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> The CSR reporting polygraph – Do investors distinguish between firms taking responsibility and firms laying out impression traps while assessing the long-term growth?

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#### Abstract

Driven by the recent global legislative developments and stakeholders' demands, CSR is becoming an integral part of the generally accepted global business practices. Previous research has examined the impact of CSR performance on accounting- and market based measures, but there is currently no academic consensus on the nature of this relationship (Borglund et al., 2017). Despite the fact that the CSR nudges the companies to abandon the short-term logic, the relationship between CSR and the long-term growth rate have not been studied. This study investigates the relationship between a firm's CSR performance and the implied long-term growth rates by analyzing three factors; the quality of reporting, the performance on material ESG aspects and the occurrence of ESG-related scandals. The study conducts panel data regression analysis on 77 companies listed on Nasdaq OMX Nordic over the period 2007-2016. The findings indicate that investors embed both the performance on material CSR aspects and the occurrence of sustainability reports enhances the credibility of the CSR performance for investors. Conclusively, in the absence of external assurance of sustainability reports, the media serves as an external party validating the CSR performance information.

**Key words:** Corporate Sustainability and Responsibility, Long-Term Growth Rates, Sustainability Reporting, ESG Performance, Information Asymmetry

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## I. INTRODUCTION

"Earth provides enough to satisfy every man's need, but not every man's greed." – reads the quote of a renowned Indian civil rights activist Mohandas K. Gandhi. Such a response to the prominent 20<sup>th</sup> century philosophy of labeling profit generation as the main responsibility of business is seemingly taking its ground on the contemporary corporate landscape. The widespread recognition of climate change, an increased awareness of the human rights issues and the lessons learnt from the financial crises have challenged the traditional investors' stance on the sustainability practices. As a result, it is unthinkable today for a global corporate sustainability and responsibility (CSR) practices as purely a marketing tool rather than a means to manage the consequences of their operations. Therefore, it is increasingly important for the shareholders to understand this discrepancy and adopt a fair and reliable approach to valuing CSR performance (Cheng et al., 2014).

Measuring and identifying substance of CSR performance poses a challenge for the academics and practitioners and to date, there is no consensus on how CSR impacts a companies' valuation (Waddock and Graves, 1997; McWilliams and Siegel, 2000; Orlitzky et al., 2003). Previous research examines the connection between CSR performance and financial measures, particularly cost of equity. For instance, El Ghoul et al. (2011) show that firms with high CSR performance have lower cost of equity capital and that this effect is explained by higher transparency, diminishing the riskiness of the potential investment. Dhaliwal et al., (2011) further supports this view in their study of voluntary CSR disclosure and its positive impact on the cost of capital. However, since CSR influences firms to overcome the short-term logic (Lombardo & D'Orio, 2012), the cost of equity capital may not be an appropriate metric to assess a firms' long-term competitive state. Unlike the desired variable, capturing investors' expectation on the longer-term horizon, cost of capital displays high levels of short-term volatility due to markets' sentiments, economic cycles or temporary fluctuations of companies' balance sheets (Treynor, 1993).

Generally, investors base their valuation decisions on the information provided both by the companies and external parties, such as financial advisers. In case of CSR performance, the market participants gather the desired information through the sustainability reports and CSR

ratings agencies. However, the CSR ratings are not fully reliable due to the lack of assurance of the underlying sustainability reports (Schäfer et al., 2006) and due to the limited disclosure and varying nature of rating methodologies (Dhaliwal et al., 2011). Moreover, the global sustainability reporting standards are in their emerging state, which makes the resulting CSR reports hard to compare and audit. Hence, the quality of these disclosures may be questionable.

As the response to the challenges described above, this study aims to examine whether and how the investors evaluate the impact of CSR performance on the long-term competitive positioning of a firm, captured by the implied long-term growth. In addition, it investigates the role of external assurance in the investors' assessment of CSR performance credibility.

This paper investigates 77 Nasdaq OMX Nordic listed companies during the period of 2007 - 2016. In particular, the study examines whether effective CSR practices, assessed in terms of environmental, social and governance (ESG) performance translate into higher implied growth rates. The intuition behind the hypothesized relationship is that a firm exhibiting good conduct towards ESG dimensions is expected to be more likely to outgrow its competitors with bad conduct. The ESG performance variables are designed to encompass quality of sustainability reporting, embeddedness of ESG into the core activities of a business and the occurrence of scandals related to ESG factors. Thereafter, the implied long-term growth rates are reverse engineered using the residual income valuation model from the market values.

This study contributes to previous research in this field in two aspects. First, it widens the academic discussion on the impact of investors' perception about CSR performance in core business aspects on their assessment of the long-term growth rates. Second, this paper provides new insights on the role of external assurance in making reported CSR performance more credible for market participants.

The given study is structured as follows. Chapter II elaborates on the findings of previous research and empirical tendencies forming the contemporary discussion of the relationship between CSR and valuation. Chapter III explains the employed methodology and discusses the sample of the study. In addition, it specifies the assumptions and details data collection process. Thereafter, chapter IV presents the results of regression analysis and their interpretation. Finally, chapter V concludes by summarizing the core findings and suggesting the topics for further research in the given field.

## **II. LITERATURE REVIEW**

This chapter discusses relevant research on CSR and its impact on shareholder value. To begin with, it defines key concepts and trends within this relationship, then it introduces relevant empirical cases and developments as well as discusses the possible measurement of CSR. The chapter concludes by introducing signaling and impression theories and detailing the authors' view on hypothesized connection between long-term growth and CSR performance.

### 1. Defining Corporate Sustainability and Responsibility

There is an ongoing debate on defining the concept of sustainability practices, comprising a classical "CSR" abbreviation. According to numerous sources, it may be interpreted as "corporate social responsibility", "corporate sustainability" or "corporate social performance" (Montiel, 2008). Visser (2011) interprets the abbreviation CSR as "Corporate Sustainability and Responsibility" and defines CSR as the way through which firms create shared value in society via economic development, good governance, stakeholder responsiveness and environmental improvement. In his view, CSR is an integrated and systemic approach companies use to build, rather than destroy, economic, social, human and natural capital. This study chooses to use the formulation articulated by Visser (2011) as the definition of the CSR, as it provides a broader coverage of activities attributed to the term.

# **1.1 Is CSR destroying, generating or irrelevant to shareholder value creation?**

Presently, the academic literature adopts three different views on CSR's impact on firms' value; there are separate strands of research labeling these practices as value destroying, value generating or value irrelevant.

The value destroying school argues that the only responsibility of a business is the maximization of profits, as this is the only way the managers' efforts are fully aligned with shareholders' interests (Friedman, 1970). Within this stance, the CSR efforts are viewed as a distraction from generating profits since it is impossible to maximize two variables (profits and social good) at the same time (Friedman, 1962). Although such view has been prominent for the most of the twentieth century, in recent years the underlying argument of value destroying school of CSR has been challenged by the changes in investors' demands. In some cases,

shareholders campaign for the introduction of sustainability into the business models of firms they own (Borglund et al., 2017). A more detailed discussion of empirical trends, which oppose Friedman's view, is presented in section 2 of the literature review.

