00	1,00	1,00	100,00
<b>Consumer Product mean</b>	58,82	60,98	71,54	74,76	56,84	64,94	83,14	66,97	59,76	57,85	53,08	0,32	0,11	0,52	0,32	0,85	92,32
<b>Consumer Product min</b>	24,87	2,58	2,54	3,13	8,75	21,42	32,41	2,42	3,65	0,60	15,76	0,00	0,00	0,00	0,00	0,00	12,50
<b>Consumer Product max</b>	89,40	93,76	98,91	99,35	95,27	97,48	99,45	98,91	99,15	99,44	93,96	0,56	1,00	1,00	1,00	1,00	100,00
<b>Energy mean</b>	64,90	77,07	86,25	89,75	55,91	79,87	90,58	77,44	71,90	77,30	72,18	0,33	0,18	0,68	0,15	0,95	66,33
<b>Energy min</b>	39,32	55,79	55,26	53,13	4,55	40,42	75,10	12,21	5,77	47,43	26,85	0,11	0,00	0,25	0,00	0,00	0,98
<b>Energy max</b>	88,29	95,43	99,71	99,62	97,92	95,83	99,79	98,98	99,66	98,81	97,76	0,58	1,00	1,00	1,00	1,00	100,00
<b>Food, Beverage a mean</b>	64,29	69,83	74,86	71,72	49,99	71,78	78,03	70,15	64,21	74,68	59,35	0,28	0,16	0,60	0,37	0,94	85,09
<b>Food, Beverage a min</b>	30,95	15,97	20,24	18,75	0,00	23,51	37,25	2,23	2,83	6,12	11,19	0,00	0,00	0,00	0,00	0,00	2,38
<b>Food, Beverage a max</b>	89,23	97,90	99,79	99,31	95,59	97,64	99,73	96,24	99,10	99,60	94,43	0,50	1,00	1,00	1,00	1,00	100,00
<b>Health Care mean</b>	60,48	54,66	69,14	63,90	53,58	70,98	80,80	72,71	65,44	75,15	57,42	0,75	0,30	0,64	0,35	0,72	90,06
<b>Health Care min</b>	21,20	0,00	1,69	1,47	8,00	19,35	7,03	13,77	3,55	14,44	4,50	0,00	0,00	0,00	0,00	0,00	2,78
<b>Health Care max</b>	91,98	93,31	99,69	99,70	98,31	96,98	99,80	97,01	99,32	99,23	94,30	40,00	1,00	1,00	1,00	1,00	100,00
<b>Industrial Goods mean</b>	60,09	58,28	67,86	65,87	53,82	67,64	76,96	68,62	66,75	66,30	59,54	0,29	0,20	0,66	0,24	0,83	90,27
<b>Industrial Goods min</b>	17,90	6,45	2,03	8,58	8,57	13,12	17,50	7,89	3,57	0,50	7,17	0,00	0,00	0,00	0,00	0,00	1,19
<b>Industrial Goods max</b>	93,72	98,46	99,83	99,78	99,84	97,49	99,84	99,42	99,88	99,64	98,05	0,60	1,00	1,00	1,00	1,00	100,00
<b>Media mean</b>	68,57	58,17	72,73	76,71	44,28	74,95	88,33	70,65	72,93	67,29	66,70	0,34	0,40	0,73	0,06	0,90	93,25
<b>Media min</b>	47,28	17,14	6,00	26,35	36,88	51,55	50,42	1,79	18,22	26,17	29,20	0,13	0,00	0,46	0,00	0,00	13,64
<b>Media max</b>	85,94	83,16	99,71	99,45	50,00	94,72	99,79	97,83	99,68	94,49	93,94	0,55	1,00	1,00	1,00	1,00	100,00
<b>Oil &amp; Gas mean</b>	62,73	39,07	66,78	33,79		65,45	90,43	66,95	52,50	23,80	86,92	0,44	0,00	1,00	1,00	0,80	88,22
<b>Oil &amp; Gas min</b>	52,83	27,47	62,96	25,60		58,18	86,70	50,00	41,92	21,69	74,83	0,38	0,00	1,00	1,00	0,00	68,18
<b>Oil &amp; Gas max</b>	68,79	49,21	72,60	44,12		68,87	92,69	79,76	61,97	25,00	93,68	0,57	0,00	1,00	1,00	1,00	100,00

