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"Listed companies and CSR disclosure: an empirical analysis of ESG indexes for US firms"

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INTRODUCTION

CSR, sustainability, ESG performance and eco-friendly trends in consumer behaviour have recently become crucial topics in business, since information about climate change, resources exploitation, scandals, human rights, inequalities and other complex phenomena flow rapidly from halfway across the world, due to media pervasiveness.

The academic contributions to the topic are countless and the related opinions are often divergent. Nonetheless, the relevance of the subject for the business field is undeniable and recent companies' choices point out this trend. Many companies try to link their CSR activity to their values, their mission and, ultimately, their strategy, in search of a win-win situation. For sure, this is a rational decision, since it ensures that the investments made in CSR contribute to enhance the company financial metrics.

This master thesis aims at empirically testing the relations among CSR activity and corporate financial performance, considering specifically the effects of carrying out different CSR activities types for what concerns financial performance. This study wants to test this association by also considering how these relationships vary depending on a company's industry sector. A sample of US listed companies present in the ESG index provided by KLD MSCI will be analysed to assess these connections.

This work draws some useful considerations and it represents an peculiar piece due to the variety of analyses performed. This study values the inherent multi-faceted spirit of the CSR concept, and this nature has been explored by breaking down the monolith version of CSR often presented in the literature. In fact, studies usually do not consider many variations in the factors considered at the same time. Nonetheless, in this work changes in ESG scoring system, aggregate and disaggregate ESG measures, multiple financial performance measures, lag between CSP and CFP, Sector of belonging have all been investigated, considering a sample that does not contain only the top performers but that is representative of all US listed companies.

In addition, this thesis also takes into consideration two measures of ESG performance which have not been analysed in the literature yet, even if both based on theoretical and practical considerations presented in previous academic papers. These measures are a *Negatively Weighted* ESG score, where the value of concerns is inflated, and a *Comparable* ESG score that smooths the differences due to changes in MSCI database structure across the considered time period. The dissertation will be divided in three parts. Chapter 1 examines the existing literature on the topic, analysing the foundation theories and the value creation based on CSR drivers at first. Voluntary reporting, disclosure and the role of third parties'

assurance will be discussed in the second section, explaining the pros and cons of relying either on a company's disclosure or on third parties' assurance, especially focusing on rating agencies. The determinants of CSR will be discussed, since they will be needed to properly model the relationship between corporate social performance and corporate financial performance in Chapter 2 and in Chapter 3. The Literature Review chapter will follow up with considering the fundamental CSP-CFP relationship characteristics and the results obtained by previous studies on the specific topic. Then, ESG indicators and their use by rating agencies will be analysed, with a special focus on MSCI KLD ones, which will be used to perform the empirical analysis. The Literature Review will end with the formulation of the Research questions.

Chapter 2 addresses the adopted Methodology, introducing the considered sample and the investigated measures. Dependent and independent variables will be distinguished, and independent variables will be further divided in ESG related ones and control variables. The Methodology chapter will then address the modelling of the linear relationship between CSP and CFP and the steps considered in the analysis.

Chapter 3 provides the obtained results and their discussion. After a descriptive part, the main issues related to the model validity are presented and discussed. The subsequent analysis will be divided in three parts.

At first, the relationship between overall ESG and the chosen financial measures will be assessed and explained.

Secondly, ESG score will be broken up in the seven ESG categories provided by KLD MSCI (Environmental, Employee-related, Human rights, Community, Diversity, Products and Corporate Governance).

Ultimately, the previous relationships will be tested for three sectors on the basis of GICS classification: Consumer Discretionary, Industrials and Information Technology. All the results will be separately commented, then synthetized and reconducted to the previously examined literature. The main limitations and the suggestions for future research will be considered afterwards, just before the Conclusion.

The Conclusion will coherently sum up the main points and the implications of this study.

CHAPTER 1: LITERATURE REVIEW ON CSR

1.1. Theoretical frameworks, value creation and motivations of CSR

1.1.1. CSR Definitions

Corporate Social Responsibility (CSR) is a multi-faceted concept and, as McWilliams, Siegel, and Wright affirm, "numerous definitions of CSR have been proposed and often no clear definition is given, making theoretical development and measurement difficult" (2006, p. 3) and also "there is no strong consensus on a definition for CSR" (2006, p. 8). Finding a shared definition of CSR seems to be an unattainable goal, even in the future, due to the diversity of scholars' approaches. In addition, CSR can be interpreted differently, depending on people's needs, roles, and cultural background as well (Blowfield and Frynas 2008).

"The social responsibility of business encompasses the economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time" (Carroll, 1979, p.500) is probably the most cited definition of CSR (Crane, Matten and Spence, 2008), while McWilliams, Siegel and Wright label as CSR all the "situations where the firm goes beyond compliance and engages in actions that appear to further some social good, beyond the interests of the firm and that which is required by law" (2006, p. 1).

Blowfield and Frynas (2008) define CSR as an "umbrella term" (p. 280), since it is not a homogeneous, coherent concept, but it includes all the existing theories and practices that recognize the following:

(a) that companies have a responsibility for their impact on society and the natural environment, sometimes beyond legal compliance and the liability of the individuals; (b) that companies have a responsibility for the behaviours of others with whom they do business (*e.g.* within supply chains); and (c) that business needs to manage its relationship with wider society, whether for reasons of commercial viability or to add value to society. (Blowfield and Frynas, 2008, p. 280)

Many papers have been written trying to sum up, organize and analyse interesting definitions of CSR (Carroll, 1999; van Marrewijk, 2003; Dahlsrud, 2008), but, despite these works, the scene continues to be complex and tangled (Crane, Matten and Spence, 2008).

CSR is often discussed together with concepts that are interrelated, but not overlapping, such as triple bottom line (TBL) and Sustainable Development and Sustainability.

Sustainability and TBL In 1987, The World Council for Economic Development (WCED)[1] described sustainable development as "the development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (van Wassenhove and Ford 2009, p.486). Similarly, AccountAbility defines sustainability as "the capability of an organization to continue its activities indefinitely, having taken due account of their impact on natural, social and human capitals" (Perrini and Tencati, 2006, p. 298).

Thus, if a business is sustainable, it will last over time, overcoming problems resiliently and creating value. In order to accomplish this, a firm has to cultivate the relationship with society as well as with the environment and the entire supply chain must be accurately controlled and organized (van Wassenhove and Ford 2009). Brockett and Rezaee (2012) present value creation, performance enhancement and accountability assurance as the main principles of business sustainability.

Within the sustainability path, Elkington (1994) develops an important concept, the Triple Bottom Line (TBL), starting from the fact that a business should focus not only on the economic results (profits), but also on people and planet, coherently with the AccountAbility definition.

Given the fact that phrasing an all-inclusive single statement containing what CSR really is results in an impossible task, and in unnecessary struggle for the aim of this work, the following sections will briefly analyse and compare the main theories released instead.

1.1.2. CSR related frameworks and their possible categorizations

CSR is a lasting object of discussion that has interested generations of scholars and researches. Even if the terminology has been subject to changes, CSR origins may be dated to a long time ago (Blowfield and Frynas, 2008). Since CSR phenomenon was neither structured nor widespread before the 1900, Carroll (1999, 2008) only considers as formal writings pieces of literature produced in the twentieth century, especially those written after 1950. This year was considered the threshold for the modern analyses of the topic by Murphy (Carroll, 2008), while the ages before 1950 were merely recognized as "philanthropic era" (Carroll, 2008, p. 25). Many authors have already offered accurate and detailed reviews of the literature referred to CSR topic (Carroll, 1999, 2008; Lee, 2008; Carroll and Shabana, 2010; Lu and Liu, 2014; Danilovic *et al.*, 2015), so the following pages present a simple overview of those scholars' proposals deemed to be the most useful to frame the subsequent sections.

Shareholder and Agency theories After Bowen's work in 1953 defined Social Responsibility for the first time (Carroll, 1999; Danilovic *et al.*, 2015), some authors followed

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[1] Known also as "Brundtland Commission"

his path adding their contribution to the topic. Nonetheless, there were also some detractors, the most important one being Friedman, who wrote about CSR in the book "Capitalism and freedom", where he describes his view (then denominated stockholder or trade-off theory), according to which managers use of CSR has the aim to accomplish their social, political or career agendas, at the expense of shareholders (McWilliams and Siegel, 2001). He states that "there is one and only one social responsibility of business […] to increase its profits so long as it stays within the rules of the game" (Friedman, 1962, p. 133) and recalls these ideas in a following article (Friedman, 1970). Friedman's stockholder theory may be traced back to agency theory, since it deals with management's opportunistic behaviour (principal vs. agent). Agent and principal usually have incompatible goals - and it is difficult and/or expensive for the principal to check the agent's activities– as well as different propensities to risk (Jones, 1995). However, many agency theorists consider corporations' voluntary disclosure as a means of reducing agency costs or avoiding future agency costs due to legislation and regulation (Benston, 1982).

CSR Pyramid and CSP Framework Carroll, in 1979, developed a three-dimensional conceptual framework called "The social performance model", aiming at describing social performance (Carroll, 1979). His CSR definition encompasses the range of possible obligations of the business: economic, legal, ethical and discretionary, in a non-mutually exclusive and non-cumulative way.

The author broadens thoroughly his ideas, resulting in a CSR pyramid that includes economic, legal, ethical and philanthropic responsibilities, where there is no conflict between a firm's "concern for profits" versus its "concern for society" (Carroll, 1991, p. 43).

Both Carroll (1979) and Preston (Preston and Post, 1975; Preston, Rey and Dierkes, 1978) contributed to the creation of a "corporate social performance" (CSP) framework, empirically tested by Waddock and Graves (1997), who reported a positive association between CSP and financial performance (McWilliams and Siegel, 2001).

Stakeholder approach In 1984 Freeman released the book "Strategic management: a stakeholder approach" containing his main reflections upon organizations and stakeholders. He mainly defines stakeholders as "any group or individual who can affect or is affected by the achievement of the organization's objectives" (Freeman, 1984, p. 46). Therefore, the more the relationships maintained with stakeholders are strong and positive, the more a company is able to achieve its business objectives and to create stakeholder value (Schaltegger and Figge, 2000). According to many scholars (Clarkson, 1995; Donaldson and Preston, 1995; Post, Preston and Sachs, 2002) a company's durability depends on the relationships with all members of its stakeholder network, but as Wang and Choi (2013) note, these relationships

require persistent efforts over a long period of time that sporadic episodes of carefulness cannot build.

Others had talked about stakeholders before, but Freeman work is considered the most important contribution to the topic. Crane, Matten and Spence consider him "the main progenitor of stakeholder theory" (2008, p. 109) and Freeman's book is often cited as the "landmark work of stakeholder theory" (Cooper, 2004, p. 20), even if that book was not originally CSR driven, but mainly oriented toward strategic management. Further contributions to stakeholder topic aimed at differentiating stakeholders, helping the management to prioritize their claims and ease the decision-making process. Stakeholders may be classified as voluntary/involuntary (Cooper, 2004) and as primary/secondary (Clarkson, 1995). A stakeholder salience model was developed, linking stakeholder importance to three factors: power (the ability to exert influence on the business), legitimacy (the claims are based on justifiable rights) and urgency (sensitivity to time or relative importance) (Mitchell, Agle and Wood, 1997). Donaldson and Preston (1995) sorted stakeholder theory into three types, with a taxonomy that is still in use: descriptive, normative, and instrumental (Lin, Yang and Liou, 2009). Instrumental stakeholder theory (Jones, 1995) is especially important when testing CSP-CFP relationships, and for this reason it will be taken into consideration in this work more than the normative and the descriptive approaches. According to this theory, a company may create a competitive advantage minimizing the costs of contracting, by developing trust-worthy relations with stakeholders through CSR, thus enjoying better financial performances (Barnett and Salomon, 2012).[2]

Balanced Scorecard The balanced scorecard is a strategic performance management tool useful for analysing and understanding the company with a non-exclusively financial outlook. It is characterized by four areas, linked by causal relationships: financial, customer, internal business (processes) and innovation and learning. Only an harmonious (balanced) combination of the four aspects that puts strategy at centre may allow the company to reach its goals in the future (Kaplan and Norton, 1992). For this reason, the instrument in not only descriptive of the present situation of the firm, but may also predict its future developments.

Further developments resulted into the Sustainability Balanced Scorecard (SBSC), which implies a tight link between the strategy and operational activities as the original tool, with a special emphasis on performance measurement (Dočekalová and Kocmanová, 2016). SBSC is based on the causal hierarchical system of strategic objectives formulated along the typical

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[2] Some studies attributed ex-post to the instrumental stakeholder theory have been listed in Orlitzky, Schmidt and Rynes (2003).

balanced scorecard perspectives, with the addition of a non-market field that enables the incorporation of the sustainability issue (Figge *et al.*, 2002).

Competitive advantage and CSV Porter and Kramer (2002) are the main supporters of the frameworks related to competitive advantage creation and long-term (sustainable) profitability, by adopting a strategic focus (Lee, 2008). In fact, "as Burke and Lodgson (1996) pointed out, when philanthropic activities are closer to the company's mission, they create greater wealth than others kinds of donations" (Garriga and Melé, 2004, p. 54).

Porter and Kramer (2007, 2011) also introduced the "Creating shared value" (CSV) concept. It is a management strategy in which companies find business opportunities in social problems to reach corporate success by maximizing the competitive value of solving them. CSR must be sensibly incorporated into a company's strategy to bring performance enhancements and create competitive advantages. Likewise, social issues must intersect core business strategy to create shared value (Jo and Na, 2012), but this concept goes further. Value is created for companies and society at the same time, in a win-win situation.

Legitimacy theory argues that "organisations can only continue to exist if the society in which they are based perceives the organisation to be operating to a value system that is commensurate with the society's own value system" (Gray, Owen and Adams, 2010, p. 28). Since a company's actions must correspond to certain systems of norms, values, beliefs and definitions in order to be considered appropriate by the society (Suchman, 1995), some ways of legitimising the activities are needed. The four legitimisation strategies to be followed by an organization in order to legitimise itself are:

1.   educate relevant stakeholders about the firm's actual performance

2.   change relevant stakeholders' perceptions without changing the organization's behaviour

3.   carry the attention away from the issue of concern moving the attention to positive aspects

4.   change external expectations about the organisation's performance (Lindblom, 1994).

These legitimization strategies can be implemented through CSR activities and reporting. Indeed, those strategies incentivize the use of communication, such as the disclosure in financial reports, to influence societal perceptions with the aim of showing superior image and reputation (Deegan, 2002).

Institutional theory (DiMaggio and Powell, 1983) deals with maintaining corporate stability, since a firm's survival requires conforming to and incorporating institutionalized norms and rules (Chen and Roberts, 2010). In this case, voluntary CSR disclosure and engagement in

CSR activities help to conform to societal and regulatory forces and may result in organizational isomorphism. Specifically, there are three drivers that lead the change:

1. Coercive pressures occur from the influence exerted by those in powerful positions, through governmental regulations (Kilbourne, Beckmann and Thelen, 2002);

2. Normative drivers ensure organizations to be perceived as legitimate and compel enterprises' responses through conventional practices implementation (Sarkis, Zhu and Lai, 2011)

3. Mimetic drivers lead to huge efforts in imitating and replicating successful competitors in their field (Sarkis, Zhu and Lai, 2011).

There also are two theories based on resources: the Resource-Based View (RBV) and the Resource dependence theory (RDT). RBV is interested in the resources owned by the organisation, while RDT is centred on the resources obtained from environment. Firstly elaborated by Barney in 1991, the **RBV** is a managerial framework that considers resources as the key to reach a superior performance (Russo and Fouts, 1997), since resources and capabilities are not perfectly mobile across firms (McWilliams, Siegel and Wright, 2006). The resources should satisfy the VRIN criteria: being valuable, rare, imperfectly imitable, non-substitutable. These resources can be exploited by the firm to achieve sustainable competitive advantage. Some authors identify CSR as a dynamic capability (Teece, Pisano and Shuen, 1997), since the relationship between firm and stakeholder can have positive effects on organizational productivity and on the ability to execute strategy (Fang *et al.*, 2010; Cantrell, Kyriazis and Noble, 2015). McWilliams and Siegel (2001) provide a study about CSR as a way to enhance performance, since having a social orientation represents a resource that satisfies VRIN criteria.

RDT (Pfeffer and Salancik, 1978) tries to explain the result of environmental constraints on an organization's survival; in fact, companies have to exchange and negotiate transactions with other organizations in order to obtain the resources they need, due to the impossibility of being self-sufficient.

Different categorizations of the theoretical background. The frameworks and theorizations mentioned above are only a part of the complex literature background concerning CSR. In order to clarify the proceedings of studies and scholars' works, some authors have proposed their classification of the concepts and frameworks produced about this topic. Some of the most representative categorizations will be briefly described in the following pages, adding some elements necessary to explain the grouping rationales.

The most common theoretical classification related to CSR topic highlights the dichotomy between stakeholder and shareholders theories, which represent the two extremes of the theoretical background (Shankman, 1999). Further developing these statement, as defined by Hasnas (1998) and sustained by Cooper (2004), we may actually observe three main normative groups of theories:

1)   stockholders and agency theories (pertaining to utilitarian or libertarian tendencies; *e.g.* Friedman, Smith, Mills)

2)   stakeholders or relational theories (Freeman, and subsequent scholars such as Clarkson)

3)   social contract or legitimacy theories, which should include the aforementioned approaches in an organic way (Mathews for the social contract concept and Suchman for the legitimacy theory explanation).

Chen and Roberts (2010) present a different theoretical categorization, consisting in the previously mentioned stakeholder and legitimization theories, to which they add institutional and resource dependence theories in order to offer a better understanding of CSR, mainly addressing social and environmental accounting. "Legitimacy theory, institutional theory, resource dependence theory, and stakeholder theory differ in their levels of perspective, setting off initially the societal value system (the highest) to arrive to the consideration of stakeholder expectation (the lowest)" (Chen and Roberts, 2010, p. 653). The analysis performed by Chen and Roberts shows that, besides their different levels of perspective, specificity, and resolution, all the examined theories have explaining organizational survival and growth as main objective, emphasizing that "financial performance and efficiency may be necessary but not sufficient for organizations to continually survive" (p. 661). Legitimacy concept is somehow relevant in almost all the existing theories analysed. There are two levels of legitimacy: institutional legitimacy and organizational (or strategic) legitimacy. Institutional legitimacy is mainly related to the institutional theory, which is commonly used to analyse specific corporation structures, while strategic legitimacy is more applicable to explain resource dependence theory and stakeholder theory, which may be essential for understanding the relations between two or more organizational groups. Conversely, legitimacy theory is more suitable for corporate public image management (Chen and Roberts, 2010).

Even Gray, Owen and Adams (2010, p.12) propose a categorization that considers different levels of perspective regarding the CSR concept and its disclosure habits. They group theories based on both the level of resolution (meta, meso, micro I/organizational, micro II/internal to organization and micro III/individual) and a metaphor (Biological, Political/Sociological,

Economic/Rationalist and Other). The authors clarify that the purpose of their work was to show the diversity of approaches regarding CSR and the related assessment tools, without the claim of offering a complete and definitive view about social and environmental accounting.

Garriga and Melé (2004) identify four broad types of theories used when dealing with CSR: instrumental, political, integrative and ethical. In their paper, they conclude that four aspects characterize the main theories existing on the topic: having long-term orientation to profits, being responsible when using social power, integrating and responding to the requests from the demand side and behave in an ethically correct way.

Table 1: Corporate social responsibilities theories and related approaches (Garriga and Melé, 2004 pp. 63-64), re-elaborated

Category	Category aims	Theories included
Instrumental theories	Achieving economic objectives through social activities	• Shareholder value maximization • Strategies for competitive advantages • Cause-related Marketing
Political theories	Using business power responsibly in the political arena	• Corporate constitutionalism • Integrative social contract theory • Corporate citizenship
Integrative theories	Integrating social demands	• Issue management • Public responsibility • Stakeholder management • Corporate social performance
Ethical theories	Achieving a good society following an improvement path	• Stakeholder normative theory • Universal rights • Sustainable development • The common good

Many authors suggest that the different theories and frameworks should be considered as complementary rather than opposed (Adams and Whelan, 2009). The aforementioned ones are the most relevant in the perspective of an overall understanding of both the current situation and the historical literature path[3], but each relevant contribution may be useful to some extent, since the creation of an all-encompassing framework to which every scholar agree is definitely utopia. Companies usually follow the strategic and managerial instrument that are

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[3] For further information regarding the frameworks, please refer to the references included in this section; as additional references, consider Finch (2004) and Koller (2010).

the most relevant or effective for them, and they combine these frameworks with standards and certifications use, such as the GRI guidelines (Finch, 2004).

1.1.4. Value creation through CSR and CSR drivers

As discovered in the past years, both economic results and non-financial indicators matter in determining corporate performance, following the point of view of an increasing number of scholars (Kaplan and Norton, 1996, 2001; Carroll, 2000).

This is because non-financial indicators are endowed with a high explanatory power of a business value, even higher than the one of mere financial data. MNEs executives deem non-financial performance measures more valuable than traditional financial measures in assessing long-term value (*Non-Financial Measures are Highest-Rated Determinants of Total Shareholder Value, PricewaterhouseCoopers Finds*, 2002), thus many activities associated with sustainability are often incorporated in companies' strategies (Barin Cruz, Ávila Pedrozo and de Fátima Barros Estivalete, 2006; Chabowski, Mena and Gonzalez-Padron, 2011). Similarly, some scholars state that "non-financial performance variables exhibit incremental value relevance over traditional accounting metrics" (Riley, Pearson and Trompeter, 2003, p. 231).

CSR activities may have a positive impact on multiple levels on firms' performances, and ultimately on firm's value creation process, both in a short-term and (mostly) in a long-term perspective (Waddock and Graves, 1997; Luo and Bhattacharya, 2009; Malik, 2015). Performing CSR activities indeed allows to make inferences about other factors that interest companies' investors and other stakeholders.

Value creation A strategic use of CSR should lead to an increase in both shareholder value and other stakeholders' benefits, considering both stakeholders internal to the organization and the entire society. However, it can legitimately be argued that CSR value creation for corporations widely differs from CSR value creation for society (Gholami, 2011).

As Koller *et al.* (2010) sustain, both shareholders and other stakeholders groups benefit by focusing on creating long-term value[4]. Besides, revenue growth and ROIC may actually work synergically with CSR actions: "the more shareholder value a company creates in an effectively regulated market, the better the company serves all its stakeholders" (Dobbs, 2005, p. 4).

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[4] A firm's value is determined by FCF/(wacc-g) or NOPLAT*(1-g/ROIC)/(wacc-g) (Gray *et al.*, 1997; Roca and Searcy, 2012).

Value creation is based on value drivers related to short, medium and long term, which together determine the path in financial value drivers such as WACC (cost of capital), ROIC, operating profit margin, incremental capital investment, income tax and long term growth (Koller *et al.*, 2010; Bistrova, Titko and Lace, 2014).

Short-term value drivers are linked to productivity (in sales, operations and capital), whereas medium-term ones are related to commercial aspects, cost structure and asset health. Long-term value drivers consist of long-term strategies and a good organizational health. In order to be healthy, an organization should have "people, skills, and culture to sustain and improve its performance" (Koller *et al.*, 2010, p. 434), so a company has to be capable of retaining its employees, ensuring high levels of satisfaction, promoting and improving its culture, values and management talent (Koller *et al.*, 2010).

Consequently, CSR may help companies make the value creation and the financial results sustainable, for instance building a brand with an outstanding reputation (relational capital), strengthening customer loyalty, controlling the costs and increase efficiency in the medium-term (Koller *et al.*, 2010; Bistrova, Titko and Lace, 2014). CSR may also push a company to be sustainable in the long term: it may improve employees well-being (human capital), maintain proficient internal conditions along with constant innovation (organizational capital) and allow to exercise an accurate corporate control, boosting financial figures as well as operations (Koller *et al.*, 2010; Bistrova, Titko and Lace, 2014).

However, value-creating mechanisms can take two forms. In the first, the appearance of CSP creates value, so a company could also pretend to join CSR activities, *i.e.* green-washing, while obtaining all the disclosure-related benefits (improved image, reputation, trust in the financial markets etc), sustaining the risk of being exposed. Other times value is created by performing CSR activities, that actually increase benefits or reduce costs for the firms, as in the case in which employees are more productive as a consequence of CSR activities directed to them (Margolis, Elfenbein and Walsh, 2007). Demonstrating a positive linkage between CSP and CFP[5] could alleviate concerns about misappropriation and misallocation. Creating value is the ultimate scope of every business, so misallocation is not true in the case of a positive CSP-CFP relation. Furthermore, if CSP creates value, resources are being used profitably, serving shareholders' interests (Margolis and Walsh, 2003).

CSR has deep impacts on value creation, in particular on those elements defined as intangible asset, which correspond approximately to 75 percent of the company's value (Kaplan and Norton, 2004): people, processes and relationships are the main sources of company's value capacity (Bistrova, Titko and Lace, 2014). Depending on the situation, CSR may be the point

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[5] See section 1.3.1.

of parity or the point of difference in an accurate positioning strategy. At the same time, CSR may be really useful to avoid adverse selection problems.

CSR drivers Every firm that implements a CSR plan may link its choice to several reasons. For sure, overall benefits should be superior to the costs when a company embraces this commitment, otherwise managers would not sacrifice time and resources in CSR investing and reporting activities.

CSR may be the source of differentiation and a competitive advantage for a company, or an essential requirement for compete with other CSR-conscious companies. Increasing the level of specificity, Windolph (2011) states that CSR activity is driven by both push and pull factors, while Lozano (2015) adopts an internal vs. external logic.

Lozano identifies as external those drivers concerning stakeholders from outside the company, frequently associated to reactive measures such as government environmental regulation and standards, whereas the internal ones are all those related to the inside-corporations processes, generally characterized by proactivity.

Summing up all the value drivers listed in scholars' papers, it is unlikely that a company could consciously benefit from or consider all of them simultaneously. Probably when deciding whether to start a CSR path the firm would take some of them into consideration, depending on the context and on its needs. The main ones recognized by Malik (2015) and Lozano (2015) are discussed in the following paragraphs.

Managers definitely take financial implications, firm's profitability and capital markets into account when choosing to invest. On the capital market side, good environmental, social and governance (ESG) performances lead to higher firm value, measured in terms of stock returns, market capitalization, and market to book (Anderson and Frankle, 1980; Freedman and Stagliano, 1991; Klassen and McLaughlin, 1996; Godfrey, 2005; Dhaliwal *et al.*, 2012; Flammer, 2013), lower cost of capital (loan debt, bond debt, and cost of equity) and decrease volatility levels, enabling better financial forecasts (Littenberg, 2017).

There are interesting results on the profitability side as well, since some authors demonstrated that ROA, ROI, ROS and other performance indicators are improved through CSR activities (Cochran and Wood, 1984; McGuire, Sundgren and Schneeweis, 1988; Russo and Fouts, 1997; Elias, 2004; Linthicum, Reitenga and Sanchez, 2010; Mishra and Suar, 2010; Malik, 2015).[6] In addition, having a reliable governance system may prevent accounting irregularities (Littenberg, 2017).

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[6] See section 1.3.1.

Human capital implications should not be underestimated: if a company enhances its working conditions, staff turnover decreases, employee attraction and job satisfaction rise, improving in such a way both the employees' productivity and the operational performance (Roberts, 1992; Salzmann, Ionescu-Somers and Steger, 2005; Mishra and Suar, 2010; Surroca, Tribó and Waddock, 2010; Gholami, 2011).

Changes in other stakeholders' attitudes may motivate a firm to chase CSR as well. An example is the possibility of obtaining market gains due to modified customers' behaviours. A firm that shows CSR consciousness may experience more recurrent purchases (Mishra and Suar, 2010), capture an unique customers' segment or simply extend its current customer base (Margolis, Elfenbein and Walsh, 2007) and set higher premium prices due to the superior (perceived or actual) quality (Servaes and Tamayo, 2013)[7]. Customers may reward the firm for its commitment, increasing at the same time their satisfaction (Cohen *et al.*, 2012) and loyalty levels, modifying their purchase habits (Brown and Dacin, 1997) and increasing the company's overall sales amount (Moser and Martin, 2012; Servaes and Tamayo, 2013). Such firms can benefit from an improved reputation and customer satisfaction through charging premium prices and the expanded marketing opportunities (Xiao *et al.*, 2018).

However, CSR may also be useful to identify opportunities for value creation that had not even been considered before, exploiting social needs and offering win-win solutions, exactly as Porter and Kramer stated dealing with creating shared value (Porter and Kramer, 2011).

Satisfying the disclosure needs of investors as well as the ones of consultants, managers, stakeholders, policy makers, regulators, customers, business partners, employees may help gaining a competitive edge, enhancing a company's reputation via trust and transparency.[8]

CSR compliance may enable a firm to cope with future stricter regulations in advance. In addition, exerting this auto-regulation might avoid further rules and legislations, giving the companies more freedom of action (Margolis, Elfenbein and Walsh, 2007; Chatterji and Toffel, 2010; Mishra and Suar, 2010).

Other aspects that actually push a company into CSR - especially considering environmental actions - may be related to operational efficiencies, redundancies elimination, innovation and R&D commitment, thus diminishing operational costs and gaining greater competitiveness (Porter and Kramer, 2002; Brammer and Millington, 2005; Barnett, 2007; Joshi and Li, 2016).[9]

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[7] Firms often use cause related marketing (Varadarajan and Menon, 1988).

[8] Many authors agree on the positive impacts for companies in terms of reputation and image (Siegel and Vitaliano, 2007; Carroll and Shabana, 2010; Skroupa, 2017; Xiao *et al.*, 2018).

[9] PricewaterhouseCooper survey in *Fortune* (2003), shows that 73% of participants indicate that cost saving is one of the main reasons why companies have become more socially responsible (Carroll and Shabana, 2010).

In addition, CSR path may bring to a better risk management, useful to reduce the probabilities of financial, social, or environmental crisis, or to reduce the damages at least, similarly to what insurances do (Godfrey, 2005; Lougee and Wallace, 2008; Jo and Na, 2012; Littenberg, 2017). Earnings quality may increase (Hong and Andersen, 2011; Cho, Seong; Lee, Cheol; Park, 2012; Kim, Park and Wier, 2012), as well as taxation savings (Mishra and Suar, 2010; Ortas, Gallego-Alvarez and Álvarez Etxeberria, 2015).

Table 2: Internal and external drivers of CSR (Lozano, 2015)

INTERNAL FACTORS	EXTERNAL FACTORS
Improve reputation and image (internally)	Avoid fines and repercussions
Increase product quality	Brand reputation and image (externally)
Employees/workforce motivation, productivity	Increased customer satisfaction
Economic Value	Respond to pressures from NGOs, government etc
Risk management, processes and intangible assets	Legitimation to operate
Innovation	Better access to market and customers
Increase performance and profitability	Regulation
Cost reduction through operational efficiency	Stakeholder trust and disclosure needs satisfied

Carroll and Shabana (2010) offered another categorization of CSR drivers, in terms of business-case arguments for CSR practices. They identified four categories: cost and risk reduction, gaining competitive advantage, developing reputation and legitimacy and seeking win–win outcomes through synergistic value creation.

The increasing number of firms that are taking steps into this path signals that companies may actually benefit from CSR, at least under certain conditions (Malik, 2015). Every firm has its unique motivations for performing CSR activities, but in the majority of the cases these motivations can be traced back to the factors analysed above.

1.2. Voluntary reporting, disclosure and the role of third parties assurance

Accounting and reporting have been mainly oriented towards costs and profitability tracking, management control system implementation and financial figures for a long time. Nowadays, both financial and management accounting are supposed to consider environmental and social performance as well (Oswald 2009). Reports, external audits and guidelines have been flourishing recently, bringing advantages on many fields. However, as stated by Boesso, Kumar and Michelon (2013), some scholars have expressed some concerns about the ability of these instruments to influence corporate social behaviours in a constructive way. In the following pages, reporting, disclosure and rating agencies' activity will be discussed, focusing on both the positive and the negative sides and discussing the problems related to voluntariness.

1.2.1. Voluntary reporting and disclosure

Report types and characteristics CSR reporting pertains to the general process of "Social accounting", which includes planning, tracking and checking the social performance indicators, comparing the actual results to the planned ones, disclosing the information to the relevant stakeholders and, possibly, auditing and verifying the collected information (Crane, Matten and Spence 2008, p. 356), integrating everything into a "Sustainability Management System" (Daub, 2007, p. 76), a more inclusive concept than EMS (Environmental Management System).

In 2007, Daub, similarly to what WBCSD did, defined a sustainability report as a report containing "qualitative and quantitative information on the extent to which the company has managed to improve its economic, environmental and social effectiveness and efficiency in the reporting period" (Daub, 2007, p. 76). Reporting activity, as described above, surely has an important internal function, of planning, tracking and checking. But if released externally, reporting shows the company's commitment and management is bound by its content.

In order to disclose its CSR activity, a company must choose whether to opt for a dedicated part included in the Annual Report (AR) or to issue a stand-alone CSR report10 (Widiarto Sutantoputra, 2009). Recently, there has been an increase in integration with financial reports as well as in the scope of the reports (Brown, De Jong and Levy, 2009). Issuing an all-encompassing document is more coherent with the ideas of interdependences and integration

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10 This kind of report may be denominated in many different ways, without meaningful variations in substance (Windolph, 2011).

(Lin *et al.*, 2017) also expressed by the TBL approach, hence many companies have shifted from issuing stand-alone documents to releasing a more complete and representative Integrated Report (Rupley, Brown and Marshall, 2017). However, issuing a stand-alone report represents an evolution from the initial way CSR communication was implemented, *i.e.* through vague and short sections in the AR (Lodhia and Martin, 2014). Disclosure provides benefits to the company and its related stakeholders, but it also involves some costs. These costs are mainly attributed to two categories: the costs related to information collection, verification and publication, and those connected to the loss of strategic edge and discretion, since the information becomes publicly available and the progresses may be tracked by competitors and other organizations. Therefore, a company would carefully consider the pros and cons of disclosing what its path into CSR consists in, only disclosing when the benefits outweigh the costs. If carefully planned and implemented, the advantages achieved through disclosure may be significant (Dhaliwal *et al.*, 2012; Malik, 2015). Disclosing is important also because investors and financial analysts use CSR disclosure in forecasting future financial performance of firms. In fact, evidence demonstrates that issuing CSR reports is related to a lower level of analyst forecast error, at least in the U.S. (Dhaliwal *et al.*, 2011).

Nowadays stakeholder can pick up information more easily than in the past, due to the Internet and other technological means (Isenmann and Lenz, 2002; Adams and Frost, 2006). This allows companies to address a broader potential target audience (Brown, De Jong and Levy, 2009) in a more transparent way (Rezabakhsh *et al.*, 2006). However, information about the process of developing reports (Adams and McNicholas, 2007) and analysis of their actual usage (Bartels, Iansen-Rogers and Kuszewski, 2008) is still inadequate.

The problems of voluntariness and the role of third parties Should international organizations give bonding norms or only suggest the guidelines? The majority of the authors and organizations sustain that CSR activities should be voluntary (McGuire, 1963), while some opponents declare that all companies must obey to some CSR standards imposed by the law (Bowen, 1953; Baker, 2010).

Crane, Matten and Spence (2008) note that voluntarism is a feature that largely characterizes contemporary CSR. Blowfield and Frynas (2008) agree on this aspect, stating that sometimes a voluntary approach might be beneficial, but they also express some concerns about the use of a voluntary approach in developing countries, where all the regulations existing in western countries are not present. Voluntarism may be useful where national legislation has failed and, on the other hand, law and corporate governance can complement one another. Therefore, the

present orientation regarding the normative aspect is towards enabling proactive legislation, instead of requiring strictly codified rules (Blowfield and Frynas 2008).

Some of the leading general normative frameworks are the UN Global Compact, the OECD guidelines and the ILO's Tripartite Declaration (Rahdari and Anvary Rostamy, 2015).

Dealing with frameworks that are relevant for CSR reporting activity, GRI guidelines are among the most known currently in use. Even if it is often classified as pertaining to the standard and certification group, GRI does not actually form part of said group, since it constitutes a tool for providing guidance on CSR assessment contents and implementation. Other frameworks providing highlights on CSR reporting are the International Integrated Reporting Committee (IIRC) and the Sustainability Accounting Standard Board (SASB) (Rahdari and Anvary Rostamy, 2015).

Global Reporting Initiative (GRI) arose in 1997 by the combined action of CERES (Coalition for Environmentally Responsible Economies) and UN environmental program. It provides some useful standards and resources for those organizations which want to adhere to sustainability reporting. GRI suggests a long-term, multi-stakeholder approach, based on the Guidelines which describe the report framework, the subjects, the content characteristics and the accessibility to the information collected.

Cooper (2004) considers GRI guidelines as the most accurate and specific instrument available today, but they are not really robust on the measures calculation side, since it is a framework, not a standard, as already stated before. He also underlines that the most developed area of analysis is the environmental one, even if all require further work to be done, and that the guidelines are applied only by a small portion of companies, without any type of control (only independent verification).