The opposing strand of research, which gains more empirical underpinning in recent years, is the value creation school of CSR. This direction of research suggests that a firm's solvency and sustainability improve together when it pursues CSR goals (Dong-young Kim and JeongYeon Kim, 2014). Therefore, the CSR activities are perceived as value generating. Furthermore, CSR is argued to be a vital piece of a firms' reputational risk management (Borglund et al., 2017) and a potential inspiration for strategic business opportunities (Simanis & Hart, 2009). Expectedly, a number of academics, such as Friedman (1970) and Orlitzky (2015), hold a rather critical view on this perspective. The authors highlight that CSR-driven activities could mask other intensions rather than achieving "social good". In particular, they highlight that marketing purposes and *window-dressing* are amongst others the true intentions for pursuing CSR activities. The concept of *window-dressing* will further be explained in this chapter section 4.2.

There is a bulk of empirical research addressing the discrepancy of theoretical views on the value creating capabilities of CSR. For example, the study of German market of Verbeeten et al., (2016) is in line with Visser (2011) and Zadek (2004), who argue that improving CSR performance would benefit the shareholders and create value. Verbeeten et al., (2016) find that CSR performance is value-relevant, but its impact differs among the respective sustainability aspects. In particular, they find that disclosure of the social aspects of CSR is positively associated with firms' value, while the environmental disclosures are not. In addition, in their investigation of CSR reporting, Berthelot et al., (2012) find that sustainability disclosures are contributing positively to the firms' value in the Canadian market setting. Similar findings were identified, suggesting that reporting on CSR is a significant factor in regard to market value, in the Finnish market (Schadewitz and Niskala, 2011). However, there is some empirical support for the value-destroying perspective and Friedman's (1970) findings, highlighting that a critical view of CSR could help firms avoid adhering to values undermining the free market foundations (Orlitzky, 2015). For instance, the evidence from listed Italian companies' analysis (Cardamone et al., 2012) also supports this view, as the researchers argue that the reporting on CSR activities is both value-relevant and value-destructive.

Alternatively, CSR engagement may be perceived by stakeholders as neither favorable or

harmful, i.e. value-irrelevant. Although Nelling and Webb's (2009) find that strong stock market performance results in increased CSR investments, the relationship does not imply that CSR affects the financial performance. Moreover, McWilliams and Siegel (2010), claim that the value relevance found by other scholars is a result of a broad misspecification of empirical data models aiming to find the connection between CSR performance and profitability. Furthermore, Baron et al. (2011) conducted a study on 1600 firms that concludes that financial performance is uncorrelated with the social aspect of CSR performance. Conclusively, the study of the Brazilian market, conducted by Lima Crisostomo et al., (2011) supports this view by finding a mutual neutral effect between companies' profitability and CSR performance.

## 2. Empirical evidence on the CSR relevance and impact

Overall, there is currently no academic consensus on the nature of the relationship between CSR performance and company value (Borglund et al., 2017). However, there is an abundance of empirical evidence in the form of events, changes in investors' demands, impact on probability of failure and legislative trends that illustrate the value relevance of CSR. These developments are summarized in the subsections below.

### 2.1 Capital markets' reception of CSR trends

To begin with, the strategic management of CSR becomes an increasingly important topic for the investors, who are considered to play an essential role in nudging the management to implement sustainability policies (Borglund et al., 2017). This trend can challenge the argument of the potential managerial conflict of interest detailed by Friedman (1970) as a basis of his critical rhetoric of CSR. Additionally, it is reflected in an increased number of incumbent investors campaigning for enhancement of CSR performance in companies of their interest. Many of them believe that improving such practices increases shareholder value in the longterm (Borglund et al., 2017). It is argued that such a trend is a response to events that demonstrate the detrimental impact that CSR mismanagement may have on shareholder value. For instance, the British Petroleum (BP) was pressured to take responsibility for the explosion of an oil platform, leading to 4.9 million barrels of oil leaking out into the ocean. Three months after the event, its value per share was reduced by almost half, which in turn affected many British pension funds that had large holdings in this stock (Borglund et al., 2017). As noted above, the investors tend to express the demands for embedding high quality CSR performance into their holdings' operations, which is also the case for private banking and consumer finance sectors. For instance, 95% of Swedish people participating in a survey, reportedly, would prefer to have their pension savings invested in a way that takes CSR aspects into account given the same return (Borglund et al., 2017). Furthermore, there is a substantial number of Swedish citizens participating in the same survey, 48%, who would like their funds to be invested into securities that take sustainability aspects into account even if they provide smaller financial returns. This trend is also prominent in other parts of the world, as Guenster et al. (2010) find that US-based institutional investors prefer to invest in firms engaged in CSR. As a result, firms with poor CSR performance such as polluting firms or firms engaging into child labor attract a smaller investor base, because green investors typically neglect stocks which do not fulfil their preferences (Heinkel et al., 2001).

## 2.2 Changes in legislation

Stakeholders' demand for incorporating CSR into the firms' business models has become one of the main driving forces for increasing transparency, improving communication and sustainability reporting. Nowadays, CSR reporting is a standard practice for large and mid-cap firms around the world, since among the 250 world's largest companies by revenue, 93 % report on their CSR performance<sup>1</sup> ("KPMG Survey", 2018).

Formerly, CSR reporting has been voluntary, but recent advancements of the European Union legislation (EU Commission, 2014), which contributed to the subsequent change of the Swedish law, make it mandatory for large companies from 2016 (Annual Accounts Act, Section 10, Chapter 6). This change is expected to draw more attention to this type of non-financial disclosure and create additional incentive for examining the impact of CSR performance on shareholder value creation. Moreover, in contemporary reality of depleting natural resources and the increased awareness of employee health and safety, the quality assurance of CSR becomes increasingly important. Thus, CSR reports have become a tangible tool to visualize firms' CSR performance, improve the transparency and enhance comparability and accountability of sustainable practices. However, there are still challenges to address – the CSR reporting standards are still an emerging field of non-financial disclosure. Currently, there are several different guidelines detailing the process of designing a sustainability report, and

<sup>1.</sup> From 63% to 75% for a sample of 4900 companies, comprised by top 100 largest companies by revenue in 49 countries.

although the Global Reporting Initiative (GRI) is undoubtedly gaining dominance in the recent years, adherence to any standards is still voluntary.

#### 2.3 Sustainability and bankruptcy risk

Another strand of empirical evidence suggesting potential positive impact of CSR performance on companies' value is the investigations of the impact of CSR on probability of bankruptcy. For instance, the study conducted by Perrini at the Research Centre at Bocconi University shows that companies incorporating CSR into their business model are less subjected to bankruptcy risk ("CSR reduces the risk of bankruptcy", 2013). In particular, bankruptcy risk is 70% less for firms engaging into CSR practices compared to those that do not. This result is based on a sample of 102 European firms within the fashion, food and automobile industries. In addition, analyzing the sample throughout the period of 2004 to 2011, Brooks (2016) shows that there is a negative relationship between CSR ratings from MSCI ESG and the probability of bankruptcy in future. It showed that one standard deviation of increase in environmental, social and governance (ESG) expenditure reduced the likelihood of bankruptcy by 28.50%. As a result, ESG activities do have an impact on investors' estimates of a firm's bankruptcy risk (Dong-young Kim and JeongYeon Kim, 2014). Extending the impact ESG engagement has on a firms' likelihood to survive, research conducted by Gupta and Krishnamurti (2016) document that it could also facilitate a firm's emergence from tough financial situations. Thus, high quality corporate governance, which is one component of the ESG terminology, enables reducing corporate bankruptcy risk as it provides reliable information to stakeholders and as a result manages tensions arising between the executives and shareholders.