SuperSector	ESG CmScr	ENV_Pil	ResUse	Ems	EnvInv	SOC_Pil	Work_frc	HumRights	Cmnt	ProdResp	GOV_Pil	FeBoD	CGC	IndBMs	CEOChSep_SustCom	ESG ContScr	
<b>Personal Care, D mean</b>	61,35	65,23	68,60	78,00	49,81	70,81	80,57	67,38	54,97	78,28	61,13	0,29	0,29	0,59	0,30	0,91	81,13
<b>Personal Care, D min</b>	33,43	26,32	23,85	24,04	10,81	37,32	52,36	0,93	6,17	16,95	19,62	0,08	0,00	0,21	0,00	0,00	2,63
<b>Personal Care, D max</b>	86,35	93,41	99,19	99,48	89,53	95,49	98,15	98,68	98,72	99,34	94,02	0,54	1,00	0,88	1,00	1,00	100,00
<b>Retail mean</b>	65,37	74,12	82,72	82,95	61,34	69,71	88,05	69,19	57,26	80,94	61,26	0,37	0,13	0,62	0,22	0,87	92,92
<b>Retail min</b>	28,86	33,50	42,73	37,50	9,15	21,56	63,27	2,34	8,78	26,73	14,57	0,00	0,00	0,33	0,00	0,00	12,86
<b>Retail max</b>	91,63	97,12	99,54	99,62	90,70	98,55	99,69	98,91	99,70	99,63	95,87	0,64	1,00	0,83	1,00	1,00	100,00
<b>Technology mean</b>	50,75	44,24	61,57	60,33	41,38	60,27	75,86	67,59	59,75	60,92	47,46	0,28	0,00	0,67	0,15	0,51	91,86
<b>Technology min</b>	11,72	1,39	3,70	4,37	0,00	13,54	32,22	1,56	6,13	14,39	7,47	0,00	0,00	0,00	0,00	0,00	8,04
<b>Technology max</b>	89,77	79,11	99,79	94,84	84,44	98,17	98,84	98,59	98,84	98,69	94,57	0,57	0,00	1,00	1,00	1,00	100,00
<b>Telecommunicatio mean</b>	58,97	62,49	68,15	65,46	59,03	67,23	72,81	71,29	53,29	76,33	60,39	0,33	0,30	0,61	0,20	0,87	78,61
<b>Telecommunicatio min</b>	9,56	4,77	3,98	8,78	11,86	2,08	6,03	13,36	2,58	17,38	20,60	0,00	0,00	0,00	0,00	0,00	2,08
<b>Telecommunicatio max</b>	88,29	93,12	98,91	99,64	88,57	97,50	99,40	95,29	99,14	99,70	91,56	0,50	1,00	1,00	1,00	1,00	100,00
<b>Travel and Leisu mean</b>	54,33	57,52	56,50	71,70	52,96	65,91	76,88	76,86	51,79	72,47	52,26	0,30	0,33	0,58	0,31	0,76	76,26
<b>Travel and Leisu min</b>	3,68	0,00	2,90	17,92	21,74	2,30	9,67	14,46	1,67	21,38	9,05	0,00	0,00	0,03	0,00	0,00	1,72
<b>Travel and Leisu max</b>	84,60	92,61	99,55	99,20	94,00	95,57	99,75	99,14	97,75	99,69	85,42	0,55	1,00	0,93	1,00	1,00	100,00
<b>Utilities mean</b>	67,77	75,00	78,15	80,16	70,77	74,13	85,56	61,62	74,64	72,97	62,26	0,30	0,27	0,65	0,07	1,00	84,54
<b>Utilities min</b>	34,32	38,24	37,88	50,00	7,89	42,64	52,50	2,50	16,67	12,50	16,61	0,05	0,00	0,32	0,00	1,00	3,57
<b>Utilities max</b>	87,94	93,69	99,64	99,17	99,08	94,23	99,74	97,79	98,78	98,68	92,05	0,54	1,00	1,00	1,00	1,00	100,00