Beyond these initiatives, there are international treaties, conventions, national and international laws that touch the themes of CSR, even though they usually lack a systematic approach and use different terminology. Recently, more complete and multi-sided plans and norms have bloomed. In the US the government has published its first National Action Plan on Responsible Business Conduct (RBC) in December 2016, to "promote fair play, the rule of law, and high standards for global commerce", with the intention of promoting and enhancing responsible business conduct (*Responsible Business Conduct: First National Action Plan for the United States of America*, 2016).

A good report should be characterized by transparency and accountability, trustworthiness, stakeholder orientation, proactivity, disclosure of both positive and inconvenient information (Doane, 2004; Crane, Matten and Spence, 2008). Specifically, the stated principles in GRI guidelines are: transparency, inclusiveness, auditability, completeness, relevance,

sustainability, context, accuracy, neutrality, comparability, clarity and timeliness (Global Reporting Initiative, 2006). Unfortunately, content and structure have not been uniquely defined and reports' variety persists (Davis and Searcy, 2010), despite the release of GRI guidelines and other similar tools.

Other CSR disclosures issues are related to nature, quality, information contents, assurance/auditability of CSR reports (Malik, 2015).

Voluntariness affects CSR on multiple levels: the voluntariness aspect involves not only the decision to disclose or not, but also the degree of disclosure, since "companies have the choice on what to report and whether they want to report" (Widiarto Sutantoputra, 2009, p. 35), regardless the "balanced" principle of GRI.

Thereby, a company may decide to entirely disclose its activities, including both positive and negative results, or to refrain the disclosure of what could be deemed as inconsistent, negative or inadequate, at least temporarily (Windolph, 2011; Lin *et al.*, 2017). Besides canonical greenwashing, that places "misleading emphasis on certain company activities or facts about products" (Idowu, 2015, p. 296) the release and circulation of false information, in order to attain benefits in terms of reputation and market share must not be underestimated (Windolph, 2011), such in the Volkswagen emissions case. Companies also tend to report positive evidences accurately, while they disclose negative information imprecisely and vaguely (Trueman, 1997).

This self-selection process causes transparency, reliability and credibility issues (Cho, Lee and Park, 2012) and also creates information asymmetries and opportunistic behaviours.[11]

Information asymmetries can be fought through two main approaches, often used in combination: signaling[12] and screening.[13]

Screening appears to be more appropriate for the asymmetry problem considered (Graafland and Eijffinger, 2004), and it is usually carried out through ratings and other external assessments (Windolph, 2011).

Dealing with accuracy and reliability of the content of reports, Adams and Frost note that "considerable doubt has been cast on the extent to which many sustainability reports accurately and completely portray corporate social and environmental impacts" (Adams and Frost, 2008, p. 289). While dealing with transparency and reliability, it thus seems clear that

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[11] Such as moral hazard and adverse selection.

[12] Companies emit credible signals indicating their sustainability orientation, such as the publication of Sustainability reports offering stakeholders information on sustainability efforts, and the establishment and use of brands or labels (Windolph, 2011).

[13] Consumers, investors, or other stakeholders are actively interested in information on the sustainability performance of companies (Brammer and Pavelin, 2008).

third-party independent entities are able to provide more reliable, accurately verified reports. Nonetheless, only a limited number of companies use some form of external certification, while the majority opt for internal assurance only. In S&P Global 1200, 30% of companies are issuing sustainability reports that include third-party verification and assurance, while among S&P 500, 12% included verification and assurance (The Conference Board, 2015).

Considering comparability, coherent time and format are fundamental in order to enable an easy comparison between companies, but heterogeneity in structure, content and period considered may prevent stakeholders to access consistent quality information (Crane, Matten and Spence, 2008; Cho, Lee and Park, 2012), since the large discretion in both structure and content hinders the assessment. Consequently, standardization and homogeneous formats should not only be implemented (Windolph, 2011; Cho, Lee and Park, 2012), but made compulsory for those firms who want to disclosure.

Assurance verification and performance quantification are usually addressed by accounting professionals and rating agencies (Cho, Lee and Park, 2012), but there are also additional figures that may take on the role of assurer, *e.g.* environmental consultants (Simnett, Vanstraelen and Chua, 2009).

The analysis of GRI reports published for the 2015-2016 period shows that there is only a slight improvement in this area when compared to the reporting period of 2014. Only 32.5% of all GRI reports (full or partial use of GRI reporting guidelines) have been externally assured (Centre for sustainability and excellence, 2017).

Conceptual frameworks, independent reviews and assurance, standardized reporting, as well as regulatory governance and oversight are the necessary components to effectively monitor CSR activities. In the U.S., as in the majority of the world, the effectiveness of these controls is generally weak (Lin *et al.*, 2017).

1.2.2. External rating and verification of CSP

There are many external entities assuring and assessing CSR performances: certification and standard-providers, eco-labels, rating agents. Certifications and standards providers are usually grouped in four types of organizations: international entities such as UN and CSR Europe, fair and equitable trade institutions (for instance, Fairtrade), private structures affiliated with research centres and universities (AA, SA, GRI), and MNEs groups such as WBCSD and BLIHR. For many of these standards and certifications, an interested organization has to rely on third-parties providers that have been recognized and accredited by the organization. This happens for ISO, SA and AA that work both directly and through

licensed providers, while GRI provides guidelines and suggest companies to seek third-parties assurance. Cooper (2004) first illustrates the fluctuating path of social accounting in action, then he describes GRI, AccountAbility and SA8000, declaring that these social accounting standards are "very different in scope and level of detail" (p. 33).

Leaving aside certification, eco-labels and standard-providers, rating agents actually play an important role in assessing CSR performance[14] and are now considered extremely practice-relevant (Scalet and Kelly, 2010). In the past few decades the demand for CSR rating agencies radically increased (Windolph, 2011), since the rating activity constitutes both a great assessment tool and an essential activity for benchmarking-based types of analysis, such as rankings and indices (Scalet and Kelly, 2010).

CSR rating agencies are defined as those organizations that rate or assess companies according to standards of social and environmental performance which consider, at least partially, non-financial data (Schäfer, 2009). The greater family of rating agents include in-house research teams, providers of stock exchange indices, NGOs, Media, Public Authorities, Management of companies, besides actual rating agencies, which are considered the new ESG-information service providers (Schäfer, 2009). As a consequence of the recently poured and increasing interest into the assessment of CSP, rating agents suffer the competition of credit rating agencies and the power of ethical investors too. Some rating agencies are also credit agencies themselves, such as Standard & Poor's, Fitch IBCA and Moody's (Rahdari and Anvary Rostamy, 2015; Huber and Comstock, 2017).

Rating agencies are usually private, non-governmental institutions; the most relevant third-party providers of ESG ratings are Bloomberg ESG Data Service, Corporate Knights Global 100, DowJones Sustainability Index (DJSI), Institutional Shareholder Services (ISS), MSCI ESG Research15, RepRisk, Sustainalytics Company ESG Reports, and Thomson Reuters ESG Research Data (Schäfer, 2009).

Rating organizations often work in networks, which enables the single organizations to keep their independence while taking advantage of synergies and of experienced human capital. This system provides local or sector-specific knowledge and it is called horizontal rating network (Finch, 2004; Standard Ethics Rating, 2015).

Besides pure rating activity, most rating organizations provide additional consulting services that may be needed by the companies, such as portfolio screening for institutional investors, assistance in SRI investment guidelines creation or help in exercising shareholder voting rights (Ibidem).

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[14] Not least because of the increasing interest of the capital market.
[15] The one that will be analysed in this work.

Ratings are solicited if asked and paid by the company subjected to the analysis. In this case, they are usually kept confidential, except when the company itself asks to make them public, due to the usage of internal information (Finch, 2004; Windolph, 2011). Unsolicited ratings are used and paid, if a subscription is needed, by third party organizations, such as investors, governments, other companies and those who may be interested in the disclosed information. They are kept undisclosed, but the company is noticed of their existence; however there is no payment proceeding from the company, avoiding conflicts of interests (Standard Ethics Rating, 2015). Rating agencies may also spontaneously execute rating activity and disclose it if required in compliance of regulations, for example in the case of listed companies (Finch, 2004). Lastly, ratings may be co-operative ones, *i.e.* unsolicited ratings where the rated company co-operates providing additional sources of non-public information, enabling superior reliability levels without compromising independence (Finch, 2004; Schäfer, 2009). Unsolicited CSR ratings is the category that has been more used recently, since those who operate in capital markets buy rating reports through subscriptions, even though there is a trend toward the use of solicited ratings. (Márquez and Fombrun, 2005; Windolph, 2011).

Table 3: Rating Types from Finch (2004), re-elaborated

Characteristics	Solicited	Unsolicited	Co-operative
Requested by the rated company	Yes	No	No
Payment to the rating agency by the rated company	Yes	No	No
Information source	Company confidential information	Public domain only	Public domain and company confidential information
Maintained independence (no conflict of interest)	No	Yes	Yes

Positive aspects As third-parties independent organizations, rating agencies are able to provide neutral, valid and reliable information about ESG performances, at least to a greater extent than companies do16 (Healy and Palepu, 2001; Windolph, 2011).

Information intermediaries role is fundamental in terms of asymmetry resolution (Schäfer, 2009). Since consistent and homogeneous practices are still not granted in companies' CSR

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[16] The reliability and independence degrees depend on the type of rating considered, as examined in the previous paragraphs.

reporting, each firm may disclose its actions following different patterns, causing a damage for comparability. In fact, there are no standards comparable to International Financial Reporting System (IFRS) or US Generally Accepted Accounting Principles (US-GAAP) for environmental and social reporting (Franc and Heydenreich, 2006; Scalet and Kelly, 2010).

In order to compensate at least partially the bias caused by companies' social and environmental reports, rating agencies collect data proceeding by other sources, besides those directly provided by the company under observation. Rating agencies analyze media, engage in independent investigations and consult government and NGOs records (Widiarto Sutantoputra, 2009).

This practice allows stakeholders to easily compare reliable and transparent ESG data since it uses the same methodology to rate all the considered companies. Thus, users may obtain a clear, independent insight on the firm's path toward CSR and sustainability, enabling cross-company comparison and accountability (Lin *et al.*, 2017).

As stated above, ratings' availability may be subject to fees payment or it may be open and publicly accessible (Schäfer, 2009) even by those stakeholders who normally cannot pay the management for the information delivery (Windolph, 2011). This is important, since information is made available with a higher level of transparency.

Negative aspects Besides the positive features that rating agency activities possess, some controversial points must be discussed. Rating agencies at least partially depend on the companies' released information regarding internal metrics to accurately and reliably assess performance, thus when externally assessing CS an important obstacle lies in information asymmetries. Nonetheless, asymmetries are present to a lesser extent with respect to a company's direct disclosure, since they are limited by the additional use of third parties information sources (Finch, 2004).

Moreover, rating agencies have been subject to some critiques regarding standardization, credibility, bias, trade-offs, transparency, variety as well as independence. The latter, in particular, is at risk when the rating is a solicited one, since payments create conflicts of interests and the released information is more positive toward the analysed company, as previously explained (Schäfer, 2009; Windolph, 2011). All the aforementioned elements may however cause a distortion in the rating results (Windolph, 2011).

Heterogeneity of assessment approaches for ratings and CS assessment in general is present (Rahdari and Anvary Rostamy, 2015; Lin *et al.*, 2017), thus rating usually lack consistency, convergence and standardization, preventing greater efficiency in the capital markets. (Márquez and Fombrun, 2005).

Table 4: Rating challenges, causes, and possible improvements (Windolph, 2011, p. 51)

Rating challenge	Cause	Possible improvements
Lack of standardization	Complexity of CS	Find a common CS understanding including several perspectives, coordinate research
Lack of credibility of information	Lack of data availability	Include NGOs and third parties for external verification
Bias	Financial background of ratings' users	Sensitize ratings' users for the integrative character of CS, open ratings for a wider audience
Tradeoffs	Demand of ratings' users	See above
Lack of transparency	Commercial use of ratings	Disclose methodology
Lack of independence	Intermingled business of raters	Avoid business relations to companies, include independent third parties

The procedure Usually the path of ESG rating agencies follows similar stages when developing CSR assessment and rating, even though every agency follows its own methodology and differences may arise depending on the type of rating requested. Márquez and Fombrun, for instance, describe the rating methodology as a three steps program, consisting of:

1.   gathering available external information about the company

2.   delivering detailed questionnaire to the company

3.   consulting key informants internally and externally, when possible (Márquez and Fombrun, 2005; Rahdari and Anvary Rostamy, 2015).

Some rating agencies screen companies based on qualitative and quantitative factors, both CSR and financials related. As a consequence, only organizations that possess some specific characteristics are assessed in such a case, while non-complying companies are excluded (Schäfer, 2009; Rahdari and Anvary Rostamy, 2015). Suitable companies may be screened through either exclusively social and/or environmental criteria, or applying financial filters before or after social and/or environmental filters 17 (Schäfer, 2009).

Rating agencies usually focus on companies listed on stock exchanges, preferably with considerable capitalization, and the "best in class approach" is the most common analytical method used in CSR ratings. It consists in using the highest current level of performance in an industry as a standard or benchmark, thus a company's score is determined in relation to peers' performance (Márquez and Fombrun, 2005).

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[17] Financial screen may be used prior to or after the social and environmental screen and whether they are equally weighted.

Legitimate and appropriate ratings criteria are fundamental, considering both stakeholders and the rated companies standpoints. For many companies spending time and resources in surveys and interviews with rating agencies to comply to all the requests is burdensome. Hence, systems for coordinating rating processes may be the key to enhance corporate collaboration and willingness to share information (Schäfer, 2009, p. 6). Coordination may enable the co-operative type of rating but it may also improve the general reliability of the results of agencies' work, obtaining more accurate data.

Rating methods differ in complexity and in results quantification. They may also include qualitative corporate profiles (rating reports) and "rankings that show an individual company's relative position with respect to its competitors and absolute universal CSR grades" (Schäfer, 2009). They may also choose whether to grade the companies subject to examination. The quantification is usually based on international standards and conventions such as the UN Declaration of Human Rights, the ILO Core Labor Standards, the OECD Guidelines and other fundamental environmental standards (Lin *et al.*, 2017).

The diversity in results among different agencies is due to the combination of definitions, measures, considered KPIs, analysed companies' internal policies and methodology variety. This represents one negative side of rating usage, as stated previously. For example, few companies (only 12 percent) appear on all three lists released by Newsweek, Forbes, and CSR Magazine Global in the research carried out by Lin *et al.*(2017).

CSP assessment procedures differ according to the analysis intent. For social measures, a stakeholder approach is usually adopted, while environmental indicators are often PLC (Product Life Cycle) oriented. Ratings may be normative, customer-oriented and deductive, or descriptive and economic-oriented. However, many of the ratings merge both these types of measurements. They often convey a single, overall, result, usually integrating economics and governance aspects too (Dočekalová and Kocmanová, 2016).

1.2.3. Primary Determinants of CSR

As explained in the previous section, undertaking and disclosing CSR activities is voluntary in the majority of the countries. In particular, reporting is not compulsory in the U.S., even though there are some exceptions *e.g.* mining and insurance industries (Lin *et al.*, 2017). However, in the last years many MNEs companies have opted for the disclosure choice. In 2016, 82 percent of S&P 500 Companies published Sustainability Reports (Governance and Accountability Institute, 2017), in 2015 56% in N100 ranking and 65% in G250 one

computed by KPMG, while in 2017 78% of G250 and 60% of N100 disclosed information regarding CSR in their financial reports18 (KPMG International, 2017).

Clearly, the factors somehow related to the decision of disclosing and the reasons for doing CSR are extremely bounded, even though they are not entirely overlapping. In particular, there are certain improvements that can be obtained by performing CSR activities (for instance, better employees' motivation or waste reduction), while public disclosure is a necessary element to achieve other favourable outcomes. Sometimes, a company may claim and carefully communicate its involvement in CSR activities when there is no actual CSR commitment in order to be positively judged by stakeholders or even to hide its misconducts. Greenwashing is a great opportunity to experience the benefits of disclosing about CSR without neither incurring in heavy costs nor dedicating time and efforts to a solid CSR program. However, the number of companies performing CSR activities is increasing over time and many of those companies that issue a CSR report actually perform some sort of CSR. Conversely, if a company does perform CSR activities, it has almost everything to gain from disclosing its efforts. Aside from this, knowing whether a company is carrying out CSR activities is really difficult for outsiders, unless the former makes the information available to the public. Therefore, studies and researches usually take into consideration the disclosure of CSR more than CSR *per se*.

In the following paragraphs some factors related to the companies' disclosure choices will be presented. It is worth mentioning that the majority of the studies actually searched for correlation, rather than causality, while only few have based their research on the latter concept. Sometimes the direction of the relationship is not clear. The investigated variables may be highly interconnected or influenced by an external factor not considered in the study. Each study may consider different categorization and different variables. Even the same variables may be measured in different ways, and at the same time similar factors may be called in different ways. The most cited ones are reported below.

Disclosure-related factors Disclosure-related factors may be classified as external or internal, similarly to those intervening in the decision of performing CSR activities, as suggested by Fifka (2013). Adams offers a slightly more sophisticated repartition, where the determinants of CSR disclosure are grouped into three categories (Adams, 2002):

1.   Corporate characteristics

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[18] Data are based on 4,900 N100 companies and 250 G250 companies (KPMG International, 2017). The underlying trend of 60 percent applies when looking at the same sample of countries in 2015 and 2017. The overall N100 rate in 2017 is 57 percent due to the inclusion of 5 new countries with relatively low reporting rates in the 2017 research.

2. General contextual factors

3. Internal contextual factors

The author highlights how the first two elements have been widely discussed and tested in the literature, while insights on the internal contextual factors are still lacking.

Corporate characteristics encompass size, industry group, financial performance (accounting measures as well as market measures such as share trading volume, price and risk), decision horizon, leverage and political contributions.

On the other hand, the context may be analysed considering either the general aspects or the internal ones. For this reason, context has been split into general contextual factors, *e.g.* country of origin, time, events, media pressure, pressure groups, and social, political, cultural and economic context, and internal context, including processes and attitudes characteristics, such as the identity of company chair or existence of a social reporting committee (Adams, 2002).

Figure 1: Diagrammatic portrayal of the influences on corporate "social" reporting

(Adams, 2002, p. 246)
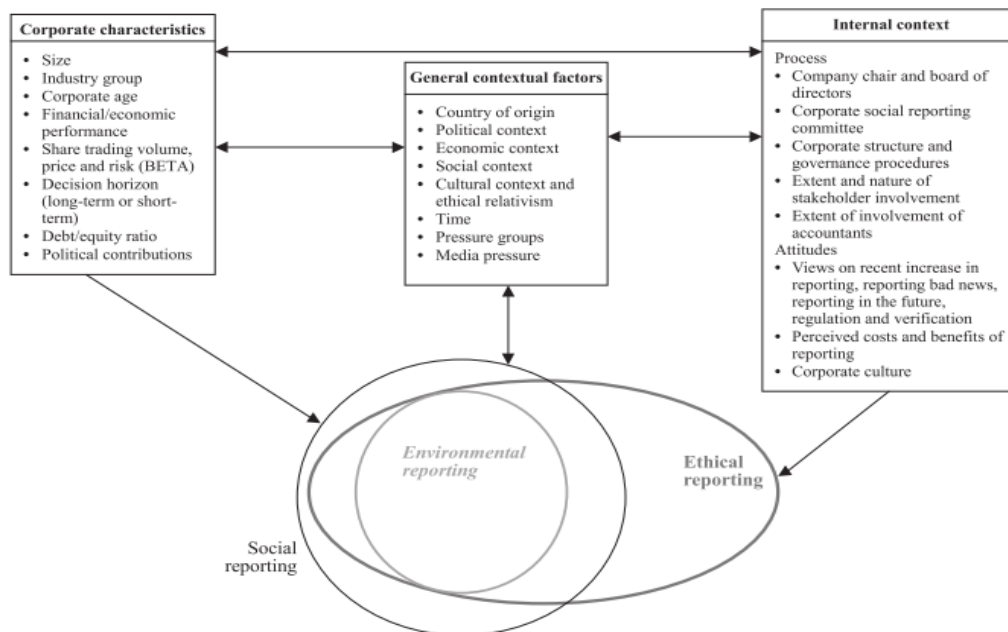
Note: Arrows show direction of influence

Voluntary disclosure choice is usually linked to a variety of factors (Cormier, D. and Magnan, 1999; Holder-Webb *et al.*, 2009; Reverte, 2009; Malik, 2015); however, the most recognized ones are profitability, size, industry and leverage (Cormier, Magnan and van Velthoven, 2005; Simnett, Vanstraelen and Chua, 2009).

The factors that have been deemed as most relevant and the mostly identified as correlated to CSR disclosure[19] (Adams, 2002; Malik, 2015; Ali, Frynas and Mahmood, 2017) will be briefly discussed below.

Studies related to both developed and developing countries are unanimous in stating that there is a strong positive correlation between **company size** and disclosure (Adams, 2002; Brammer and Pavelin, 2008; Holder-Webb *et al.*, 2009; Ali, Frynas and Mahmood, 2017). Many authors report that the bigger the firm, the more the reputational risks must be managed, somehow providing an insurance for the company's image (Margolis, Elfenbein and Walsh, 2007; Reverte, 2009). Moreover, larger firms recur more often to the capital markets for financing (Frias-Aceituno, Rodríguez-Ariza and Garcia-Sánchez, 2014). Recurring to capital markets entails that information must be provided to future investors and debt-holders, for financial purposes.[20] Besides financial markets' needs, agency theory plays a role in disclosure choices too: agency costs rise in larger companies because information asymmetries and conflicts of interest are more present.[21] Reducing information asymmetries through CSR disclosing is one of the viable solutions to face these companies' peculiarities.

Leveraged companies are more likely to disclose about CSR (Adams, 2002; Cormier, Magnan and van Velthoven, 2005; Simnett, Vanstraelen and Chua, 2009), probably to reduce their agency costs and their cost of capital (Jensen and Meckling, 1976). However, some authors state that creditors are not that interested in CSR, since they deem CSR investments neither useless nor necessary. Hence, they suppose a negative correlation instead (Brammer and Pavelin, 2008), so a common standpoint has not been reached yet.

Many authors identify the **industry** or the **sector** of activity to be relevant determinants for CSR disclosure (Roberts, 1992; Adams, 2002; Cormier, Magnan and van Velthoven, 2005; Holder-Webb *et al.*, 2009; Frias-Aceituno, Rodríguez-Ariza and Garcia-Sánchez, 2014; Ali, Frynas and Mahmood, 2017). As Watts and Zimmerman stated in 1978, same-industry firms are expected to conform to homogeneous standards of disclosure with the aim of avoiding negative market reactions (Frias-Aceituno, Rodríguez-Ariza and Garcia-Sánchez, 2014). Organizations in "sensitive"[22] industries may use voluntary disclosure to minimize possible damages, as they are more subject to critiques related to their high-risk activities (Reverte, 2009; Chan, Watson and Woodliff, 2014; Flammer, 2015).[23]

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[19] Note that this list is not complete, there is no full agreement in some points-as indicated-and many factors actually are related to each other, simply co-existing or in a cause-effect relationship.

[20] See the capital market and the leverage company parts.

[21] See section 1.1.2., which deals with agency theory.

[22] Adams, 2002; Cormier, Magnan and van Velthoven, 2005; Brammer and Pavelin, 2008; Holder-Webb *et al.*, 2009; Simnett, Vanstraelen and Chua, 2009; Malik, 2015; Ali, Frynas and Mahmood, 2017.

[23] See more on industry and CSR relationship on section 1.3.1.

Cochran and Wood (1984), Ullmann (1985), Roberts (1992), Adams (2002), Holder-Webb *et al.* (2009) and Dhaliwal *et al.* (2012) found that **corporate age** might be positively related to disclosure. Mature firms may more likely be capable of performing and reporting on CSR, due to factors such as larger resources availability, broad experience and more specialized employees.

The relationship between disclosure and **economic performance** has been highly debated. The results are largely conflicting, therefore the relationship's nature is still unclear. Some authors state that there is a positive relationship between CSR and profitability or market measures, due to their analyses' results, whether the latter were directly obtained or review-based. For instance, Flammer (2015), Lin and Amin (2016), Margolis, Elfenbein and Walsh (2007) and Orlitzky, Schmidt and Rynes (2003) found a positive connection. Others, such as Ullmann (1985), Vance (1975), Wright and Ferris (1997), Brammer and Millington (2008), Mcwilliams and Siegel (2000) cannot agree on the basis of their researches' outcomes. Roberts (1992) proved a relation between CSR disclosure and the lagged economic performance measured as return on equity (ROE).[24] The level of dependence on capital markets may have an influence on CSR disclosure choice as well (Ali, Frynas and Mahmood, 2017).

The larger the **management decision horizon**, the more a company is prone to issue reporting about CSR (Trotman *et al.*, 1981; Adams, 2002; Fifka, 2013; Malik, 2015), *ceteris paribus*. Investing in CSR may not show results in a shorter time span, so managers who are oriented to achieve short-term goals only would not waste time and resources in performing and reporting about CSR.

There is a positive relationship between an active **strategic posture** and CSR disclosure (Adams, 2002; Barnett, 2007; Holder-Webb *et al.*, 2009; Malik, 2015). Roberts (1992) measured strategic posture taking into consideration corporate sponsorship of a philanthropic organisation, the size of a company's public affairs department and debt equity ratio.

A negative relationship between the level of CSR and **systematic risk** (*i.e.* Beta) has been found by Roberts (1992) while Cormier, Magnan and Van Velthoven (2005) found a positive one. These results appear inconsistent (Ali, Frynas and Mahmood, 2017), but many authors recognize that systematic risk has some kind of relationship with CSR disclosure, even if the topic should be further investigated (Holder-Webb *et al.*, 2009; Malik, 2015).

The extent of **country-effect** is sometimes difficult to determine due to the sample and methodology, but many authors have affirmed that it is actually present (Trotman *et al.*, 1981;

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[24] Section 1.3.1. will be entirely dedicated to CSP-CFP relationship, where the discussion on the topic will be developed further.

Belkaoui and Karpik, 1989; Gray *et al.*, 2001; Dhaliwal *et al.*, 2012). A real positive relationship is hard to be detected here, so talking about influences seems to be more appropriate (Adams, 2002). Probably the country itself is not the determinant of disclosure, whereas the social, political, cultural and economic factors are those that characterize it. Ali, Frynas and Mahmood (2017) consider developed and developing countries separately, only developed countries, but even among developing countries there are substantial differences related to both disclosure and the actual practice of CSR activities. This is especially true when comparing the United States to Europe, but also when considering differences among European countries (Ali, Frynas and Mahmood, 2017). A firm is quite affected by the context in which it operates, so CSR disclosure may be affected by:

▪ Social, normative and political context. Adams (2002) states that social and political aspects are strongly linked together, as shown in some longitudinal studies; also the legislative context may have some effects on disclosure (Cormier, D. and Magnan, 1999).

▪ Economic context is important, even if to a less extent. For instance, developing countries and developed ones have different attitudes toward CSR, but also distinct socio-political situations (Wanderley *et al.*, 2008; Khan, Badrul and Siddiqui, 2013).

▪ Cultural context and ethical relativism also have some effects, since they shape moral values, affecting the selection of the issues to be disclosed. Depending on the cultural background, a country may express a different level of CSR attention, of political interest and of public pressure toward corporations, for example through activism (Adams and Kuasirikun, 2000; Adams, 2002; Dhaliwal *et al.*, 2012; Gallén and Peraita, 2018).

Disclosure characteristics vary depending on the time period considered (Adams, 2002) as a consequence of social, political and economic context changes. Even single events and scandals may affect the extent of reporting, pushing companies to legitimate their activities through disclosure, also in the case of no direct involvement or belonging to a different industry (Darrell and Schwartz, 1997).

A positive relationship has also been found between **stakeholder power** and disclosure, especially when an overall corporate strategy for managing government stakeholders and for meeting creditor expectations exists (Adams, 2002). There are plenty of different stakeholders who may affect a company, such as regulators, shareholders, creditors, investors, environmentalists and media (Roberts, 1992; Deegan, 2002; Reverte, 2009; Chih, Chih and Chen, 2010). The disclosure decision is often primarily related to the increased credibility that the company may obtain, offering a positive image among its stakeholders (Widiarto Sutantoputra, 2009). In developed countries firms also take into serious consideration local

community, suppliers, and customers when dealing with CSR and CSR disclosure (Ali, Frynas and Mahmood, 2017).

As stated in Malik (2015), a positive relationship occurs between reporting and **media exposure** (Deegan, 2002; Reverte, 2009), especially for those firms that are highly visible and widely known (Ali, Frynas and Mahmood, 2017). However, Brammer and Pavelin (2008) found no relationship between voluntary disclosures and media exposure. Companies are also prone to make social and environmental information available due to public pressures, especially if they are operating in developed countries (Ali, Frynas and Mahmood, 2017).

Internal Contextual Factors Some scholars highlight that internal organisational factors are actually linked to CSR disclosure (Adams, 2002). Such factors may be referred to the corporate governance structure, as explained in Michelon and Parbonetti (2012) and sustained also by Chan, Watson and Woodliff (2014). Another element to be considered when dealing with internal contextual factors is the organizational culture (Gray *et al.*, 2001). The company chair person, the presence of a corporate social reporting committee (Adams, 2002; Michelon and Parbonetti, 2012) as well as the executives' attitudes toward disclosure (Ali, Frynas and Mahmood, 2017) seem to play a role in the disclosure choices.

Other factors may be related to disclosure choices[25], but there have been less studies about this or with less significant results. Besides the amount of investigations on CSR determinants and CSR disclosure drivers, Gholami (2011) states that "many of dimensions of organization such as centralization and decentralization, formalization, particular culture, technology, and training have not been considered." (p. 151).

In the following section the relationship between CSP and CFP will be further analysed, since it represents the core aspect of the empirical analysis. Insights on how industry affects this relationship, on financial performance measures and on ESG indicators will also appear in the next pages.

1.3. CSP-CFP relationship and ESG indicators

1.3.1. CSP-CFP relationship

After decades of analyses and researches, CSP[26] and CFP relationship is still a controversial topic: the empirical studies have reported inconsistent results, giving no clear evidence on the

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[25] See Margolis, Elfenbein and Walsh (2007) on information asymmetry, political contributions, regulatory requirements, etc.

[26] Authors of empirical studies often use the terms corporate social performance (CSP) and corporate social responsibility (CSR) interchangeably, even if some theorists do not agree on this practice (2017).

nature of this link (Griffin and Mahon, 1997; Mcwilliams and Siegel, 2000; Barnett, 2007; Surroca, Tribó and Waddock, 2010).

Hence, considering the articles on the topic and what the authors of some systematic reviews on past studies stated, the relationship between CSP and CFP can pertain to one of the following categories:

▪ positive, as in the recent primary research studies performed by Lin, Yang and Liou (2009), Flammer (2015) and Lin and Amin (2016).[27] The systematic reviews performed by Griffin and Mahon (1997) Orlitzky, Schmidt and Rynes (2003) and Margolis, Elfenbein and Walsh (2007) were already oriented toward this direction, since they found an overall positive, even if small, correlation between CSR and CFP.[28] According to these analyses the relationship between CSP and CFP is direct and positive (Soana, 2011).

▪ negative, as encountered by Wright and Ferris (1997) and Brammer and Millington (2008).[29] According to this view, the additional expenses sustained by companies due to CSR apparently did not lead to any increase in benefits or costs reduction, so the socially responsible firms are actually in disadvantage with respect to those competitors not involved in such activities (Lin and Amin, 2016). The negative relationship is entirely in accordance with Friedman's considerations, but was the least occurred result in Margolis, Elfenbein and Walsh systematic review.

▪ not significant, as found by Patten (1982), Mcwilliams and Siegel (2000) and Reverte (2009).[30]

▪ mixed, in the case of contradictory results. This happened especially when the studies considered various measures of CFP and/or of CSP, or took into account multiple model specifications that included different factors. Another cause of mixed results is the non-linearity of the relationship, supposed by some scholars. In their opinion CSP-CFP relationship is not stable, but U-shaped and non-symmetrical (Lin, Yang and Liou, 2009; Barnett and Salomon, 2012).

Potential biases and issues in the researches Instead of bringing some ultimate insights on the actual existence of a CSP-CFP relationship and on its characteristics, researching a definitive answer seems to be a never-ending process (Margolis and Walsh, 2003). However,

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[27] Previous positive results are listed in Ali, Frynas and Mahmood (2014) and in Frias-Aceituno, Rodríguez-Ariza and Garcia-Sánchez (2014) papers.

[28] The coefficient of CSR in the regression where forms of CSP were regressed on CFP.

[29] Akin to the previous studies by Vance (1985), Ullmann (1987) and Cornell and Shapiro (2017).

[30] Other studies resulting in no significant relationships are listed in Ali, Frynas and Mahmood (2014), Frias-Aceituno, Rodríguez-Ariza and Garcia-Sánchez (2014), Margolis and Walsh (2003) and Xiao *et al.* (2018).

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trying to validate the assumption that CSP and CFP are universally related, regardless of all the contingent conditions, is "theoretically untenable" (Rowley and Berman, 2000, p. 406). Ullmann (1985) had already expressed similar concerns about the contingency of CSR impact. As mentioned before, many factors affect the success of a CSR plan, so there are no one-size-fits-all solutions. Everything has to be tailored to the strategy, to the context and the company's characteristics, since there is no secret recipe to always have favourable returns from performing CSR activities (Margolis and Walsh, 2003; Lin, Yang and Liou, 2009; Lin and Amin, 2016). So, afterwards, many scholars tried to isolate contingencies in their empirical research. Nevertheless, according to Rowley and Berman, neither these studies were interpretable due to the absence of sound theoretical explanations addressing the heterogeneity in financial returns. However, such a large diversity in the obtained results was not only due to the inability of drawing universal conclusions about CSP and CFP relationship, since many scholars either tried to provide theoretical underpinnings or distinguished contingent factors since then. The diverse findings have actually been attributed to a variety of shortcomings.

Model misspecification due to variable-omission, absence of necessary mediators or moderators, considering both organizational (firm-level factors) and environmental variables (industry and societal factors).[31] Financial performance is the last step of a process that includes many mediating and independent variables. The analyses must get rid of all the possible intervening elements to isolate the effect of CSR on CFP (Husted and Allen, 2007), otherwise the obtained results cannot be generalized. The role of mediating variables and situational contingencies is especially important (Carroll and Shabana, 2010). These contingent factors have been widely studied.[32]

Considering the **factors related to the company**, research and development (Mcwilliams and Siegel, 2000), leverage or debt ratio (Wang and Choi, 2013), failure to control for risk or the average age of corporate assets (Cochran and Wood, 1984) are among the omitted variables. Size is usually included as a control variable, less often is the time a firm started doing CSR (Lin and Amin, 2016). Consistency, both in temporal and in interdomain -among stakeholders groups-terms, has a moderating effect (Wang and Choi, 2013). More doubtful conclusions were drawn about CSR engagement strategy's pace (Tang, Hull and Rothenberg, 2012). Barnett (2007) presented the concept of "stakeholder influence capacity" (p. 803) as a moderator of CSP-CFP relationship: when firms have low CSP they have higher CFP than

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[31] Only by combining them it is possible to have a complete picture of CSP-CFP relationship (Barnett, 2007).
[32] Studies by Servaes and Tamayo (2013), Barnett and Salomon (2012) Wang and Choi (2013) and Xiao *et al.* (2018).

firms with moderate CSP, but firms with high CSP have the highest CFP.[33] Wang and Choi (2013) and Servaes and Tamayo (2013) reported that Hull and Rothenberg in 2008 found that another moderator was represented by innovation.[34] A high customer awareness measured through advertising expenses (Surroca, Tribó and Waddock, 2010) and intangibles (Russo and Fouts, 1997) has been included in some studies as mediator, while others (Pivato, Misani and Tencati, 2007) included customer satisfaction with the same function.

However, there are also some **exogenous factors** related to market and industry conditions to be considered. Wang and Choi (2013) found out that the growth of an industry may positively moderate the relationship between CSP and CFP. Other moderators may be identified in Hull and Rothenberg's in-industry differentiation (Flammer, 2015) and in the institutional norms level of industries (Xiao *et al.*, 2018). Despite the fundamental role of society when dealing with the CSR theories,[35] this aspect has not been deeply analysed in empirical studies, with the exception of those considering the moderator effect of the result of social and political modifications or of country-level sustainability such as Siche *et al.* in 2008 and Wagner in 2010, as reported in Margolis and Walsh (2003).

Relationship type and its direction The majority of studies are mainly based on correlation, without further tests on the causality presence and the direction of the relationship between variables (Waddock and Graves, 1997). Waddock and Graves (1997) discovered that the relationship between CSP and CFP was bi-directional and synergic, *i.e.* that social performance is at the same time a predictor and a consequence of financial results, resulting in a virtuous circle process. A virtuous circle and the bi-directionality of the relationship were both found also in Surroca, Tribó and Waddock (2010).