### 3. Assessing Corporate Sustainability and Responsibility in terms of ESG

CSR is a complex term, which entails a wide range of different practices that enable the companies to take responsibility over the consequences of their operations. This study aims to investigate its relationship with long-term growth rates, and therefore it is useful to explore the ways to measure it. One of the approaches to defining and classifying the aforementioned practices of the CSR is the concept of the triple-bottom line. First introduced by Elkington (1997), it is based on defining CSR as a combination of three components – economic, environmental and social. This approach is also used as a basis for one of the CSR reporting frameworks, the GRI, and has a stable positioning within the academic literature (Joyce & Paquin, 2016; Braungart, McDonough et al., 2006/7). Similar to the triple bottom line,

environmental, social and governance (ESG) aspects are also viewed to be the three components of CSR according to Staub-Bisnang, (2012). Moreover, these two concepts are quite close in their nature, differing only in an approach to defining economic or governance dimension. In order to avoid potential misinterpretations, this study measures firms' CSR in terms of ESG performance as it captures the assessment of managerial effort without the impact of short-term financial metrics. There are various approaches to capture ESG performance on the equity market (Borglund et al., 2017) but this study develops a framework, aiming to encompass three approaches in order to create a comprehensive assessment of a firms' ESG performance; quality of *reporting, performance on material ESG aspects and* occurrences of ESG-related *scandals*.

### 3.1 Reporting

One way to gauge the firms' ESG performance is to measure the quality of sustainability reporting. Sustainability accounting plays a defining role in informing the investors about the ESG performance in a firm (Borglund et al., 2017). This approach has an important advantage: in case the reviewed firm adheres to certain standards and organizes external assurance, there could be a series of designated tests for assessing its reporting quality and content such as in *GRI 101: Foundation*. Despite the fact that it is flawed to claim that good quality of such reporting implies better ESG performance, the assessment of the reporting quality remains to be an important step in assessing companies' performance within the CSR.

Adoption of widely accepted set of accounting standards may be viewed both as an effort to increase the quality and comparability of ESG reporting and as a managerial effort to create value for stakeholders by increasing transparency, and hence reducing information asymmetry. There are various sets of standards aimed at making the ESG reporting more comparable, complete and better in quality and content. Borglund et al., (2017) list at least three initiatives for ESG reporting: Global Reporting Initiative (GRI) founded in 1997, its US-based alternative Sustainability Accounting Standards Board (SASB) established in 2011 and CDP (*formerly the Carbon Disclosure Project*). The GRI focuses on developing an overarching reporting framework, which would imply that different companies report on *material* aspects that are important to their business models, while SASB draws up *material* industry-specific standards, where firms are expected to report comparable data within their industry. SASB prescribes which key performance indicators should be reported and how. On the other hand, CDP

concentrates on reporting lump data on carbon dioxide emissions and water use on 5,000 firms in their own annual publications. Therefore, the area of CDP coverage is narrower than those of GRI and SASB in terms of the ESG approach. Thus, in order to assess ESG reporting effort more comprehensively, the discussion is concentrated on the GRI and SASB standards.

Another factor within the scope of reporting is organizing audit of sustainability reports by external parties. This element could signal management's commitment to provide more reliable and transparent information and a higher degree of investment into adhering to ESG. In addition, the review of the sustainability reports professional external agencies may signal better quality and content of the disclosure. Therefore, assessing whether the sustainability report was audited may add an important piece to the corporate sustainability and responsibility performance puzzle (Pinnuck et al., 2017).

## **3.2 Materiality**

The purpose of assessing *material* factors is in improving the usefulness and relevance of the reported CSR information. The SASB defines *material* issues as those trends and uncertainties that are likely to affect the financial and/or operating condition of a company (Sustainability Accounting Standards Board, 2017). Similarly, the GRI explains material topics as those reflecting a firm's significant economic, environmental and social impacts or that influences the stakeholders' decision-making (Global Reporting Initiative, 2016). Interestingly, the GRI's definition is in line with the Conceptual Framework for Financial Reporting, Financial Accounting Standards Board (2010), which describes *materiality* as the information that if misstating or omitting it could influence decisions that users make on the basis of it.

Therefore, assessing material topics guides the investors in capturing the firms' ESG performance more accurately. Moreover, the individual assessment and prioritization of the material aspects of ESG performance comprise the first step of integrating CSR into business operations (Borglund et al., 2017). Both Visser (2011) and Zadek (2004) suggest that a comprehensive measure of corporate sustainability and responsibility should assess how embedded the sustainability efforts are in the strategy and operations of a company.

However, there are some pitfalls in the process of assessing materiality, such as a variety of cross-industry material factors and the lack of cross-country comparability. Moreover, there is

no uniform quantitative threshold regarding what is considered to be material and there is no predetermined analysis of what could be material in certain situations. Nevertheless, there is a "5% rule" that is commonly used by practitioners and auditors as a starting point in the assessment of materiality (Vorhies, 2005). The rule implies that yearly fluctuations of the net income (attributed to the subject of interest) less than or equal to 5% will not be regarded as material. However, the "5% rule" it is not rooted in any existing accounting standards.

## **3.3 Scandals**

The third approach to capture the degree of ESG performance incorporation into a firms' strategy is to assess ESG-related scandals. This idea is introduced by Visser (2011) as a part of a rather pessimist rhetoric on the current state of corporate sustainability and responsibility within business practices. Visser (2011) and Zadek (2004) argue that the quality of firms' CSR depends on management's motivation for pursuing the policies. Moreover, Visser (2011) argues that the criterion for success is at least the absence of failure, while the proxy for failure is the occurrence of a reputational scandal connected to one of the ESG dimensions.

## 4. Sustainability through the lens of information asymmetry

In the capital markets setting, managers are believed to possess superior information regarding ESG performance in comparison to other stakeholders (Jensen and Meckling 1979). This indicates the presence of information asymmetry between the agents, represented by the managers, and principals, represented by shareholders. Therefore, it is essential to understand how the principals translate the information that they receive from the agents into the company valuation. This section will describe how the concept of information asymmetry and signaling theory could provide the reader with a better understanding of the market's interpretation of CSR performance information. Thereafter, the impression theory is introduced to further illustrate the setting of the described interpretation mechanisms.

#### 4.1 Information asymmetry and role of signaling theory

The agency theory deals with the incentive issues arising from the separation of ownership and control. According to Morris (1987), agency and signaling theories are consistent because they are based on the common assumption of *information asymmetry*. Fama and Jensen (1983) that focused on the agency problem arising between managers and shareholders found that one type of adverse effects originating from this relationship is the decline in the firm's value due to the

belief that management will not act in the interest of shareholders. Therefore, it is interesting to examine whether and how the investors interpret the signals on companies' CSR performance, as they could both see it as an employment of a vital risk-management tool (Visser, 2011) or the distraction of direct managerial duties linked to maximizing profits (Friedman, 1970).