**Table 8**

Pearson's correlations coefficients - N=1.429

	MVE	BVE	EPS	Size	ROE	LEV	Risk	Loss	ETR	ESG~mScr	ENV_Pi~r	SOC_Pi~r	GOV_Pi~r	ESG~rScr	ResUse	Ems	EnvInv	Work_frc	HumRght:	Cmnt	ProdResp	FeBoD	CGC	IndBMs	
<i>N=1.429</i>																									
BVE	0.9924																								
EPS	0.9945	0.9964																							
Size	-0.0420	-0.0299	-0.0389																						
ROE	-0.0098	-0.0128	-0.0089	-0.0136																					
LEV	-0.0431	-0.0439	-0.0429	0.1957	0.3861																				
Risk	-0.0204	0.0105	-0.0147	0.4049	-0.1460	-0.0463																			
Loss	-0.0090	0.0001	-0.0164	0.1152	-0.0458	0.0426	0.1222																		
ETR	-0.0035	-0.0002	-0.0060	0.0552	-0.0214	-0.0022	0.0427	0.3049																	
ESG_ComScr	-0.0155	-0.0191	-0.0144	0.0953	0.0394	0.0338	-0.1309	-0.0608	-0.0087																
ENV_PilScr	0.0156	0.0198	0.0185	0.4121	0.0176	0.0647	0.1257	0.0133	0.0155	0.5084															
SOC_PilScr	0.0065	0.0027	0.0084	0.3939	0.0146	0.1260	0.0053	0.0085	0.0108	0.5653	0.5349														
GOV_PilScr	-0.1322	-0.1337	-0.1307	0.2358	-0.0146	0.0610	0.0943	0.0292	0.0275	0.4685	0.1591	0.2353													
ESG_ContrS	0.0457	0.0388	0.0447	-0.5033	0.0161	-0.1280	-0.3030	-0.1459	-0.0509	0.4383	-0.2225	-0.2260	-0.1655												
ResUse	0.0769	0.0759	0.0759	0.3420	0.0491	0.0426	0.0560	-0.0315	-0.0150	0.4293	0.7677	0.5640	0.0551	-0.1585											
Ems	-0.0449	-0.0407	-0.0415	0.4196	0.0119	0.0516	0.1282	0.0203	0.0182	0.4097	0.7847	0.4591	0.1411	-0.1826	0.6113										
EnvInv	-0.0978	-0.0930	-0.0950	0.1847	-0.0223	0.0019	0.1219	0.0204	0.0345	0.3185	0.6776	0.2266	0.1273	-0.1320	0.2586	0.2891									
Work_frc	-0.0396	-0.0430	-0.0366	0.3318	0.0156	0.0395	0.0946	-0.0672	0.0137	0.4224	0.5195	0.5700	0.2160	-0.1176	0.5021	0.5810	0.1922								
HumRghts	0.0298	0.0328	0.0304	0.2418	0.0116	0.0709	-0.0336	0.0389	0.0076	0.3861	0.3304	0.7601	0.1054	-0.1648	0.3956	0.2505	0.1090	0.2089							
Cmnt	-0.0412	-0.0422	-0.0389	0.2733	0.0234	0.1312	-0.0047	0.0215	0.0325	0.4491	0.3393	0.7232	0.2992	-0.1546	0.3580	0.2846	0.1840	0.3313	0.4027						
ProdResp	0.0407	0.0322	0.0415	0.2308	0.0139	0.0868	-0.0354	0.0011	-0.0264	0.2873	0.3183	0.6097	0.0559	-0.1473	0.3114	0.2404	0.1490	0.3187	0.2360	0.2221					
FeBoD	-0.0398	-0.0381	-0.0401	0.1751	-0.0284	-0.0605	0.0315	0.0217	0.0566	0.0500	0.1487	0.1066	0.0537	-0.0869	0.1836	0.1581	0.0662	0.0944	0.1244	0.0210	0.0555				
CGC	-0.0407	-0.0434	-0.0418	0.3917	-0.0475	0.1152	0.0865	0.0712	-0.0173	0.1183	0.2513	0.2090	0.1768	-0.1942	0.1888	0.2921	0.0940	0.2352	0.1325	0.1616	0.0415	0.1734			
IndBMs	0.0067	0.0066	0.0084	-0.0701	0.0073	-0.0016	-0.0730	0.0108	0.0173	0.1637	0.0316	0.0752	0.3293	-0.0126	0.0061	-0.0031	0.0600	-0.0691	0.0239	0.1522	0.0182	-0.0082	-0.0127		
CEOChSep	0.1246	0.1190	0.1246	0.1174	-0.0491	-0.0803	-0.0145	0.0320	-0.0198	0.0191	0.1149	0.1263	-0.1804	0.0138	0.1388	0.2191	-0.0315	0.1917	0.0831	-0.0167	0.1276	0.1366	0.3441	-0.1922	

**Table 9**

Regressions results for H1 and H2.