In the review operated by Margolis and Walsh (2003) CSP has been treated mostly as an independent variable able to forecast financial performance (109 studies over 127). On the other hand, CSP has been modelled as a dependent variable in 22 studies and only four studies actually investigated the relationship in both directions. In the latter case, the majority of the studies caught a positive relation, while in the former a positive relation was detected only in less than a half.

Lin, Yang and Liou (2009) highlights that the dependent variable is actually influenced by a variety of factors, both firm and industry related. Therefore, inferring a causal relationship must be done cautiously. Social responsibility seems to be more linked to organizational

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[33]Also in Barnett and Salomon (2012).

[34] Moderators affect the strength of the relationship between a dependent and independent variable, while a mediator partially intervene in the relation between dependent and independent variables.

[35] For instance, legitimisation, institutional, stakeholder theories.

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outcomes than financial performance, so organizational outcomes might be better dependent variables to deepen CSP-CFP comprehension (Wang and Choi, 2013).

Endogeneity Some researchers have identified endogeneity as a critical issue, since a company's decision to engage in CSR activities is akin to correlate with unobservable firm characteristics, the same that may also influence CFP (Malik, 2015). A two-stage model might be used to eliminate endogeneity problems (Malik, 2015). Some authors documented a positive association between CSR performance and corporate economic performance once got rid of endogeneity, but the presence of endogeneity has not been verified for each study, so it may actually still represent a factor altering the studies' results.[36] Additionally, endogeneity cannot always be fully removed due to omitted variables and simultaneity problems (Xiao *et al.*, 2018).

The measures used for CSP and CFP, sample and methodology Many studies only consider a single measure of CSR, discretionally-chosen and related to a peculiar aspect (Barnett and Salomon, 2012), or resulting from the aggregation of multiple measures (Windolph, 2011).[37] This is a huge problem when trying to assess the relationship with CFP, since not all the measures impact CFP in the same way. The multiplicity of the CSR concept is smoothed off in these cases, giving incorrect results. Some studies, for instance, consider either environmental responsibility only or social aspects only, so they do not address entirely the CSR issue. In particular, the number of studies conducted on the environmental aspect exceed the number of researches on social aspects (Waddock and Graves, 1997). Measurement method is also a problem: using a survey methodology or a case-study for CSP, where there are not objective and certified measure (Lin, Yang and Liou, 2009) may be more prejudicial, but also content analysis seems not to be completely unbiased and independent from the scholar's classification. CFP measures used, since they were not homogeneous (in the summary review studies), equally significant or comparable. Some authors focus on market indicators, others on profitability and internal performance measures. Some metrics are short-term related, others are long-terms ones and the proceeding results should not be mixed together and compared.

Corporate Economic performance indicators can be divided in liquidity ratios (current, quick, cash ratio, working capital), profitability ratios (ROE, ROA, ROS, ROI), indicators concerning the financial structure (debt, equity, debt-equity, gearing), valuation and growth

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[36] There are two main endogeneity problems: reverse causality and the possible correlation between time-invariant unobservable heterogeneity and explanatory variables of performance (Surroca, Tribó and Waddock, 2010). Endogeneity occurs when an explanatory variable is correlated with the error term. Endogeneity may happen when there is an uncontrolled confounder causing both independent and dependent variables of a model or a loop of causality between the independent and dependent variables of a model.

[37] See section 1.3.2.

(EVA, EPS, BV, BSC, Dividend yield) and Management Efficiency (inventory, account payables, account receivables).[38] Financial indicators will be further discussed in the methodology chapter, where those considered for the empirical study will be analysed in detail.

Sample selection may cause distortions in the results too. Not all the sample are equally reliable, sufficiently big or not biased. In many studies the sample is limited or consists of bigger firms only, since data are available for them. When the number of firms is too low, problems arise when trying to validate and generalise the results (Ullmann, 1985). Other authors express concerns about the availability of databases (Malik, 2015), since they drive CSR measurements and the actual results. Margolis (2009) explains that many advanced meta-analytic techniques could not be applied to the sample considered in the review because many studies used data from the same pool of companies, mining statistical independence.

Some additional notes Some scholars consider CSR a resource characterised by decreasing marginal returns. Additional investments in CSR do not produce high benefits so for firms that have already high levels of CSR activities as those obtained by firms that perform zero to small CSR activities (Adams, 2002). Others claim that that environmental disclosure is more positively related to financial performance than the social one (Surroca, Tribó and Waddock, 2010). Barnett observes that the initially high influence of CSP on CFP turned into a less powerful one due to the development of stricter regulations on social and environmental fields in developed countries. The improved conditions made stakeholders less responsive to firms CSR involvement (Barnett, 2007). Consistently with Barnett's observations, Xiao *et al.* (2018) report that CSP-CFP relationship seems to be weakening over time. Some scholars re-tested previous studies, considering the same measures and the same firms for recent years, but obtained weaker results.

As a consequence of the aforementioned issues, not every study has the same validity: the more rigorous ones, which have addressed or have avoided the problems listed above should be taken into greater consideration than those with gaps, inconsistencies and missing parts.

An insufficient theoretical linkage Some authors criticized lacks in key concepts explanation, the absence of definitions of social and financial performance (Ullmann, 1985; Griffin and Mahon, 1997). Actually, in the following years, many authors tried to give their explanation, recalling theoretical concepts and frameworks, most of which were discussed in Section 1.1.2. Hence, the following paragraphs will deal with theories justifying positive CSP-CFP relation; hereafter, also those explaining a negative relationship will be presented.

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[38] Some examples in brackets.

Stakeholder theory is one of the most diffused theoretical foundation of empirical works on CSP-CFP relationship (Xiao *et al.*, 2018). Instrumental stakeholder theory is especially used in empirical studies it is capable of relative predictive validity concerning CSP–CFP relationship (Orlitzky, Schmidt and Rynes, 2003). Instrumental stakeholder theory states that CSR contributes to CFP by promoting a firm's consistent and dependable bond with both internal and external stakeholders (Jones, 1995; Barnett, 2007; Xiao *et al.*, 2018), obtaining necessary resources or stakeholder support (Flammer, 2015), reducing transaction costs, improving a firm's reputation and brand equity, and saving costs in operations (Lee, Singal and Kang, 2013). Similarly, also good management theory supports a positive CSP-CFP linkage (Waddock and Graves, 1997)

Considering RBV, a positive linkage is reached by establishing valuable and unique assets, both tangible and intangible, such as reputation, brand, and trust, that attract new customers and increase profitability (Tang, Hull and Rothenberg, 2012; Flammer, 2015). But tackling RBV from another perspective, (Joshi and Li, 2016) state that only firms with distinctive resources and management capability can exploit CSR activities gaining financial benefits. Both assertions make sense. In order to be profitable, a company has to have some unique resources, that may or may not derive from CSR, but if the company wants to join CSR, it has to be capable of handling it (hence the need of unique resources) and to incorporate this choice into the overall strategy. Surroca, Tribó and Waddock (2010) widely based their analysis on RBV and stakeholder theory.

Porter and Kramer's concepts are focused on strategic CSR, both in terms of sustainable competitive advantage and of shared value creation. Strategic CSR is often used as a foundation to explain positive CSP-CFP relationship. Other authors sustain the strategic CSR, *e.g.* Husted and Allen (2007). Some studies have been conducted trying to use a multiplicity of approaches, *e.g.* strategic CSR, instrumental and descriptive stakeholder theories in Boesso, Favotto and Michelon (2015).

Gholami (2011) states that the positive relationship between CSP and CFP is explained not only by stakeholder theory but also by agency theory, that deals with the conflict between shareholders and managers (Jensen and Meckling, 1976). CSR disclosure may reduce agency costs or hinder possible future agency costs due to legislation and regulation (Ortas, Gallego-Alvarez and Álvarez Etxeberria, 2015). CSR relationship with CFP is explained by agency theory as follows: if a company achieves positive financial performance, managers will communicate their CSR actions as clearly as possible to shareholders in order to promote a good image for management (Ortas, Gallego-Alvarez and Álvarez Etxeberria, 2015). It may reduce the information asymmetry between management and stockholders as well (Chan,

Watson and Woodliff, 2014), preventing agency problems from happening and making outflows profitable.

Information asymmetries are also taken into consideration by signalling theory (Windolph, 2011), which is also used as an explanation for a positive CSP-CFP relation. When companies reach a high level of financial performance, they want to inform their shareholders and create favourable opinions by increasing the amount of information disclosed (Ortas, Gallego-Alvarez and Álvarez Etxeberria, 2015), thus reducing the information asymmetries that are present. Profitable companies disclose in order to differentiate themselves, obtain capital at the minimum cost and avoid a reduction in share pricing (Frias-Aceituno, Rodríguez-Ariza and Garcia-Sánchez, 2014). Under conditions of incomplete information (Orlitzky, Schmidt and Rynes, 2003), profitability is an indicator of the quality of investment for shareholders. In many of these case, CFP seems to precede CSP disclosure. Slack resources theory also explains positive CSP-CFP relation in accordance to this inverted order (Orlitzky, Schmidt and Rynes, 2003; Tang, Hull and Rothenberg, 2012). When there are resources in excess, managers may decide to use them for joining CSR activities (Waddock and Graves, 1997; Surroca, Tribó and Waddock, 2010). Legitimacy theory, political costs theory and institutional theory are often used to support a positive relationship between CSP and CFP too.[39]

Typically, the hypothesis that justifies a negative relation between CSP and CFP is the trade-off hypothesis (Friedman, 1962), since firms reduce their profitability by unnecessarily investing shareholders' money into CSR activities. CSR activities are represent as sub-optimal choices that drain resources otherwise usable in productivity-enhancing activities (Joshi and Li, 2016). Slightly changing perspective, CSR may be specifically driven by managers' opportunism (Flammer, 2015), such as ensuring the stability of their job role, their reputation and increasing their compensation (Frias-Aceituno, Rodríguez-Ariza and Garcia-Sánchez, 2014), even when CSR activity is not beneficial for the firm and causing negative performance and damaging investors (Joshi and Li, 2016). Some argue that a negative CSP-CFP relationship is the result of managers prone to reduce expenditure on CSR when CFP is good, to maximize personal compensation (Salzmann, Ionescu-Somers and Steger, 2005). However, the negative correlation found in some studies could be due to the fact that companies have invested in the wrong set of CSR activities or that they did not take into

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[39] See Ortas, Gallego-Alvarez and Álvarez Etxeberria (2015) for both legitimacy and political cost theories, Chan, Watson and Woodliff (2014) for legitimacy and institutional theory, Frias-Aceituno, Rodríguez-Ariza and Garcia-Sánchez (2014) for political cost theory, Parast and Adams (2012) and Flammer (2015) for institutional theory - although institutional theory is mainly used to demonstrate diversity across industries (see following paragraphs).

consideration the expectation of the most important stakeholders. Generally, even if studies controlled for many variables, negative (or positive) CFP results may be due to other reasons, not directly related to CSR activity.

Discussing theoretical explanations, it should be considered that some theories related to CSP-CFP relationship should be considered as complementary, and that sometimes theories cannot explain every aspect of this relationship. Besides, both empirical studies and theoretical background can be further improved.

Industry and contextual differences For the sake of this work-understanding if there is a link between CSP areas and CFP depending on the sector of activity-the country analysed is only one: the US. Taking into consideration societal factors would not have particular significance in this case, since the sample is all referred to US companies. In the empirical part also the belonging to a specific sector will be studied to model the relation between CSP-CSF, since, as anticipated, the association between the overall CSR activities (and even more if the different CSR categories are considered) and firm performance is heterogeneous across industries and sectors.

Apparently, CSR has significant positive implications for firms from most, but not all, industries. More specifically, taking into consideration the empirical results, there are evidences that distinct types of CSR have different influences on financial performance of firms belonging to different sectors. Distinct categories of CSR are usually associated to different stakeholder groups. Applying the stakeholder theory it appears clear that to fulfil a stakeholders group' expectations a company has to concentrate on those activities that the group value the most. The underling hypotheses are that stakeholder composition varies across industries and that stakeholders may differ in their responsiveness to CSR across industries.

Barnett (2007) proposed that the variation of CFP in CSP-CFP relation was influenced by industries and called for more research of potential heterogeneity of CSR's impact on firm performance across industries. During time many sector-based studies have been developed, some analysing one specific industry or sector, while others compared a couple of sectors at once.

Some recent industry-specific studies that analysed CSP and CFP performance addressed the following categories: financial and banking sector (Chih, Chih and Chen, 2010; Soana, 2011), mining and petroleum industry (Parast and Adams, 2012) and hospitality[40] (Kang, Lee and Huh, 2010). Some industries (*e.g.* mining, production, utilities, and finance industries) seem

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[40] Hotel, casino, restaurant and airline companies.

to be more exposed to environmental and social risks (Simnett, Vanstraelen and Chua, 2009) and are called "sensitive" industries. For the firms belonging to these sensitive industries, gaining trust is essential and often they attain it by increasing the reporting on CSR activities. These industries are also among the most debated in the industry - specific studies, probably not by chance, but due to their controversy.

Some studies compared multiple industries at the same time (Hull and Rothenberg, 2008; Hoepner, Yu and Ferguson, 2010), while others, such as Baron *et al.* (2009), faced broader topics, such as considering the differences between consumer-oriented and industrial-oriented companies. CSP effect on CFP resulted positive in the case of consumer industries, negative otherwise (Feng, Wang and Kreuze, 2017). Other differences may be found between those companies that sell to the consumer (B2C) and those who interact only with other businesses or the government. B2C firms are likely more exposed to customer scrutiny and activism than those who are dealing with other businesses or governments (Flammer, 2015), which may keep abuses and violations hidden to a larger extent.

Some authors also analysed the role of some industry characteristics as moderators in the CSP-CFP relationship. Innovation and differentiation within the industry seem to be the moderators for a positive relationship between corporate social performance and financial performance. Specifically, CSP has stronger effects on performance when considering low-innovation firms and industries with little differentiation (Hull and Rothenberg, 2008). Industry growth is also believed to moderate the relation (van Beurden and Gössling, 2008). Flammer also differentiates industries with higher institutional norms of CSR *i.e.* "clean", from those that are characterized by lower institutional norms of CSR *i.e.* "dirty". The author underlines that in the first case, stakeholders such as customers and strategic partners are more responsive to CSR efforts, leading to higher returns, while in the latter case stakeholders are more likely to be indifferent towards companies' engagement with CSR, probably due to cognitive dissonances.

Also the type of firm determines the focus on CSR activities. Being a multinational enterprise (MNE) adds some degrees of complexity in the CSP-CFP relationship. MNEs seem to have many advantages when trying to be environmentally and socially conscious and this may favour their attempts to become leaders in sustainability. However, MNEs are constantly observed by the general public and every scandal has huge repercussions around the globe, thanks to the media. Crane, Matten and Spence (2008) underline that "large corporations are far more visible and thus far more vulnerable to criticism from the public than smaller firms" (p. 9). In addition, larger companies, especially if spread globally, usually have access to more resources and means when facing CSR topic. In large corporations, separation between

ownership and control leads to the legitimate question about which interests management should take into consideration. SMEs, on the contrary, are usually less active in the CSR field, but they deeply value local relationships with employees, neighbours, suppliers, customers that could irretrievably damage the business if managed incorrectly (Crane, Matten and Spence, 2008).

1.3.2. CSR Indicators – KLD MSCI ESG indexes

By assessing corporate sustainability it is possible to measure the extent to which companies incorporate economic, environmental, social and governance factors into their activities (Rahdari and Anvary Rostamy, 2015). In section 1.1.2. frameworks related to CSP assessment and tracking have already be examined. In this section, useful indicators for CSP will be discussed, since they are the most used instruments by rating agencies. In the next section, the topic will be restricted to the MSCI one, after a brief introduction on MSCI organization and its methodology when assessing companies' ESG performance.

Indicators and KPIs The main approaches used in literature to measure corporate social activities involve indicators. An indicator is "a parameter, or a value derived from parameters, which points to, provides information about, describes the state of a phenomenon/environment/area, with a significance extending beyond that directly associated with a parameter value" (OECD, 2003).

Indicators are really useful to track progresses in a specific and accurate way, helping to determine the extent to which intended objectives, projects and programmes are being achieved, both for long term and short-term goals. Indicators related to CSR and sustainability help managers to consider also non-financial performances into their decision making, enabling in such a way the companies to operate in long-term, but also to further innovate and develop strategically significant products (Kocmanová and Dočekalová, 2012). Indicators also provide a deeper understanding of a company's economic performance (Rahdari and Anvary Rostamy, 2015), even if they cannot track every aspect of it (Crane, Matten and Spence, 2008).

However, the right sets of indicators, referred not only to financial aspects but also to social, environmental and governance fields should be used, since these indicators are becoming increasingly important (Rahdari and Anvary Rostamy, 2015). Sustainability indicators measure either qualitative or quantitative information related to CSP. The progress of non-financial performance must be tracked chronologically, and the cross-company comparison should be feasible (Global Reporting Initiative, 2006). Once disclosed, non-financial

indicators acquire importance for investors too, since their analysis enable to maximize the long-term payoff (Idowu, 2015, p. 353).

Key performance indicators (KPIs) are the most relevant ones. KPIs possess a higher significance level and are highly influential in the decision-making process. For this reason, they must be monitored on an ongoing basis, to assess an organization's performance trends, and they should be considered in the objectives definition process. KPIs are extremely useful to plan and manage a company's economic priorities, being "quantitative or qualitative measures of organisational performance." (Kocmanová and Dočekalová, 2012). They are even more valuable if they are focused on the core business strategy, through operational plans' performance targets, even though in these cases their integration in internal management and in Sustainable reporting is necessary (Idowu, 2015, p. 353). KPIs related to CSR are usually called 'soft' KPIs, due to their non-financial aspect, in contraposition with financial ones, which represent "hard-facts" (Idowu, 2015). Sometimes KPIs usage is limited in scope, inconsistent or lacks independent audit. Inconsistencies in approaches across regions and industries are present too (Adams and Frost, 2008). Even though some authors highlighted the importance of including KPIs in corporate sustainability reporting (Roca and Searcy, 2012), only few studies have further analysed the indicators in such a way (Cho, Lee and Park, 2012).

ESG Indicators For the purposes of this work, hereafter indicators will be analysed as means used by rating agencies to measure firms' CSR performances. Developing indicators is the most common form of measuring CS performance[41] (Bassen and Kovacs, 2008), especially when an all-round view of the analysed company is needed (Huber and Comstock, 2017). Indicators' use has been blooming recently, due to the increasing interest in receiving reliable information about companies' CSR activity and sustainability claims. Many stakeholders, such as institutional investors, asset managers and financial institutions need dependable and consistent measurement, both over time and compared to peers (Dočekalová and Kocmanová, 2016). Consequently, they rely on those indicators provided by third parties organizations, especially those proceeding from rating agencies. Sometimes composite indicators[42] are used in order to summarise complex multidimensional phenomena in a single figure which is easy to interpret and ease the comparison, but this type of indicator smoothes the results, hiding useful insights about performance (Rahdari and Anvary Rostamy, 2015).

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[41] Less often they are used with a merely descriptive function too.

[42] Also called *composite index*.

Much more frequently, indicators are presented in sets related to the same field, usually following the Environmental, Social and Governance (ESG) tripartition. In fact, combining multiple indicators provides a better picture of a company's performance in relation to economic, social and environmental issues (Roca and Searcy, 2012).

Some authors argue that organizing the indicators following the triple bottom line framework is the most used categorization (Rahdari and Anvary Rostamy, 2015).

However, incorporating the governance aspect is necessary in order to obtain a full understanding of the company status, and investors and other interested parts may look to both ESG performance and financial figures.

Figure 2: Number of indicators per report in each sector Roca and Searcy (2012, p. 110)
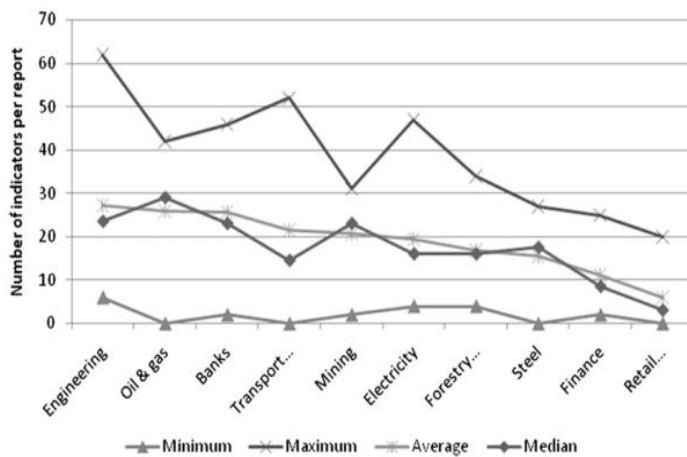
Usually companies operating in different sectors are evaluated on the basis of different indicators, at least partially. Many scholars have tried to develop industry specific sets of indicators Roca and Searcy (2012). In the graph the quantification of the indicators per industry in Canada presented by Roca and Searcy can be found.

As mentioned above, ESG indicators refer to three categories related to CSR: environmental, social and governance aspect. Environmental indicators usually take into consideration a company's energy use, natural resource conservation, waste, pollution, and animal treatment. Social criteria are focused on relationships, both within the company and outside. Stakeholders considered may vary, but employees, local community, suppliers, customers usually are carefully analysed. With regard to governance, accuracy and transparency is important to avoid accounting irregularities, vote rights must be protected and assured, while conflicts of interest must be avoided.

The importance of using disaggregated measures A great number of studies use aggregate measure of CSR usually resulting by combining several categories of CSR together. Waddock and Graves (1997) used the aggregate measure of KLD data, Servaes and Tamayo (2013) used the aggregate measure of several KLD categories, other authors used weighted aggregate measures or some alternative combination. Nonetheless, using an aggregate measure of KLD categories has been firmly criticized, due to the multi-dimensionality of the concept. Providing an aggregate CSR measure may be incorrect and misleading. In fact, the impact

degree of negative performance is higher than the positive one, an appropriate theoretical as well as statistical background may lack (Paredes-Gazquez, Rodriguez-Fernandez and de la Cuesta-Gonzalez, 2016) and the weighting of indicators may be completely discretional or incorrect (Feng, Wang and Kreuze, 2017).

Scholars often use some grouping mechanisms for better managing ESG indicators in empirical studies and draw relevant conclusions. Some disaggregated the overall ESG indicators into four categories of CSR activities: employees-oriented CSR, environment-oriented CSR, society-oriented CSR, and market-oriented CSR (Siegel and Vitaliano, 2007; Cajias *et al.*, 2014; Semenova and Hassel, 2015).

However, many alternative classifications have been developed over the years, some based on a stakeholder approach, others more oriented towards the separation of ESG factors, others selecting only some of the existing groups.

MSCI KLD ESG indicators From 1991 MSCI KLD has yearly produced a data set considering ESG performance indicators for a large number of publicly traded companies. For that purpose, MSCI uses three main sources of information: macro data (from academic, government, NGO datasets), company disclosure and information proceeding from Government databases, media, NGO and other stakeholder sources.

KLD indicators may either be positive or negative. Some indicators are positive (originally defined as "strengths"), while others are negative (originally qualified as "concerns"). Negative ones are tested for all the companies in the database,[43] while positive ones are analysed only for relevant firms, depending on their sector of activity.[44] When a company has not been researched for a specific indicator, the score assigned is "NR" (Not Researched); on the other hand, if the indicator has been investigated and the company meets the established assessment criteria, "1" is the score assigned; alternatively, the attributed mark is "0" (binary scoring model).

MSCI follows a three-step process in order to assess the level of ESG performance:

1.   Identify key issues by industry

2.   Measure risk exposure

3.   Measure risk management

As stated above, ESG indicators encompass three main categories: Environment, Social and Governance. The social category is furthermore divided into four sub-categories in KLD

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[43]With the exception of the STATS-2010 and STATS-2011 Data Sets.

[44] Prior to STATS – 2010 Data Set, all of the positive ESG performance indicators were researched for all of the companies in the coverage universe (MSCI KLD, 2016)

MSCI: Community, Human Rights, Employee Relations and Diversity, for a total amount of 7 categories.

The indicators will be analysed more extensively in the Methodology chapter. For a detailed illustration of KLD MSCI indicators, please refer to the table included in the Appendix.

1.3.3. Research question

This theoretical chapter offered an overview of CSR-related notions that have been used in the subsequent sections, detailing the most relevant topics. The entire analysis was essentially based on the fact that CSR is a multi-faceted concept and needs to be adapted to the context in which the company is operating, taking into consideration both internal and external characteristics.

Businesses' strive for competitiveness, good financial results and over-time sustainability is an undeniable fact, hence the previous sections helped building a "business case for CSR", analysing value creation process and the CSP-CFP relationship. Demonstrating that doing good is positive for the planet, the people, but also for companies' performance, may tear off the "generosity and philanthropy-based" label that has too often been attributed to CSR. Bearing in mind that CSR is not a miraculous cure for all the companies' problems, by presenting CSR as a strategic, powerful and profitable instrument, reluctant managers may be persuaded and motivated to exploit its opportunities. For this to happen, CSR practice must be legitimized from an economical point of view and its shortcomings must be recognized.

Hence, the fundamental theories trying to validate either a positive or a negative relation between CSP and CFP were analysed. This step offers a solid ground to later explain the results obtained and make them consistent with the economic theories. In particular, stakeholder theory was fundamental in helping to define that different groups of people have different necessities also in terms of CSR actions, explaining the importance of maintaining a multi-faceted approach to CSR, considering a multiplicity of CSR indicators and not a sole summary value. Institutional theory was extremely important too, since it explains the differences related to CSR behaviour among industries. Each analysed theory adds something to the CSR examination landscape.

Third parties' role in opposition to companies' disclosure has been discussed to show the larger degree of objectivity provided by using this kind of data and the additional benefits that external assessment can provide, that do not come without some disadvantages. However, company disclosure choices continue to be fundamental, since the data used for ranking and indexes are partially based on them. The analysis of the CSR determinants prepared to the

empirical modelling phase, facilitating the identification of those variables able to intervene in, modify or moderate the relationship between CSR and financial performance.

Finally, indicators have been discussed to provide a better understanding of the instrument that has been applied in the empirical part, *i.e.* KLD MSCI ESG index.

The research objective of this study is to empirically test the relations among CSR activity as a multi-faceted concept and corporate financial performance, on the basis of the existent theoretical background. In particular, the analysis will take into account the multiplicity of ESG related scoring systems and, to conclude the empirical examination, also the variability across industry sectors will be considered and tested. This relationship has been only partially analysed in an extensive and multivariate way in some studies, but few to none have considered all the mentioned aspects simultaneously, trying to respond to the need of contingency expressed by Ullman (1985) at first, aand then by Barnett (2007) addressing Industries in particular. Many of those studies focused only on a couple of industries, if not a single one, and they often considered one indicator of financial performance only. Even a smaller amount of studies actually considered CSR in its multiple facets, whereas the majority of scholars opted for a single measure of CSR, often an aggregation of multiple CSR- related measures. Among those studies, some performed incomplete or erroneous analyses. On these bases, the research question reads as follows:

What are the effects of carrying out different CSR activities types for what concerns financial performance? Do these effects change when considering different industry sectors?

These questions will be quantitatively investigated by performing the appropriate statistical analyses, trying to construct some valid models for the relation and determining which ones can better explain the phenomenon. Research sub-objectives for this study are four, interconnected ones:

1.   To test the overall CSR activities impact on a variety of financial performance indicators

2.   To check which CSR aspects are the most developed depending on the sector

3.   To check which CSR categories improve financial performance

4.   Above all, testing which CSR activities are the most beneficial, and in which terms, for firms' performance depending on the industry belonging, and creating a predictive model for performance based on industry and CSR activity types for a selection of sectors, for which not many empirical studies of comparable depth have been executed.

This study may be beneficial for a variety of reasons. For sure it can add a piece to the existing empirical studies on CSR and corporate performances, while providing some useful cues and insights to refine the theoretical background, hence its value for the academic world. The multi-faceted approach and the comparison of many variables combinations in the same study ease the comparability, since the models are constructed in a consistent way and the results are based on the same sample of companies. This study may also inspire future research on the topic that may enhance the comprehension of CSR dynamics. However, this work may be useful for others, too. Managers and practitioners may better understand the dynamics underlying profitability creation through CSR activities, and they may direct their decision-making more sensibly, especially for what concerns the US listed companies. Investors and financial institutions may draw some relevant elements for their transactions as well, improving their awareness on the topic.

CHAPTER 2: METHODOLOGY APPLIED TO INVESTIGATE CFP-CSP RELATIONSHIP

2.1. Sample and measures

2.1.1. The sample

KLD MSCI index was used to obtain all the data related to CSP. The provided KLD MSCI database contained five sub-sets of data denominated "Universes", the more extensive one (A) covering a time span of 25 years. D is the Universe taken into consideration for this study, since B and C were discontinued in 2014, E does not address US listed companies and A only includes a small number of companies, all of them also included in Universe D. Universe D contains all the firms included in the IMI index, and it presents the largest number of observations.

The time period considered in this study goes from 2013 to 2015. In order to have homogeneous and recent data that has not been deeply analysed in previous studies, this time period was the only suitable one. In fact, prior to 2010 the investigation methodology included the analysis of every strength indicator, regardless the industry membership of the firm, while in both 2010 and 2011 Data sets MSCI did not include all the negative ESG performance indicators. In 2012 some major changes in indicators took place, so that year was excluded from the analysis too (MSCI KLD, 2016). Although 2015, 2014 and 2013 datasets are not perfectly homogeneous, they are more comparable than the previous ones. In 2013, 2,420 firms were analysed by KLD MSCI in Universe D, while in 2014 and 2015 the amount was equal to 2,458 and 2,416, respectively.

Eikon platform by Thomson Reuters[45] was used in order to gather information related to the financials, the organizational measures and the characteristics of the companies under examination. Financial data was collected for the ESG observation year, plus the following one. This procedure enables to have a more complete overview of the impact of CSR activities by performing a lagged analysis. ESG and Eikon databases have been linked through companies' identification codes using Access, then checking companies' names and data matching. The number of total observations decreased due to the impossibility of finding

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[45] The resource is available at the Department of Economics and Management of the University of Padua for Graduating students, PhD students and Professors after registration.

financial data for some companies that were acquired, merged, or were subject to some major changes that made impossible to link the ESG data to the information available in Eikon. In addition, the needed data to perform the analyses were not available for some companies present in Eikon, hence these companies were not included in the study. Eliminating companies with largely incomplete data, the total firm-year observations are 5,914 for the three-year period, respectively 1872 in 2013, 1974 in 2014 and 2068 in 2015. Due to some missing data, the number of observations used in each regression is actually lower, around 5200. These observations are referred to different companies over the three periods, with only some of the companies observed for more than one year. Hence, the panel is surely a non-balanced one. In this case the data may be considered as pooled cross-sectional, since a great number of firms do not present repeated observations over the considered time span - the aim is not to study the behaviour of single individuals (firms) over time. An alternative would have been to delete all the companies that are not present all the three years, but they were too many (4,160 observations) and the sample would have become extremely reduced in size and not significantly representing US firms due, for instance, to the survival bias. However, there may be some effects that are common for some of the analysed companies. For this reason, year and sector of belonging were introduced among the control variables. So, even with a potential attrition problem, the preferred solution was to keep the unbalanced panel; even if the companies do not exit the panel completely randomly, the factors that may intervene vary and not all are linked to the firm's performances: absence of data in Eikon database, mergers and acquisitions, name or other identification changes, changing status from public to private, absence in a year's IMI index among others. For sure, further analyses are needed to check if in this specific case keeping the larger sample was the best choice. However, the companies in object are not part of a multi-year program, so even a sole year of observation is useful for the aim of this study.

Inserting a Firm's fixed effect seemed to be not necessary and even counterproductive in this case, since the large majority of the firms did not had multiple observations across the chosen time period considered. In addition, managerial orientation, context and firms' strategic aims may be changing between the years considered. Nevertheless, independence and autocorrelation of the error will be tested to identify any possible related issues.

2.1.2. Independent variables: the measures of CSP and control variables

The measures of CSP As explained in the previous chapter, KLD MSCI ESG index is characterized by a repartition in seven groups, namely environment, human rights,

community, employee relations, product, corporate governance and diversity, plus some indicators dedicated to particular types of industry.

Since one of the purposes of this study is to provide a higher granularity than the one granted in previous works, after a phase dedicated to the link between financial performance and social performance in terms of overall ESG score, the repartition into the seven categories will be maintained in a dedicated part of the analysis. The single indicators[46] will be summed up maintaining the division in the seven groups. Including those indicators related to some specific issues (Alcohol, Firearms, Gambling, Military, Nuclear Power and Tobacco) is not among the purposes of this analysis, even though they could surely be inserted in future elaborations.

Even if this work is oriented towards offering a more granular view on CSR topic, some form of aggregation is still needed. In fact, an overall aggregation is important to compare results to other studies, besides the fact that, even if at a lower level, some aggregation among the indicators must be performed in order to have only one figure for each one of the seven groups and to smooth the differences in data across years due to methodology changes. It would be impossible and also not significant to perform a regression where each indicator is represented through a different variable.

Dealing with the ways in which these indicators may be analysed, the landscape of possibilities varies a lot. The most common way is to sum up the positive indicators and deducing the negative ones, thus obtaining a net score (Waddock and Graves, 1997; Barnett and Salomon, 2012). This will be performed with ESG_NET_A variable. In order to obtain an overall figure related to the ESG performance of a company, when performing this operations scholars may either assign the same importance to the seven categories or employ some sorts of weighting schemes, adjusting the importance of each one of the seven groups depending on other studies or theoretical motivations (Waddock and Graves, 1997). However, composite scores present relevance problems, and weighting schemes may not be appropriate. Capelle-Blancard and Petit (2017 p. 920) highlighted in their work that summing and weighting indicators are not straightforward issues: "The aggregation (…) makes sense if (a) a good score may compensate for a bad score (the fungibility hypothesis) and (b) it is possible to assign some weights to each criterion (the commensurability hypothesis)" and they strongly suggest to keep strengths and concerns separated.

For the purpose of this work, the weighting scheme of the categories presented by KLD MSCI will be kept unchanged when computing the overall ESG score. In accordance to those scholars (Nelling and Webb, 2009; Erhemjamts, Li and Venkateswaran, 2013; Capelle-

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[46] The complete list of indicators related to ESG performance is provided by MSCI (MSCI KLD, 2016).

Blancard and Petit, 2017) who criticized the use of overall scores, in the first part also ESG_S_A and ESG_C_A will both be used as independent variable in the same regression, while in the second part of the analysis the seven categories will be kept separated, each one being represented by a different variables. This choice is coherent with the description of CSR as a multifaceted concept depicted in Chapter 1.

Consequently, in this study the overall ESG scores will only only be used in the first part of the performed analysis, to compare the outcomes to other researches and draw some general deductions, while the heterogeneity of the CSR will be maintained through considering the seven ESG-related groups (Environmental, Diversity, Human, Community, Employees, Products and Governance) in the subsequent part.

Moreover, in order to take into consideration, at least partially, what was expressed by some scholars (Paredes-Gazquez, Rodriguez-Fernandez and de la Cuesta-Gonzalez, 2016) regarding the different effects of positive or negative actions for what concerns CSR, besides calculating a widely used net score, an additional "negative weighted" score was employed (ESG_A_W). The weight used was chosen to be 1.5 in order to penalize without completely jeopardizing the effect of the positive actions undertaken.

Another score was computed to check ESG performance, by homogenizing the results with respects to the changes in indicator numbers. In order to differentiate this score, which is computed through another procedure, the letter "C" as Comparable is employed, instead of the "A" suffix indicating Actual scoring. The choice of using "C" score is based on the structure of the MSCI scoring system. Strengths [Concerns] where the figure assigned to the company is "1" indicate that the company conforms to the best practices on that aspect [is subject to that controversy]. Thus, by simply subtracting these scores, "NR" and 0 seem to count the same, even if their meaning is extremely different: in fact, NR implies that the indicator has not been researched for that company, usually due to the field in which it operates, 0 that it has been researched, but that the requirements (either positive or negative) have not been satisfied. In order to avoid the problems related to this point, in this work the score has been divided by 1 plus the number of indicators actually investigated for that type of firm, so the sum of 1 has been divided by $(1 + n)$, were n are the indicators observed for that particular firm. 1 is added to actually be able to perform the calculation even when the indicators have not been researched for the entire category. Then, to keep a scoring distribution that followed the one chosen by ESG and reflected the number of indicators considered, that number has been multiplied for the number of indicators present for that ESG category in 2015, to keep the measures comparable. Similar indicators have been employed in other studies, since the problem of results' comparability has been widely recognized.

Table 5 synthesizes the ESG variables considered in each part of the analysis.