In order to achieve better understanding of the investors' interpretation of CSR information, it is useful to examine the communication process between the market and company management in a greater detail. Spence (1973) and Connelly et al. (2011) describe the signaling theory as a tool that explains the communicative behavior between two parties in the context of the information asymmetry. The given section goes on to elaborate on the signaling theory in the context of sustainability reports release and their interpretation by the stakeholder groups inspired by the framework of Connelly et al. (2011).

To begin with, the signaler makes a choice on whether and how to communicate information to the receiver, who in turn interprets the signal and chooses how to act upon it. In this thesis, the role of the signaler is attributed to the management of the companies who decide on the main directions of the firms' ESG performance. One example of managerial commitment to ESG practices could be initiating the external assurance of the sustainability reports, as it may signal to the investors that the information disclosed is more reliable and verifiable.

Another important aspect of the signaling theory is the signal itself, which is defined as a piece of information communicated to the receivers by the signaler. For instance, the sustainability reports' quality and contents as well as the occurrence of sustainability-related scandals are the signals, which the firms' management willingly or unwillingly (in case of the scandals) sends to the broad base of the investors.

The role of the receiver is of particular interest in the context of this thesis, because unlike reporting of financial information, ESG performance information concerns a broader dimension of stakeholders. The interpretation of signals by the receiver may not be a straightforward process, because receivers and signalers have partially conflicting interests, as the signaler may deceive the receiver at her expense (Bird & Smith 2005). The situation of managerial opportunism of this kind is further discussed in the next section of the literature review.

In the last phase of the signaling timeline, the investors interpret the firms signals about the

ESG performance. In particular, their interpretation of such signals as "good" or "poor" is reflected in their evaluation of companies' value and further in investing behavior, such as buying, holding or selling stocks. This can be illustrated by the infamous reporting scandal of Tesco in 2014 that revealed overstated profits by £250 million. The news led to a 20 percent drop of the market value and consequently a drop in the share price.

Another phenomenon that could be interesting to examine within interpretation phase is whether the investors assign value to the information adjusted to represent the material aspects of CSR. The ESG information that is not material for investors' decision-making can potentially mislead them by, for instance, assigning higher environmental grade to the industries with lower need for environmental impact management. Scoring higher in ESG performance of such industries would not require as much of the focused effort as for the industries that alter the environment, given the same criteria. At the same time, it does not mean that the industries with naturally low impact on the environment (such as financial industry, IT, advisory companies, etc.) do not have ESG issues to tackle – they only tend to be of a different kind, such as cyber security for financial industry or the removal of inappropriate content for internet providers (elements of social and governance aspects of ESG).

Closing the signalling time loop, actions taken by the investors impact the utility of the senders in the next period. For instance, Surendranath et al. (2015) found that in the occurrence of a corporate scandal between the period of 1993 and 2011 of both financial and non-financial nature linked to a firms' chief executive officer, resulted in share prices decrease with between 6.5% and 9.5% in the month after the misconduct was made public. However, in the long-run, the stock performance of the firms studied matched the performance of other similar firms that had not been involved in corporate scandal. This study showed that the signal sent, in term of corporate scandal, was only remembered by investors in the short-term, without extending the impact to the long-term. Therefore, it is of interest in this research to examine whether the combination of scandals, together with an assessment of current ESG performance impacts the valuation for the long-term perspective, in particular to see if it affects the implied long-term growth.

This study largely concerns whether the investors can interpret the signals sent by firms correctly and whether the signals issued by the sender matter to them. In this case, upon interpreting the signal, investors decide whether the company with better ESG performance is

more likely to survive in the long-term, resulting in a higher growth rate. The examination of the growth rates allows to assess the investors' interpretation of companies' future competitive state, as it is based on the analysts' consensus predictions on companies' financial information. Moreover, the analysis of long-term implied growth rates was preferred to the analysis of cost of capital because a firms' cost of capital entails more variance driven by the temporary changes of the overall economic situation and market's reactions to financial results (Treynor, 1993). In addition, the cost of equity reflects the effect on value caused by changes in the denominator, while it could be interesting to observe this effect though examining the numerator, i.e. growth rate.

As argued above, it is important to assess the ESG performance from three perspectives – quality of reporting, performance on material ESG aspects and the occurrence of ESG-related scandals. Together, these three perspectives provide a reliable estimate of the extent of ESG practices incorporation into firms' business models (Visser, 2011; Borglund et al., 2017).

Ultimately, the main hypothesis tested in the study is as follows:

## *"Effective CSR-related performance impacts the expected implied long-term growth positively".*

### **4.2 Impression theory in accounting communication**

As noted above, companies may send untruthful signals of positive ESG performance to investors in order to improve the firm's image. This phenomenon is known as *window dressing* (Brule, 2008). Such managerial opportunism creates inconsistencies between actual ESG performance and the messages communicated to stakeholders. To analyze a firms' attempts to influence audiences' perception of a firm's financial performance, the concept of *impression management* is applied in a corporate reporting context (Clatworthy and Jones, 2001, 2003, 2006; Courtis, 2004a; Rutherford, 2003). This concept implies that organizations aim to construct a positive impression with the intention to appeal to their stakeholders (Merkl-Davies, Doris M. and Brennan, Niamh M., 2011). As a result, they may hide poor financial reporting quality. This phenomenon is particularly prominent during periods when a firm wishes to restore its legitimacy, such as after scandal occurrence (Linsley and Kajüter, 2008), environmental disasters (Hooghiemstra, 2000) or reorganization (Arndt and Bigelow, 2000;

Odgen and Clarke, 2005). In such cases, impression management can have an even larger impact.

The case of Enron immediately prior to its collapse is one example of the power of impression management – how its unethical accounting practices such as fake holdings and off-the-books accounting with an intention to hide losses and manipulate stakeholders' perceptions of the firm's achievements led the company into bankruptcy. In addition, Merkl-Davies, et al., (2011) suggest that a rational investor in a semi-strongly efficient capital market is viewing biased disclosure as "cheap talk" and as managerial optimism (Benabou and Laroque, 1992), unless it's verified by external parties. Therefore, it is of interest to examine the mechanisms of investors' interpretation of signals such as ESG performance. In particular, it is valuable to assess whether investors interpret the signals differently depending on whether it is disclosed in an audited sustainability report or not. Finally, it could be important to examine how investors react on signals sent from external parties such as media, when they make an announcement of a new scandal.

Therefore, another hypothesis of the research is as follows:

"Investors rely on external assurance in examining the truthfulness of the ESG signals emitted by the companies"

## **III. RESEARCH DESIGN**

This thesis aims to investigate whether a firms' ESG performance has an impact on the implied long-term growth rates. This chapter outlines the methodology of our research. It begins by detailing the assessment of the ESG performance and the process of reverse-engineering of the long-term growth rate, thereafter continuing with the description of the chosen sample. The chapter concludes with the review of statistical methods used to examine the relationship between ESG scores and the implied long-term growth rates.