**Model for H1**

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3ENV\_PilScr_{it} + a_4Size_{it} + a_5LEV_{it} + a_6Risk_{it} + \varepsilon_{it} \text{ (Model.1)}$$

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3ResUse_{it} + a_4Ems_{it} + a_5EnvInv_{it} + a_6Size_{it} + a_7LEV_{it} + a_8Risk_{it} + \varepsilon_{it} \text{ (Model.1i)}$$

**Model for H2**

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3GOV\_PilScr_{it} + a_4Size_{it} + a_5LEV_{it} + a_6Risk_{it} + \varepsilon_{it} \text{ (Model.2)}$$

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3FeBoD_{it} + a_4CGC_{it} + a_5IndBMs_{it} + a_6CEOChSep_{it} + a_7CSR\_SustCom_{it} + a_8Size_{it} + a_9LEV_{it} + a_{10}Risk_{it} + \varepsilon_{it} \text{ (Model.2i)}$$

Variables	Basic Model	H1		H2	
		Model.1	Model.1i	Model.2	Model.2i
<b>Constant</b>	17,163 (14,538)	15,249 (13,392)	1,987 (17,256)	13,248 (14,268)	11,106 (16,046)
<b>BVE</b>	1,064*** (0,213)	1,062*** (0,211)	0,996*** (0,208)	1,071*** (0,213)	1,072*** (0,206)
<b>EPS</b>	1,367 (0,847)	1,352 (0,846)	1,195 (1,045)	1,375* (0,834)	1,328 (0,840)
<b>Controls</b>					
<b>Size</b>	9,985* (4,017)	8,280* (3,947)	10,039* (5,148)	9,251** (3,867)	7,218** (3,530)
<b>LEV</b>	-0,865* (0,606)	-0,846 (0,625)	-2,066** (0,776)	-0,877 (0,603)	-0,838 (0,568)
<b>Risk</b>	-69,562*** (7,688)	-69,687*** (7,668)	-66,477*** (8,859)	-70,112*** (7,781)	-69,979*** (7,829)
<b>Variables of Interest</b>					
<b>ENV_PilScr</b>		0,140* (0,067)			
<i>ResUse</i>			0,106* (0,058)		
<i>Ems</i>			0,138* (0,757)		
<i>EnvInv</i>			-0,040 (0,054)		
<b>GOV_PilScr</b>				0,115** (0,055)	
<i>FeBoD</i>					18,350* (11,035)
<i>CGC</i>					7,498 (5,310)
<i>IndBMs</i>					7,835 (8,999)
<i>CEOChSep</i>					2,671 (4,847)
<i>CSR_SustCom</i>					5,186** (2,464)
<b>N (firm/ year)</b>	1.270	1.270	924	1.270	1.260
<b>N (groups, ID_Comp)</b>	273	273	211	273	271
<b>R<sup>2</sup>: (within)</b>	0,2917	0,2943	0,2776	0,2985	0,2992
<b>R<sup>2</sup>: (between)</b>	0,5657	0,5687	0,6237	0,5625	0,5759

\* Statistical significance at 10% level.

\*\* Statistical significance at 5% level.

\*\*\* Statistical significance at 1% level.

Robust standard errors (in parantheses) clustered by firm.

Variables definitions are provided in Appendix.

**Table 10**

Regressions results for H3, H4 and H5.