Table 5: ESG variables included in each part of the analysis

PART 1	PART 2	PART 3
ESG_NET_A	NET_ENV_A NET_COM_A NET_HUM_A NET_EMP_A NET_DIV_A NET_PRO_A NET_GOV_A	ESG_NET_A
ESG_S_A + ESG_C_A	ENV_S_A ENV_C_A COM_S_A COM_C_A HUM_S_A HUM_C_A EMP_S_A EMP_C_A DIV_S_A DIV_C_A PRO_S_A PRO_C_A GOV_S_A GOV_C_A	ESG_S_A + ESG_C_A
ESG_A_W	ENV_A_W COM_A_W HUM_A_W EMP_A_W DIV_A_W PRO_A_W GOV_A_W	NET_ENV_A NET_COM_A NET_HUM_A NET_EMP_A NET_DIV_A NET_PRO_A NET_GOV_A
ESG_NET_C	NET_ENV_C NET_COM_C NET_HUM_C NET_EMP_C NET_DIV_C NET_PRO_C NET_GOV_C	

Control variables and cofounders Eikon platform by Thomson Reuters was used to gather organizational information, including the economical and financial data, as well as the industry classification. Trying to find the most suitable models in order to predict performance results on the basis of ESG measures and organization-related variables, the set of previous studies on the topic was the starting point also for determining control variables and cofounders.

ESG factors are clearly not the only determinants in a firm's financial performance. Consequently, other variables – financial and organizational related ones - were included in the regression, based on previous eminent studies, both empirically tested and meta-analytical. However, but this particular combination of variables has not been tested yet, at least from the papers revised.

The control variables inserted are Size, Age, Sales growth, Risk, Market share, Number of Employees and Research and Development (R&D) expenses. Size, Number of Employees and R&D expenses are inserted as natural logarithms of the original values.

Firm size is expressed as the natural logarithm of total assets (Khan, Badrul and Siddiqui, 2013; Wang and Choi, 2013; Frias-Aceituno, Rodríguez-Ariza and Garcia-Sánchez, 2014; De Villiers and Marques, 2016).

The chosen industry classification is based on the GICS Categorization, which identifies 11 sectors: Consumer Discretionary, Consumer Staples, Energy, Financials, Health Care, Industrials, Information Technology, Materials, Real Estate, Telecommunication Services and Utilities. GICS categorization has been widely used in CSR-related studies (Cantrell, Kyriazis and Noble, 2015; Ortas, Gallego-Alvarez and Álvarez Etxeberria, 2015). This piece of information will be transformed in dichotomous (dummy) variables, indicating the belonging (1) or not (0) of a company to a specific sector. In the regressions, Utilities sector was left out as comparison group to avoid perfect multicollinearity.

Firm age is also believed to be relevant by many scholars (Barnea and Rubin, 2010; Erhemjamts, Li and Venkateswaran, 2013; Fifka, 2013; Khan, Badrul and Siddiqui, 2013; Chen *et al.*, 2016). Age may be related to inertia, activism and level of structure and may have an impact in financial performance. It has been calculated as the number of years passed from the incorporation date to the year considered. It has been indicated in the results as AGE.

Sales growth offer some understanding on the current situation of the company and may be reflected in the dependent variables (McGuire, Sundgren and Schneeweis, 1988; Mishra and Suar, 2010; Jo and Na, 2012; Fifka, 2013; Chen *et al.*, 2016). Sales growth has been calculated as the increase in sales from the previous year divided by prior year sales. It has been indicated in the results as REVG.

Firm risk (Waddock and Graves, 1997), measured as debt to equity ratio has been already used (Holder-Webb *et al.*, 2009; Reverte, 2009; Garcia-Castro, Ariño and Canela, 2010) because it has an impact in financial performance. It has been indicated in the results as DEY0.

Market share level indicates the power of a company in relation to the competitors and may impact financial results as well (Riley, Pearson and Trompeter, 2003; Cohen *et al.*, 2012). It has been indicated in the results as MKTSH.

Employees are extremely relevant, since they represent the expertise, know-how and human capital of a company (Husted and Allen, 2007; Garcia-Castro, Ariño and Canela, 2010; Surroca, Tribó and Waddock, 2010; Barnett and Salomon, 2012; Boesso, Kumar and Michelon, 2013). The related value has been calculated as the natural logarithm of full-time employees. It has been indicated in the results as LEMP.

Research and Development expenses (Mcwilliams and Siegel, 2000; van Beurden and Gössling, 2008; Surroca, Tribó and Waddock, 2010; Barnett and Salomon, 2012; Jo and Na,

2012; Erhemjamts, Li and Venkateswaran, 2013) are important since the innovation degree of a company and its orientation toward the future may affect financial performance. The corresponding variable has been calculated as the natural logarithm of Research and development expenses of the year. It has been indicated in the results as LRED.

Year dummies are included to control for year fixed effects linked to macroeconomic phenomena that may impact the financial performance. Year dummies have been indicated in the results as Y2013 and Y2014. The dummy variable related to 2015 was left outside the regression model to avoid perfect multicollinearity and serves the purpose of comparison group.

Unfortunately, intangibles and advertising expenses were not inserted in the model, due to a substantial lack of observations. Nonetheless, it would be important to check the regressions results including also these variables as well, as explained in many papers (Waddock and Graves, 1997; Mcwilliams and Siegel, 2000; Surroca, Tribó and Waddock, 2010).

2.1.3. Dependent variables: the measures of CFP

With regards to the variables used to measure financial performance, there was a large diversity across studies. Some authors have focused on accounting measures, while others have only analysed market-based ones. In this study, a measure related to market (Tobin's Q) and other two related to accounting (ROA and CAPEX) will be used and tested as dependent variables.

Tobin's Q has been widely recognized as an important indicator regarding the firm well-being and has been used and analysed in many papers related to CSR (Barnea and Rubin, 2010; Surroca, Tribó and Waddock, 2010); for this study, Tobin's Q was calculated by using the proxy of market-to-book value ratio, deemed to be sufficiently accurate by many academics and practitioners (Garcia-Castro, Ariño and Canela, 2010). Market measures such as Tobin's Q are really useful due to their intrinsic characteristics. In fact, finding the exact time lag to capture the effect of social performance is not needed in this case; in addition, Tobin's Q and other market-based measures can control for more factors than many accounting measures (Wang and Choi, 2013).

ROA is more oriented towards short-term performance recognition and has been used extensively to prove the relation between social and financial performance (Waddock and Graves, 1997; Nelling and Webb, 2009), while CAPEX is medium-term oriented and less frequently included in studies (Dhaliwal et al., 2012; Michelon, Boesso and Kumar, 2013; De Villiers and Marques, 2016), despite the fact that it can provide useful insights since it indicates the long-term initiatives oriented to improve a firm's future performance.

The measures of CFP are referred to both the current (in this case, 2013, 2014 or 2015 depending on the year of the observation) and the subsequent year, while ESG data and control variables are always referred to the current year, also for the t+1 regression, in order to capture the lagged effect identified by many scholars (Hillman and Keim, 2001; Nelling and Webb, 2009; Wang and Choi, 2013).[47]

After some trials and checks, two of the three dependent variables where subject to a natural logarithmic transformation as suggested by Kang, Lee and Huh (2010) to reduce the problems linked to skewness and improve the model specification and the goodness of the results. Thus, instead of using CAPX and TOB, LCAPX and LTOB were used instead. For ROA, although some degrees of skewness were present, no transformation seemed to be able to improve the modelling (neither logarithm, square root, inverse), so the original form was kept and deemed sufficiently significant.

2.2. The methodology

In order to give an overview of the data, some descriptive analyses will be performed to further explore the phenomenon, using measures of central tendency, variability, correlation and frequency distribution. Thus, when dealing with the regressions outcomes, the results will be more easily interpreted. All the models which will be discussed in Chapter 3 will be based on multiple linear regressions. Multiple linear regression attempts to model the relationship between two or more explanatory variables and a response variable by fitting a linear equation to the observed data. Linearity is intended as linearity in parameters, *i.e.* the mean of the response variable is a linear combination of the parameters (regression coefficients) and the predictor variables. In the model, an error term is present, since the expected mean value (fitted value) is usually different from the observed value present in the sample. Ordinary Least Squares (OLS) approach will be used to estimate the parameters.

In order to obtain meaningful results, some assumptions underlying multiple linear regression must be verified. These assumptions are: absence of perfect multicollinearity and autocorrelation, error independence and normal distribution [$e_i \sim N(0,\sigma^2)$], homoscedasticity and linearity. In addition, to have accurate results, sample size should be sufficiently high.

The models tested will be the following ones:

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[47] Please consider what explained about the model formulation at page 60.

$$Financial\ Performance_{it} = \beta_0 + \beta_1 KLD_{it} + \beta_2 AGE_{it} + \beta_3 DE_{it} + \beta_4 LNTA_{it} + \beta_5 LEMP_{it} + \beta_6 MKTSH_{it} + \beta_7 REVG_{IT} + \beta_8 LRED_{it} + \sum_{k=1}^{10} \beta_{9k} Sector_{itk} + \sum_{j=1}^{2} \beta_{10j} Year_{itj} + \varepsilon$$

(1)

$$Financial\ Performance_{it+1} = \beta_0 + \beta_1 KLD_{it} + \beta_2 AGE_{it} + \beta_3 DE_{it} + \beta_4 LNTA_{it} + \beta_5 LEMP_{it} + \beta_6 MKTSH_{it} + \beta_7 REVG_{IT} + \beta_8 LRED_{it} + \sum_{k=1}^{10} \beta_{9k} Sector_{itk} + \sum_{j=1}^{2} \beta_{10j} Year_{itj} + \varepsilon$$

(2)

where Company Performance indicates to the financial measures that will be considered, namely ROA, Tobin's Q and CAPEX, KLD represents one (or more) of the ESG related scores depending on the system considered (*see Table 5*), Sector refers to the dummy variables related to the sector of belonging and the Year is the dummy variable related to the year of the observation, to capture the potential year fixed effect.

For the third part, where the three subsamples will be examined, the Sector variable will not be included.

Equation (1) is referred to all the non-lagged regressions, while (2) addresses the regressions where the dependent variable has one-year lag with respect to the other company data.

It is worth noting that both previous-year and current ESG scores and other company's characteristics could be both implicated in the current year's financial performance. This could have been done by including the independent variables of the previous as well as the current year or, alternatively, considering the differences of the variables' values between t - 1 and t, obtaining a dynamic panel model. However, by using them, the complexity of the system would increase, and for the aim of this work the investigation will be considering the models 1 (and 2) for the regressions, from which it is possible to also desume the combined effect.

As anticipated when dealing with the included variables, the inferential analysis will be articulated into three steps: at first, the overall ESG scores will be considered as the KLD values in both equations (1) and (2), varying the dependent variable. After having discussed those results, KLD term will be expressed as the scores related to the seven groups of variables (environment, human, community, employees, products, governance and diversity), the regressions will be re-run and also those results will be debated. As third step, only the companies proceeding from determined industry sectors will be analysed. The sectors in exam will be Consumer Discretionary, Industrials and Information Technology. The whole analysis aims at finding out the peculiarities of the link between ESG and financial performance, focusing on the changes of ESG categories and on the consequences in different industry sectors.

Some important limitations of the present study and suggestions for further research will be presented at the end of the discussion, in a dedicated paragraph.

CHAPTER 3: DATA EXPLORATION AND RESULTS DISCUSSION

3.1. Descriptive analysis

Table 6 gathers the number of observations finally considered for the study, divided by year and industry sector.

The sectors which contain the largest amount of observations are Financials, Industrials and Consumer Discretionary, while the sectors with less observations are Telecommunications and Utilities. When applying the models to sector subsamples, only Consumer Discretionary, Industrials and Information Technology will be considered, due to their large number of observations in the dataset. Despite the amount of observation, financials will not be further investigated due to the peculiarities of the sector. However, insights on the CSP-CFP relationship have been provided in many studies, cited in Chapter 1.

Table 6: Observations by year and by sector of activity

Sector	2013	2014	2015	Total by sector
Consumer Discretionary	274	293	309	876
Consumer Staples	82	84	88	254
Energy	123	130	113	366
Financials	303	313	328	944
Health Care	207	237	275	719
Industrials	298	312	315	925
Information Technology	277	283	301	861
Materials	104	105	107	316
Real Estate	124	137	145	406
Telecommunication Services	19	18	22	59
Utilities	61	62	65	188
Total number of observation	**1872**	**1974**	**2068**	**5914**

In *Table 7* some synthetic measures are listed for those independent variables which are not dichotomous. The total number of valid observations, mean and standard deviation are presented. Please note that both the original and the transformed variable are reported for those variables that were logarithm-transformed after a careful analysis of previous works.

The variables referred to the year distributions may be inferred from the previous table and their results are not crucial to a better understanding of the phenomenon. Mean and standard deviation show widely differing variables characteristics, which should be borne in mind

when analysing the results. In general, LEMP, LTA, MKTSH, REVG and LRED should all impact positively in the regression, at least from a theoretical background (see Chapter 1). DE and AGE relationship with CSR is more difficult to predict; some authors, as explained in Section 1.2.3. have discovered a positive relationship between CSR activity and D/E level, while others found out opposite results. On the other hand, AGE may present some obstacles as well as some advantages when dealing with CSR activities.

Table 7: Descriptive Statistics related to the Independent Variables a)

Variable b)	N	Mean	Std. Deviation
AGE	5790	26.43	24.66
DE	5894	1.27	33.11
LNTA	5897	21.78	1.72
LEMP	5737	8.04	1.95
MKTSH	5914	0.00	0.02
REVG	5419	0.19	4.46
LRED	5914	7.30	8.89

NOTES: a) dichotomous variables are not included in the table: year distribution and industry distribution may be checked in the previous Table. b) AGE is firm's age, DE is the ratio of Debt and Equity, TA is Total assets, LNTA is the natural logarithm of total assets, EMP is the number of employees, LEMP is the natural logarithm of employees, MKTSH is the Market share, REVG indicates Revenue growth, RED is the amount of Research&Development expenses, LRED indicates the natural logarithm of R&D expenses.

The following table analyses the overall ESG values by sector of activity, for all the overall ESG variables that will be investigated when modelling the relation. It is clear from the data that the ESG performance varies a lot across industries. The best net scores (ESG_NET_A) belong to Consumer staples, Utilities and Information Technology, while Consumer Discretionary, Industry and especially Energy present the lowest scores. Consumer Staples and Utilities score high also in Strengths measurements, followed by Materials; however, Consumer staples, together with Energy and Telecommunication Services, has also high values of Concerns going on. Energy is definitely the worst performing sector when looking to the different measures of overall scores, obtaining even a negative result with the weighted scores, as well as the lowest when looking at the ESG_NET_C score.

In the weighted scores (ESG_A_W), Consumer Discretionary and Industry are coherent to the ESG_NET_A ones. ESG_NET_C provides slightly different results, probably due to the fact of considering only the investigated variables in the computation. Overall, at least for the global ESG scores, even using different scoring methods there are not extreme inconsistencies. However, only further analyses will help understanding if results actually change by using different scoring methods.

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Table 8: ESG scores by Industry Sector

Sector	ESG_NET_A	ESG_S_A	ESG_C_A	ESG_A_W	ESG_NET_C
Consumer Discretionary	0.41	1.19	0.78	0.02	1.52
Consumer Staples	1.60	2.99	1.39	0.91	4.29
Energy	0.22	1.82	1.60	-0.57	1.12
Financials	0.80	1.38	0.58	0.51	1.71
Health Care	0.73	1.44	0.70	0.38	2.38
Industrials	0.42	1.25	0.83	0.00	1.83
Information Technology	1.37	2.02	0.66	1.04	3.21
Materials	0.93	2.08	1.15	0.35	2.92
Real Estate	0.57	1.16	0.58	0.28	2.58
Telecommunication Services	0.85	2.02	1.17	0.26	2.85
Utilities	1.84	2.97	1.13	1.28	3.12
Overall Average	0.78	1.61	0.83	0.37	2.26

ESG_NET_A is the overall net score considering the Actual value of the indicators, ESG_S_A and ESG_C_A are respectively the scores related to strengths and Concerns respectively calculated on the Actual values of the indicators, ESG_A_W is the negatively weighted score based on the Actual value of the indicators, ESG_NET_C is the overall net score considering the Comparable value of the indicators

For what concerns ESG scores considered by category, in the table below the average values for each ESG category are reported, showing strengths, concerns and net value. For some categories, such as environment, community, human and governance concern scores are not really high, so strengths and net follow similar patterns. Product and, above all, diversity presents more accentuate concerns profiles. Overall, the categories in which firms perform better, following KLD MSCI scores, are employees and environment.

Table 9: Scores distribution among ESG categories: Radar graph representation and Average values table

CATEGORIES	STRENGTHS	CONCERNS	NET
ENV	0.47	0.102	0.368
COM	0.072	0.024	0.048
HUM	0.051	0.02	0.031
EMP	0.603	0.074	0.529
DIV	0.18	0.409	-0.229
PRO	0.148	0.134	0.014
GOV	0.083	0.063	0.02
Total	**1.607**	**0.826**	**0.781**
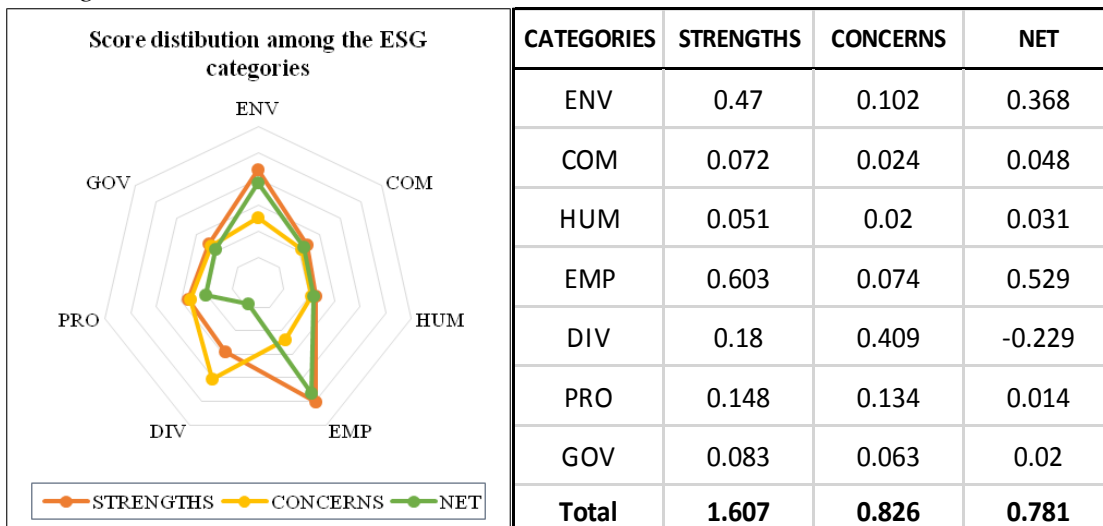
Breaking down the previous table by sector and considering only the net scores by category, some patterns can be found in relation to the category analysed. Before interpreting the results by industry, those patterns will be analysed. Environment has generally positive scores, except for a sector (Energy), Community has overall positive scores except for Materials; Human show quite antithetical results, passing from negative values to extremely positive ones, similarly to Product and Governance, which have respectively five and three positive results. Diversity is almost always negative (except for Utilities), while Employees scores are always positive, regardless of the considered sector.

After skimming the pattern of the category scores, some peculiarities popped up: Consumer Discretionary has low, but positive, results except for Humanity, Diversity, Product and Governance. A similar pattern is followed by Consumer staples, even if it has generally higher scores. Energy has low score in Environment, but it has the highest level of Human and general positive scores except for Diversity and Product categories. Financials have all positive results, except for Diversity. Health care is similar to Financials, even if it presents negative results also in Human and Governance. Industrials, Information Technology, Materials, Real Estate and Telecommunication services all have positive environmental, community (material 0) and Employees, but each one has one or multiple negative scores in other categories.

Utilities has the highest value for employees and the only positive score for diversity, but negative results for Product and Governance.

Table 10 : ESG scores by Sector and Category (Average values)

Sector	ENV	COM	HUM	EMP	DIV	PRO	GOV
Consumer Discretionary	0.34	0.03	-0.01	0.36	-0.15	-0.13	-0.03
Consumer Staples	1.09	0.16	0.05	0.40	0.00	-0.02	-0.08
Energy	-0.16	0.15	0.55	0.22	-0.64	-0.04	0.15
Financials	0.17	0.06	0.00	0.53	-0.17	0.06	0.15
Health Care	0.28	0.03	-0.01	0.43	-0.11	0.17	-0.05
Industrials	0.46	0.03	-0.05	0.35	-0.31	-0.10	0.05
Information Technology	0.53	0.05	0.00	0.98	-0.30	0.13	-0.03
Materials	0.62	0.00	0.09	0.66	-0.26	-0.18	0.00
Real Estate	0.35	0.02	0.00	0.39	-0.43	0.23	0.00
Telecommunication Services	0.47	0.10	-0.08	0.51	-0.14	0.03	-0.05
Utilities	0.25	0.04	0.05	1.38	0.34	-0.14	-0.07
Total	**0.37**	**0.05**	**0.03**	**0.53**	**-0.23**	**0.01**	**0.02**

In grey the minimum scores, in boxes the maximum for each ESG category

Dealing with the dependent variables data, some information – both numerical and graphical - about their distribution are provided to better understand the subsequent results.

Table 11: Dependent variables descriptives

Variable	Measure	Statistic time t	Std. Error time t	Statistic time t+1	Std. Error time t+1
LTOB	Mean	.022	.014	-.030	.013
	Median	.052		.026	
	Variance	1.054		1.011	
	Std. Deviation	1.027		1.005	
LCAPX	Mean	17.920	.028	17.958	.028
	Median	17.950		17.960	
	Variance	4.556		4.448	
	Std. Deviation	2.135		2.109	
ROA	Mean	.022	.002	.017	.002
	Median	.037		.034	
	Variance	.028		.022	
	Std. Deviation	.167		.149	

As it can be noticed by looking at the frequency distribution graphs, the dependent variables for which a natural logarithmic transformation was performed (Tobin's Q and CAPEX) are more normally distributed than the non-transformed ones (ROA), even if some degree of skewness is still present in Tobin's Q and both are not perfectly regular.

Figure 3: Frequency distribution of each dependent variable considered
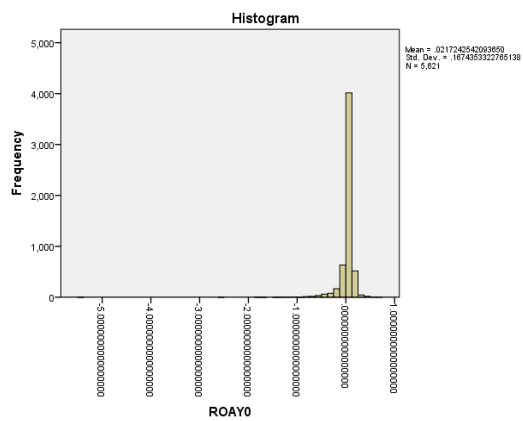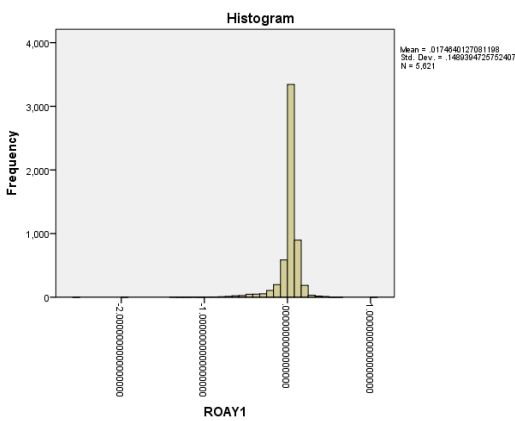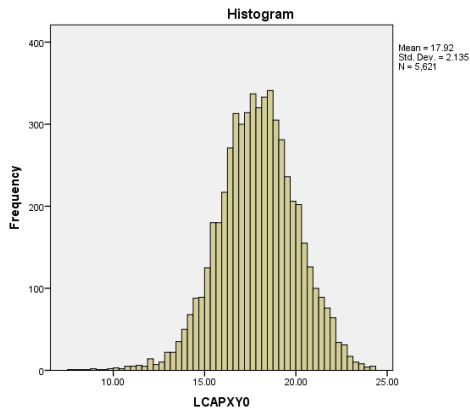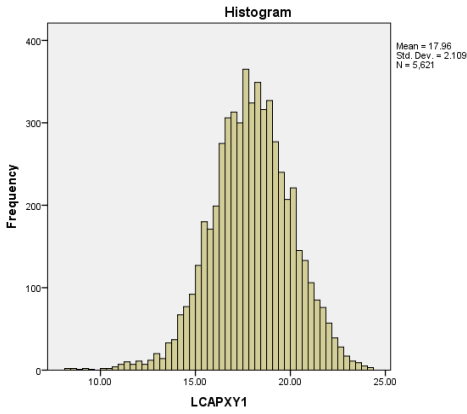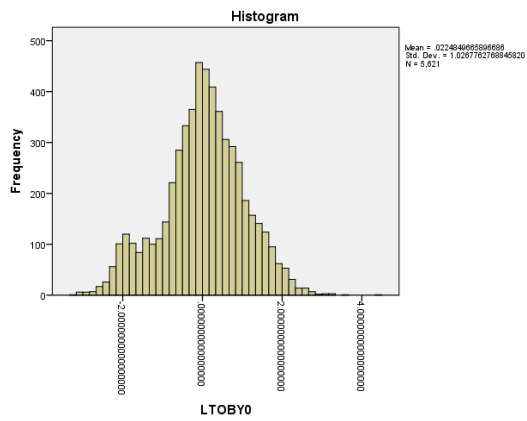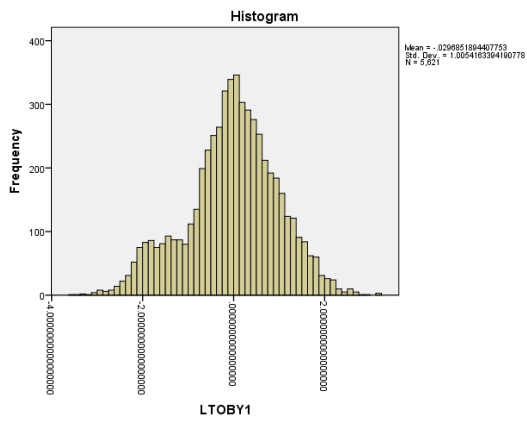
To complete the overview of the data under examination, the next page will present the part of the correlation matrix that includes the highest value.

Table 12: Correlation Matrix (partial) for the Overall dataset

	S_A	S_B	S_C	S_D	S_E	S_F	S_G	S_H	S_I	S_J	AGE	DE	LNTA	LEMP	MKTSH	REVG	LRED
S_A	1	-.088	-.107	-.182	-.155	-.180	-.172	-.099	-.113	-.042	.009	.015	-.057	.204	-.045	-.012	-.178
S_B		1	-.054	-.092	-.079	-.091	-.087	-.050	-.058	-.021	.115	-.002	.027	.120	.074	-.007	.020
S_C			1	-.112	-.096	-.111	-.106	-.061	-.070	-.026	-.040	-.003	.069	-.071	.021	-.015	-.018
S_D				1	-.162	-.188	-.180	-.104	-.118	-.044	-.037	.000	.311	-.118	-.056	-.008	-.347
S_E					1	-.160	-.154	-.088	-.101	-.037	-.064	-.009	-.223	-.165	-.018	.073	.310
S_F						1	-.178	-.102	-.117	-.043	.103	-.005	-.076	.171	-.048	-.014	.050
S_G							1	-.098	-.112	-.041	-.070	-.011	-.142	.042	-.046	-.007	.359
S_H								1	-.065	-.024	.076	.018	.000	.048	.037	-.010	.103
S_I									1	-.027	-.112	.001	.035	-.305	.015	-.003	-.216
S_J										1	-.019	.002	.035	.022	.261	-.002	-.014
AGE											1	.001	.155	.264	.107	-.017	.064
DE												1	.019	.012	.005	-.002	.015
LNTA													1	.579	.406	-.053	-.177
LEMP														1	.338	-.052	.022
MKTSH															1	-.011	.015
REVG																1	.028
LRED																	1

Where S_A is Consumer Discretionary, S_B is Consumer Staples, S_C is Energy, S_D is Financials, S_E is Health Care, S_F is Industrials, S_G is Information Technology, S_H is Materials, , S_I is Real Estate, S_J is Telecommunication Services.

3.2. OLS Linear model results

Some considerations on the validity of the models All the independent variables have been tested for collinearity. In this case there is no risk of perfect multicollinearity, given the fact that none of the variables is the linear transformation of some other variables. In particular, the highest values of correlation in the data between independent variables that are present simultaneously in the same regression are the ones observed between LNTA and LEMP (.579) and LNTA and ESG_S_A (.543), for what concerns the dataset related to the entire spectrum of sectors. The correlation among those variables is thus under .6 in absolute value and VIF coefficient equals the maximum value of 5.3, hence there is not a problem of multicollinearity. In fact VIF factors are below the threshold of 10 that is commonly used (Husted and Allen, 2007).

Collinearity was tested also for the sub-sample models. Even in those cases there is not perfect multicollinearity, even though the correlations between some variables were higher (Maximum value .832). Nonetheless, when tested for collinearity, all the VIF were less than 10. Autocorrelation should not represent a huge problem in this kind of regression since the majority of the companies are not present for more than one year, T (the periods considered in the regressions) equals 3, so it is really small. Since each year and each sector considered may be affected by particular conditions, year and sector dummies were inserted to control for them as previously explained. The performed Durbin-Watson test presented values around 2 for all the models tested, hence the risk related to high values of autocorrelation is largely avoided. Correlation between the residuals and the predicted value was found as non-existent as well, hence independence of the error term with respect to the fitted values seems to be present.

Residuals were also analysed to check the assumption in a graphical way. To check normality, the histogram of the residuals should be bell-shaped; to check linearity and homoscedasticity the residuals must be plotted against fitted values. The resulting scatter plot should appear homogeneus.[48]

A certain degree of heteroscedasticity is present in the data, as suggested by the graphical representations of the residuals and confirmed analytically testing through White, Breusch-Pagan and Koenker. The chosen way to cope with heteroscedasticity was to perform all regressions with robust standard errors, which provide more conservative results than regular regressions, even if it does not solve heteroscedasticity. The tables contained hereafter present said results.

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[48] See the Appendix for the residuals analysis through graphs.

Linearity is present, even if for very large and very small values the fit is not so accurate. This must be kept in mind whenever trying to do predictions estimating the values or the intervals of values for CFP for a given combination of the independent variables.

Normality of the dependent variable has been tested graphically, as for the residuals, and even if the related shapes are not perfectly normally distributed, OLS regression is still valid.

As explained in the Methodology Chapter, the interpretation of the coefficient when at least one among dependent and independent variables is obtained through a natural logarithmic transformation is less straightforward than in the regular linear regression. In the first model the interpretation will be extensively explained, while for the subsequent ones only the relevant annotations about the ESG variables and, if the case, other peculiarities will be listed. When analysing the effect of one independent variable over the dependent one, other variables are always held constant, in order to isolate the effects.

It is worth noting that the value of the coefficient is not really critical for this analysis, since, besides the variable significance and the model fitting, the most important aspect is the sign of the relationship.

The following results try to explain the relationships between the dependent and the independent variables considered without making assumptions about causality. They can only show the existence of some linear relationship. As a consequence, if the relationship is not linear in parameters those models will fail to correctly capture it. However, this should have been avoided, at least partially, by the previous analyses carried on and studying the relevant papers about this relationship characteristics.

The significance threshold chosen when discussing the following results is of 95%, so when a variable is described as not significant its p-value is larger than 5%. The tables report different levels of significance: 90% (*), 95% (**) and 99% (***). The comments will be referred to the unconstrained regressions, which are the ones presented in Chapter 2 and are based on the theoretical background. However, if the regressions were used in order to make predictions, it would be preferable to consider the constrained ones, since they give more efficient results. The constrained regressions should been obtained by removing the non-significant variables, one at the time, with a stepwise approach, in order to catch the changes in other variables' significance due to the removal of the non-significant variable.

3.2.1. Results for the overall ESG scores

As explained in the Methodology (Chapter 2), the first part of this analysis will address the overall ESG scores.

Table 13: ESG_NET_A in t

	D.V. LTOBY0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	6.237	0.228	0.000	***	1.901	0.363	0.000	***	-0.225	0.077	0.004	***
ESG_NET_A	0.065	0.005	0.000	***	0.017	0.006	0.007	***	0.000	0.001	0.892	
SECTOR_A	0.439	0.045	0.000	***	-1.365	0.074	0.000	***	0.039	0.007	0.000	***
SECTOR_B	0.458	0.060	0.000	***	-1.287	0.074	0.000	***	0.047	0.008	0.000	***
SECTOR_C	0.067	0.053	0.204		0.497	0.072	0.000	***	-0.015	0.009	0.092	*
SECTOR_D	-0.106	0.053	0.047	**	-3.014	0.086	0.000	***	0.042	0.006	0.000	***
SECTOR_E	0.702	0.049	0.000	***	-1.940	0.075	0.000	***	-0.077	0.010	0.000	***
SECTOR_F	0.197	0.044	0.000	***	-1.481	0.077	0.000	***	0.030	0.007	0.000	***
SECTOR_G	0.381	0.051	0.000	***	-1.820	0.075	0.000	***	0.033	0.009	0.000	***
SECTOR_H	-0.004	0.053	0.940		-0.963	0.069	0.000	***	0.020	0.008	0.011	**
SECTOR_I	0.562	0.040	0.000	***	0.200	0.079	0.012	**	0.049	0.005	0.000	***
SECTOR_J	-0.444	0.082	0.000	***	-0.351	0.117	0.003	***	0.030	0.014	0.029	**
AGE	-0.001	0.000	0.003	***	-0.001	0.000	0.006	***	0.000	0.000	0.001	***
DE	-0.001	0.001	0.056	*	0.000	0.000	0.293		0.000	0.000	0.924	
LNTA	-0.347	0.012	0.000	***	0.699	0.022	0.000	***	0.004	0.004	0.249	
LEMP	0.093	0.009	0.000	***	0.288	0.022	0.000	***	0.017	0.002	0.000	***
MKTSH	6.044	0.699	0.000	***	0.684	0.633	0.281		-0.429	0.120	0.000	***
REVG	0.007	0.001	0.000	***	-0.002	0.001	0.123		-0.004	0.002	0.053	*
LRED	0.021	0.001	0.000	***	0.003	0.002	0.073	*	-0.001	0.000	0.000	***
Y2013	0.178	0.024	0.000	***	0.010	0.034	0.768		0.020	0.005	0.000	***
Y2014	0.178	0.023	0.000	***	0.038	0.034	0.271		0.015	0.006	0.005	***
	Mean D.V.	0.129	S.D. of D.V.	0.944	Mean D.V.	18.067	S.D. of D.V.	2.085	Mean D.V.	0.027	S.D. of D.V.	0.165
	SSR	2456.318	S.E. reg	0.692	SSR	4969.535	S.E. reg	0.993	SSR	117.921	S.E. reg	0.151
	R^2	0.465	Adj R^2	0.463	R^2	0.774	Adj R^2	0.773	R^2	0.158	Adj R^2	0.155
	$F_{(20, 5131)}$	239.788	F p-value	0.000	$F_{(20, 5043)}$	1089.300	F p-value	0.000	$F_{(20, 5145)}$	28.087	F p-value	0.000
	N	5152			N	5064			N	5166		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error. SECTOR_A Consumer Discretionary, SECTOR_B Consumer Staples, , SECTOR_C Energy, SECTOR_D Financials, SECTOR_E Health Care, SECTOR_F Industrials, SECTOR_G Information Technology, SECTOR_H Materials, , SECTOR_I Real Estate, SECTOR_J Telecommunication Services.