#### **1. Measurement of the ESG performance**

As discussed in the literature review, this study addresses the ESG performance of companies from three perspectives; *quality of reporting, the performance on material ESG aspects* and in terms of *the occurrence of ESG-related scandals*. Incorporating all these perspectives is essential to obtaining the necessary level of breadth and depth of the sustainability assessment, capturing both quantitative and qualitative performance characteristics. This section will present the process of obtaining the ESG *performance* score using two models: Model I and Model II, see Figure 1. It begins with describing the calculation of the *quality of reporting* scores. Thereafter it explains the calculation of the Model I (*MESG*) estimates of the *material* ESG performance through weighting Thomson Reuters ESG Scores according to SASB industry materiality map. Conclusively, this section presents the calculation of the *holistic ESG performance* score by incorporating the Thomson Reuters Controversies variable into the calculated *material* ESG performance score, i.e. Model II (*MESGH*).



Figure 1 Illustration of the two models capturing the ESG Performance

## 1.1 Reporting

The quality of reporting is one of the dimensions, which, in authors' view, comprises enterprises' ESG performance. Assessing quality of reporting implies determining whether a firm prepares sustainability reports and whether this sustainability reports are being audited. The reporting perspective will be integrated into the regression analysis through the inclusion of two dummy variables;  $SustRep_t^i$ , which indicates whether the firm *i* prepares its sustainability reports at the time *t* or not and  $ExternAud_t^i$ , which indicates whether firm *i* audits their sustainability reports at the time *t*.

### **1.2 Materiality**

The relevance of the materiality analysis in the assessment of the ESG performance of companies is reflected in two frameworks of contemporary sustainability reporting standards – GRI and SASB. Moreover, Kiron et al., (2013) highlights the importance of assessing materiality by emphasizing that sustainability-driven innovation needs to be in line with a firm's business model to be financially successful. This paper conducts industry-specific materiality analysis of the reported ESG information by weighting Thomson Reuters ten category ESG scores according to the SASB materiality map (Sustainability Accounting Standards Board, 2018).

## 1.2.1 Thomson Reuters ESG scores – overview and structure

Thomson Reuters ESG scoring system, provided by Thomson Reuters Eikon, is based on firms self-assessed data. The scoring system aims to objectively measure a company's relative ESG performance<sup>2</sup>. The resulting Thomson Reuters ESG score is measured across ten sustainability categories, which include 178 ESG metrics selected by analysts based on comparability, data availability, and industry relevance, see Table 1. In order to standardize the information and increase comparability, the metrics are processed manually for each firm. A combination of algorithmic and human processes is used to achieve high data quality. ESG scores are recalculated whenever the relevant events occur, e.g. the release of new sustainability report, and hence the database is continuously updated. Conclusively, the Thomson Reuters ESG scoring system is chosen as it is robust enough to differentiate between firms with poor ESG implementation and execution and firms that "walk the talk" and act as industry leaders (Thomson Reuters Eikon, 2018).

<sup>&</sup>lt;sup>2</sup> The database covers over 6,500 public companies globally with a data from 2002.

| Pillar        | Category               | # Metrics |
|---------------|------------------------|-----------|
|               | Resource use           | 20        |
| Environmental | Emissions              | 22        |
|               | Innovation             | 19        |
|               | Workforce              | 29        |
|               | Human Rights           | 8         |
| Social        | Community              | 14        |
|               | Product Responsibility | 12        |
|               | Management             | 34        |
| Governance    | Shareholders           | 12        |
|               | CSR Strategy           | 8         |
| Total         |                        | 178       |

Table 1 Thomson Reuters ten category scores including the number of metrics

## 1.2.2 Thomson Reuters Category Scores Calculation Methodology

This section briefly explains the calculation of 178 metrics within Thomson Reuters ESG scoring system. The metric score is determined according to the percentile rank formula below, based on three factors: number of companies that are worse than the current one in a given metric, number of companies with the same value and number of companies with a value at all:

$$Metric_{score} = \frac{no. of \ companies \ with \ a \ worst \ value + \frac{no. \ companies \ with \ the \ same \ value}{2}}{no. \ of \ companies \ with \ a \ value}$$

. . .

Having obtained the metric scores, the category score can be calculated by equally weighting the sum of all relevant metrics within the category. Indicators with no data available are excluded as it would be inaccurate to assign a default value to a missing observation.<sup>3</sup> The metrics included in a category score are both of qualitative and quantitative nature. The qualitative metrics are in Boolean logic type – values are *TRUE*, *FALSE (YES/NO)* or *N/A* which in turn are converted into the numeric values as the Table 2 below indicates. In addition, each metric has a polarity which reveals whether the higher value is positive or negative, e.g. having an emission reduction policy is positive but having environmental scandal is negative.

<sup>&</sup>lt;sup>3</sup> With the exception of GHG emissions where analysts calculate estimated emissions when not reported by the companies.

| <b>Boolean value</b> | Numeric value |
|----------------------|---------------|
| Yes                  | 1             |
| No                   | 0.5           |
| NA                   | 0             |

| T | abla | 2 | Companyia  |    | f Doologu | data to | mumonio   | aluar |
|---|------|---|------------|----|-----------|---------|-----------|-------|
| 1 | uvie | 4 | Conversion | 10 | Doolean   | aata to | numeric v | aiues |

Quantitative metrics are assigned a numeric value depending on which the percentile rank formula is applied. When data point is not available (N/A) it has no impact on the resulting score, as percentile rank formula only considers firms with numeric values. Similar to the qualitative metrics, each quantitative metric has a polarity, indicating whether higher value is positive or negative. If an indicator is not relevant for a specific sector, e.g. responsible asset management only relevant for financial sector, the metric is excluded from calculation and its value will be not relevant (N/R).

## 1.2.3 Materiality Analysis of ESG aspects

This study investigates whether ESG performance of companies affects their implied long-term growth rate. The long-term growth factor is defined as a rate at which the firm is assumed to grow in a steady state. Stakeholder theory suggests that integrating sustainability aspects into the business model can enhance a firm's long-term competitive state (Brooks, 2016). Therefore, this study excludes the sustainability aspects that are not material to the companies' business models from the ESG performance score calculation, because they have lower probability of impacting the long-term development of the firm. Hence, it is important to identify firm-specific material topics to create an indicator of ESG performance with a desired quality. This study employs Sustainability Accounting Standards Board's (SASB) materiality map to identify and count them.

SASB's materiality map (Sustainability Accounting Standards Board, 2018) identifies likely material issues on an industry level and suggests corresponding accounting metrics to be reported for each identified material issue. Even though SASB applies *materiality* definition established under the US securities laws, we make the assumption that a firm's business model within a specific industry in Nordics is similar to the one in US. Therefore, the SASB materiality map has been used to identify and count the material issues for each industry in the Nordics.

## 1.3 Model I: Material ESG score

As Thomson Reuters ESG scoring system does not entail any materiality analysis, the listed steps are followed to incorporate it in the calculation of the *material* ESG performance score, or the *MESG* score:

- According to the Thomson Reuters industry classification system<sup>4</sup>, the selected listed companies within the Nordic region are allocated to industry groups;
- These industries are compared to and reallocated according to the SASB materiality map industry classification system (Sustainability Accounting Standards Board, 2018).
- The ESG issues included into SASB materiality map are translated into Thomson Reuters ten category ESG scores, see Table 1 in Appendix.
- 4) The number of SASB issues in respective Thomson Reuters ESG category are counted for each industry and assigned respective weights, see Table 2 in Appendix.

This way, a material ESG performance score for each company was obtained.