**Model for H3**

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3SOC\_Pil_{it} + a_4Size_{it} + a_5LEV_{it} + a_6Risk_{it} + \varepsilon_{it} \text{ (Model.3)}$$

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3Work\_frc_{it} + a_4HumRights_{it} + a_5Cmnt_{it} + a_6ProdResp_{it} + a_7Size_{it} + a_8LEV_{it} + a_9Risk_{it} + \varepsilon_{it} \text{ (Model.3i)}$$

**Model for H4**

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3ENV\_PilScr_{it} + a_4SOC\_Pil_{it} + a_5GOV\_PilScr_{it} + a_6ESG\_ContrScr_{it} + a_7Size_{it} + a_8LEV_{it} + a_9Risk_{it} + \varepsilon_{it} \text{ (Model.4)}$$

**Model for H5**

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3ENV\_PilScr_{it} + a_4ETR_{it} + a_5(ENV\_PilScr_{it} \times ETR_{it}) + a_6Size_{it} + a_7LEV_{it} + a_8Risk_{it} + \varepsilon_{it} \text{ (Model.5)}$$

$$MVE_{it} = a_0 + a_1BVE_{it} + a_2EPS_{it} + a_3SOC\_PilScr_{it} + a_4ETR_{it} + a_5(SOC\_PilScr_{it} \times ETR_{it}) + a_6Size_{it} + a_7LEV_{it} + a_8Risk_{it} + \varepsilon_{it} \text{ (Model.5i)}$$

Variables	H3		H4	H5	
	Model.3	Model.3i	Model.4	Model.5	Model.5i
<b>Constant</b>	11,018 (12,844)	-14,336 (16,786)	11,147 (13,605)	15,887 (13,715)	7,747 (12,652)
<b>BVE</b>	1,0612*** (0,208)	1,057*** (0,207)	1,066*** (0,209)	1,079*** (0,214)	1,074*** (0,210)
<b>EPS</b>	1,310 (0,837)	1,150 (0,841)	1,331 (0,831)	1,293 (0,888)	1,287 (0,879)
<b>Controls</b>					
<b>Size</b>	7,735** (3,670)	13,271** (5,311)	7,118* (3,701)	7,975** (3,901)	7,294** (3,635)
<b>LEV</b>	-0,908 (0,624)	-1,202* (0,673)	-0,920 (0,627)	-0,814 (0,624)	-0,853 (0,620)
<b>Risk</b>	-69,661*** (7,640)	-72,452*** (8,268)	-70,222*** (7,708)	-71,743*** (7,988)	-71,733*** (7,938)
<b>Variables of Interest</b>					
<b>ETR</b>				4,775 (10,576)	21,946 (13,767)
<b>ETR x SOC_PilScr</b>					-0,255 (0,168)
<b>ETR x ENV_PilScr</b>				-0,054 (0,146)	
<b>ESG_ComScr</b>					
<b>ENV_PilScr</b>			0,028 (0,071)	0,155* (0,082)	
<b>SOC_PilScr</b>	0,219** (0,634)		0,179** (0,699)		0,286*** (0,075)
<i>Work_frc</i>		0,123* (0,732)			
<i>HumRights</i>		0,064** (0,028)			
<i>Cmnt</i>		0,030 (0,050)			
<i>ProdResp</i>		0,056 (0,052)			
<b>GOV_PilScr</b>			0,079 (0,555)		
<b>ESG_ContrScr</b>			-0,015 (0,177)		
<b>N (firm/ year)</b>	1.270	1.144	1.270	1.260	1.260
<b>N (groups, ID_Comp)</b>	273	260	273	272	272
<b>R<sup>2</sup>: (within)</b>	0,3001	0,3054	0,3045	0,2954	0,3021
<b>R<sup>2</sup>: (between)</b>	0,5693	0,5928	0,5666	0,5708	0,5735

\* Statistical significance at 10% level.

\*\* Statistical significance at 5% level.

\*\*\* Statistical significance at 1% level.

Robust standard errors (in parantheses) clustered by firm.

Variables definitions are provided in Appendix.

## **4.2 Multivariate analysis**

Table 9 illustrates the results of regressions testing for Hypotheses 1 and 2. Initially, a basic model is estimated, where the market value of equity (MVE) is regressed on the two basic variables (BVE and EPS) as well as all control variables (Size, LEV, Risk). The next columns present the estimated coefficients with the robust standard errors of Model 1, 1i, 2 and 2i.