Table 14: ESG_NET_A in t+1

	D.V. LTOBY1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	5.831	0.235	0.000	***	2.011	0.371	0.000	***	-0.119	0.050	0.018	**
ESG_NET_A	0.067	0.005	0.000	***	0.012	0.007	0.061	*	0.001	0.001	0.340	
SECTOR_A	0.319	0.046	0.000	***	-1.380	0.075	0.000	***	0.024	0.006	0.000	***
SECTOR_B	0.425	0.059	0.000	***	-1.284	0.076	0.000	***	0.037	0.007	0.000	***
SECTOR_C	-0.096	0.057	0.093	*	0.114	0.076	0.132		-0.068	0.011	0.000	***
SECTOR_D	-0.180	0.053	0.001	***	-3.061	0.085	0.000	***	0.045	0.006	0.000	***
SECTOR_E	0.563	0.051	0.000	***	-1.890	0.075	0.000	***	-0.078	0.009	0.000	***
SECTOR_F	0.146	0.044	0.001	***	-1.516	0.079	0.000	***	0.019	0.006	0.001	***
SECTOR_G	0.330	0.051	0.000	***	-1.833	0.076	0.000	***	0.013	0.007	0.062	*
SECTOR_H	-0.052	0.054	0.337		-1.027	0.071	0.000	***	0.007	0.007	0.321	
SECTOR_I	0.586	0.040	0.000	***	0.135	0.082	0.099	*	0.062	0.005	0.000	***
SECTOR_J	-0.457	0.092	0.000	***	-0.391	0.118	0.001	***	-0.006	0.018	0.760	
AGE	0.000	0.000	0.604		-0.002	0.000	0.000	***	0.000	0.000	0.000	***
DE	-0.001	0.000	0.060	*	-0.001	0.001	0.216		0.000	0.000	0.701	
LNTA	-0.325	0.012	0.000	***	0.699	0.023	0.000	***	-0.002	0.002	0.467	
LEMP	0.100	0.010	0.000	***	0.280	0.023	0.000	***	0.021	0.002	0.000	***
MKTSH	5.417	0.649	0.000	***	1.181	0.645	0.067	*	-0.303	0.097	0.002	***
REVG	0.003	0.001	0.001	***	-0.001	0.002	0.603		-0.001	0.002	0.548	
LRED	0.021	0.001	0.000	***	0.003	0.002	0.071	*	-0.001	0.000	0.000	***
Y2013	0.070	0.024	0.003	***	0.123	0.035	0.000	***	0.020	0.004	0.000	***
Y2014	-0.051	0.025	0.039	**	0.074	0.036	0.036	**	-0.002	0.005	0.740	
	Mean D.V.	0.070	S.D. of D.V.	0.936	Mean D.V.	18.105	S.D. of D.V.	2.059	Mean D.V.	0.021	S.D. of D.V.	0.145
	SSR	2614.210	S.E. reg	0.714	SSR	5313.595	S.E. reg	1.026	SSR	87.578	S.E. reg	0.130
	R²	0.421	Adj R²	0.419	R²	0.753	Adj R²	0.752	R²	0.195	Adj R²	0.192
	F(20, 5132)	199.512	F p-value	0.000	F(20, 5044)	1001.210	F p-value	0.000	F(20, 5147)	31.423	F p-value	0.000
	N	5153			N	5065			N	5168		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.
SECTOR_A Consumer Discretionary, SECTOR_B Consumer Staples, , SECTOR_C Energy, SECTOR_D

As it can be observed in the table, not all the variables included are significant, when testing the null hypothesis. In particular, ESG_NET_A is not significant in the ROA regression (both for current and lagged values). Debt to equity ratio only has some relevance (at a level of significance equal to 90%) in the LTOB regression.

In the following paragraphs the explanation of the different possible cases will be discussed to properly interpret the coefficients.

First, we consider the interpretation of log transformed independent variables when the dependent variable is also log-transformed (Log-Log regression). If R&D expenses increase by 1%, the expected increase in Tobin's Q in time t will be equal to β %, that in this case is 0.02%, other things held equal.

When considering the effect of a Log-Level regression, one-unit increase in the independent variable (not transformed) is associated to an increase in the dependent variable equal to $100*(e^{\beta}-1)$%. Considering REVG as independent variable in relation to Tobin's Q in time t, one-unit increase in REVG is associated to an increase equal to 0.7% in Tobin's Q, since $100*(e^{\beta}-1)$%.=100*exp(0.007)% = 100*(1.007025-1)%=0.7%[49]. The same reasoning applies to ESG_NET_A, thus one unit increase in ESG_NET_A produces an increase equal to 6,7% of Tobin's Q in t, since exp(0.065)=1.067. On these bases, ESG_NET_A has a positive relationship with CAPEX (+1.7% and +1.2%) and Tobin's Q (+6,7% and +6,9% respectively), for both time t and t+1 at a significance level of 10%.

When a non-log-transformed dependent variable (in this case, ROA) is considered in combination with a log-transformed independent variable (LEMP) to obtain a level-log regression, if LEMP increases by 1%, ROA will increase by $\Delta y=(\beta 1/100)\%\Delta x=0.00017$ or, with a more strict formulation, $\beta*\ln(1+\Delta x)=0.017*\ln(1.01)= 0.000169156$, when considering time t.

Lastly, when both the dependent and the independent variables are not transformed, the interpretation of the coefficient do not need additional calculations: an increase of 1 unit in the independent variable X_1 produces an variation equal to β_1 in the dependent variable Y.

Dealing with the significance of the control variables included in the model, it seems that the chosen modelling fits LTOB the best.

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[49] The variation is described by the following formula, even if for some valuesit can be simplified to 100·β1 percent

$$\%\Delta y = 100 \cdot \left(e^{\beta_1} - 1\right)$$

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Table 15: ESG_S_A and ESG_C_A in t

	D.V. LTOBY0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	6.498	0.229	0.000	***	2.024	0.377	0.000	***	-0.242	0.084	0.004	***
ESG_S_A	0.077	0.005	0.000	***	0.023	0.007	0.001	***	-0.001	0.001	0.398	
ESG_C_A	-0.010	0.011	0.351		0.008	0.013	0.566		-0.003	0.002	0.078	*
SECTOR_A	0.444	0.046	0.000	***	1.363	0.074	0.000	***	0.038	0.007	0.000	***
SECTOR_B	0.437	0.060	0.000	***	1.297	0.075	0.000	***	0.049	0.008	0.000	***
SECTOR_C	0.042	0.053	0.431		0.484	0.072	0.000	***	-0.014	0.009	0.144	
SECTOR_D	-0.076	0.054	0.154		-3.003	0.086	0.000	***	0.040	0.006	0.000	***
SECTOR_E	0.713	0.049	0.000	***	1.936	0.075	0.000	***	0.078	0.010	0.000	***
SECTOR_F	0.205	0.044	0.000	***	1.478	0.077	0.000	***	0.029	0.007	0.000	***
SECTOR_G	0.394	0.051	0.000	***	1.815	0.075	0.000	***	0.032	0.009	0.000	***
SECTOR_H	-0.004	0.054	0.942		0.963	0.069	0.000	***	0.020	0.008	0.011	**
SECTOR_I	0.583	0.041	0.000	***	0.209	0.080	0.009	***	0.048	0.005	0.000	***
SECTOR_J	0.375	0.081	0.000	***	-0.320	0.119	0.007	***	0.025	0.013	0.055	*
AGE	-0.001	0.000	0.001	***	-0.001	0.000	0.005	***	0.000	0.000	0.001	***
DE	0.001	0.001	0.066	*	0.000	0.000	0.327		0.000	0.000	0.979	
LNTA	-0.360	0.012	0.000	***	0.693	0.022	0.000	***	0.005	0.004	0.206	
LEMP	0.093	0.009	0.000	***	0.287	0.022	0.000	***	0.017	0.002	0.000	***
MKTSH	4.331	0.693	0.000	***	-0.088	0.731	0.904		0.320	0.094	0.001	***
REVG	0.007	0.001	0.000	***	-0.002	0.001	0.118		-0.004	0.002	0.053	*
LRED	0.019	0.001	0.000	***	0.003	0.002	0.149		-0.001	0.000	0.000	***
Y2013	0.140	0.025	0.000	***	-0.007	0.035	0.837		0.023	0.005	0.000	***
Y2014	0.180	0.023	0.000	***	0.038	0.034	0.262		0.015	0.006	0.006	***
	Mean D.V.	0.129	S.D. of D.V.	0.944	Mean D.V.	18.067	S.D. of D.V.	2.085	Mean D.V.	0.027	S.D. of D.V.	0.165
	SSR	2439.333	S.E. reg	0.690	SSR	4966.024	S.E. reg	0.992	SSR	117.849	S.E. reg	0.151
	R^2	0.469	Adj R^2	0.467	R^2	0.774	Adj R^2	0.773	R^2	0.159	Adj R^2	0.155
	$F_{(21, 5130)}$	232.831	F p-value	0.000	$F_{(21, 5042)}$	1092.476	F p-value	0.000	$F_{(21, 5144)}$	27.457	F p-value	0.000
	N	5152			N	5064			N	5166		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error. SECTOR_A Consumer Discretionary, SECTOR_B Consumer Staples, SECTOR_C Energy, SECTOR_D Financials, SECTOR_E Health Care, SECTOR_F Industrials, SECTOR_G Information Technology, SECTOR_H Materials, SECTOR_I Real Estate, SECTOR_J Telecommunication Services.

Table 16: ESG_S_A and ESG_C_A in t+1

	D.V. LTOBY				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	6.005	0.237	0.000	***	2.159	0.385	0.000	***	-0.139	0.054	0.010	**
ESG_S_A	0.075	0.005	0.000	***	0.019	0.007	0.010	***	0.000	0.001	0.857	
ESG_C_A	-0.030	0.011	0.009	***	0.018	0.014	0.209		-0.005	0.002	0.003	***
SECTOR_A	0.323	0.046	0.000	***	-1.377	0.075	0.000	***	0.024	0.006	0.000	***
SECTOR_B	0.410	0.059	0.000	***	-1.296	0.076	0.000	***	0.039	0.007	0.000	***
SECTOR_C	-0.113	0.058	0.050	*	0.098	0.076	0.196		-0.066	0.011	0.000	***
SECTOR_D	-0.161	0.054	0.003	***	-3.047	0.085	0.000	***	0.043	0.006	0.000	***
SECTOR_E	0.571	0.051	0.000	***	-1.884	0.075	0.000	***	-0.079	0.009	0.000	***
SECTOR_F	0.152	0.044	0.001	***	-1.512	0.079	0.000	***	0.019	0.006	0.001	***
SECTOR_G	0.339	0.051	0.000	***	-1.827	0.075	0.000	***	0.012	0.007	0.080	*
SECTOR_H	-0.052	0.055	0.340		-1.027	0.071	0.000	***	0.007	0.007	0.316	
SECTOR_I	0.600	0.041	0.000	***	0.146	0.082	0.076	*	0.060	0.005	0.000	***
SECTOR_J	-0.411	0.091	0.000	***	-0.354	0.121	0.003	***	-0.011	0.018	0.551	
AGE	0.000	0.000	0.513		-0.002	0.000	0.000	***	0.000	0.000	0.000	***
DE	-0.001	0.000	0.068	*	-0.001	0.001	0.236		0.000	0.000	0.798	
LNTA	-0.334	0.013	0.000	***	0.692	0.023	0.000	***	-0.001	0.003	0.783	
LEMP	0.099	0.010	0.000	***	0.280	0.023	0.000	***	0.021	0.002	0.000	***
MKTSH	4.275	0.681	0.000	***	0.256	0.740	0.730		-0.171	0.089	0.056	*
REVG	0.003	0.001	0.001	***	-0.001	0.002	0.579		-0.001	0.002	0.551	
LRED	0.020	0.001	0.000	***	0.003	0.002	0.159		-0.001	0.000	0.000	***
Y2013	0.045	0.025	0.069	*	0.102	0.036	0.005	***	0.023	0.004	0.000	***
Y2014	-0.050	0.025	0.044	**	0.075	0.035	0.034	**	-0.002	0.005	0.719	
	Mean D.V.	0.070	S.D. of D.V.	0.936	Mean D.V.	18.105	S.D. of D.V.	2.059	Mean D.V.	0.021	S.D. of D.V.	0.145
	SSR	2606.659	S.E. reg	0.713	SSR	5308.543	S.E. reg	1.026	SSR	87.473	S.E. reg	0.130
	R^2	0.423	Adj R^2	0.420	R^2	0.753	Adj R^2	0.752	R^2	0.196	Adj R^2	0.193
	F(21, 5131)	191.072	F p-value	0.000	F(21, 5043)	1008.325	F p-value	0.000	F(21, 5146)	30.286	F p-value	0.000
	N	5153			N	5065			N	5168		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error. SECTOR_A Consumer Discretionary, SECTOR_B Consumer Staples, SECTOR_C Energy, SECTOR_D Financials, SECTOR_E Health Care, SECTOR_F Industrials, SECTOR_G Information Technology, SECTOR_H Materials, SECTOR_I Real Estate, SECTOR_J Telecommunication Services

When ESG_S_A and ESG_C_A are kept separated, one unit increase in ESG_S_A is associated to an increase equal to 8% in Tobin's Q in year t, and a 7,8% increase in Tobin's Q in year t+1. Dealing with CAPEX, one unit increase in ESG_S_A is associated to an increase equal to 8% of 2,3% and 1,9% in CAPEX, respectively in t and t+1. On these bases, ESG_S_A has a positive relationship with CAPEX and Tobin's Q, for both time t and t+1 at a significance level of 0.01. Its relationship with ROA is not significant for any of the significance level considered.

Addressing the effects of ESG_C_A, there is an actual relationship only with Tobin's Q in t and ROA. In the first case, one unit increase in ESG_C_A is associated to a decrease equal to 3% in Tobin's Q in year t+1, while considering ROA t and ROA t+1, the decrease amounts to 0.003 and 0.005 respectively.

Table 17: ESG_A_W in t

	D.V. LTOBY0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	6.027	0.226	0.000	***	1.831	0.356	0.000	***	-0.221	0.074	0.003	***
ESG_A_W	0.052	0.005	0.000	***	0.013	0.006	0.026	**	0.000	0.001	0.713	
SECTOR_A	0.429	0.045	0.000	***	-1.369	0.074	0.000	***	0.039	0.007	0.000	***
SECTOR_B	0.464	0.061	0.000	***	-1.285	0.074	0.000	***	0.047	0.008	0.000	***
SECTOR_C	0.065	0.053	0.217		-0.495	0.072	0.000	***	-0.015	0.009	0.108	
SECTOR_D	-0.121	0.053	0.022	**	-3.018	0.086	0.000	***	0.042	0.006	0.000	***
SECTOR_E	0.695	0.049	0.000	***	-1.942	0.075	0.000	***	-0.077	0.010	0.000	***
SECTOR_F	0.184	0.044	0.000	***	-1.485	0.077	0.000	***	0.030	0.007	0.000	***
SECTOR_G	0.376	0.051	0.000	***	-1.821	0.075	0.000	***	0.033	0.009	0.000	***
SECTOR_H	0.011	0.053	0.838		-0.966	0.069	0.000	***	0.020	0.008	0.011	**
SECTOR_I	0.552	0.040	0.000	***	0.198	0.079	0.013	**	0.050	0.005	0.000	***
SECTOR_J	-0.475	0.083	0.000	***	-0.359	0.117	0.002	***	0.030	0.014	0.030	**
AGE	0.001	0.000	0.007	***	0.001	0.000	0.007	***	0.000	0.000	0.001	***
DE	-0.001	0.001	0.054	*	0.000	0.000	0.290		0.000	0.000	0.932	
LNTA	-0.336	0.012	0.000	***	0.702	0.021	0.000	***	0.004	0.004	0.255	
LEMP	0.095	0.009	0.000	***	0.288	0.022	0.000	***	0.017	0.002	0.000	***
MKTSH	6.623	0.747	0.000	***	0.810	0.649	0.212		-0.422	0.122	0.001	***

	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
REVG	0.007	0.002	0.000	***	-0.002	0.001	0.129		-0.004	0.002	0.053	*
LRED	0.022	0.001	0.000	***	0.004	0.002	0.052	*	-0.001	0.000	0.000	***
Y2013	0.192	0.024	0.000	***	0.013	0.034	0.697		0.020	0.005	0.000	***
Y2014	0.174	0.024	0.000	***	0.036	0.034	0.294		0.016	0.006	0.005	***
Mean D.V.	0.129	S.D. of D.V.	0.944		Mean D.V.	18.067	S.D. of D.V.	2.085	Mean D.V.	0.027	S.D. of D.V.	0.165
SSR	2473.346	S.E. reg	0.694		SSR	4971.360	S.E. reg	0.993	SSR	117.919	S.E. reg	0.151
R²	0.462	Adj R²	0.460		R²	0.774	Adj R²	0.773	R²	0.158	Adj R²	0.155
F(20, 5131)	236.658	F p-value	0.000		F(20, 5043)	1073.617	F p-value	0.000	F(20, 5145)	27.613	F p-value	0.000
N	5152.00				N	5064.00			N	5166.00		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error. SECTOR_A Consumer Discretionary, SECTOR_B Consumer Staples, SECTOR_C Energy, SECTOR_D Financials, SECTOR_E Health Care, SECTOR_F Industrials, SECTOR_G Information Technology, SECTOR_H Materials, SECTOR_I Real Estate, SECTOR_J Telecommunication Services

Table 18: ESG_A_W in t+1

	D.V. LTOBY1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	5.639	0.232	0.000	***	1.947	0.364	0.000	***	-0.115	0.049	0.018	**
ESG_A_W	0.055	0.005	0.000	***	0.008	0.006	0.184		0.001	0.001	0.116	
SECTOR_A	0.311	0.046	0.000	***	-1.383	0.075	0.000	***	0.025	0.006	0.000	***
SECTOR_B	0.432	0.060	0.000	***	-1.283	0.076	0.000	***	0.038	0.007	0.000	***
SECTOR_C	-0.095	0.057	0.098	*	0.111	0.076	0.145		-0.068	0.011	0.000	***
SECTOR_D	-0.196	0.053	0.000	***	-3.064	0.085	0.000	***	0.045	0.006	0.000	***
SECTOR_E	0.556	0.051	0.000	***	-1.891	0.075	0.000	***	-0.078	0.009	0.000	***
SECTOR_F	0.136	0.044	0.002	***	-1.520	0.079	0.000	***	0.020	0.006	0.001	***
SECTOR_G	0.325	0.051	0.000	***	-1.834	0.076	0.000	***	0.013	0.007	0.064	*
SECTOR_H	-0.057	0.054	0.288		-1.030	0.071	0.000	***	0.007	0.007	0.298	
SECTOR_I	0.576	0.040	0.000	***	0.133	0.082	0.104		0.062	0.005	0.000	***
SECTOR_J	-0.488	0.092	0.000	***	-0.397	0.118	0.001	***	-0.006	0.018	0.744	
AGE	0.000	0.000	0.782		-0.002	0.000	0.000	***	0.000	0.000	0.000	***
DE	-0.001	0.000	0.057	*	-0.001	0.001	0.215		0.000	0.000	0.720	
LNTA	-0.316	0.012	0.000	***	0.702	0.022	0.000	***	-0.002	0.002	0.420	
LEMP	0.101	0.010	0.000	***	0.281	0.023	0.000	***	0.021	0.002	0.000	***

	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
MKTSH	6.056	0.696	0.000	***	1.243	0.662	0.061	*	-0.285	0.098	0.004	***
REVG	0.003	0.001	0.001	***	-0.001	0.002	0.617		-0.001	0.002	0.547	
LRED	0.022	0.001	0.000	***	0.004	0.002	0.053	*	-0.001	0.000	0.000	***
Y2013	0.085	0.024	0.000	***	0.125	0.035	0.000	***	0.021	0.004	0.000	***
Y2014	-0.055	0.025	0.027	**	0.073	0.035	0.041	**	-0.001	0.005	0.772	
Mean D.V.	0.070	S.D. of D.V.	0.936		Mean D.V.	18.105	S.D. of D.V.	2.059		Mean D.V.	0.021	S.D. of D.V. 0.145
SSR	2627.194	S.E. reg	0.715		SSR	5314.993	S.E. reg	1.027		SSR	87.560	S.E. reg 0.130
R^2	0.418	Adj R^2	0.416		R^2	0.752	Adj R^2	0.751		R^2	0.196	Adj R^2 0.192
F(20, 5132)	197.951	F p-value	0.000		F(20, 5044)	987.862	F p-value	0.000		F(20, 5147)	31.213	F p-value 0.000
N	5153				N	5065				N	5168	

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.
SECTOR_A Consumer Discretionary, SECTOR_B Consumer Staples, , SECTOR_C Energy, SECTOR_D
Financials, SECTOR_E Health Care, SECTOR_F Industrials, SECTOR_G Information Technology,
SECTOR_H Materials, , SECTOR_I Real Estate, SECTOR_J Telecommunication Services

For the weighted score, the dependent variable has a significant and positive association with Tobin's Q in t (+5.34%) and t+1 (+5.65%) and for CAPEX in t (+1.3%) as well. However, the associations are not relevant for the other dependent variables considered. The effects of the control variables are not too different from the ones present in the previous tables, at least considering the sign.

Table 19: ESG_NET_C in t

	D.V. LTOBY0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	6.259	0.228	0.000	***	1.973	0.368	0.000	***	-0.201	0.077	0.009	***
ESG_NET_C	0.037	0.003	0.000	***	0.013	0.004	0.001	***	0.001	0.000	0.030	**
SECTOR_A	0.396	0.044	0.000	***	-1.375	0.074	0.000	***	0.039	0.007	0.000	***
SECTOR_B	0.397	0.059	0.000	***	-1.306	0.075	0.000	***	0.046	0.008	0.000	***
SECTOR_C	0.034	0.051	0.508		0.492	0.071	0.000	***	-0.014	0.009	0.127	
SECTOR_D	-0.124	0.052	0.017	**	-3.018	0.086	0.000	***	0.042	0.006	0.000	***
SECTOR_E	0.658	0.048	0.000	***	-1.954	0.075	0.000	***	-0.077	0.010	0.000	***
SECTOR_F	0.147	0.043	0.001	***	-1.493	0.077	0.000	***	0.030	0.007	0.000	***
SECTOR_G	0.348	0.050	0.000	***	-1.831	0.075	0.000	***	0.032	0.009	0.000	***

	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
SECTOR_H	-0.057	0.052	0.276		-0.977	0.069	0.000	***	0.020	0.008	0.012	**
SECTOR_I	0.499	0.039	0.000	***	0.180	0.080	0.024	**	0.048	0.005	0.000	***
SECTOR_J	-0.475	0.080	0.000	***	-0.359	0.117	0.002	***	0.030	0.014	0.029	**
AGE	-0.001	0.000	0.003	***	-0.001	0.000	0.005	***	0.000	0.000	0.002	***
DE	-0.001	0.001	0.066	*	0.000	0.000	0.303		0.000	0.000	0.941	
LNTA	-0.347	0.012	0.000	***	0.696	0.022	0.000	***	0.003	0.004	0.389	
LEMP	0.095	0.009	0.000	***	0.287	0.022	0.000	***	0.017	0.002	0.000	***
MKTSH	5.383	0.618	0.000	***	0.505	0.619	0.415		-0.430	0.117	0.000	***
REVG	0.007	0.002	0.000	***	-0.002	0.001	0.121		-0.004	0.002	0.052	*
LRED	0.020	0.001	0.000	***	0.003	0.002	0.122		-0.001	0.000	0.000	***
Y2013	0.169	0.024	0.000	***	0.008	0.034	0.823		0.020	0.005	0.000	***
Y2014	0.154	0.023	0.000	***	0.032	0.034	0.350		0.016	0.006	0.004	***
	Mean D.V.	0.129	S.D. of D.V.	0.944	Mean D.V.	18.067	S.D. of D.V.	2.085	Mean D.V.	0.027	S.D. of D.V.	0.165
	SSR	2462.715	S.E. reg	0.693	SSR	4966.803	S.E. reg	0.992	SSR	117.865	S.E. reg	0.151
	R^2	0.464	Adj R^2	0.462	R^2	0.774	Adj R^2	0.773	R^2	0.159	Adj R^2	0.155
	$F_{(20, 5131)}$	245.214	F p-value	0.000	$F_{(20, 5043)}$	1106.934	F p-value	0.000	$F_{(20, 5145)}$	27.895	F p-value	0.000
	N	5152			N	5064			N	5166		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error. SECTOR_A Consumer Discretionary, SECTOR_B Consumer Staples, SECTOR_C Energy, SECTOR_D Financials, SECTOR_E Health Care, SECTOR_F Industrials, SECTOR_G Information Technology, SECTOR_H Materials, SECTOR_I Real Estate, SECTOR_J Telecommunication Services

Table 20: ESG_NET_C in t+1

	D.V. LTOBY1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	5.797	0.236	0.000	***	2.120	0.378	0.000	***	-0.095	0.050	0.060	*
ESG_NET_C	0.036	0.003	0.000	***	0.012	0.004	0.005	***	0.002	0.000	0.001	***
SECTOR_A	0.275	0.045	0.000	***	-1.386	0.075	0.000	***	0.024	0.006	0.000	***
SECTOR_B	0.364	0.059	0.000	***	-1.301	0.076	0.000	***	0.035	0.007	0.000	***
SECTOR_C	0.134	0.056	0.017	**	0.114	0.076	0.132		-0.067	0.010	0.000	***
SECTOR_D	0.200	0.052	0.000	***	-3.064	0.085	0.000	***	0.045	0.006	0.000	***
SECTOR_E	0.520	0.050	0.000	***	-1.902	0.075	0.000	***	-0.079	0.009	0.000	***
SECTOR_F	0.094	0.043	0.029	**	-1.524	0.079	0.000	***	0.019	0.006	0.001	***
SECTOR_G	0.298	0.051	0.000	***	-1.844	0.076	0.000	***	0.012	0.007	0.093	*

	Coef.	S.E.	p-value	Sig.	Coef.	S.E.	p-value	Sig.	Coef.	S.E.	p-value	Sig.
SECTOR_H	-0.106	0.054	0.048	**	-1.037	0.071	0.000	***	0.006	0.007	0.369	
SECTOR_I	0.525	0.039	0.000	***	0.117	0.082	0.155		0.060	0.005	0.000	***
SECTOR_J	-0.488	0.089	0.000	***	-0.397	0.118	0.001	***	-0.006	0.018	0.745	
AGE	0.000	0.000	0.690		-0.002	0.000	0.000	***	0.000	0.000	0.000	***
DE	-0.001	0.000	0.073	*	-0.001	0.001	0.220		0.000	0.000	0.711	
LNTA	-0.323	0.012	0.000	***	0.694	0.023	0.000	***	-0.003	0.002	0.245	
LEMP	0.102	0.010	0.000	***	0.280	0.023	0.000	***	0.021	0.002	0.000	***
MKTSH	4.743	0.588	0.000	***	1.051	0.629	0.095	*	-0.313	0.095	0.001	***
REVG	0.003	0.001	0.001	***	-0.001	0.002	0.591		-0.001	0.002	0.543	
LRED	0.020	0.001	0.000	***	0.003	0.002	0.129		-0.001	0.000	0.000	***
Y2013	0.061	0.024	0.010	**	0.121	0.035	0.001	***	0.020	0.004	0.000	***
Y2014	-0.076	0.025	0.002	***	0.071	0.035	0.046	**	-0.002	0.005	0.721	
	Mean D.V.	0.070	S.D. of D.V.	0.936	Mean D.V.	18.105	S.D. of D.V.	2.059	Mean D.V.	0.021	S.D. of D.V.	0.145
	SSR	2630.644	S.E. reg	0.716	SSR	5309.583	S.E. reg	1.026	SSR	87.470	S.E. reg	0.130
	R^2	0.417	Adj R^2	0.415	R^2	0.753	Adj R^2	0.752	R^2	0.196	Adj R^2	0.193
	$F_{(20, 5132)}$	201.933	F p-value	0.000	$F_{(20, 5044)}$	1025.964	F p-value	0.000	$F_{(20, 5147)}$	31.278	F p-value	0.000
	N	5153			N	5065			N	5168		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error. SECTOR_A Consumer Discretionary, SECTOR_B Consumer Staples, SECTOR_C Energy, SECTOR_D Financials, SECTOR_E Health Care, SECTOR_F Industrials, SECTOR_G Information Technology, SECTOR_H Materials, SECTOR_I Real Estate, SECTOR_J Telecommunication Services

Dealing with the comparable score**,** ESG_NET_C coefficients seem to have all a significant positive association with the dependent variable considered.

For Tobin's Q, the effect of one unit increase in ESG_NET_C are +3.37% and +3.67%, for CAPEX they are +1.3% and +1.2%, while for ROA they equal +0.001 and +0.002, respectively for time t and t+1.

The effect on the dependent variables of the overall ESG scores is thus in line with what found in the literature: sometimes this relation is not present, it often is positive, and, when strengths and concerns are considered separately, they are significant and they have the expected sign.

The association is stronger for those dependent variables more medium-to-long term oriented (such as Tobin's Q and CAPEX), while it often vanishes for those accounting measures which entail a shorter horizon (for instance, considering ROA).

The results for the ESG categories will be presented in the following paragraphs.

3.2.2. Results for the ESG categories scores

Sector variables are not shown in the tables, but the full results are available in the Appendix.

Table 21: Actual net scores by category in t

	D.V. LTOBY0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	6.340	0.228	0.000	***	1.954	0.369	0.000	***	-0.242	0.080	0.002	***
ENV_A_NET	0.076	0.012	0.000	***	-0.001	0.014	0.960		0.001	0.002	0.630	
COM_A_NET	-0.017	0.033	0.599		-0.046	0.040	0.249		-0.006	0.005	0.222	
HUM_A_NET	0.084	0.036	0.018	**	0.186	0.047	0.000	***	-0.017	0.006	0.007	***
EMP_A_NET	0.094	0.010	0.000	***	0.045	0.013	0.000	***	0.002	0.002	0.285	
DIV_A_NET	0.055	0.014	0.000	***	0.006	0.021	0.774		-0.005	0.003	0.133	
PRO_A_NET	0.026	0.022	0.237		0.010	0.027	0.704		0.011	0.004	0.004	***
GOV_A_NET	-0.069	0.033	0.035	**	-0.085	0.047	0.070	*	-0.005	0.005	0.283	
AGE	-0.001	0.000	0.003	***	-0.001	0.000	0.010	**	0.000	0.000	0.001	***
DE	-0.001	0.001	0.060	*	0.000	0.000	0.348		0.000	0.000	0.937	
LNTA	-0.352	0.012	0.000	***	0.694	0.022	0.000	***	0.005	0.004	0.185	
LEMP	0.092	0.009	0.000	***	0.290	0.022	0.000	***	0.017	0.002	0.000	***
MKTSH	5.593	0.646	0.000	***	0.930	0.689	0.177		-0.400	0.119	0.001	***
REVG	0.007	0.001	0.000	***	-0.002	0.001	0.122		-0.004	0.002	0.053	*
LRED	0.021	0.001	0.000	***	0.004	0.002	0.055	*	-0.001	0.000	0.000	***
Y2013	0.173	0.026	0.000	***	0.002	0.037	0.960		0.018	0.005	0.000	***
Y2014	0.181	0.023	0.000	***	0.040	0.034	0.239		0.015	0.006	0.007	***
	Mean D.V.	0.129	S.D. of D.V.	0.944	Mean D.V.	18.067	S.D. of D.V.	2.085	Mean D.V.	0.027	S.D. of D.V.	0.165
	SSR	2438.616	S.E. reg	0.690	SSR	4950.343	S.E. reg	0.991	SSR	117.543	S.E. reg	0.151
	R^2	0.469	Adj R^2	0.467	R^2	0.775	Adj R^2	0.774	R^2	0.161	Adj R^2	0.157
	$F_{(26, 5125)}$	185.383	F p-value	0.000	$F_{(26, 5037)}$	839.649	F p-value	0.000	$F_{(26, 5139)}$	22.163	F p-value	0.000
	N	5152			N	5064			N	5166		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 22: Actual net scores by category in t + 1

	D.V. LTOBY1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	5.907	0.236	0.000	***	2.037	0.374	0.000	***	-0.136	0.052	0.009	***
ENV_A_NET	0.066	0.012	0.000	***	-0.005	0.015	0.710		0.002	0.002	0.303	
COM_A_NET	0.013	0.035	0.704		-0.070	0.040	0.083	*	-0.006	0.004	0.204	
HUM_A_NET	0.150	0.037	0.000	***	0.154	0.051	0.002	***	-0.014	0.008	0.081	*
EMP_A_NET	0.088	0.010	0.000	***	0.051	0.013	0.000	***	0.003	0.002	0.080	*
DIV_A_NET	0.062	0.015	0.000	***	-0.015	0.021	0.474		-0.004	0.003	0.139	
PRO_A_NET	0.040	0.023	0.073	*	0.022	0.027	0.415		0.013	0.004	0.000	***
GOV_A_NET	-0.411	0.092	0.000	***	-0.356	0.122	0.004	***	-0.011	0.018	0.547	
AGE	0.000	0.000	0.673		-0.002	0.000	0.000	***	0.000	0.000	0.000	***
DE	-0.001	0.000	0.068	*	-0.001	0.001	0.233		0.000	0.000	0.725	
LNTA	-0.330	0.012	0.000	***	0.695	0.023	0.000	***	-0.001	0.003	0.704	
LEMP	0.099	0.010	0.000	***	0.283	0.023	0.000	***	0.021	0.002	0.000	***
MKTSH	5.201	0.624	0.000	***	1.516	0.690	0.028	**	-0.263	0.097	0.007	***
REVG	0.003	0.001	0.001	***	-0.001	0.002	0.596		-0.001	0.002	0.546	
LRED	0.021	0.001	0.000	***	0.004	0.002	0.046	**	-0.001	0.000	0.000	***
Y2013	0.066	0.026	0.011	**	0.106	0.038	0.006	***	0.018	0.004	0.000	***
Y2014	-0.048	0.025	0.050	*	0.076	0.035	0.032	**	-0.002	0.005	0.642	
	Mean D.V.	0.070	S.D. of D.V.	0.936	Mean D.V.	18.105	S.D. of D.V.	2.059	Mean D.V.	0.021	S.D. of D.V.	0.145
	SSR	2602.298	S.E. reg	0.713	SSR	5291.292	S.E. reg	1.025	SSR	87.187	S.E. reg	0.130
	R^2	0.424	Adj R^2	0.421	R^2	0.754	Adj R^2	0.752	R^2	0.199	Adj R^2	0.195
	F(26, 5126)	152.989	F p-value	0.000	F(26, 5038)	782.359	F p-value	0.000	F(26, 5141)	25.483	F p-value	0.000
	N	5153			N	5065			N	5168		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

ENV_A_NET coefficients are significant only for Tobin's Q. One unit increase in ENV_A_NET is associated to an increase of 7.9% and 6.8% in t and t+1 respectively.

COM_A_NET has a significant coefficient only for CAPEX in t+1, and one unit increase is associated to a variation in CAPEX equal to -0.7%.

HUM_A_NET is relevant for all the dependent variables, but while for Tobin's Q and CAPEX the variation of the dependent variable due to one unit increase in the independent variable is positive (+8.8%, +16.2%, +20.4% and +16.65% respectively), for ROA the variations are equal to -0.017 and -0.014.

Dealing with EMP_A_NET, for Tobin's Q and CAPEX the variation of the dependent variable due to one unit increase in the independent variable is +9.9%, +9.2%, +4.6% and +5.2% respectively, while for ROA t+1 it is +0.003.

DIV_A_NET is relevant only for Tobin's Q, with increases of +5.7% and +6.4% for a one-unit increase respectively, while PRO_A_NET is relevant for only for ROA +0.011 and +0.013 points, in addition to Tobin's Q t+1 with an increase of +4.1%.

One unit increase in GOV_A_NET is associated to a variation in the dependent variable equal to -6.7% for Tobin's Q in t and -8.1% and -9.6% for CAPEX, respectively in t and t+1.

When considering the single categories, thus, usually the effect on the dependent variable is positive, except for GOV_A_NET and some cases of HUM_A_NET and COM_A_NET.