## 1.4 Model II: Holistic ESG score

To obtain the *holistic* ESG performance score, or the *MESGH score*, the *scandal occurrence* factor is added. For this purpose, the study employs Thomson Reuters methodology and its ESG Controversy Score data. The database compares the performance on 23 ESG controversies topics on an industry level. The scandals, which are reflected in the Scandal score have occurred at the latest complete financial period. The Scandal score is updated as often as a relevant scandal occurs. The impact of one event might be further reflected in following years, if progresses linked to the same negative event develop, e.g. ongoing legislation disputes.

The default value for all scandals<sup>5</sup> is measured as 0, e.g. if the benchmark includes 10 companies out of which 6 has a value of 0 and 4 has a value of 1 then the score for firms with no scandals would according to the percentile rank formula be:  $\frac{4+\frac{6}{2}}{10} = 70\%$ . The objective is to penalize firms that allow controversial events to occur. This is done by including the impact of scandals to the previously described *material* ESG score (*MESG*).

<sup>&</sup>lt;sup>4</sup> TR.TRBCIndustryGroup

<sup>&</sup>lt;sup>5</sup> Polarity is negative, the higher the number the worse it is

If the Scandal score is greater than (or equal to) 50%, then the MESGH score stays the same as the MESG score, i.e. if a firm is not involved in any scandal, the MESGH score will remain the same as the MESG sore, see Table 3. Correspondingly, if a firm is involved in a scandal, then the *holistic* ESG score is calculated as the weighted average of MESG score and the Scandal score.<sup>6</sup>

The scandal occurrence dimension is incorporated into analysis in order to obtain a more holistic view on ESG performance in a calculated indicator. Inclusion of scandals on ESG issues is argued to give a more complete image of a firms' ESG performance, as the criterion for success is at least absence of failure (Visser, 2011).

| Scenario  | ESG Scandal<br>Score | MESG<br>Score | MESGH<br>Score |
|---|----------------------|---------------|----------------|
| If Scandal Score $\geq$ 50,<br>then MESGH = MESG Score  | 57                   | 38            | 38             |
| If Scandal Score > MESG Score,<br>but less than 50, <b>then</b> MESGH = MESG Score                              | 49                   | 42            | 42             |
| If Scandal Score < 50 and scandal score < MESG<br>score, <b>then</b> MESGH = average of MESG &<br>Scandal Score | 48                   | 49            | 48.5           |

Table 3 Representation of the combined score logic

## 2. Valuation

This section presents the calculation of the implied long-term growth rates. It begins with providing some reasoning for the choice of the Residual Income Valuation (RIV) model and the calculation of its parameters. Thereafter, the mechanism of calculation of the growth rate is explained by detailing the reverse engineering process.

## 2.1 Residual Income Valuation model

The main function of a valuation model is to estimate a firms' value, which is later compared to the current share price on the market. Based on such comparison, an investment decision is

<sup>&</sup>lt;sup>6</sup> This is in line with Thomson Reuters methodology of adding scandals to the original Thomson Reuters ESG score.

made – whether to buy, sell or hold the share (Penman, 2007). Developing forecasts and incorporating those into the valuation model is a standard practice of estimating the firm's value.

There are various valuation models to consider, each of them having a range of advantages and disadvantages. According to Damodaran (2012), the Dividend Discount Model (DDM) is the simplest equity valuation model. The idea of the model is as follows: the share held by an investor is worth its present value of expected future cash flows, which for a shareholder are represented by dividends. Additionally, Penman, (2013) argues that using the DDM to calculate the firm value is a straightforward method because the dividends are more stable in their nature than cash flows. However, Penman, (2013) reveals a major weakness to DDM – a firm does not have to be profitable to pay out dividends, because it could take on more debt to distribute the funds to the investors or decide not to pay them out at all, even if it is profitable. This is in line with the *dividend irrelevance theorem* presented by Miller and Modigliani (1961), suggesting that dividend policies are irrelevant when determining a firm's value. Furthermore, several researchers argue that the dividends cannot explain the volatility in stock prices due to their stable nature (Shiller, 1981; Jiang and Lee, 2005). Finally, the DDM requires a forecast of the dividend growth rate in perpetuity, which is hard to assess and therefore may unavoidably yield flawed valuation results (Penman, 2013).

The weaknesses of DDM have inspired the development of other equity valuation models, such as the Residual Income Valuation model (RIV). The RIV model, in contrast to the DDM, is based on the value generating activities such as earnings and growth of investments (Penman, 2013), and hence shifts away from using dividends as a value determinant. This valuation model uses accounting-based information (Frankel and Lee, 1998; Jiang and Lee, 2005) and the forecasts are made for the income statement and balance sheet rather than the cash flows. Penman (2007), argues that the connection between accounting and value are better matched compared to the connection between cash flows and value. Apart from the *going concern* concept, there are two assumptions defining grounds for the RIV model: i) firm value is equal to the present value of future expected dividends and ii) *clean surplus relation* holds; where net income, dividends and new issues of share capital explain the changes in the book value of owners' equity Skogsvik (1999).

There are two approaches of using the RIV model to calculate the equity value – the *historical*and *forecast approach* (Begley & Feltham, 2002). This study adopts the forecast approach, as it reflects the expectations of the investors on the future development of the firms. Researches that apply the forecast approach are, among others, Frankel and Lee (1998), Penman and Sougiannis (1998), Francis, Ohlson and Oswald (2000), Courteau, Kao and Richardson (2001) and Jorgensen, Lee and Yoo (2011). As it is difficult to make a realistic prediction about the future (Frankel and Lee, 1998; Penman, 2013), the forecast horizon is usually divided into two parts – an explicit forecast horizon and a terminal value calculation (Penman, 1998). Terminal value calculation allows for simplified assumptions regarding the future and implies that a firm has reached steady state with a constant long-term growth (Koller, Goedhart and Wessels, 2010; Penman, 2013).

As the research design requires backing out the growth rates from the RIV model, the basic prerequisites for choosing the model are as follows: 1) the valuation is based on the information available at the valuation point of time; 2) the model contains long-term growth as one of the variables; and 3) from a fundamental valuation perspective, the model is as reliable as possible. Given the above criteria and discussion, the RIV model was chosen as the most suitable valuation model for this thesis:

$$V_0 = BPS_0 + \sum_{t=0}^{T} \frac{(EPS_t - r_e * BPS_{t-1})}{(1+r_e)^t} + \frac{(EPS_T - r_e * BPS_{T-1}) * (1+g)}{(1+r_e)^T * (r_e - g)}$$

Where,

*BPS* – book value per share *EPS* – earnings per share  $r_e$  – required rate of return g – implied expected long-term growth rate  $V_0$  – share price

## 2.2 Model inputs

Given that the actual and forecasted data is inserted into the chosen valuation model, it is possible to solve the resulting equation for long-term growth. The valuation model requires forecasts and actual data for the following variables: share price ( $V_0$ ), book value of common equity per share forecasts (BPS<sub>0</sub> and BPS<sub>t-1</sub>), dividend per share forecasts and actual values, earnings per share forecasts (EPS) and the required rate of return  $(r_e)$ . The choices of terminal point in time (the beginning of the steady state) and the valuation horizon of this study are also discussed in this section.