To begin with the basic model, there is a positive relationship at 1% significance level between the independent variables BVE, Risk and the dependent variable MVE. Another interesting finding is that control variables LEV and Risk have the expected signs like Lins (2003) and Fama and French (1992), respectively. Specifically, LEV is at 10% level of significance negatively associated with MVE (for every unit increase in leverage, meaning that firm owe more debt, the market value decreases by € 0,865). Risk coefficient stresses out the negative relationship with share price (for every additional degree of risk, the market value of equity decreases by 69,56 € on average holding all the other variables constant). Size is positively associated with MVE but is not statically different from zero. Meaning that one unit increase in the natural logarithm of the size, decreases the market value by € 0,10 (9,985/100). Finally, R-squared value: within equals 0,2917 which explains how much of the variation in MVE within company units is captured by the model. In other words, in our model 29,17% of the variation in MVE is explained by the variation in independent variables, leaving 70,83% not explained as an error in our model. R-squared between equals 0,5657 meaning that 56,57% of the variation in the MVE between company units is captured by our model. In other words, the explanatory variables account for differences in MVE between companies at 56,57%.

Consistent with prior studies, firm's basic accounting information are positively related with market value in all Models (1-5). This finding indicates that BVE has a positive effect on the market valuation of companies of STOXX<sup>®</sup> Europe 600 index. The magnitude of the coefficient is around 1 meaning that € 1,00 increase in BVE causes approximately € 1,00 increase in share value per price.

Regarding Model 1, the estimated coefficient of the main variable of interest (ENV\_PiIScr) appears to be positive (0,140) and statistically significant at 10% level. Furthermore, we investigate in Model 1i whether environmental dimensions are

correlated with market valuation. Resource use, as well as emissions are positively associated with MVE at 90% of significance. Environmental innovativeness has no significant impact on market valuation based on Model 1i. Thus, we can prove that Hypothesis 1 stands, and high environmental performance shall impact the market value. Environmental performance is affected especially by two dimensions: the eco-friendly resource use and the emissions management of firms.

Based on regression output of Model 2, we find that a high score in governance pillar appears to have a positive signed coefficient with a statistically significant effect at 5% level on firm value. Further analysis in governance mechanisms (Model 2i), provide us with interesting results. Among the corporate governance mechanisms (existence of female BoD, independent board members, CEO/ Chairman duality, CSR sustainability committee) under examination, we conclude that only CSR\_SustCom and FeBoD appear to have a positive impact at 5% and 10% significance level, respectively. Basically, CSR\_SustCom is a binary variable which equals 1 if there is a CSR sustainability committee to support BoD functions. Thus, if CSR\_SustCom is not zero, then the expected market value of equity shall be increased by € 5,186 on average holding all other variables constant. FeBoD is a continuous variable which depicts the percentage of females in the BoD. An increase in the percentage of FeBoD, may impact the market value by an increase of € 18,35.

Analysing Model 3, we notice that although social pillar has a positive coefficient and is statistically significant at 5% level. Based on Model 3i, we conclude that human rights and work force are the two dimensions that boost the relationship between social performance and firm value at 5% and 10% level, respectively. Thus, we prove that Hypothesis 3 stands.

As a last resort, we employ Model 4 to examine which of the four elements that constitute the ESG Combined Score (environmental, social, governance pillar and ESG controversies) may affect the share price more. We conclude that social performance is statistically significant at 5% level, while the other three elements are not statistically important.

Finally, the estimated coefficients of Model 5 and Model 5i, in which the interaction term “ETRxENV\_PilScr” and “ETRxSOC\_PilScr” are incorporated respectively, unveil that the interaction effect on effective tax rate and environmental or social pillar score is



found to be not statistically significant. Furthermore, the effective tax rate appears to have no significant impact on market value of equity. Therefore, we reject the Hypothesis 4.

## 5. Conclusions

The European Commission, among other intermediaries, has been promoting the notion of Europe's markets to work in the direction of sustainable growth. Depicting the ranking of "Transparency International's Corruption Perceptions Index", EU member states were among the least-corrupt nations in 2017.