Table 23: Actual net ESG scores by category, keeping strengths and concerns separated in t

	D.V. LTOBY0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	6.646	0.235	0.000	***	2.183	0.388	0.000	***	-0.226	0.082	0.006	***
ENV_S_A	0.087	0.013	0.000	***	0.008	0.015	0.584		-0.002	0.002	0.367	
ENV_C_A	0.007	0.028	0.812		0.075	0.030	0.013	**	-0.005	0.004	0.236	
COM_S_A	0.050	0.037	0.184		-0.013	0.044	0.762		-0.003	0.006	0.576	
COM_C_A	0.168	0.072	0.020	**	0.026	0.084	0.759		-0.007	0.008	0.408	
HUM_S_A	0.061	0.044	0.168		0.143	0.058	0.014	**	-0.018	0.008	0.023	**
HUM_C_A	-0.018	0.067	0.783		-0.239	0.084	0.004	***	0.000	0.009	0.958	
EMP_S_A	0.092	0.011	0.000	***	0.048	0.013	0.000	***	0.001	0.002	0.711	
EMP_C_A	-0.019	0.038	0.622		0.027	0.039	0.487		-0.021	0.004	0.000	***
DIV_S_A	0.003	0.024	0.902		-0.064	0.033	0.049	**	-0.012	0.005	0.026	**
DIV_C_A	-0.075	0.019	0.000	***	-0.047	0.030	0.118		-0.001	0.004	0.875	
PRO_	0.148	0.029	0.000	***	0.078	0.041	0.053	*	0.031	0.006	0.000	***

	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
S_A_PRO_C_A_GOV_	0.093	0.028	0.001	***	0.056	0.032	0.085	*	0.010	0.004	0.005	***
S_A_GOV_	-0.207	0.045	0.000	***	-0.171	0.071	0.016	**	-0.013	0.007	0.048	**
C_A	-0.110	0.045	0.015	**	-0.021	0.056	0.708		-0.004	0.006	0.489	
AGE	-0.001	0.000	0.001	***	-0.001	0.000	0.005	***	0.000	0.000	0.001	***
DE	-0.001	0.001	0.057	*	0.000	0.000	0.263		0.000	0.000	0.924	
LNTA	-0.368	0.012	0.000	***	0.683	0.023	0.000	***	0.005	0.004	0.263	
LEMP	0.092	0.009	0.000	***	0.289	0.022	0.000	***	0.017	0.002	0.000	***
MKTSH	4.111	0.618	0.000	***	0.362	0.782	0.644		-0.223	0.101	0.028	**
REVG	0.007	0.001	0.000	***	-0.002	0.001	0.106		-0.004	0.002	0.051	*
LRED	0.019	0.001	0.000	***	0.003	0.002	0.124		-0.001	0.000	0.000	***
Y2013	0.166	0.027	0.000	***	0.014	0.040	0.716		0.021	0.005	0.000	***
Y2014	0.170	0.023	0.000	***	0.029	0.034	0.402		0.014	0.005	0.010	**
	Mean D.V.	0.129	S.D. of D.V.	0.944	Mean D.V.	18.067	S.D. of D.V.	2.085	Mean D.V.	0.027	S.D. of D.V.	0.165
	SSR	2390.621	S.E. reg	0.683	SSR	4927.920	S.E. reg	0.990	SSR	116.636	S.E. reg	0.151
	R^2	0.480	Adj R^2	0.476	R^2	0.776	Adj R^2	0.775	R^2	0.167	Adj R^2	0.162
	$F_{(33, 5118)}$	155.044	F p-value	0.000	$F_{(33, 5030)}$	716.638	F p-value	0.000	$F_{(33, 5132)}$	18.831	F p-value	0.000
	N	5152			N	5064			N	5166		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 24: Actual net ESG scores by category, keeping strengths and concerns separated in t +1

	D.V. LTOBY1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	6.196	0.241	0.000	***	2.265	0.398	0.000	***	-0.122	0.054	0.023	**
ENV_S_A	0.075	0.013	0.000	***	0.005	0.016	0.771		0.000	0.002	0.999	
ENV_C_A	-0.017	0.031	0.573		0.100	0.033	0.002	***	-0.005	0.004	0.299	
COM_S_A	0.092	0.040	0.021	**	-0.047	0.045	0.299		0.000	0.005	0.973	
COM_C_A	0.149	0.078	0.056	*	0.016	0.085	0.850		-0.001	0.009	0.891	
HUM_S_A	0.136	0.046	0.003	***	0.113	0.063	0.072	*	-0.016	0.011	0.126	
HUM_C_A	-0.063	0.070	0.369		-0.215	0.086	0.012	**	-0.001	0.007	0.864	
EMP_S_A	0.089	0.011	0.000	***	0.050	0.014	0.000	***	0.002	0.002	0.307	
EMP_C_A	-0.015	0.041	0.707		-0.007	0.041	0.864		-0.021	0.004	0.000	***
DIV_S	-0.027	0.025	0.280		-0.066	0.033	0.047	**	-0.015	0.005	0.001	***

	D.V. (1)				D.V. (2)				D.V. (3)			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
DIV_C_A	-0.109	0.020	0.000	***	-0.013	0.031	0.669		-0.004	0.004	0.303	
PRO_S_A	0.153	0.029	0.000	***	0.107	0.042	0.011	**	0.030	0.006	0.000	***
PRO_C_A	0.075	0.030	0.012	**	0.063	0.033	0.053	*	0.007	0.004	0.081	*
GOV_S_A	-0.206	0.048	0.000	***	-0.200	0.069	0.004	***	-0.019	0.007	0.013	**
GOV_C_A	-0.138	0.047	0.003	***	-0.017	0.058	0.763		-0.008	0.007	0.206	
AGE	0.000	0.000	0.491		-0.002	0.000	0.000	***	0.000	0.000	0.000	***
DE	-0.001	0.001	0.053	*	-0.001	0.001	0.214		0.000	0.000	0.758	
LNTA	-0.344	0.013	0.000	***	0.684	0.024	0.000	***	-0.001	0.003	0.575	
LEMP	0.099	0.010	0.000	***	0.283	0.024	0.000	***	0.021	0.002	0.000	***
MKTSH	4.035	0.621	0.000	***	0.994	0.772	0.198		-0.082	0.092	0.370	
REVG	0.003	0.001	0.002	***	-0.001	0.002	0.553		-0.001	0.002	0.552	
LRED	0.020	0.002	0.000	***	0.003	0.002	0.113		-0.001	0.000	0.000	***
Y2013	0.075	0.027	0.005	***	0.112	0.040	0.006	***	0.022	0.005	0.000	***
Y2014	-0.062	0.025	0.011	**	0.065	0.036	0.068	*	-0.004	0.005	0.416	
Mean D.V.	0.070	S.D. of D.V.	0.936		Mean D.V.	18.105	S.D. of D.V.	2.059	Mean D.V.	0.021	S.D. of D.V.	0.145
SSR	2552.325	S.E. reg	0.706		SSR	5266.623	S.E. reg	1.023	SSR	86.304	S.E. reg	0.130
R^2	0.435	Adj R^2	0.431		R^2	0.755	Adj R^2	0.753	R^2	0.207	Adj R^2	0.202
$F_{(33,5119)}$	128.650	F p-value	0.000		$F_{(33,5031)}$	661.093	F p-value	0.000	$F_{(33,5134)}$	21.663	F p-value	0.000
N	5153				N	5065			N	5168		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Since the ESG-related variables are many in this model, the analysis will be limited to catch the sign of the relationship where the effect on the dependent variable is significant.

When significant, strength-related variables coefficients have the expected sign, except for DIV_S_A GOV_S_A. Concern-related variables effect, however, is negative only in the cases of HUM_C_A, EMP_C and DIV_C_A, but the association is significant in more cases. This regression probably contains too many variables and, due to the model misspecification, the results provided are quite incoherent, not only with the literature but also from a logical perspective, even if some implications may be drawn anyway.

Table 25: Actual weighted ESG scores by category in t

	D.V. LTOBY0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	6.250	0.227	0.000	***	1.935	0.367	0.000	***	-0.232	0.078	0.003	***
ENV_	0.061	0.011	0.000	***	-0.006	0.012	0.654		0.002	0.001	0.243	

	DV1 Coeff.	s.e.	p-value	S.L.	DV2 Coeff.	s.e.	p-value	S.L.	DV3 Coeff.	s.e.	p-value	S.L.
COM_A_W	-0.032	0.030	0.273		-0.041	0.035	0.241		-0.005	0.004	0.279	
HUM_A_W	0.069	0.030	0.023	**	0.164	0.040	0.000	***	-0.012	0.005	0.027	**
EMP_A_W	0.089	0.010	0.000	***	0.039	0.012	0.001	***	0.002	0.002	0.140	
DIV_A_W	0.047	0.011	0.000	***	0.010	0.016	0.511		-0.003	0.002	0.193	
PRO_A_W	-0.001	0.017	0.932		-0.003	0.020	0.881		0.005	0.003	0.062	*
GOV_A_W	-0.031	0.026	0.231		-0.049	0.035	0.159		-0.003	0.004	0.442	
AGE	-0.001	0.000	0.005	***	-0.001	0.000	0.011	**	0.000	0.000	0.001	***
DE	-0.001	0.001	0.062	*	0.000	0.000	0.351		0.000	0.000	0.898	
LNTA	-0.348	0.012	0.000	***	0.694	0.022	0.000	***	0.005	0.004	0.222	
LEMP	0.093	0.009	0.000	***	0.291	0.022	0.000	***	0.017	0.002	0.000	***
MKTSH	6.090	0.678	0.000	***	1.135	0.702	0.106		-0.420	0.124	0.001	***
REVG	0.007	0.001	0.000	***	-0.002	0.001	0.127		-0.004	0.002	0.053	*
LRED	0.021	0.001	0.000	***	0.004	0.002	0.040	**	-0.001	0.000	0.000	***
Y2013	0.187	0.026	0.000	***	0.009	0.037	0.812		0.018	0.005	0.000	***
Y2014	0.180	0.023	0.000	***	0.040	0.034	0.241		0.015	0.006	0.006	***
Mean D.V.	0.129	S.D. of D.V.	0.944		Mean D.V.	18.067	S.D. of D.V.	2.085	Mean D.V.	0.027	S.D. of D.V.	0.165
SSR	2450.977	S.E. reg	0.692		SSR	4952.095	S.E. reg	0.992	SSR	117.695	S.E. reg	0.151
R²	0.467	Adj R²	0.464		R²	0.775	Adj R²	0.774	R²	0.160	Adj R²	0.156
F(26, 5125)	182.514	F p-value	0.000		F(26, 5037)	827.904	F p-value	0.000	F(26, 5139)	22.279	F p-value	0.000
N	5152				N	5064			N	5166		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 26: Actual weighted ESG scores by category in t + 1

	D.V. LTOBY1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	5.821	0.235	0.000	***	2.022	0.372	0.000	***	-0.128	0.051	0.012	**
ENV_A_W	0.054	0.011	0.000	***	-0.010	0.013	0.426		0.002	0.001	0.116	
COM_A_W	-0.005	0.031	0.871		-0.061	0.036	0.086	*	-0.005	0.004	0.186	
HUM_A_W	0.126	0.032	0.000	***	0.137	0.043	0.001	***	-0.009	0.006	0.151	
EMP_A_W	0.083	0.010	0.000	***	0.045	0.012	0.000	***	0.003	0.001	0.029	**
DIV_A_W	0.056	0.011	0.000	***	-0.007	0.016	0.644		-0.002	0.002	0.293	
PRO_A_W	0.011	0.018	0.534		0.003	0.020	0.872		0.007	0.003	0.007	***
GOV_A_W	-0.014	0.027	0.590		-0.060	0.035	0.089	*	-0.002	0.004	0.612	

	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
AGE	0.000	0.000	0.786		-0.002	0.000	0.000	***	0.000	0.000	0.000	***
DE	-0.001	0.000	0.066	*	-0.001	0.001	0.244		0.000	0.000	0.688	
LNTA	-0.326	0.012	0.000	***	0.695	0.023	0.000	***	-0.001	0.002	0.581	
LEMP	0.101	0.010	0.000	***	0.284	0.024	0.000	***	0.021	0.002	0.000	***
MKTSH	5.787	0.659	0.000	***	1.651	0.705	0.019	**	-0.265	0.100	0.008	***
REVG	0.003	0.001	0.001	***	-0.001	0.002	0.611		-0.001	0.002	0.546	
LRED	0.021	0.001	0.000	***	0.004	0.002	0.036	**	-0.001	0.000	0.000	***
Y2013	0.084	0.026	0.001	***	0.109	0.038	0.005	***	0.018	0.004	0.000	***
Y2014	-0.049	0.025	0.046	**	0.076	0.035	0.031	**	-0.002	0.005	0.727	
Mean D.V.	0.070	S.D. of D.V.	0.936		Mean D.V.	18.105	S.D. of D.V.	2.059	Mean D.V.	0.021	S.D. of D.V.	0.145
SSR	2612.233	S.E. reg	0.714		SSR	5294.031	S.E. reg	1.025	SSR	87.332	S.E. reg	0.130
R^2	0.421	Adj R^2	0.418		R^2	0.753	Adj R^2	0.752	R^2	0.198	Adj R^2	0.194
$F_{(26, 5126)}$	151.409	F p-value	0.000		$F_{(26, 5038)}$	773.208	F p-value	0.000	$F_{(26, 5141)}$	25.561	F p-value	0.000
N	5153				N	5065			N	5168		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

In the regression with weighted ESG scores, ENV_A_W has significant effects only with respect to Tobin's Q values. Their relationship is positive. COM_A_W is significant only in CAPEX t+1 regression, and the variation in the dependent variable caused by the one-unit increase in COM_A_W is negative. HUM_A_W increase has positive and significant effects on both Tobin's Q and CAPEX, but a significant negative one in ROA at time t. Also EMP_A_W increase is significantly and positively associated to both Tobin's Q and CAPEX, as well as on ROA at time t+1. DIV_A_W has positive and significant effects only on Tobin's Q.

PRO_A_W is significant and positive only for ROA at a 90% significance level, while GOV_A_W is significant only for CAPEX in t+1 (at a 90% significance level), bearing a negative effect when its value is increased.

Table 27: Comparable ESG scores by category in t

	D.V. LTOBY0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	-0.022	0.073	0.758		14.657	0.139	0.000	***	-0.144	0.015	0.000	***
ENV_C_NET	0.001	0.005	0.872		0.047	0.007	0.000	***	-0.001	0.001	0.131	
COM_C_NET	0.004	0.075	0.953		-0.158	0.120	0.188		-0.016	0.012	0.170	

	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
HUM_C_NET	-0.030	0.052	0.564		0.587	0.098	0.000	***	-0.027	0.009	0.002	***
EMP_C_NET	0.033	0.010	0.001	***	0.105	0.014	0.000	***	0.001	0.001	0.421	
DIV_C_NET	0.024	0.026	0.367		0.178	0.039	0.000	***	-0.006	0.005	0.243	
PRO_C_NET	0.021	0.008	0.007	***	0.029	0.011	0.008	***	0.006	0.001	0.000	***
GOV_C_NET	-0.113	0.042	0.008	***	-0.053	0.061	0.390		-0.006	0.005	0.287	
SECTOR_A	1.042	0.040	0.000	***	-2.430	0.071	0.000	***	0.018	0.005	0.000	***
LEMP	-0.101	0.009	0.000	***	0.645	0.017	0.000	***	0.021	0.002	0.000	***
MKTSH	-0.192	0.589	0.744		8.567	1.136	0.000	***	-0.429	0.088	0.000	***
REVG	0.009	0.002	0.000	***	-0.005	0.002	0.025	**	-0.004	0.002	0.052	*
RED	0.000	0.000	0.007	***	0.000	0.000	0.000	***	0.000	0.000	0.002	***
Y2013	0.191	0.028	0.000	***	-0.009	0.042	0.822		0.020	0.005	0.000	***
Y2014	0.164	0.026	0.000	***	0.053	0.040	0.187		0.015	0.005	0.006	***
	Mean D.V.	0.127	S.D. of D.V.	0.943	Mean D.V.	18.075	S.D. of D.V.	2.082	Mean D.V.	0.026	S.D. of D.V.	0.165
	SSR	3154.744	S.E. reg	0.777	SSR	7015.121	S.E. reg	1.169	SSR	119.899	S.E. reg	0.151
	R^2	0.324	Adj R^2	0.321	R^2	0.686	Adj R^2	0.685	R^2	0.160	Adj R^2	0.156
	$F_{(23, 5219)}$	128.357	F p-value	0.000	$F_{(23, 5135)}$	413.167	F p-value	0.000	$F_{(23, 5238)}$	19.854	F p-value	0.000
	N	5243			N	5159			N	5262		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 28: Comparable ESG scores by category in t + 1

	D.V. LTOBY1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	-0.024	0.073	0.740		14.729	0.142	0.000	***	-0.146	0.013	0.000	***
ENV_C_NET	0.000	0.005	0.984		0.043	0.007	0.000	***	-0.001	0.001	0.250	
COM_C_NET	0.107	0.079	0.173		-0.242	0.120	0.044	**	-0.016	0.010	0.104	
HUM_C_NET	0.070	0.054	0.193		0.555	0.103	0.000	***	-0.023	0.011	0.035	**
EMP_C_NET	0.030	0.010	0.003	***	0.107	0.014	0.000	***	0.001	0.001	0.415	
DIV_C	0.030	0.027	0.268		0.153	0.040	0.000	***	-0.006	0.005	0.223	

	coef	SE	p	sig	coef	SE	p	sig	coef	SE	p	sig
NET PRO C_NET	0.025	0.008	0.002	***	0.033	0.011	0.003	***	0.006	0.001	0.000	***
GOV_ C_NET	-0.091	0.044	0.038	**	-0.075	0.062	0.227		-0.007	0.006	0.255	
LEMP	-0.081	0.009	0.000	***	0.638	0.017	0.000	***	0.021	0.002	0.000	***
MKTSH	-0.252	0.612	0.681		9.049	1.206	0.000	***	-0.391	0.088	0.000	***
REVG	0.005	0.002	0.001	***	-0.003	0.001	0.016	**	-0.001	0.002	0.548	
RED	0.000	0.000	0.006	***	0.000	0.000	0.000	***	0.000	0.000	0.001	***
Y2013	0.079	0.027	0.004	***	0.108	0.043	0.012	**	0.020	0.004	0.000	***
Y2014	-0.065	0.027	0.018	**	0.087	0.041	0.036	**	-0.002	0.005	0.646	

Mean D.V.	0.067	S.D. of D.V.	0.936		Mean D.V.	18.110	S.D. of D.V.	2.060	Mean D.V.	0.021	S.D. of D.V.	0.145
SSR	3255.502	S.E. reg	0.790		SSR	7422.567	S.E. reg	1.202	SSR	89.032	S.E. reg	0.130
R^2	0.291	Adj R^2	0.288		R^2	0.661	Adj R^2	0.660	R^2	0.198	Adj R^2	0.195
$F_{(23, 5222)}$	102.944	F p-value	0.000		$F_{(23, 5136)}$	380.821	F p-value	0.000	$F_{(23, 5241)}$	25.049	F p-value	0.000
N	5246				N	5160			N	5265		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

In the regression with Comparable ESG scores, ENV_C_NET has significant effects only with respect to CAPX values. Their relationship is positive. COM_C_NET is significant and positive only in t+1, while a HUM_ C_NET increase has positive and significant effects on CAPEX, but negative effects on ROA. DIV_ C_NET increase is significantly and positively associated to both Tobin's Q and CAPEX. DIV_ C_NET is significant and positive only for CAPEX, has positive and significant effects only on Tobin's Q. PRO_ C_NET is relevant in all the regressions, with a positive relationship.

GOV_ C_NET is significant only for Tobin's Q, bearing a negative effect when its value is increased.

Results of the general regressions In the following table R squared values are presented for each of the considered models. Regardless the model specification, R squared and Adjusted R squared values are quite similar within the models where the same Dependent variable was inserted. CAPEX presents the larger R squared values, Tobin's Q shows intermediate values, while ROA provides the lowest figures. However, R squared (regular and adjusted) is not sufficient, by itself, to determine whether a model is good or not. For these reasons the residuals were analyzed, as well as the significance of the coefficients and the F values. The overall results will be discussed together with the ones obtained in the following analyses in Section 3.3.1.

Table 29: R Squared and Adjusted R Squared for the regressions considered

ESG inserted	Dependent V.	R SQUARED	ADJ-R SQUARED	ESG inserted	Dependent V.	R SQUARED	ADJ-R SQUARED
ESG_NET_A	LTOB t	0.465	0.463	ESG_NET_A by category	LTOB t	0.469	0.467
	LTOB t+1	0.421	0.419		LTOB t+1	0.424	0.421
	LCAPX t	0.774	0.773		LCAPX t	0.775	0.774
	LCAPX t+1	0.753	0.752		LCAPX t+1	0.754	0.752
	ROA t	0.158	0.155		ROA t	0.161	0.157
	ROA t+1	0.195	0.192		ROA t+1	0.199	0.195
ESG_S_A + ESG_C_A	LTOB t	0.469	0.467	ESG_S_A + ESG_C_A by category	LTOB t	0.480	0.476
	LTOB t+1	0.423	0.420		LTOB t+1	0.435	0.431
	LCAPX t	0.774	0.773		LCAPX t	0.776	0.775
	LCAPX t+1	0.753	0.752		LCAPX t+1	0.755	0.753
	ROA t	0.159	0.155		ROA t	0.167	0.162
	ROA t+1	0.196	0.193		ROA t+1	0.207	0.202
ESG__A_W	LTOB t	0.462	0.460	ESG__A_W by category	LTOB t	0.467	0.464
	LTOB t+1	0.418	0.416		LTOB t+1	0.421	0.418
	LCAPX t	0.774	0.773		LCAPX t	0.775	0.774
	LCAPX t+1	0.752	0.751		LCAPX t+1	0.753	0.752
	ROA t	0.158	0.155		ROA t	0.160	0.156
	ROA t+1	0.196	0.192		ROA t+1	0.198	0.194
ESG_NET_C	LTOB t	0.464	0.462	ESG_NET_C by category	LTOB t	0.324	0.321
	LTOB t+1	0.417	0.415		LTOB t+1	0.291	0.288
	LCAPX t	0.774	0.773		LCAPX t	0.686	0.685
	LCAPX t+1	0.753	0.752		LCAPX t+1	0.661	0.660
	ROA t	0.159	0.155		ROA t	0.160	0.156
	ROA t+1	0.196	0.193		ROA t+1	0.198	0.195

3.2.3. Results for the the selected Sectors' sub-samples

After having analysed the general models that included the entire sample, three different sub-samples have been examined, each one taking into consideration one of the following sectors of activity: Consumer Discretionary, Industrials and Information Technology. Due to the results obtained in the general regressions, only three of the models were tested: ESG_NET_A, ESG_S_A + ESG_C_A and ESG_NET_A keeping the categories separated.

The complete results may be found in the Appendix and can be interpreted as the previously analysed tables. Only the differences in the patterns of significance of the variables inserted in each model across the three sectors considered will be addressed. Consumer Discretionary has been indicated with the letter "A", Industrials with the letter "B" and Information Technology with the letter "C".

As it can be easily observed, for the non-ESG variables the pattern of significance is quite constant regardless the ESG score(s) inserted in the regressions, and varies a lot depending on the financial performance measure considered. However, there also are quite relevant changes

within the same financial performance variable depending on the lag considered. The level of significance considered is 95%.

Table 30: Comparison of significant variables - ESG_NET_A regression

Variables considered in the model	LTOB						LCAPX						ROA					
	t			t+1			t			t+1			t			t+1		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
ESG_NET_A	x	X	X	x	X	X	x						X			X	X	
AGEY0	x		X		X	X	x		X	X		X	X	X	X	X	X	X
DEY0	x	X		x	X													
LNTAY0	x	X	X	x	X	X	x	X	X	X	X	X	X		X	X	X	X
LEMPY0	x	X	X	x	X	X	x		X	X		X		X		X	X	
MKTSHY0		X	X		X	X	x		X	X		X						
REVGY0	x	X	X	x		X		X				X					X	
LREDY0	x	X	X	x	X	X	x	X	X	X	X	X			X			X
Y2013	x	X	X	x											X	X		X
Y2014	x	X	X		X										X			

Where A refers to Consumer Discretionary sub-set, B to Industrials and C to Information Technology
X indicates the presence of a significant relationship, regardless its sign

In Table 20 ESG_NET_A is significant for all the industries considered in LTOB regressions, while in LCAPX and ROA regressions this is only valid for Consumer Discretionary sector (besides in LCAPX t+1, where is not significant at all) and for Industrials only in ROA t+1. In LTOB regressions for Consumer Discretionary only MKTSHY0 is not significant, in Industrials only MKTSHY0 and AGEY0, while in Information Technology only DEY0 in t. The goodness of the model seems to decrease in the lagged regression. For LCAPX the results are equal for both Consumer Discretionary and Information Technology in t, besides the lack of significance for the ESG variable in Information Technology. In ROA, the patterns seem to be more randomized, with some consistency for Age across the sectors. LNTAY0, but also AGEY0, LEMPY0 and LREDY0 seem to be the most relevant variable included in ESG_NET_A regression.

Table 31: Comparison of significant variables - ESG_S_A + ESG_C_A regression

Variables considered in the model	LTOB						LCAPX						ROA					
	t			t+1			t			t+1			t			t+1		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
ESG_S_A	X	X	X	X	X	X	X						X			X		
ESG_C_A						X												X
AGEY0	X	X	X		X	X	X		X	X		X	X	X	X	X	X	X
DEY0	X	X		X	X													X

Variables	LTOB t A	B	C	t+1 A	B	C	LCAPX t A	B	C	t+1 A	B	C	ROA t A	B	C	t+1 A	B	C
LNTAY0	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X
LEMPY0	X	X	X	X	X	X	X		X	X		X		X		X	X	
MKTSHY0			X			X	X				X							
REVGY0	X	X	X	X		X		X				X				X		
LREDY0	X	X	X	X	X	X	X	X	X	X	X	X			X			X
Y2013	X	X	X	X										X			X	X
Y2014	X	X	X		X									X				

Where A refers to Consumer Discretionary sub-set, B to Industrials and C to Information Technology
X indicates the presence of a significant relationship, regardless its sign

Since the pattern in the control variables is quite constant, the analysis will be reduced to the ESG related part for this table and the subsequent one. ESG_S_A follow the exact same path of ESG_NET_A, while ESG_C_A is relevant only in Information Technology when considering LTOB for t+1 and in ROA t+1 for Industrials. Consumer Discretionary seems the most conditioned by ESG performance, at least from the two tables considered.

Table 32: Comparison of significant variables – NET score by category regression

Variables considered in the model	LTOB						LCAPX						ROA					
	t			t+1			t			t+1			t			t+1		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
NET_ENV_A		X		X				X	X		X	X						
NET_COM_A		X		X			X									X	X	
NET_HUM_A								X	X		X	X						
NET_EMP_A			X		X	X	X		X	X		X	X		X	X		X
NET_DIV_A			X		X	X	X										X	
NET_PRO_A	X			X				X										
NET_GOV_A	X			X										X				X
AGEY0	X		X		X	X	X		X	X		X	X	X	X	X	X	X
DEY0	X	X		X	X									X				
LNTAY0	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
LEMPY0	X	X	X	X	X		X		X	X		X		X			X	
MKTSHY0		X	X		X	X	X		X	X		X						
REVGY0	X	X	X	X		X		X				X				X		
LREDY0	X	X	X	X	X	X	X	X	X	X	X	X		X				X
Y2013	X	X	X	X										X			X	X
Y2014	X	X	X		X									X				

Where A refers to Consumer Discretionary sub-set, B to Industrials and C to Information Technology
X indicates the presence of a significant relationship, regardless its sign

NET_ENV_A is not significant for Consumer Discretionary, but it is relevant for Industrials in both LTOB and LCAPX regressions and for Information Technology only for LCAPX regressions.

NET_COM_A is not significant for Information Technology, while it impact the ROA in t+1 for Consumer Discretionary and Industrials as well as having some effects in LTOB and LCAPX.

NET_HUM_A only has effects on LCAPX for Industrials and Information Technology both in t and t+1, while NET_EMP_A is significant for some combinations of lag and Financial variable considered in every sector. NET_DIV_A mostly has effects on LTOB, whereas NET_PRO_A and NET_GOV_A have an influence on LTOB for Consumer Discretionary and in some cases on LCAPX and ROA for Information Technology.

It is important to note that, as reported in the results included in the Appendix, the explanatory power of the models referred to the three sectors considered is different than the one referred to the whole sample. In particular, models where LCAPX is considered seem to capture the variability of the dependent variable in a similar way than the general models do. In ROA and, to a less extent, LTOB models, however, the proportion of the variability of the dependent variable explained by the independent variables included is around half the one of the whole sample regression. However, it should be considered that LTOB regressions are the ones that adhere the most to the model theorized, having more significant independent variables than other models, especially for Industrials and Information Technology sectors. Actual vs. fitted values show a better pattern in LCAPX regressions, while LTOB appears more dispersed. Regardless the fact that a number of the variables included in the model are not significant in LCAPX, the relationship seems to be quite appropriate. For LTOB, almost all the variables are significant, however the linear relationship is weaker, so probably other factors should be considered to specify better the model. Dispersion and a considerable number of non-significant variables characterize ROA, hence for this variable the modelling should be further investigated.

3.3. Results synthesis and limitations of the study

3.3.1. Results synthesis and their implications

The results obtained are in line with the literature on the topic. In fact, results mostly show a positive relationship between CSP and CFP, while sometimes this relationship appears to be negative or non-existent. One observation on the outcomes should be pointed out: the chosen financial variables usually matter more in terms of results differentiation than the various scoring systems, at least in the cases considered.

The following tables present the synthetised results in term of sign. The main commonalities and discrepancies will be analysed,

Table 33: Coefficient signs for Part 1 regressions (overall ESG scores)

I.V.	1	2	3	4	5	6	I.V.	1	2	3	4	5	6	I.V.	1	2	3	4	5	6	I.V.	1	2	3	4	5	6
							ESG_C_A			-	-		-														
ESG_NET_A	+	+		+	+		ESG_S_A	+	+		+	+		ESG_A_W	+	+	+	+			ESG_NET_C	+	+	+	+	+	+
S_A	+	-	+	+	-	+	S_A	+	-	+	+	-	+	S_A	+	-	+	+	-	+	S_A	+	-	+	+	-	+
S_B	+	-	+	+	-	+	S_B	+	-	+	+	-	+	S_B	+	-	+	+	-	+	S_B	+	-	+	+	-	+
S_C		+	-	-		-	S_C		+		-		-	S_C		+	-	-		-	S_C		+		-		-
S_D	-	-	+	-	-	+	S_D		-	+	-	-	+	S_D	-	-	+	-	-	+	S_D	-	-	+	-	-	+
S_E	+	-	-	+	-	-	S_E	+	-	-	+	-	-	S_E	+	-	-	+	-	-	S_E	+	-	-	+	-	-
S_F	+	-	+	+	-	+	S_F	+	-	+	+	-	+	S_F	+	-	+	+	-	+	S_F	+	-	+	+	-	+
S_G	+	-	+	+	-	+	S_G	+	-	+	+	-	+	S_G	+	-	+	+	-	+	S_G	+	-	+	+	-	+
S_H		-	+		-		S_H		-	+		-		S_H		-	+		-		S_H		-	+	-	-	
S_I	+	+	+	+	+	+	S_I	+	+	+	+	+	+	S_I	+	+	+	+		+	S_I	+	+	+	+		+
S_J	-	-	+	-	-		S_J	-	-	+	-	-		S_J	-	-	+	-	-		S_J	-	-	+	-	-	-
AGE	-	-	+		-	+	AGE	-	-	+		-	+	AGE	-	-	+		-	+	AGE	-	-	+		-	+
DE	-			-			DE	-			-			DE	-			-			DE	-			-		
LNTA	-	+		-	+		LNTA	-	+		-	+		LNTA	-	+		-	+		LNTA	-	+		-	+	
LEMP	+	+	+	+	+	+	LEMP	+	+	+	+	+	+	LEMP	+	+	+	+	+	+	LEMP	+	+	+	+	+	+
MKTSH	+		-	+	+	-	MKTSH	+		-	+		-	MKTSH	+		-	+	+	-	MKTSH	+		-	+	+	-
REVG	+		-	+			REVG	+		-	+			REVG	+		-	+			REVG	+		-	+		
LRED	+	+	-	+	+	-	LRED	+		-	+		-	LRED	+	+	-	+	+	-	LRED	+		-	+		-
Y2013	+		+	+	+	+	Y2013	+		+	+	+	+	Y2013	+		+	+	+	+	Y2013	+		+	+	+	+
Y2014	+		+	-	+		Y2014	+		+	-	+		Y2014	+		+	-	+		Y2014	+		+	-	+	-

Where 1 is the regression referred to LTOB in t, 2 to CAPX in t, 3 to ROA in t, 4 to LTOB in t+1, 5 to CAPX in t+1,6 to ROA in t+1.

In the models that consider the overall scoring, without the repartition in ESG categories, there are many commonalities in the results. Considering at first the sign of the ESG score, it is always positive - if significant - for all the regressions. In one of the regressions strengths and Concerns are kept separeted, and in that case the Concern score is negative, when significant, as expected from a theoretical and logical point of view. Considering also the association between the control/cofounders variables and the dependent ones, certain patterns are affected by the dependent variable under examination and by the lag effect. Dealing with sectors, Consumer discretionary, Consumer staples, Industrials and Information Technology

are characterized by a positive variation in the expected value of the dependent variable with respect to Utilities (the comparison group) when considering Tobin's Q and ROA, ceteris paribus, while the variation is negative in the case of CAPEX. Energy has quite discordant results, while Financials and Real estate are characterized by a negative variation in the expected value of the dependent variable with respect to Utilities for what concerns Tobin's Q and Capex variables, ceteris paribus. This is also true for Materials when the dependent variable is CAPEX. Health care is characterized by a positive variation in the expected value of the dependent variable with respect to Utilities when considering Tobin's Q, while the variation is negative when looking at CAPEX and ROA.

Y2013 and Y2014 are both linked to a positive variation in the expected value when compared to year 2015, ceteris paribus, especially when no lag is considered. More ambiguity is present when one-year lag is studied. Dealing with the non-dichotomous control variables, AGE has negative associations with Tobin's Q and CAPEX, but positive with ROA. DE is not significant at all, besides in some cases where the sign is negative (when considering Tobin's Q as dependent variable). High levels of indebtedness may indeed harm a company's value, when there is a problem of financial distress. However higher levels of D/E ratio are common in certain sectors, such as Financial and capital intensive industries, so the interpretation may be done cautiously. LNTA is negatively associated with Tobin's Q probably due to the ratio formulation and positively with CAPEX. LEMP is always positively associated with financial performance. MKTSH and REVG have ambiguous results (positive association with Tobin's Q and a negative one with ROA), LRED is positively associated to Tobin's Q and CAPEX and negatively with ROA, as expected.

In the next table only the results related to the ESG categories will be discussed. What has been stated above stays valid for the remaining variables, since no substantial changes on those aspects take place in the regressions that consider the seven ESG categories.

Table 34: Coefficient signs for Part 2 regressions (ESG scores by category-net values)

I.V. ESG	1	2	3	4	5	6	I.V. ESG	1	2	3	4	5	6	I.V. ESG	1	2	3	4	5	6
ENV_A_NET	+			+			ENV_C_NET		+			+		ENV_A_W	+			+		
COM_A_NET					-		COM_C_NET					-		COM_A_W					-	
HUM_A_NET	+	+	-	+	+	-	HUM_C_NET		+	-		+	-	HUM_A_W	+	+	-	+	+	
EMP_A_NET	+	+		+	+	+	EMP_C_NET	+	+		+	+		EMP_A_W	+	+		+	+	+
DIV_A_NET	+			+			DIV_C_NET		+			+		DIV_A_W	+			+		
PRO_A_NET			+	+		+	PRO_C_NET	+	+	+	+	+	+	PRO_A_W			+			+
GOV_A_NET	-	-			-	-	GOV_C_NET	-			-			GOV_A_W					-	

Table 35: Coefficient signs for Part 2 regressions (ESG scores by category- strengths vs. concerns)

I.V. ESG	1	2	3	4	5	6
ENV_S_A	+			+		
ENV_C_A		+			+	
COM_S_A				+		
COM_C_A	+			+		
HUM_S_A		+	-	+	+	
HUM_C_A		-			-	
EMP_S_A	+	+		+	+	
EMP_C_A			-			-
DIV_S_A		-			-	-
DIV_C_A	-			-		
PRO_S_A	+	+	+	+	+	+
PRO_C_A	+	+	+	+	+	+
GOV_S_A	-	-	-	-	-	-
GOV_C_A	-			-		

Where 1 is the regression referred to LTOB in t, 2 to CAPX in t, 3 to ROA in t, 4 to LTOB in t+1, 5 to CAPX in t+1,6 to ROA in t+1.

These regressions include a larger number of variables related to ESG, and the relationship is often not as strong as in the previous cases. However, some patterns may be identified. In particular, looking at the first table, some variables have consistent sign in the association with financial performance, when they are significant: environment, employee-related, diversity and product. Interestingly, these variable, besides Environment, are all strictly related to the core of the firm operations, both in human capital terms and in its competitive behaviour. Human rights score seems to have a positive association with Tobin's Q and CAPEX, generally, but a negative one with ROA. Probably its benefits are less tangible and more long-term oriented than what ROA may catch. Community and - especially - Corporate Governance sometimes show a negative association, while they are never positively associated to the dependent variables. However, the negative association is less strong in the models considering Comparable and Weighted scores. This relation should be investigated more in depth, further considerations will be done when considering the three sectors' results in the following pages. One explanation could be related to the absence of interest from stakeholders in this aspect or the absence of strategic prioritization, that may cause unjustified costs (Michelon, Boesso and Kumar, 2013).

The last table presents some inconsistent results, as already thiscussed. This regression has been provided for completeness, but it is not as good as the other models probably due to the great amount of indicators inserted.

Now the results of the sub-samples related regressions that consider three different sectors will be synthetized.

Due to the similarities in the results among ESG_NET_A, ESG_A_W and ESG_NET_C, in the sub-samples analysis only ESG_NET_A was taken into consideration. For sure there were some discrepancies in the effects, but the focus was more directed to the differences in financial variables considered. For this reason, the results will be discussed maintaining the financial variables separated.

Table 36: LTOB synthetic results

LTOB	A		B		C		GENERAL	
	t	t+1	t	t+1	t	t+1	t	t+1
ESG_NET_A	+	+	+	+	+	+	+	+
ESG_S_A	+	+	+	+	+	+	+	+
ESG_C_A	NS	NS	NS	NS	NS	-	NS	-
NET_ENV_A	NS	NS	+	+	NS	NS	+	+
NET_COM_A	NS	+	-	NS	NS	NS	NS	NS
NET_HUM_A	NS	NS	NS	NS	NS	NS	+	+
NET_EMP_A	NS	NS	NS	+	+	+	+	+
NET_DIV_A	NS	NS	NS	+	+	+	+	+
NET_PRO_A	+	+	NS	NS	NS	NS	NS	NS
NET_GOV_A	-	-	NS	NS	NS	NS	-	NS

Where A refers to Consumer Discretionary sub-set, B to Industrials, C to Information Technology and GENERAL considers the oveall dataset

The first table deals with Tobin's Q. ESG_NET_A is significant and has a positive effect for every model considered, and this is true also for ESG_S_A. ESG_C_A is not so significant, but when it is, the association has the expected negative sign. In the general model, the ESG category-related variables are relevant and have a positive effect for the most part, except for NET_COM_A and NET_PRO_A, that are not significant, and NET_GOV_A, that has a negative impact in time t. When analyzing the sector-based results, though, there is much more variability in both significance and sign of the effect. NET_ENV_A is positively related to Industrials, NET_EMP_A as well as is NET_DIV_A positively related to Industrials and Information Technology. NET_PRO_A and NET_GOV_A are respectivelly positively and negatively associated to Consumer Discretionary.