#### 2.2.1 Share price

The spot equity prices are obtained from Thomson Reuters Eikon database. The share prices  $(V_0)$  for the model are calculated as an average of 5 calendar days prior and post May 1<sup>st</sup> of a given year. Such share prices are assumed to be ex-dividend, because most companies have already paid out the dividends at that point (given that all the companies in the sample have their financial year ending in December, 31<sup>st</sup>).

2.2.2 Book value of equity per share forecasts and dividends per share forecasts As the proper estimation of companies' value is based on the investors' expectations of future financial performance, the RIV model requires forecasted rather than actual inputs. The forecasted book values of equity per share,  $BPS_{t+n}$ , are retrieved from Thomson Reuters DataStream I/B/E/S database<sup>7</sup>. They represent the mean of analysts' predictions of BPS at the valuation point of time. However, the estimates of BPS are cum-dividend, so to be consistent, the forecasted dividends<sup>8</sup> retrieved from Thomson Reuters I/B/E/S database are subtracted from the  $BPS_{t+n}$  in order to arrive to an ex-dividend forecasted BPS. On the other hand, the  $BPS_0$  at the beginning of each valuation point in time is retrieved as the actual value from Thomson Reuters DataStream<sup>9</sup> and adjusted for the actual dividends<sup>10</sup> to result in an ex dividend value.

### 2.2.3 Earnings per share forecasts

The forecasted values of earnings per share are based on the mean of available analysts' forecasts. They are retrieved from DataStream's I/B/E/S data base<sup>11</sup>. The obtained earnings per share forecasts cover the period of 2007-2019.

<sup>&</sup>lt;sup>7</sup> code: BPSEXXMN

<sup>&</sup>lt;sup>8</sup> code: DPSEXXMN

<sup>&</sup>lt;sup>9</sup> code: AXXBPS

<sup>&</sup>lt;sup>10</sup> code: AXXDPS

<sup>&</sup>lt;sup>11</sup> consensus predictions of earnings per share, average of the analysts' assessments, DataStream code: EPSEXXMN

#### 2.2.4 The valuation period

The majority of the firms included in the Nordic sample had both BPS and EPS forecasts available up to three years into the future, which motivated a three-year valuation time horizon. The observed period in this thesis is ten years, which means that the growth rates are obtained for each year 2007-2016, as it provided more observations.

## 2.3 re through CAPM

The cost of equity is one of the essential elements of the RIV model. This factor is calculated through the traditional capital asset pricing model, CAPM, which was introduced by Sharpe, Lintner and Treynor in the mid-1960s. The underlying idea of the model suggests that the investor requires a higher rate of return for taking more risk. Despite the criticism in the academic literature, it continues to be the preferred model for managers to use (Da et al., 2012). In addition, CAPM has been advocated as the primary model used to estimate the required rate of return (Liljeblom & Vaihekoski, 2004). Therefore, this study will use the CAPM to estimate the cost of equity in the RIV model. The traditional CAPM formula is as follows:

$$r_e = r_f + \beta_e (r_m - r_f)$$

Where,

 $r_f$  - risk free rate  $\beta_e$  - beta of the asset  $r_e$  - required rate of return  $r_m$  - market rate

The calculations of the required rate of return are year- and firm specific. They require assumptions regarding the risk-free rate, beta and market risk premium. The required rate of return is later adjusted for bankruptcy risk, as it makes the calculated growth rates more realistic and reliable.

#### 2.3.1 Risk free rate of return

Swedish, Finnish and Danish government bonds rates with ten years to maturity are chosen as the estimates of risk-free rates. Firstly, it is a common approach in the academic world to use government bond rates as a substitute for the risk-free rates in valuation (Mukherji, 2011). Additionally, it is strongly preferred by practitioners (Mukherji, 2011). Moreover, it is important that the risk-free rate is consistent with the terminal value discounted in the RIV model (Damodaran, 1999) and therefore the long-term maturity rate seems appropriate, according to Claus & Thomas (2001).

### 2.3.2 Beta

The beta factors in the CAPM model reflect the dynamics of share returns in comparison to the overall market. If a beta is higher than one, it implies that the stock is riskier than the market, which, according to CAPM, indicates a higher required rate of return by the investors, as they need to compensate for the higher risk taken on by investing in a share. The market related risk cannot be alleviated through diversification (Brealey et al. 2012).

The market returns were calculated based on Nordic OMX 40 index values<sup>12</sup>. The close prices of Nordic main market equity instruments have been used for estimating the company returns. The quotes are converted to the returns through the logarithmic formula  $R_{i,t} = \ln \frac{P_t}{P_{t-1}}$ , which has been chosen due to its favorable statistical properties, equivalent to first order differencing (Huang et al., 2005). After calculating the necessary returns, the following data model has been used for estimating the betas.

$$(R_{i,t}-r_{f,t})=\beta_i(r_{m,t}-r_{f,t})+\varepsilon_{i,t}.$$

The betas are estimated on weekly returns data for three years back<sup>13</sup> from valuation points of time. For the estimation simplicity of about 1240 resulting regressions, the following Ordinary Least Squares formula is used for the data model without intercept:

$$Y_{i,t} = \beta_i X_{i,t} + \varepsilon_{i,t};$$

Hence, the beta estimation formula:  $\hat{\beta}_i = \frac{\overline{XY}}{\overline{X^2}}$  where  $Y_{i,t}$  are the returns of stock *i* at time *t* less the risk-free rate of the country of the stock's origin at time *t*, while  $X_{i,t}$  is the market premium of a certain country of the stock at the time *t*. To make sure the beta-calculations are reasonable, their properties are examined before continuing the analysis. The majority of estimated betas have a value around 1, none with a value <0 and none with a value >2.

<sup>&</sup>lt;sup>12</sup> Data has been retrieved from the Thomson Reuters Eikon terminal.

<sup>&</sup>lt;sup>13</sup> Adjustments for dividends have not been made as they are not considered to make a significant impact on the beta estimations. Beta calculations are based on estimating regressions with 156 observations each, of which only 3 could entail the effects of dividend payout.

## 2.3.3 Market premium

There are mainly two methods for calculating the market risk premium  $E(r_m) - r_f$ , namely *ex post* which looks at historical returns and *ex ante* which is the forward-looking risk premium. Since this study solves the expectation-driven RIV model equation for the implied growth rate, the *ex ante* risk premium is chosen. The annualized market premium for a certain year and country is obtained from the database of Damodaran (Damodaran, 2018), which contains yearly assessments for country risk premiums for Denmark, Sweden and Finland.

## 2.4 Adjusting re for bankruptcy

Having calculated the required returns on equity, it was further decided to adjust them for bankruptcy risk (Skogsvik, 2006). Such procedure is introduced in order to make the analysis more realistic and keep it consistent, as the obtained forecasts are conditional on survival. One of the factors addressing such purpose is suggested by Fama & French (1992), who emphasize the importance of including the company size in the assessment of firms' cost of equity. However, adding on the bankruptcy risk into the valuation takes this factor into consideration as it implies that smaller firms will get a higher p-fail, meaning that small firms run higher risk in going bankrupt as they sometimes cannot pay off the high debt level of have low liquidity rate. Hence, only bankruptcy risk was incorporated into the model by using the following adjustment formula (Skogsvik, 2006):

$$r^{*}_{e,i} = \frac{r_{e,i} + p_{fail,i}}{1 - p_{fail,i}}$$

There are several reasons for choosing the Skogsvik (1990) accounting-based bankruptcy prediction model in comparison to other existing ones. Firstly, to be able to adjust the required rate of return for failure, the bankruptcy model need to generate probabilities of failure, which both Ohlson (1980) and Skogsvik (1990) do. Other accounting based bankruptcy prediction models include those presented by Altman (1968) and Beaver (1966). Secondly, as this study examines the Nordic countries, Skogsvik's (1990) model is deemed to be more suitable as the parameters in that model are estimated based on Swedish sample which is more in line with the Nordic firms, rather than an US sample. Therefore, estimates from Skogsvik (1990) are used to

calculate the probability of failure for years 1, 2, 4 and  $6^{14}$ . The average of these probabilities is used as a proxy for the constant long-term probability of failure, used to adjust the cost of capital for calculating growth rates.