The aim of this research covers a wide spectrum of business issues for which more light needs to be shed on. Prior research has focused more on the relationship between environmental performance, specific corporate governance mechanisms and firm value enhancement. This study focused more on sustainability reporting and whether CSR scores impact the actual performance of the company. Furthermore, we provide the answer whether effective tax rate is another factor which drives managers to avoid expenditures in CSR initiatives, which leads in bad CSR performance. The new taxation framework that must be adopted by EU Member States (*ATAD -CFC rule, GAAR*) aims to strengthen the protection against aggressive tax planning.

Utilizing a sample of corporations of STOXX<sup>®</sup> Europe 600 index for the five-year period from 2015 to 2019, we conclude that among all ESG dimensions, there is indeed an impact on firm's market valuation associated with environmental, social and governance performance. The level of significance is at 10% for good environmental behaviour and more significant at 5% for social and governance performance. However, the magnitude of the above relationships is not too important (less than 1€ effect). However, two specific corporate governance dimensions, FeBoD and CSR\_SustCom are both significant and important in magnitude. FeBoD at a 10% significance level causes an increase of 18,35€, CSR\_SustCom at a 5% significance level causes a positive impact of € 5,19 in firm value, while all other independent variables remain constant.

It should be stressed that this research although studying European accounting data in connection with measurements of ESG performance, its regression models did not focus on the particularities of different countries or different industries. Therefore, we

believe that by enriching the sample and having a more balanced country or/ and industry sample, would be a highly interesting future research a cross-country and industry comparisons within the EU.

We conjecture that the pressure of the markets, investors, and different kind of stakeholders for sustainability reporting on behalf of corporations will have an ascending tendency. The debate between stakeholder's theory and agency theory will endure for decades coming.