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Table 37: LCAPX synthetic results

LCAPX	A		B		C		GENERAL	
	t	t+1	t	t+1	t	t+1	t	t+1
ESG_NET_A	+	NS	NS	NS	NS	NS	+	+
ESG_S_A	+	NS	NS	NS	NS	NS	+	+
ESG_C_A	NS	NS	NS	NS	NS	NS	NS	NS
NET_ENV_A	NS	NS	+	+	-	-	NS	NS
NET_COM_A	-	NS	NS	NS	NS	NS	NS	NS
NET_HUM_A	NS	NS	+	+	+	+	+	+
NET_EMP_A	+	+	NS	NS	+	+	+	+
NET_DIV_A	+	NS	NS	NS	NS	NS	NS	NS
NET_PRO_A	NS	NS	NS	NS	-	NS	NS	NS
NET_GOV_A	NS	NS	NS	NS	NS	NS	NS	-

Where A refers to Consumer Discretionary sub-set, B to Industrials, C to Information Technology and GENERAL considers the oveall dataset

When looking at the results for LCAPX, ESG_NET_A does not have a meaningful explication power in two out three of the sectors considered, although it was always positively relevant in the General regression. This also holds true when considering ESG_S_A, while for ESG_C_A all the results are not significant. However, the situation changes when considering the repartition of the scores related to the ESG categories.

NET_ENV_A has positive effects for Industrials, negative effects for Information Technology and is not significant in Consumer Discretionary. NET_COM_A is not significant except for a single, negative value, while NET_HUM_A and NET_EMP_A are sometimes significant and have a positive effect, sometimes not significant at all. Diversity is almost not significant in any case except for Consumer Discretionary, where it is positively linked to CAPEX, while NET_PRO_A and NET_GOV_A are almost always not significant, even if with some exceptions.

Table 38: ROA synthetic results

ROA	A		B		C		GENERAL	
	t	t+1	t	t+1	t	t+1	t	t+1
ESG_NET_A	+	+	NS	+	NS	NS	+	+

ESG_S_A	+	+	NS	NS	NS	NS	NS	NS
ESG_C_A	NS	NS	NS	-	NS	NS	NS	-
NET_ENV_A	NS	NS	NS	NS	NS	NS	NS	NS
NET_COM_A	NS	+	NS	-	NS	NS	NS	NS
NET_HUM_A	NS	NS	NS	NS	NS	NS	-	NS
NET_EMP_A	+	+	NS	NS	+	+	NS	NS
NET_DIV_A	NS	NS	NS	+	NS	NS	NS	NS
NET_PRO_A	NS	NS	NS	NS	NS	NS	+	+
NET_GOV_A	NS	NS	NS	NS	+	+	NS	NS

Where A refers to Consumer Discretionary sub-set, B to Industrials, C to Information Technology and GENERAL considers the oveall dataset

In the ROA regression ESG_NET_A is significant and has positive effect in the general and in the Consumer Discretionary regressions, as well as in t+1 for Industrials, whereas in the other cases it is not significant. ESG_S_A is significant –and positively related- only for Consumer Discretionary, while ESG_C_A is usually not significant, but when it is it has the expected negative sign as in LTOB results. NET_ENV_A is not significant at all, whereas NET_COM_A in the two occurrences where it is relevant has two opposite signs (it has positive effects on Consumer Discretionary, negative ones in the General model). NET_HUM_A has negative sign only in the general model, because it is not significant on the other cases, while NET_EMP_A has a positive significant effect on both Consumer Discretionary and Information Technology.

NET_DIV_A, NET_PRO_A, and NET_GOV_A are significant, with a positive relationship, respectively for Industrials (in t+1), the general model and Information Technology.

To synthetize, when looking at Consumer Discretional, Community is positively associated with Tobin's Q and ROA, but negatively with CAPEX, while Employe relations are positively associated with both CAPEX and ROA, but not with Tobin's Q. For Industrials, Environment was positively associated with Tobin's Q and CAPEX, said positive relationship existed also for Diversity with Tobin's Q and ROA, while Community was negatively related with both Tobin's Q and ROA. Finally, in Information Technology, Employee relations was positively associated with both Tobin's Q and CAPEX, while Human and Product had opposite signs in CAPEX and ROA relationships.

From the entire analysis, also including the previous parts of the work, some considerations can be drawn. A multi-sided approach is needed to comprehend the phenomenon under examination. By analysing one index, one sector or one financial measure only, the results cannot be widely generalised.

Keeping into consideration the fitting of the models, the most reliable ones are those related with Tobin's Q and CAPEX. They better describe the variation in CFP and are more solid from a statistical point of view, on the basis of the residuals analysis, the significance of the variables R squared and F values. Besides, they seem to have more consistency in relation to the theoretical background, especially when considering Tobin's Q. ROA, on the other side, appears to not be appropriate to capture the relationship with CSR, especially when not applying any lag period.

The results are quite in line with what expected from the combination of previous researches and intuitions, since the outcomes show that CSP and CFP relationship is characterized by mixed results (Orlitzky, Schmidt and Rynes, 2003), but they highlight also some clear patterns. Scores related to overall ESG performance seem to be often positively related to a firm's financial performance, but how this superior competitive advantage is reached is not easy to tell.

Recalling the literature, the variety in findings can be reconducted to some of the examined theories. Dealing with the consistent patterns in the results, institutional theory explains why companies by subjected to organizational isomorphism, especially when belonging to the same sector. This can surely affect their attitude toward CSR and make it uniform, especially if the resulting financial performances related to CSR are positive. Companies within the same sector may also face different stakeholder types with respect to another sector, characterized by particular levels of urgency, power and legitimacy and they may face them in similar ways. Instrumental stakeholder theory may in this way contribute to the explanation of the results. However, even within sectors there are important differences: in order to create a sustainable competitive advantage, a company has to embrace a strategic focus, and define the relevance of the ESG aspects depending on its goals and objectives, both financial and not financial-related ones. Hence, the variety of results.

It should be consider that there could be activities when performing CSR that are not capable of increasing directly the company value or its profitability, or, considering also the opposite relationship, that are not affected by the level of a firm's financials. For this reason the relationship between the two may appear not significant. As reported above, one aspect of CSP may be of crucial importance for one company and completely irrelevant for another.

The absence of significance may be related also to the specific data or to the model specification: in order to isolate the effects of ESG performance on CFP, many control variables were included, but while some seemed quite useless, others seemed still lacking in order.

In addition, the results only prove the existence of a positive (or in some cases, negative) relation, but they do not determine the direction of this linkage, *i.e.* whether good financial measures lead to a better CSR performance or the reverse. The positive results have wide explanations in the literature, as previously assessed, since they can be justified by stakeholder theory, RBV and institutional theory, among others. Nonetheless, there also were results not easily interpretable on the basis of the literature, or conflicting outcomes. In addition, there are some negative effects that may direct the opinion towards a negative, and not positive, association of CSP and CFP, as sustained by shareholders theories. However, the negative relationship may be justified by investments made in the wrong (for a company's strategy) area or by the bad execution of the activity.

The choice of implementing a CSR program should thus be evaluated considering its consistency with the strategic path and which financial aims the managers want to obtain. Besides, not all actions undertaken in CSR field can be reflected on financial figures, because financials are the result of the combination of all the choices made by the management, so the positive effect gained through CSR could potentially be offset by other types of managerial decisions

Considering the results on the basis of the descriptive statistics related to the different Industry Sectors, improving the ESG scores especially in the critical areas that may develop performance is key, when there is a clear reason behind it. In Industrials, for instance, Environment has a positive association with LTOB and CAPX, so probably it makes sense for companies belonging to Industrials sector to focus on and invest in this area, compatibly with their strategic intents. In fact, when looking at the descriptive analysis, Environmental average score for Industrials is above the mean for that category. Industrials companies have been proven to be more sensitivive to the environmental aspect, because of their activity related to capital goods and transportation, thus problems such as pollution and the employment of raw materials in a sustainable way may make a huge impact and cause some efficiency improvements. Similarly, for Information Technology, Employees score seems to be positively related to the three financial measures considered and, simoultaneously, that sector scores over the average of that category. In Information Technology the role of employees in contributing to innovation is crucial, each company has to be on top of the game to not fall behind, so it makes sense to invest in Human resources, offer better conditions and develop the professional knowledge.

Since this work does not aim at proving causality, the direction of the relationship is not defined. Nonetheless, if managers choose to invest in some particular fields with respect to others, their choice is determined by what the company can actually do as well as the strategic

implications. Some studies proved that CSR has a causal effect on financial measures or, to a greater extent, the existence of a bidirectional nexus (Waddock and Graves, 1997; Surroca, Tribó and Waddock, 2010), while others found no causation (Baron, Harjoto and Jo, 2009) or a reverse causation (Preston and O'Bannon, 1997). Moreover, even the most sophisticated statistical techniques cannot exactly ascertain the existence of a causal connection, that only investigations through experiments (natural experiments, for the Social Science field) may prove beyond any doubt, especially when so many factors are considered. Every firm should consider - on the basis of its conditions, capabilities and restrictions - whether and how to deal with CSR, considering the sector in which it operates and which areas could be more beneficial for a strategic application of CSR that goes beyond greenwashing or pure charity donations. What the obtained results may help with is proposing some aspects to consider, some insights and some general results to build the subsequent actions and make the management ask the proper questions when facing the decision-making process.

3.3.2. Limitations and suggestions for future research

Besides the efforts in obtaining and elaborating the data, with the aim of obtaining the best models that explain the connection between ESG performance, financial performance and sector of belonging, this study involves some limitations.

The first limitation considered is referred to the data. By only using the ESG performance data provided by MSCI KLD, there could be some biases in the methodology used by MSCI KLD itself that make not possible to capture the phenomenon entirely. Hence, for a more complete analysis, choosing more than one ESG provider would be beneficial (Griffin and Mahon, 1997). These data are not available to the large public for free and combining them involves some problems, due to their different structure. Many authors have solely used this database, which has been widely recognized as the most reliable among the existing ones. Besides the choice of the indicators by KLD MSCI, there are some additional issues: the measurement scale itself brings to the compensation of extreme values and the number of indicators varies across groups of variables. This has been partially solved by keeping the variables separated in the regression or by adding some disincentives for negative aspects (concerns). However, KLD MSCI has its own biases in calculations that sum up to the ones of the present work (Dhaliwal *et al.*, 2011).

In addition to the problems related to the ESG data, there are those linked to the organizational and financial data used. These data have been entirely extracted through Eikon platform by Thomson Reuter and then associated to the firms. Unfortunately, for many firms there were no available data, or the data were very limited. Some of the firms were acquired,

merged or it was not possible to find all the necessary information, so they could not be included in the analysis. Dealing with time span, only three years were considered, due to the reasons mentioned in the Methodology chapter (related to the variation of indicators and to the underlying methodological changes realised by KLD MSCI). Surely a larger time span would give a better insight about the phenomenon, although the data included in the analysis must be homogeneous - the same rules should apply to every year of data collection - at least for a large extent. Another limitation related to the data is due to the use of an unbalanced panel. It would be interesting to repeat some of the analyses performed using a sufficiently large balanced panel instead. However, the data used were reliable and objective, since they were certified by external authorities and not based on subjective surveys results. These characteristics are really important to ensure correct results in the analyses.

Causality proof has not been taken into account in this work. Some previous studies have used Granger causality, Instrumental Variables, Two Stages Least Squares Regression and Tobit regression (Waddock and Graves, 1997). Nevertheless, besides needing a solid statistical knowledge, some doubts on their effectiveness in actually proving causality remain. In this field of research there are many variables intervening on different levels, some synergies take place and bilateral relationships as well as virtuous [or vicious] circles may be present, therefore it is difficult to reach a complete understanding that indisputably involves also causality. For these reasons, the analysis was dedicated to correlation and more oriented toward providing a useful instrument to predict and analyse financial performance on the basis of ESG scores in different categories, sector of belonging and other general factors.

An important limitation regards the methodology used. Despite the effort of providing consistent and theory-complying regressions, by performing many checks and correcting the emerged problems, it is possible that the specification chosen is not appropriate enough or that there are better modelling to describe the phenomenon, which require more advanced and sophisticated techniques and knowledge. However, this work can be used as a starting point for more detailed analyses, that may confirm, enrich or reverse the results obtained. In addition, multiple linear regression has been widely used in the literature on the topic, hence the outcomes may be compared to previous and future researches. In addition, the two alternatives proposed in Chapter 2 when dealing with relationship modelling could be tested: dynamic panel models - through the use of values differences - and models including both simultaneous and lagged variables.

It would be interesting to consider a larger lag between CSR-related observations and the financial measures as well. Another indication for the future could be related to performing a

Logit model regression considering the probability of the company well-being (or if it survived) after a time t, given the ESG scores, sector and some other parameters.

An additional suggestion for future research would be to consider GICS Industry groups too, as well as to disaggregate the results while also considering other factors, *e.g.* country (if the dataset contains data from multiple geographic areas) and management style, to better describe the phenomenon and enable correct predictions. Weighting the concerns considering a different weight value may be considered as well and Sector regressions could be tested for larger samples and for the Sectors not considered in this work.

It would also be useful to repeat the analyses with different data from other indexes and scores providers. In addition, some intermediates managerial measures (consumer attraction and retention, reputation, etc) could be used instead of only looking at the financial figures, as done in many previous works (Marin and Ruiz, 2007; Vlachos *et al.*, 2009; Du, Bhattacharya and Sen, 2010), while adding some deeper analyses by some relevant categories.

Considering only ESG company scoring may not be sufficient to deeply understand the phenomenon. It is indeed a good starting point, but integrating also the results of qualitative-based works in the framework may help to draw in a more accurate way the present conditions of CSR activities, while reflecting on the possible future outcomes.

CONCLUSION

Some interesting insights emerge from the data of the empirical analysis, partially confirming, as well as questioning, the results obtained in previous works, adding some new insights on the phenomenon as well.

The choice of the measures of financial performance has been proven as extremely relevant when attempting to model the relationship between Corporate Social performance and Corporate Financial performance. The results that may be valid for that particular relationship may not hold when examining another financial performance related variable. Therefore, generalizing the phenomenon with statements as "CSR improves [or, on the contrary, harms] Corporate Financial performance" is clearly misleading. From the analysis performed in the previous pages, there is no evidence that support the aforementioned assertion, due to the heterogeneous outcomes.

As assessed through the employed regressions, the *overall* CSR performance, measured through KLD MSCI index, seems to be positively associated to Tobin's Q, Capital expenditure (CAPEX) and ROA metrics for the considered US listed companies. However, when decomposing the phenomenon, the results vary: for the three sectors taken into consideration this entirely positive association holds only for Tobin's Q, while for CAPEX and ROA in some cases there was no significant relationship (for Industrials and Information Technology and for Information Technology, respectively) regardless considering the *simultaneous* performance or the *lagged* one. When considering ESG scores in another form (*Strengths* vs. *Concerns*), the results were less significant. For the Strengths score in Tobin's Q regression, the results were perfectly reproducing the ones obtained with the previous score, but for Concerns and for the other two financial measures the majority of the outcomes indicated a non-significant relationship. On the other side, in the cases in which Concerns were significant, the relationship with the Dependent variable was negative, as it was expected. Dealing with the results obtained by performing the *negatively weighted* and the *comparable* regressions, the *direction* of the results is usually constant, even though the *significance* of some variables changes depending on the scoring system considered.

However, the core peculiarity of this work resides in studying the association of different ESG categories with the chosen financial metrics, as well as combining the different ESG categories with the companies' Sector of belonging, by analysing the sub-samples related to Consumer Discretional, Industrials and Information Technology. For sure, "The broad view

of the business case for CSR suggests that the relationship between CSR and firm financial performance is better depicted when the role of mediating variables and situational contingencies are accounted for" (Carroll and Shabana, 2010, p. 94).

These analyses offered new insights on the topic. Considering the whole sample, Environment, Community, Human rights, Employee-related and Diversity showed a positive association with Tobin's Q, while the relation with Product was not significant and Governance had a negative relationship in time t.

However, Environment, Community and Diversity had no significant relationship with neither CAPEX or ROA, while Human rights and Employees were positively related in the case of CAPEX and Product in the case of ROA. Governance gave a partially negative result in CAPEX, whereas it had no relationship with financial performance in the case of ROA. These results pose some questions about which aspects really matter in determining a positive association between CSR and CFP.

The results of the last part of the study, where only the subsamples were examined, add some levels of difficulty to the entire phenomenon. Governance seems to be not so relevant, and when it is associated with the dependent variable, that association is mostly negative. The results linked to Environmental were not consistent, apart from Industrials, where this aspect is positively associated to the financial metrics. For the Social indicators, which comprehend many different subcategories related to different aspects and stakeholders, Employees and, to a less extent, Diversity, seem to play an important positive role, while the effects related with Community, Human and Product are less straightforward. Given the obtained outcomes, CSR seems to be more associated to medium-long term financial performance (Tobin's Q and CAPEX), but some associations can also be found in short-term measures (ROA).

The literature presents a large variety of empirical outcomes and their possible explanations, as outlined in the Literature Review and recalled when examining the results. Consistent results by Sector are explained by Institutional and Instrumental Stakeholder theories, while the heterogeity may be reconducted to the theories related to the sustainable competitive advantage, the strategic CSR and the Resource Based View.

Since there is no one-size-fits-all solution in business and, in this particular case, in CSR, what this study implies is that heterogeneity in the results is normal and usually sensibly motivated. Generalizing is useful only to a certain extent, hence when companies and practitioners want to understand and predict the impact of performing CSR on the financial performance, considering factors such as sector, financial measures to use and organizational characteristics is necessary. However, some trends both in the general regressions and within sectors have been identified and highlighted above.

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As stated in the previous Section, every firm should consider whether and how to deal with CSR, considering the sector in which it operates, which CSR aspects are worth of investments with a strategic approach which involves more than simple greenwashing or philanthropic activities *per se*. Intermediate indicators may be used to ascertain the relationship as well, because financial measures represent summaries obtained combining all the managerial choices, so sometimes some incongruences may be present even when controlling for the main variables.

Subsequent tests on different samples will be surely important to test the validity of the results. Indications and suggestions for future research have been discussed at the end of Chapter 3, along with the main limitations of this study. All the suggestions are related to the underlying desire of providing sound tools and useful insights to practitioners as well as enriching the developments in the academic sector.

Despite the clear limitations embedded in the work, the hope is that some pieces have been added to the understanding path of the CSR phenomenon, considering in particular its relationship with financial performance.

Appendix

APPENDIX A: Graphical residuals analysis

To avoid unnecessary repetitions, only the residuals plots of two of the models reffered to the sample containing the observations for all the analysed Sectors are reported. However, the pattern is unchanged regardless the model configuration; it only changes among different dependent variables and slightly across time periods.

This Appendix reports the plot of Standardized Residuals vs. Fitted values, which should resemble a homogeneous scatter as a "cloud" inserted in a rectangular shape, and the histogram of the Standardized residual distribution, which in linear OLS regressions should be distributed as a Normal distribution (bell-shape) with mean 0 and constant variance. Considering the plots, LCAPX and LTOB are better shaped than ROA, even if they present some disturbance toward the left side. ROA residuals are better in t than in t+1, since in the latter they are characterized by a significant disturbance toward the bottom of the graph.

For what concerns residuals frequency distribution, even if there is not a perfect fit with the curve, the results are not completely disappointing, especially for the ln-transformed variables.

In addition to the residuals analysis, also the observed vs. fitted values plots were examined. For LTOB and LCAPX the fitting was quite good, more disperse for LTOB and more concentrated for LCAPX, while for ROA the fitting was even more disperse than the one of LTOB.

Figure 4: Standardized Residuals vs. Fitted values ESG_NET_A
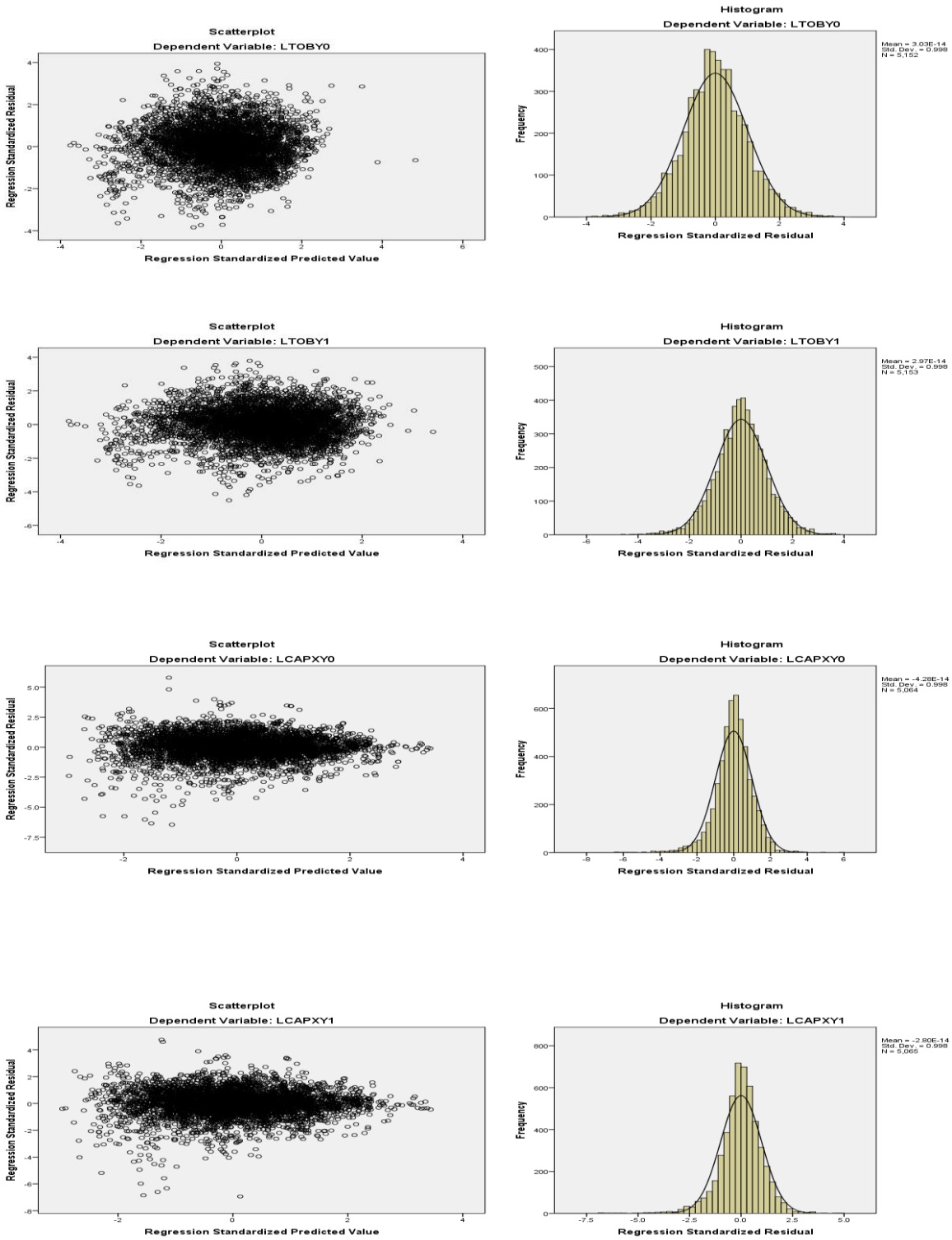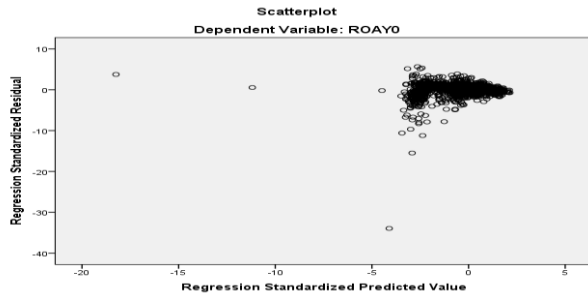
Figure 5: Standardized Residuals vs. Fitted values ESG_S_A + ESG_C_A
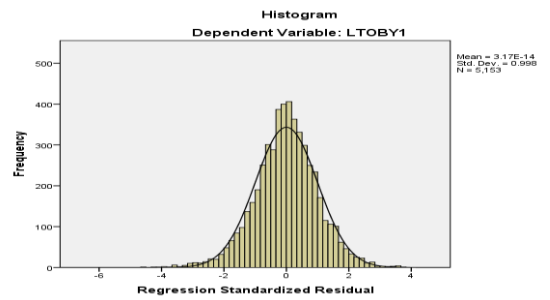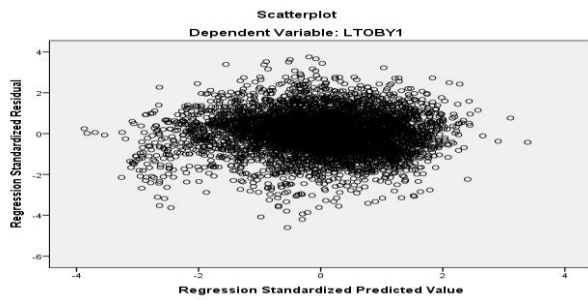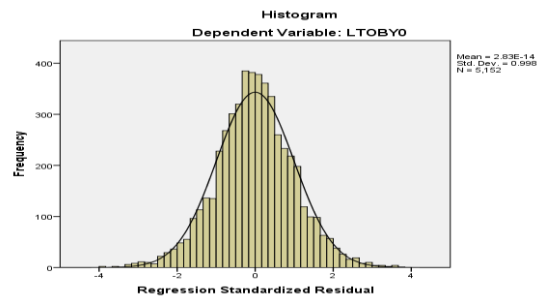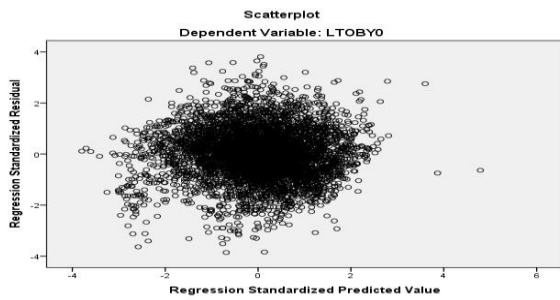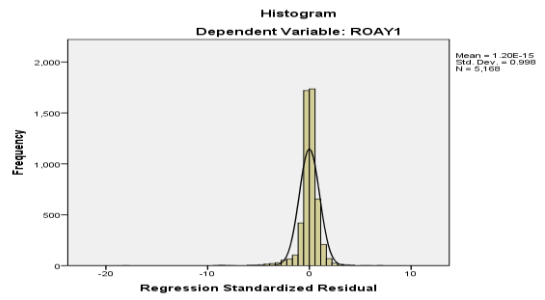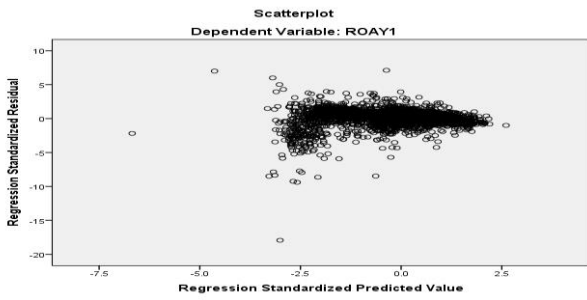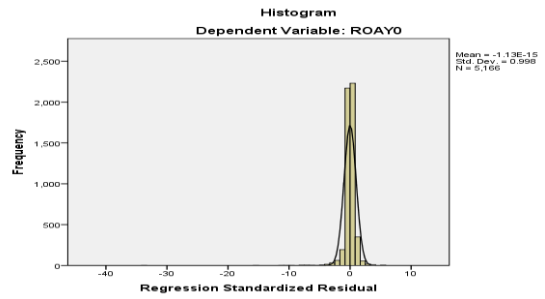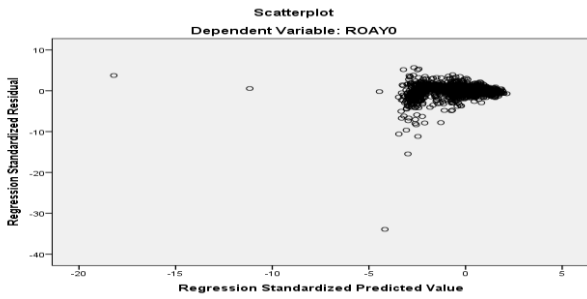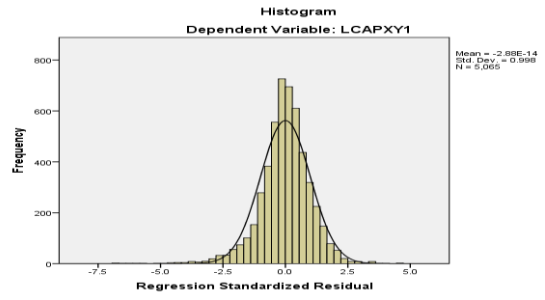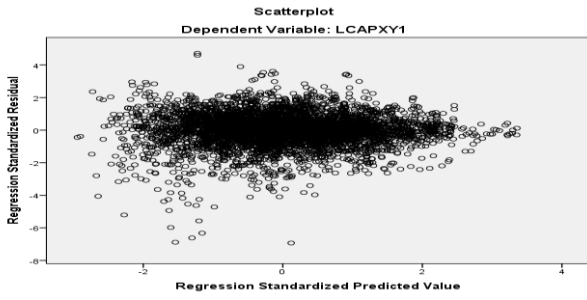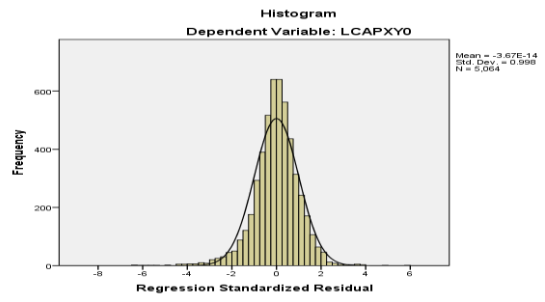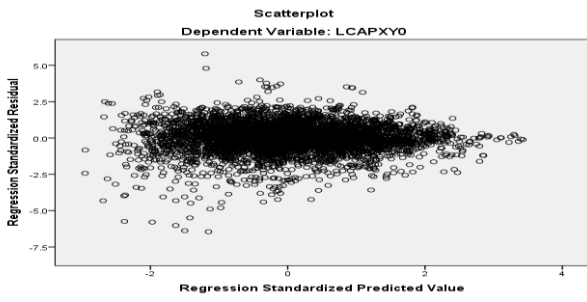
Table 39: ESG_NET_A in t – Consumer Discretionary

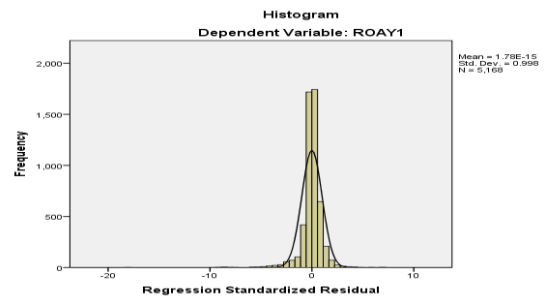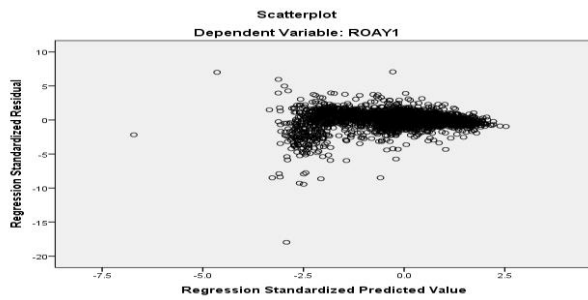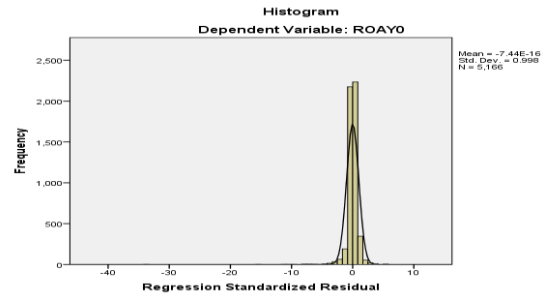|	D.V. LTOB0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	5.278	0.479	0.000	***	5.323	0.665	0.000	***	0.331	0.061	0.000	***
ESG_NET_A	0.050	0.017	0.003	***	0.034	0.017	0.039	**	0.004	0.002	0.013	**
AGEY0	-0.002	0.001	0.005	***	-0.006	0.001	0.000	***	0.000	0.000	0.256	
DEY0	0.002	0.001	0.044	**	-0.002	0.001	0.158		0.000	0.000	0.267	
LNTAY0	-0.303	0.024	0.000	***	0.376	0.037	0.000	***	-0.014	0.003	0.000	***
LEMPY0	0.144	0.025	0.000	***	0.533	0.038	0.000	***	0.004	0.003	0.116	
MKTSHY0	7.163	6.984	0.305		19.218	4.361	0.000	***	0.823	0.424	0.052	*
REVGY0	1.044	0.214	0.000	***	-0.246	0.245	0.315		0.036	0.024	0.131	
LREDY0	0.008	0.003	0.017	**	0.014	0.004	0.000	***	0.000	0.000	0.647	
Y2013	0.229	0.061	0.000	***	-0.021	0.074	0.775		0.011	0.007	0.119	
Y2014	0.205	0.059	0.001	***	0.011	0.074	0.880		0.007	0.006	0.244	
Mean D.V.	0.254	S.D. of D.V.	0.779		Mean D.V.	18.203	S.D. of D.V.	1.653	Mean D.V.	0.071	S.D. of D.V.	0.079
SSR	399.947	S.E. reg	0.698		SSR	631.566	S.E. reg	0.877	SSR	4.941	S.E. reg	0.078
R^2	0.206	Adj R^2	0.197		R^2	0.722	Adj R^2	0.718	R^2	0.043	Adj R^2	0.031
$F_{(10, 820)}$	22.437	F P-value	0.000		$F_{(10, 821)}$	282.253	F P-value	0.000	$F_{(10, 821)}$	3.837	F P-value	0.000
N	831				N	832			N	832		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 40: ESG_NET_A in t+1 – Consumer Discretionary

	D.V. LTOB1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	4.895	0.523	0.000	***	5.630	0.622	0.000	***	0.315	0.069	0.000	***
ESG_NET_A	0.050	0.018	0.005	***	0.029	0.017	0.090	*	0.005	0.002	0.001	***
AGEY0	-0.001	0.001	0.314		-0.005	0.001	0.000	***	0.000	0.000	0.038	**
DEY0	0.002	0.001	0.003	***	-0.002	0.001	0.181		0.000	0.000	0.165	
LNTAY0	-0.292	0.027	0.000	***	0.364	0.036	0.000	***	-0.015	0.003	0.000	***
LEMPY0	0.150	0.027	0.000	***	0.521	0.037	0.000	***	0.005	0.003	0.048	**
MKTSHY0	6.492	7.484	0.386		23.402	4.333	0.000	***	0.898	0.498	0.072	*
REVGY0	0.946	0.216	0.000	***	0.451	0.253	0.075	*	0.052	0.026	0.044	**
LREDY0	0.009	0.003	0.011	**	0.018	0.004	0.000	***	0.000	0.000	0.675	
Y2013	0.200	0.062	0.001	***	0.057	0.073	0.437		0.014	0.0	0.039	**

	D.V. (1)				D.V. (2)				D.V. (3)			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
											07	
Y2014	0.039	0.063	0.533		0.063	0.074	0.389		0.009	0.0 07	0.181	
	Mean D.V.	0.154	S.D. of D.V.	0.801	Mean D.V.	18.259	S.D. of D.V.	1.631	Mean D.V.	0.065	S.D. of D.V.	0.082
	SSR	444.044	S.E. reg	0.735	SSR	616.005	S.E. reg	0.866	SSR	5.280	S.E. reg	0.080
	R^2	0.169	Adj R^2	0.159	R^2	0.721	Adj R^2	0.718	R^2	0.051	Adj R^2	0.040
	$F_{(10, 822)}$	17.977	F P-value	0.000	$F_{(10, 821)}$	269.525	F P-value	0.000	$F_{(10, 820)}$	4.488	F P-value	0.000
	N	833			N	832			N	831		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 41: ESG_NET_A in t – Industrials