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# Appendix

## Appendix.

### Variables definitions

Variables	Description
<b>MVE</b>	Market Value of Equity, closing price at fiscal year-end scaled by the number of common shares (Amadeus database)
<b>BVE</b>	Book Value of Equity scaled by the number of common shares (Amadeus database)
<b>EPS</b>	Earnings per Share scaled by the number of common shares (Amadeus database)
<b>Size</b>	Natural logarithm of total assets, where total assets measured in millions of euros (Amadeus database)
<b>ROE</b>	Return on Equity (Amadeus database)- This value is calculated as the Net Income Before Extraordinary Items for the fiscal year divided by the same period Average Total Equity and is expressed as a percentage.
<b>LEV</b>	Leverage computed as total liabilities divided by book value of equity and is expressed as percentage (Amadeus database)
<b>Risk</b>	Book-to-market ratio computed as book value of equity to market value of equity (Amadeus database)
<b>Loss</b>	Binary variable which equals one if EPS is negative and zero otherwise
<b>ETR</b>	Effective Tax Rate (Thomson Reuters Refinitiv Eikon database) This value is Total Income Tax for the fiscal year divided by the same period Income Before Taxes and is expressed as a percentage.
<b>ESG_ComScr</b>	ESG Combined Score is an overall company score based on the reported information in the environmental, social and corporate governance pillars (ESG Score) with an ESG Controversies overlay. (Thomson Reuters Refinitiv Eikon database)
<b>ENV_PilScr</b>	The environmental pillar measures a company's impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. It reflects how well a company uses best management practices to avoid environmental risks and capitalize on environmental opportunities in order to generate long term shareholder value. (Thomson Reuters Refinitiv Eikon database)
<i>ResUse</i>	Resource use category score reflects a company's performance and capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management. (Thomson Reuters Refinitiv Eikon database)
<i>Ems</i>	Emission category score measures a company's commitment and effectiveness towards reducing environmental emission in the production and operational processes. (Thomson Reuters Refinitiv Eikon database)
<i>EnvInv</i>	Environmental innovation category score reflects a company's capacity to reduce the environmental costs and burdens for its customers, and thereby creating new market opportunities through new environmental technologies and processes or eco-designed products. (Thomson Reuters Refinitiv Eikon database)
<b>SOC_PilScr</b>	The social pillar measures a company's capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the company's reputation and the health of its license to operate, which are key factors in determining its ability to generate long term shareholder value. (Thomson Reuters Refinitiv Eikon database)
<i>Work_frc</i>	Workforce category score measures a company's effectiveness towards job satisfaction, healthy and safe workplace, maintaining diversity and equal opportunities, and development opportunities for its workforce. (Thomson Reuters Refinitiv Eikon database)
<i>HumRghts</i>	Human rights category score measures a company's effectiveness towards respecting the fundamental human rights conventions. (Thomson Reuters Refinitiv Eikon database)
<i>Cmnt</i>	Community category score measures the company's commitment towards being a good citizen, protecting public health and respecting business ethics. (Thomson Reuters Refinitiv Eikon database)
<i>ProdResp</i>	Product responsibility category score reflects a company's capacity to produce quality goods and services integrating the customer's health and safety, integrity and data privacy. (Thomson Reuters Refinitiv Eikon database)
<b>GOV_PilScr</b>	The corporate governance pillar measures a company's systems and processes, which ensure that its board members and executives act in the best interests of its long term shareholders. It reflects a company's capacity, through its use of best management practices, to direct and control its rights and responsibilities through the creation of incentives, as well as checks and balances in order to generate long term shareholder value. (Thomson Reuters Refinitiv Eikon database)
<i>FeBoD</i>	The percentage of female directors on the board (Thomson Reuters Refinitiv Eikon Eikon Re database)
<i>CGC</i>	A dummy variable that equals one if there is the presence of a corporate Governance board committee and zero otherwise (Thomson Reuters Refinitiv Eikon database)
<i>IndBMs</i>	The percentage of independent board members (Thomson Reuters Refinitiv Eikon database)
<i>CEOChSep</i>	A dummy variable that equals one if CEO and the chairman of the board are different and zero otherwise (Thomson Reuters Refinitiv Eikon database)
<i>CSR_SustCom</i>	A dummy variable that equals one if there is the presence of a CSR sustainability committee (Thomson Reuters Refinitiv Eikon database)
<b>ESG_ContrScr</b>	ESG controversies category score measures a company's exposure to environmental, social and governance controversies and negative events reflected in global media. (Thomson Reuters Refinitiv Eikon database)
<b>DY</b>	Multiple dummy variable based on the five years under examination (DY1=2015... DY5=2019)
<b>DInd</b>	Multiple dummy variable based on the ten industries of the Industry Classification Benchmark (ICBIC)
<i>DInd1</i>	Equals 1 if ICBCC=Oil & Gas
<i>DInd2</i>	Equals 1 if ICBCC=Basic Materials
<i>DInd3</i>	Equals 1 if ICBCC=Industrials
<i>DInd4</i>	Equals 1 if ICBCC=Consumer Goods
<i>DInd5</i>	Equals 1 if ICBCC=Health Care
<i>DInd6</i>	Equals 1 if ICBCC=Consumer Services
<i>DInd7</i>	Equals 1 if ICBCC=Telecommunications
<i>DInd8</i>	Equals 1 if ICBCC=Utilities
<i>DInd9</i>	Equals 1 if ICBCC=Financials
<i>DInd10</i>	Equals 1 if ICBCC=Technology
<b>DCntr</b>	Multiple dummy variable based on the seventeen countries chosen by STOXX 600 Europe
<i>DCntr1</i>	Equals 1 if Country=AT (Austria)
<i>DCntr2</i>	Equals 1 if Country=BE (Belgium)
<i>DCntr3</i>	Equals 1 if Country=DK (Denmark)
<i>DCntr4</i>	Equals 1 if Country=FI (Finland)
<i>DCntr5</i>	Equals 1 if Country=FR (France)
<i>DCntr6</i>	Equals 1 if Country=DE (Germany)
<i>DCntr7</i>	Equals 1 if Country=IE (Ireland)
<i>DCntr8</i>	Equals 1 if Country=IT (Italy)
<i>DCntr9</i>	Equals 1 if Country=LU (Luxembourg)
<i>DCntr10</i>	Equals 1 if Country=NL (the Netherlands)
<i>DCntr11</i>	Equals 1 if Country=NO (Norway)
<i>DCntr12</i>	Equals 1 if Country=PL (Poland)
<i>DCntr13</i>	Equals 1 if Country=PT (Portugal)
<i>DCntr14</i>	Equals 1 if Country=ES (Spain)
<i>DCntr15</i>	Equals 1 if Country=SE (Sweden)
<i>DCntr16</i>	Equals 1 if Country=CH (Switzerland)
<i>DCntr17</i>	Equals 1 if Country=GB (United Kingdom)