	D.V. LTOB0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	5.003	0.492	0.000	***	-4.339	0.833	0.000	***	0.053	0.062	0.397	
ESG_NET_A	0.046	0.012	0.000	***	-0.001	0.017	0.951		0.001	0.001	0.271	
AGEY0	0.001	0.001	0.092	*	0.002	0.001	0.101		0.000	0.000	0.000	***
DEY0	-0.004	0.002	0.021	**	0.004	0.003	0.240		0.000	0.000	0.175	
LNTAY0	-0.274	0.028	0.000	***	1.045	0.057	0.000	***	-0.005	0.003	0.136	
LEMPY0	0.072	0.025	0.004	***	-0.003	0.069	0.963		0.010	0.003	0.003	***
MKTSHY0	15.369	4.860	0.002	***	-4.871	5.935	0.412		-0.462	0.448	0.302	
REVGY0	0.376	0.115	0.001	***	-0.416	0.132	0.002	***	-0.008	0.019	0.665	
LREDY0	0.012	0.002	0.000	***	-0.020	0.003	0.000	***	0.000	0.000	0.114	
Y2013	0.238	0.051	0.000	***	0.080	0.078	0.305		0.008	0.006	0.139	
Y2014	0.204	0.051	0.000	***	0.035	0.078	0.655		0.004	0.006	0.500	
	Mean D.V.	0.113	S.D. of D.V.	0.682	Mean D.V.	17.962	S.D. of D.V.	1.716	Mean D.V.	0.053	S.D. of D.V.	0.070
	SSR	341.707	S.E. reg	0.619	SSR	789.685	S.E. reg	0.941	SSR	4.262	S.E. reg	0.069
	R^2	0.185	Adj R^2	0.176	R^2	0.702	Adj R^2	0.699	R^2	0.045	Adj R^2	0.034
	$F_{(10, 891)}$	20.621	F P-value	0.000	$F_{(10, 891)}$	269.818	F P-value	0.000	$F_{(10, 889)}$	4.290	F P-value	0.000
	N	902			N	902			N	900		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 42: ESG_NET_A in t+1 – Industrials

	D.V. LTOB1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	4.508	0.546	0.000	***	-3.907	0.868	0.000	***	0.074	0.063	0.235	
ESG_NET_A	0.050	0.012	0.000	***	0.010	0.018	0.570		0.002	0.001	0.047	**

	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
AGEY0	0.002	0.001	0.012	**	0.001	0.001	0.474		0.000	0.000	0.001	***
DEY0	-0.004	0.002	0.037	**	0.005	0.003	0.096	*	0.000	0.000	0.330	
LNTAY0	-0.254	0.030	0.000	***	1.016	0.062	0.000	***	-0.007	0.003	0.039	**
LEMPY0	0.097	0.026	0.000	***	0.022	0.081	0.789		0.012	0.003	0.000	***
MKTSHY0	10.820	4.522	0.017	**	-2.127	6.242	0.733		-0.482	0.425	0.258	
REVGY0	0.154	0.155	0.322		0.277	0.167	0.097	*	0.021	0.017	0.225	
LREDY0	0.011	0.002	0.000	***	-0.022	0.004	0.000	***	0.000	0.000	0.322	
Y2013	0.044	0.051	0.395		0.077	0.083	0.356		0.007	0.005	0.140	
Y2014	-0.146	0.053	0.006	***	0.039	0.081	0.629		0.002	0.005	0.758	
Mean D.V.	0.083	S.D. of D.V.	0.682		Mean D.V.	17.995	S.D. of D.V.	1.736	Mean D.V.	0.052	S.D. of D.V.	0.066
SSR	360.738	S.E. reg	0.636		SSR	882.524	S.E. reg	0.995	SSR	3.713	S.E. reg	0.065
R²	0.139	Adj R²	0.130		R²	0.675	Adj R²	0.671	R²	0.058	Adj R²	0.047
F(10, 891)	14.568	F P-value	0.000		F(10, 891)	254.892	F P-value	0.000	F(10, 889)	5.303	F P-value	0.000
N	902				N	902			N	900		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 43: ESG_NET_A in t – Information Technology

	D.V. LTOB0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	4.002	0.565	0.000	***	-0.174	0.646	0.788		-0.332	0.090	0.000	***
ESG_NET_A	0.068	0.011	0.000	***	-0.005	0.014	0.709		0.001	0.001	0.329	
AGEY0	-0.008	0.001	0.000	***	-0.007	0.002	0.000	***	0.000	0.000	0.022	**
DEY0	-0.009	0.009	0.298		-0.002	0.007	0.734		-0.002	0.001	0.084	*
LNTAY0	-0.148	0.036	0.000	***	0.654	0.036	0.000	***	0.018	0.005	0.000	***
LEMPY0	-0.076	0.032	0.018	**	0.395	0.037	0.000	***	0.000	0.005	0.928	
MKTSHY0	8.251	2.211	0.000	***	6.821	2.150	0.002	***	0.214	0.323	0.508	
REVGY0	0.746	0.285	0.009	***	0.299	0.251	0.233		-0.026	0.019	0.167	
LREDY0	0.013	0.004	0.002	***	0.034	0.004	0.000	***	-0.002	0.000	0.000	***
Y2013	0.126	0.056	0.025	**	-0.063	0.068	0.356		0.027	0.009	0.003	***
Y2014	0.157	0.054	0.004	***	-0.047	0.066	0.480		0.018	0.009	0.047	**
Mean D.V.	0.555	S.D. of D.V.	0.754		Mean D.V.	17.327	S.D. of D.V.	1.774	Mean D.V.	0.034	S.D. of D.V.	0.109
SSR	338.196	S.E. reg	0.647		SSR	513.835	S.E. reg	0.795	SSR	8.595	S.E. reg	0.103
R²	0.274	Adj R²	0.265		R²	0.802	Adj R²	0.799	R²	0.118	Adj R²	0.107
F(10, 809)	27.163	F P-value	0.000		F(10, 814)	382.073	F P-value	0.000	F(10, 813)	12.113	F P-value	0.000
N	820				N	825			N	824		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 44: ESG_NET_A in t+1 – Information Technology

	D.V. LTOB1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	3.728	0.554	0.000	***	-0.616	0.668	0.357		-0.422	0.098	0.000	***
ESG_NET_A	0.070	0.010	0.000	***	-0.015	0.014	0.308		0.002	0.002	0.370	
AGEY0	-0.007	0.001	0.000	***	-0.008	0.002	0.000	***	0.001	0.000	0.000	***
DEY0	-0.012	0.011	0.273		-0.008	0.008	0.348		-0.002	0.001	0.062	*
LNTAY0	-0.139	0.036	0.000	***	0.690	0.037	0.000	***	0.020	0.005	0.000	***
LEMPY0	-0.062	0.031	0.047	**	0.364	0.037	0.000	***	0.003	0.006	0.574	
MKTSHY0	6.541	2.204	0.003	***	8.473	2.111	0.000	***	-0.222	0.381	0.561	
REVGY0	0.613	0.231	0.008	***	0.780	0.280	0.006	***	0.016	0.021	0.445	
LREDY0	0.014	0.004	0.001	***	0.031	0.004	0.000	***	-0.002	0.000	0.000	***
Y2013	0.037	0.054	0.495		0.005	0.067	0.936		0.026	0.010	0.008	***
Y2014	-0.018	0.057	0.748		-0.005	0.068	0.941		0.011	0.010	0.301	
Mean D.V.	0.510	S.D. of D.V.	0.737		17.389	S.D. of D.V.	1.763		0.026	S.D. of D.V.	0.121	
SSR	344.633	S.E. reg	0.653		524.870	S.E. reg	0.803		10.632	S.E. reg	0.114	
R^2	0.224	Adj R^2	0.214		0.795	Adj R^2	0.792		0.117	Adj R^2	0.106	
F(10, 808)	23.406	F P-value	0.000	F(10, 813)	354.239	F P-value	0.000	F(10, 812)	10.999	F P-value	0.000	
N	819			N	824			N	823			

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 45: ESG_S_A and ESG_C_A in t – Consumer Discretionary

	D.V. LTOB0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	5.252	0.472	0.000	***	5.355	0.672	0.000	***	0.334	0.062	0.000	***
ESG_S_A	0.047	0.019	0.012	**	0.039	0.019	0.043	**	0.004	0.002	0.011	**
ESG_C_A	-0.059	0.036	0.098	*	-0.024	0.037	0.522		-0.003	0.004	0.424	
AGEY0	-0.002	0.001	0.005	***	-0.006	0.001	0.000	***	0.000	0.000	0.272	
DEY0	0.002	0.001	0.047	**	-0.002	0.001	0.162		0.000	0.000	0.254	
LNTAY0	-0.302	0.024	0.000	***	0.374	0.037	0.000	***	-0.015	0.003	0.000	***
LEMPY0	0.145	0.025	0.000	***	0.533	0.038	0.000	***	0.004	0.003	0.121	
MKTSHY0	8.026	7.656	0.295		18.144	5.176	0.000	***	0.718	0.503	0.154	
REVGY0	1.043	0.214	0.000	***	-0.246	0.245	0.316		0.036	0.024	0.130	
LREDY0	0.008	0.003	0.017	**	0.014	0.004	0.001	***	0.000	0.000	0.604	
Y2013	0.234	0.064	0.000	***	-0.029	0.076	0.706		0.010	0.007	0.146	

	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
Y2014	0.204	0.059	0.001	***	0.012	0.074	0.874		0.007	0.006	0.241	

Mean D.V.	0.254	S.D. of D.V.	0.779	Mean D.V.	18.203	S.D. of D.V.	1.653	Mean D.V.	0.071	S.D. of D.V.	0.079
SSR	399.885	S.E. reg	0.699	SSR	631.470	S.E. reg	0.878	SSR	4.940	S.E. reg	0.078
R^2	0.206	Adj R^2	0.196	R^2	0.722	Adj R^2	0.718	R^2	0.043	Adj R^2	0.030
$F_{(11,819)}$	20.756	F P-value	0.000	$F_{(11,820)}$	273.148	F P-value	0.000	$F_{(11,820)}$	3.636	F P-value	0.000
N	831			N	832			N	832		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 46: ESG_S_A and ESG_C_A in t+1 – Consumer Discretionary

	D.V. LTOB1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	4.881	0.517	0.000	***	5.655	0.627	0.000	***	0.316	0.067	0.000	***
ESG_S_A	0.048	0.019	0.013	**	0.032	0.020	0.107		0.005	0.002	0.002	***
ESG_C_A	-0.055	0.038	0.146		-0.020	0.036	0.565		-0.005	0.004	0.221	
AGEY0	-0.001	0.001	0.319		-0.005	0.001	0.000	***	0.000	0.000	0.039	**
DEY0	0.002	0.001	0.003	***	-0.002	0.001	0.184		0.000	0.000	0.163	
LNTAY0	-0.291	0.027	0.000	***	0.363	0.036	0.000	***	-0.015	0.003	0.000	***
LEMPY0	0.150	0.027	0.000	***	0.521	0.037	0.000	***	0.005	0.003	0.048	**
MKTSHY0	6.970	8.072	0.388		22.596	5.265	0.000	***	0.871	0.626	0.165	
REVGY0	0.946	0.216	0.000	***	0.451	0.253	0.074	*	0.052	0.026	0.044	**
LREDY0	0.009	0.003	0.013	**	0.017	0.004	0.000	***	0.000	0.000	0.669	
Y2013	0.203	0.065	0.002	***	0.051	0.076	0.502		0.014	0.007	0.059	*
Y2014	0.039	0.063	0.536		0.064	0.074	0.387		0.009	0.007	0.180	

Mean D.V.	0.154	S.D. of D.V.	0.801	Mean D.V.	18.259	S.D. of D.V.	1.631	Mean D.V.	0.065	S.D. of D.V.	0.082
SSR	444.025	S.E. reg	0.735	SSR	615.951	S.E. reg	0.867	SSR	5.280	S.E. reg	0.080
R^2	0.169	Adj R^2	0.158	R^2	0.721	Adj R^2	0.718	R^2	0.051	Adj R^2	0.039
$F_{(11,821)}$	16.663	F P-value	0.000	$F_{(11,820)}$	252.050	F P-value	0.000	$F_{(11,819)}$	4.463	F P-value	0.000
N	833			N	832			N	831		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 47: ESG_S_A and ESG_C_A in t – Industrials

	D.V. LTOB0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value.	S.L.	Coeff.	s.e.	p-value.	S.L.	Coeff.	s.e.	p-value.	S.L.
const	5.084	0.486	0.000	***	-4.309	0.848	0.000	***	0.050	0.062	0.422	
ESG_S_A	0.064	0.013	0.000	***	0.005	0.021	0.802		0.001	0.001	0.532	
ESG_C_A	0.005	0.024	0.849		0.019	0.036	0.593		-0.003	0.003	0.294	
AGEY0	0.001	0.001	0.049	**	0.002	0.001	0.087	*	0.000	0.000	0.000	***
DEY0	-0.004	0.002	0.021	**	0.004	0.003	0.246		0.000	0.000	0.166	

	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
LNTAY0	-0.280	0.028	0.000	***	1.043	0.058	0.000	***	-0.004	0.003	0.153	
LEMPY0	0.073	0.025	0.004	***	-0.003	0.069	0.965		0.010	0.003	0.003	***
MKTSHY0	8.166	5.492	0.137		-7.470	6.762	0.270		-0.214	0.570	0.707	
REVGY0	0.368	0.116	0.002	***	-0.419	0.132	0.002	***	-0.008	0.019	0.675	
LREDY0	0.012	0.002	0.000	***	-0.020	0.003	0.000	***	0.000	0.000	0.120	
Y2013	0.197	0.053	0.000	***	0.065	0.086	0.449		0.010	0.006	0.102	
Y2014	0.202	0.051	0.000	***	0.034	0.078	0.663		0.004	0.006	0.491	
Mean D.V.	0.113	S.D. of D.V.	0.682		Mean D.V.	17.962	S.D. of D.V.	1.716	Mean D.V.	0.053	S.D. of D.V.	0.070
SSR	339.392	S.E. reg	0.618		SSR	789.384	S.E. reg	0.942	SSR	4.259	S.E. reg	0.069
R^2	0.190	Adj R^2	0.180		R^2	0.703	Adj R^2	0.699	R^2	0.045	Adj R^2	0.033
F(11, 890)	20.416	F P-value	0.000		F(11, 890)	265.076	F P-value	0.000	F(11, 888)	3.930	F P-value	0.000
N	902				N	902			N	900		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 48: ESG_S_A and ESG_C_A in t+1 − Industrials

	D.V. LTOB1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value.	S.L.	Coeff.	s.e.	p-value.	S.L.	Coeff.	s.e.	p-value.	S.L.
const	4.565	0.545	0.000	***	-3.882	0.881	0.000	***	0.069	0.063	0.272	
ESG_S_A	0.062	0.013	0.000	***	0.015	0.022	0.481		0.001	0.001	0.383	
ESG_C_A	-0.014	0.024	0.560		0.005	0.041	0.896		-0.006	0.003	0.029	**
AGEY0	0.002	0.001	0.007	***	0.001	0.001	0.434		0.000	0.000	0.001	***
DEY0	-0.004	0.002	0.039	**	0.005	0.003	0.100		0.000	0.000	0.301	
LNTAY0	-0.258	0.030	0.000	***	1.015	0.063	0.000	***	-0.006	0.003	0.052	*
LEMPY0	0.098	0.026	0.000	***	0.022	0.081	0.788		0.012	0.003	0.000	***
MKTSHY0	5.748	5.040	0.254		-4.322	7.326	0.555		-0.010	0.541	0.986	
REVGY0	0.148	0.156	0.343		0.274	0.167	0.100		0.021	0.017	0.211	
LREDY0	0.011	0.002	0.000	***	-0.022	0.004	0.000	***	0.000	0.000	0.352	
Y2013	0.015	0.053	0.780		0.064	0.091	0.481		0.010	0.005	0.042	**
Y2014	-0.147	0.053	0.005	***	0.039	0.081	0.635		0.002	0.005	0.739	
Mean D.V.	0.083	S.D. of D.V.	0.682		Mean D.V.	17.995	S.D. of D.V.	1.736	Mean D.V.	0.052	S.D. of D.V.	0.066
SSR	359.589	S.E. reg	0.636		SSR	882.309	S.E. reg	0.996	SSR	3.703	S.E. reg	0.065
R^2	0.142	Adj R^2	0.132		R^2	0.675	Adj R^2	0.671	R^2	0.060	Adj R^2	0.049
F(11, 890)	13.899	F P-value	0.000		F(11, 890)	246.441	F P-value	0.000	F(11, 888)	4.872	F P-value	0.000
N	902				N	902			N	900		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 49: ESG_S_A and ESG_C_A in t − Information Technology

	D.V. LTOB0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	4.012	0.566	0.000	***	-0.138	0.643	0.830		-0.335	0.090	0.000	***
ESG_S_A	0.070	0.011	0.000	***	0.003	0.014	0.861		0.001	0.002	0.635	
ESG_C_A	-0.060	0.036	0.100		0.057	0.040	0.153		-0.006	0.005	0.224	
AGEY0	-0.008	0.001	0.000	***	-0.007	0.002	0.000	***	0.000	0.000	0.023	**
DEY0	-0.009	0.009	0.316		-0.001	0.007	0.848		-0.002	0.001	0.071	*
LNTAY0	-0.149	0.037	0.000	***	0.651	0.036	0.000	***	0.018	0.005	0.000	***
LEMPY0	-0.075	0.032	0.019	**	0.397	0.037	0.000	***	-0.001	0.005	0.900	
MKTSHY0	7.627	3.192	0.017	**	3.079	3.346	0.358		0.519	0.446	0.246	
REVGY0	0.744	0.286	0.009	***	0.289	0.249	0.246		-0.025	0.019	0.179	
LREDY0	0.013	0.004	0.002	***	0.033	0.004	0.000	***	-0.002	0.000	0.000	***
Y2013	0.121	0.059	0.040	**	-0.093	0.070	0.186		0.029	0.009	0.002	***
Y2014	0.158	0.054	0.004	***	-0.045	0.066	0.494		0.018	0.009	0.049	**

Mean D.V.	0.555	S.D. of D.V.	0.754		Mean D.V.	17.327	S.D. of D.V.	1.774	Mean D.V.	0.034	S.D. of D.V.	0.109
SSR	338.167	S.E. reg	0.647		SSR	512.723	S.E. reg	0.794	SSR	8.588	S.E. reg	0.103
R^2	0.274	Adj R^2	0.264		R^2	0.802	Adj R^2	0.800	R^2	0.118	Adj R^2	0.106
$F_{(11, 808)}$	24.892	F P-value	0.000		$F_{(11, 813)}$	359.515	F P-value	0.000	$F_{(11, 812)}$	11.146	F P-value	0.000
N	820				N	825			N	824		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 50: ESG_S_A and ESG_C_A in t+1 − Information Technology

	D.V. LTOB1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	3.719	0.554	0.000	***	-0.588	0.666	0.377		-0.428	0.098	0.000	***
ESG_S_A	0.069	0.011	0.000	***	-0.009	0.015	0.555		0.000	0.002	0.912	
ESG_C_A	-0.077	0.039	0.049	**	0.055	0.042	0.187		-0.010	0.005	0.051	*
AGEY0	-0.007	0.001	0.000	***	-0.008	0.002	0.000	***	0.001	0.000	0.000	***
DEY0	-0.012	0.011	0.276		-0.007	0.008	0.391		-0.003	0.001	0.036	**
LNTAY0	-0.139	0.036	0.000	***	0.688	0.037	0.000	***	0.020	0.005	0.000	***
LEMPY0	-0.062	0.031	0.046	**	0.365	0.037	0.000	***	0.003	0.006	0.614	
MKTSHY0	7.091	3.197	0.027	**	5.591	3.408	0.101		0.412	0.505	0.415	
REVGY0	0.614	0.233	0.008	***	0.772	0.279	0.006	***	0.018	0.021	0.399	
LREDY0	0.014	0.004	0.001	***	0.030	0.004	0.000	***	-0.002	0.000	0.001	***
Y2013	0.041	0.058	0.481		-0.018	0.069	0.800		0.031	0.011	0.004	***
Y2014	-0.019	0.057	0.745		-0.004	0.068	0.955		0.010	0.010	0.311	

Mean D.V.	0.509	Mean D.V.	17.389	Mean D.V.	1.763	
S.D. of D.V.	0.73677	S.D. of D.V.		S.D. of D.V.	0.026	0.121
SSR	344.610	SSR	524.211	SSR	10.600	
S.E. reg	0.653473	S.E. reg	0.803	S.E. reg		0.114
R²	0.223	R²	0.795	R²	0.792	
Adj R²	0.213334	Adj R²	0.795	Adj R²	0.119	0.107
F(11, 807)	21.388	F(11, 812)	329.873	F(11, 811)	9.945	
F P-value	0.000	F P-value	0.000	F P-value		0.000
N	819	N	824	N	823	

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 51: Actual net scores by category in t – Consumer Discretionary

	D.V. LTOB0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	5.251	0.476	0.000	***	5.078	0.697	0.000	***	0.330	0.062	0.000	***
NET_ENV_A	0.021	0.037	0.573		-0.014	0.046	0.754		0.003	0.003	0.352	
NET_COM_A	0.235	0.134	0.080	*	-0.286	0.139	0.041	**	0.021	0.015	0.163	
NET_HUM_A	0.179	0.182	0.327		-0.395	0.228	0.084	*	-0.032	0.026	0.232	
NET_EMP_A	0.043	0.032	0.184		0.106	0.033	0.001	***	0.006	0.003	0.047	**
NET_DIV_A	0.044	0.036	0.228		0.095	0.046	0.039	**	0.002	0.004	0.681	
NET_PRO_A	0.149	0.061	0.014	**	-0.001	0.066	0.987		0.001	0.006	0.840	
NET_GOV_A	-0.333	0.117	0.004	***	-0.211	0.126	0.094	*	0.000	0.012	0.987	
AGEY0	-0.002	0.001	0.020	**	-0.005	0.001	0.000	***	0.000	0.000	0.268	
DEY0	0.002	0.001	0.003	***	-0.001	0.001	0.219		0.000	0.000	0.196	
LNTAY0	-0.300	0.024	0.000	***	0.390	0.037	0.000	***	-0.014	0.003	0.000	***
LEMPY0	0.138	0.024	0.000	***	0.527	0.037	0.000	***	0.004	0.003	0.131	
MKTSHY0	10.572	6.607	0.110		14.705	5.034	0.004	***	0.688	0.453	0.129	
REVGY0	1.064	0.205	0.000	***	-0.203	0.247	0.412		0.038	0.024	0.112	
LREDY0	0.007	0.003	0.042	**	0.013	0.004	0.001	***	0.000	0.000	0.633	
Y2013	0.197	0.065	0.003	***	0.002	0.077	0.975		0.007	0.007	0.288	
Y2014	0.200	0.058	0.001	***	0.024	0.074	0.741		0.007	0.006	0.249	
Mean D.V.	0.254	S.D. of D.V.	0.779		Mean D.V.	18.203	S.D. of D.V.	1.653	Mean D.V.	0.071	S.D. of D.V.	0.079
SSR	389.436	S.E. reg	0.692		SSR	618.928	S.E. reg	0.871	SSR	4.909	S.E. reg	0.078
R²	0.227	Adj R²	0.212		R²	0.727	Adj R²	0.722	R²	0.049	Adj R²	0.031
F(16, 814)	15.103	F P-value	0.000		F(16, 815)	176.424	F P-value	0.000	F(16, 815)	2.778	F P-value	0.000
N	831				N	832			N	832		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 52: Actual net scores by category in t+1 – Consumer Discretionary

	D.V. LTOB1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	4.929	0.526	0.000	***	5.506	0.647	0.000	***	0.325	0.069	0.000	***
NET_ENV_A	0.027	0.039	0.494		0.009	0.048	0.854		0.004	0.003	0.216	
NET_COM_A	0.317	0.145	0.029	**	-0.230	0.129	0.076	*	0.033	0.012	0.005	***
NET_HUM_A	0.219	0.172	0.203		-0.286	0.211	0.177		-0.004	0.020	0.838	
NET_EMP_A	0.040	0.033	0.232		0.092	0.032	0.004	***	0.008	0.003	0.016	**
NET_DIV_A	0.026	0.037	0.482		0.062	0.045	0.175		0.000	0.004	0.993	
NET_PRO_A	0.138	0.064	0.032	**	-0.020	0.065	0.762		0.004	0.008	0.633	
NET_GOV_A	-0.298	0.113	0.008	***	-0.180	0.138	0.194		-0.003	0.015	0.842	
AGEY0	0.000	0.001	0.595		-0.005	0.001	0.000	***	0.000	0.000	0.034	**
DEY0	0.002	0.001	0.000	***	-0.001	0.001	0.216		0.000	0.000	0.106	
LNTAY0	-0.291	0.027	0.000	***	0.371	0.036	0.000	***	-0.015	0.003	0.000	***
LEMPY0	0.145	0.027	0.000	***	0.517	0.037	0.000	***	0.005	0.003	0.051	*
MKTSHY0	10.349	7.017	0.141		19.047	5.196	0.000	***	1.004	0.520	0.054	*
REVGY0	0.964	0.212	0.000	***	0.485	0.250	0.052	*	0.053	0.026	0.044	**
LREDY0	0.008	0.003	0.023	**	0.016	0.004	0.000	***	0.000	0.000	0.712	
Y2013	0.156	0.065	0.017	**	0.072	0.077	0.349		0.008	0.007	0.239	
Y2014	0.033	0.062	0.600		0.073	0.073	0.320		0.009	0.007	0.204	

	Mean D.V.	0.154	S.D. of D.V.	0.801	Mean D.V.	18.259	S.D. of D.V.	1.631	Mean D.V.	0.065	S.D. of D.V.	0.082
	SSR	434.469	S.E. reg	0.730	SSR	607.854	S.E. reg	0.864	SSR	5.249	S.E. reg	0.080
	R^2	0.187	Adj R^2	0.171	R^2	0.725	Adj R^2	0.720	R^2	0.057	Adj R^2	0.038
	$F_{(16, 816)}$	12.440	F P-value	0.000	$F_{(16, 815)}$	158.980	F P-value	0.000	$F_{(16, 814)}$	3.884	F P-value	0.000
	N	833			N	832			N	831		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 53: Actual net scores by category in t – Industrials

	D.V. LTOB0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	5.137	0.479	0.000	***	-4.390	0.861	0.000	***	0.060	0.065	0.355	
NET_ENV_A	0.098	0.026	0.000	***	0.075	0.032	0.020	**	0.002	0.003	0.413	
NET_COM_A	-0.200	0.094	0.034	**	-0.147	0.118	0.213		-0.008	0.007	0.210	
NET_HUM_A	0.151	0.090	0.093	*	0.342	0.108	0.002	***	0.021	0.011	0.067	*
NET_EMP_A	0.048	0.025	0.058	*	0.032	0.038	0.391		0.002	0.002	0.333	
NET_DIV_A	0.057	0.029	0.052	*	-0.082	0.045	0.067	*	0.003	0.004	0.413	
NET_PRO_A	-0.034	0.056	0.536		-0.076	0.090	0.398		-0.002	0.006	0.678	
NET_GO	-0.082	0.060	0.172		-0.159	0.083	0.057	*	-0.008	0.008	0.299	

V_A	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
AGEY0	0.001	0.001	0.085	*	0.001	0.001	0.124		0.000	0.000	0.000	***
DEY0	-0.004	0.002	0.017	**	0.004	0.003	0.255		0.000	0.000	0.153	
LNTAY0	-0.281	0.027	0.000	***	1.043	0.059	0.000	***	-0.005	0.003	0.106	
LEMPY0	0.073	0.025	0.004	***	0.004	0.069	0.951		0.011	0.003	0.002	***
MKTSHY0	13.065	5.006	0.009	***	-4.710	5.559	0.397		-0.332	0.517	0.521	
REVGY0	0.375	0.116	0.001	***	-0.434	0.132	0.001	***	-0.008	0.020	0.698	
LREDY0	0.012	0.003	0.000	***	-0.020	0.004	0.000	***	0.000	0.000	0.212	
Y2013	0.260	0.056	0.000	***	0.045	0.086	0.603		0.008	0.006	0.162	
Y2014	0.205	0.051	0.000	***	0.033	0.077	0.673		0.004	0.006	0.525	

Mean D.V.	0.113	S.D. of D.V.	0.682	Mean D.V.	17.962	S.D. of D.V.	1.716	Mean D.V.	0.053	S.D. of D.V.	0.070	
SSR	335.533	S.E. reg	0.616	SSR	773.588	S.E. reg	0.935	SSR	4.231	S.E. reg	0.069	
R^2	0.199	Adj R^2	0.185	R^2	0.709	Adj R^2	0.703	R^2	0.052	Adj R^2	0.034	
$F_{(16, 885)}$	14.358	F P-value	0.000	$F_{(16, 885)}$	256.081	F P-value	0.000	$F_{(16, 883)}$	3.892	F P-value	0.000	
N	902			N	902			N	900			

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 54: Actual net scores by category in t+1 − Industrials

	D.V. LTOB1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	4.658	0.547	0.000	***	-3.932	0.896	0.000	***	0.086	0.064	0.182	
NET_ENV_A	0.069	0.027	0.011	**	0.085	0.034	0.013	**	0.004	0.002	0.147	
NET_COM_A	-0.145	0.088	0.102		-0.215	0.125	0.086	*	-0.019	0.009	0.046	**
NET_HUM_A	0.174	0.099	0.079	*	0.397	0.130	0.002	***	0.009	0.007	0.188	
NET_EMP_A	0.057	0.025	0.022	**	0.042	0.038	0.264		0.002	0.002	0.416	
NET_DIV_A	0.078	0.032	0.015	**	-0.056	0.047	0.228		0.007	0.003	0.015	**
NET_PRO_A	-0.020	0.056	0.726		-0.055	0.091	0.543		0.002	0.005	0.756	
NET_GOV_A	-0.070	0.061	0.248		-0.146	0.093	0.117		-0.008	0.007	0.232	
AGEY0	0.002	0.001	0.013	**	0.001	0.001	0.555		0.000	0.000	0.000	***
DEY0	-0.004	0.002	0.033	**	0.005	0.003	0.103		0.000	0.000	0.284	
LNTAY0	-0.262	0.030	0.000	***	1.012	0.064	0.000	***	-0.007	0.003	0.029	**
LEMPY0	0.100	0.026	0.000	***	0.030	0.082	0.712		0.012	0.003	0.000	***
MKTSHY0	9.979	5.033	0.048	**	-0.933	6.251	0.881		-0.512	0.445	0.250	
REVGY0	0.162	0.156	0.298		0.261	0.165	0.114		0.021	0.017	0.203	
LREDY0	0.011	0.003	0.000	***	-0.021	0.004	0.000	***	0.000	0.000	0.457	
Y2013	0.060	0.056	0.284		0.057	0.093	0.540		0.011	0.005	0.042	**
Y2014	-0.147	0.053	0.005	***	0.038	0.081	0.634		0.002	0.005	0.761	

Mean D.V.	0.083	S.D. of D.V.	0.682	Mean D.V.	17.995	S.D. of D.V.	1.736	Mean D.V.	0.052	S.D. of D.V.	0.066
SSR	356.484	S.E. reg	0.635	SSR	865.080	S.E. reg	0.989	SSR	3.679	S.E. reg	0.065
R^2	0.150	Adj R^2	0.134	R^2	0.682	Adj R^2	0.676	R^2	0.066	Adj R^2	0.050
F(16, 885)	9.655	F P-value	0.000	F(16, 885)	241.195	F P-value	0.000	F(16, 883)	4.291	F P-value	0.000
N	902			N	902			N	900		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

Table 55: Actual net scores by category in t – Information Technology

	D.V. LTOB0				D.V. LCAPXY0				D.V. ROAY0			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	4.026	0.590	0.000	***	0.025	0.648	0.970		-0.339	0.096	0.000	***
NET_ENV_A	0.045	0.027	0.098	*	-0.077	0.032	0.017	**	0.000	0.004	0.908	
NET_COM_A	-0.035	0.088	0.693		-0.052	0.131	0.691		-0.010	0.010	0.353	
NET_HUM_A	0.164	0.123	0.185		0.308	0.152	0.042	**	0.005	0.023	0.821	
NET_EMP_A	0.086	0.022	0.000	***	0.064	0.024	0.008	***	0.006	0.003	0.037	**
NET_DIV_A	0.089	0.036	0.014	**	-0.018	0.043	0.678		-0.004	0.005	0.418	
NET_PRO_A	0.025	0.068	0.711		-0.170	0.078	0.029	**	-0.005	0.009	0.595	
NET_GOV_A	0.182	0.097	0.063	*	0.031	0.116	0.791		0.031	0.009	0.000	***
AGEY0	-0.008	0.001	0.000	***	-0.007	0.002	0.000	***	0.000	0.000	0.030	**
DEY0	-0.011	0.010	0.258		-0.005	0.007	0.535		-0.003	0.001	0.048	**
LNTAY0	-0.151	0.038	0.000	***	0.640	0.036	0.000	***	0.018	0.005	0.001	***
LEMPY0	-0.072	0.032	0.026	**	0.408	0.037	0.000	***	0.000	0.005	0.984	
MKTSHY0	9.544	2.293	0.000	***	8.180	2.528	0.001	***	0.413	0.309	0.182	
REVGY0	0.735	0.285	0.010	***	0.270	0.236	0.254		-0.029	0.019	0.128	
LREDY0	0.014	0.004	0.001	***	0.035	0.004	0.000	***	-0.002	0.000	0.000	***
Y2013	0.146	0.060	0.015	**	-0.096	0.075	0.200		0.023	0.010	0.019	**
Y2014	0.169	0.055	0.002	***	-0.038	0.066	0.570		0.017	0.009	0.055	*
Mean D.V.	0.555	S.D. of D.V.	0.754	Mean D.V.	17.327	S.D. of D.V.	1.774	Mean D.V.	0.034	S.D. of D.V.	0.109
SSR	336.293	S.E. reg	0.647	SSR	501.538	S.E. reg	0.788	SSR	8.519	S.E. reg	0.103
R^2	0.278	Adj R^2	0.264	R^2	0.807	Adj R^2	0.803	R^2	0.125	Adj R^2	0.108
F(16, 803)	18.105	F P-value	0.000	F(16, 808)	245.331	F P-value	0.000	F(16, 807)	9.555	F P-value	0.000
N	820			N	825			N	824		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

	D.V. LTOB1				D.V. LCAPXY1				D.V. ROAY1			
	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.	Coeff.	s.e.	p-value	S.L.
const	3.709	0.578	0.000	***	-0.515	0.666	0.439		-0.420	0.104	0.000	***
NET_ENV_A	0.047	0.030	0.113		-0.098	0.031	0.002	***	-0.001	0.005	0.858	
NET_COM_A	-0.016	0.084	0.847		-0.019	0.124	0.876		-0.024	0.013	0.066	*
NET_HUM_A	0.172	0.126	0.172		0.312	0.150	0.038	**	-0.023	0.031	0.452	
NET_EMP_A	0.090	0.023	0.000	***	0.052	0.025	0.033	**	0.006	0.003	0.038	**
NET_DIV_A	0.076	0.037	0.039	**	-0.031	0.044	0.484		0.001	0.005	0.897	
NET_PRO_A	0.027	0.064	0.673		-0.140	0.083	0.091	*	-0.007	0.011	0.545	
NET_GOV_A	0.243	0.128	0.058	*	0.078	0.118	0.510		0.039	0.011	0.001	***
AGEY0	-0.007	0.001	0.000	***	-0.009	0.002	0.000	***	0.001	0.000	0.001	***
DEY0	-0.014	0.011	0.221		-0.011	0.010	0.280		-0.002	0.001	0.051	*
LNTAY0	-0.140	0.037	0.000	***	0.681	0.037	0.000	***	0.019	0.006	0.001	***
LEMPY0	-0.058	0.031	0.062	*	0.375	0.037	0.000	***	0.004	0.006	0.515	
MKTSHY0	8.180	2.318	0.000	***	10.629	2.505	0.000	***	0.011	0.346	0.975	
REVGY0	0.597	0.228	0.009	***	0.745	0.266	0.005	***	0.014	0.021	0.509	
LREDY0	0.015	0.004	0.000	***	0.032	0.004	0.000	***	-0.002	0.000	0.002	***
Y2013	0.045	0.059	0.442		-0.031	0.074	0.676		0.027	0.011	0.020	**
Y2014	-0.010	0.058	0.860		0.005	0.068	0.943		0.012	0.011	0.270	

Mean D.V.	0.510	S.D. of D.V.	0.737	Mean D.V.	17.389	S.D. of D.V.	1.763	Mean D.V.	0.026	S.D. of D.V.	0.121
SSR	342.040	S.E. reg	0.653	SSR	512.969	S.E. reg	0.797	SSR	10.534	S.E. reg	0.114
R^2	0.230	Adj R^2	0.214	R^2	0.799	Adj R^2	0.795	R^2	0.125	Adj R^2	0.107
$F_{(16, 802)}$	15.666	F P-value	0.000	$F_{(16, 807)}$	225.960	F P-value	0.000	$F_{(16, 806)}$	8.652	F P-value	0.000
N	819			N	824			N	823		

Where D.V. indicates the Dependent variable, S.D. the Standard deviation and S.E. the Standard error.

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