The coefficients obtained in Skogsvik's (1990) study are biased, as the percentage of failing firms in the sample in Skogsvik (1990) is greater than the percentage in the economy as a whole. Therefore, the probabilities of failure obtained from the model are overstated. This issue has been solved by using Skogsvik and Skogsvik (2013) correction equation, where the country averages of long-term probabilities of failure  $\phi$  for each of the economies are used:

$$p_{fail_{POP}} = p_{fail_{EST}} \times \left[ \frac{\phi \times (1 - prop)}{prop \times (1 - \phi) + p_{fail_{EST}} \times (\phi - prop)} \right]$$

Where,

*prop* – Number of failure companies in relation to total number of companies in the estimation sample.

 $\phi$  – Proportion of failure companies in the population of companies.

 $p_{fail_{FST}}$  – The probability of failure in the estimation sample.

 $p_{fail_{POP}}$  – The probability of failure in the population.

## **3.** Reverse Engineering – Solution of Valuation Model Equation for the Implied Growth Rate

To reverse-engineer the growth rates, the RIV model equation has been solved for growth the following way:

$$V_{0} = BPS_{0} + \sum_{t=1}^{T} \frac{(EPS_{t} - r_{e}BPS_{t-1})}{(1 + r_{e})^{t}} + \frac{EPS_{T} - r_{e}BPS_{T-1}}{(1 + r_{e})^{T}} \times \frac{1 + g}{r_{e} - g}$$

$$A \qquad B$$

$$V_{0} = A + B \times \frac{1 + g}{r_{e} - g}; \qquad \frac{V_{0} - A}{B} = \frac{1 + g}{r_{e} - g}$$

$$C$$

<sup>&</sup>lt;sup>14</sup> When interest expense (actual) is not available, the sum of operating and non-operating interest expense is used. The last factor, R6 is ignored in the calculations as its impact would not be significant, but its calculation would significantly reduce the sample size.

$$g(1+C) = Cr_e - 1; \ g = \frac{Cr_e - 1}{(1+C)}$$

## 4. Data

This section reviews the firm data used in the research. It elaborates on the selection criteria, treatment of the missing data and extreme values as well as the composition of the final sample.

## 4.1 Selection criteria

Scandinavian region has rightfully enjoyed the reputation of a pioneer in spreading sustainability practices, becoming a global leader within this field (Gjølberg, 2009; Midttun et al., 2006; Morsing et al., 2007). According to the Global Sustainability Competitiveness Index (SolAbility, 2013) that compiles CSR measurements from various organizations including World Bank and UN agencies, Nordic countries' companies are ranked highly: out of 176 countries, Denmark, Sweden and Finland scored top three in corresponding order in 2013. Therefore, analyzing these economies could provide the most reliable insights on the relationship between CSR and long-term growth, as the investors are likely to assign higher credibility to the CSR performance reported by Nordic companies.

The selected firms followed the criteria listed below<sup>15</sup>:

- Listed on the Nasdaq OMX Nordic Stock Exchange's main market Sweden, Finland and Denmark;
- No industry restrictions;
- The valuation dates is set at May 1<sup>st</sup> 2007-2016, which required data over the period of 2004-2019

Firstly, the selected sample of firms was limited to Nordic region because of the similarities in levels of economic development and common history of institutional development. Secondly, the degrees of sustainability efforts ought to be comparable due to a uniform compliance to the rules and guidelines for sustainability issued by the European Union's initiative on Corporate Social Responsibility (EU Commission, 2014)<sup>16</sup>. Thirdly, all industries were chosen as this study aims to look whether inclusion of materiality in the ESG performance has an impact on the expected growth rate and if this relation holds for some, all or none of the industries.

<sup>&</sup>lt;sup>15</sup> Thompson Reuters Eikon selection of databases have been used for retrieving data.

<sup>&</sup>lt;sup>16</sup> The directive is in force; member states are required to have legislation in place as of December 2016. Company reports are expected to be published in 2018 for financial year 17/18.

## 4.2 Missing data and outliers

From the initial 1348 panel observations available in the OMX Stockholm, OMX Helsinki and OMX Copenhagen, the observations are reduced due to several factors, see Table 4.

| Final Sample                            |      |
|---|------|
| Year 2006-2019                          |      |
| Total number of observations            | 1348 |
| Missing values and Extreme Observations |      |
| Cost of capital                         | -109 |
| Missing values to calculate growth      | -230 |
| Missing values to claculate p-fail      | -389 |
| Outliers growth*                        | -45  |
| Missing values due to ESG factors       | -88  |
| Missing data on Net income              | -2   |
| Missing data on actual Equity 2006      | -4   |
| Final count of observations             | 481  |

\*threshold for extreme value for growth factor was <-30% and >+30%. Table 4 The final observation count and data reduction due to missing values and outliers

## 4.3 Final sample

Given the adjustment for missing data and extreme values, the final sample contains 481 observations. These are attributable to 76 firms in the Nordic stock exchange between the valuation time period 2007-2016 with 56% Swedish, 20% Finnish and 24% Danish firms. The characteristics of the sample and its distribution is presented in Table 3 in Appendix.

## 5. Statistical analysis

In this section, the statistical approach to analyzing the relationship between the ESG and implied long-term growth rates is outlined. First, the financial control variables are introduced. Second, the approach to analyzing descriptive statistics is presented and finally, the data models used for regression analysis paper are described.

## **5.1 Financial Indicators and ESG Scores as control variables**

The study employs a number of financial performance indicators as control variables in order to further identify the strength of the relationship between the ESG performance and the implied long-term growth rates. The intuition behind including these variables is as follows: calculated

implied growth rates are based on the financial expectations of the investors, which tend to be driven by the past financial performance of companies, among other factors (Penman, 2013). Therefore, by including financial performance indicators, authors aim to gauge whether the ESG performance's contribution to growth variance is overshadowed by the variance explained by the financial ratios.

The data for the calculation of control variables is obtained through Thomson Reuters terminal. It includes fourteen fundamental income statement and balance sheet items, which are used to calculate the financial performance indicators. As a result, ten various financial ratios are included in the assessed regressions as controlling variables. The calculations of the ratios are available in Table 4 in Appendix.

First of all, the profitability ratios have been introduced. The measures of past profitability performance can be an important driver for the investors to create predictions of the companies' future growth. To be more specific, the return on owner's equity of previous periods may help the investors forecast the capabilities of the firm to earn a required share of invested equity capital per year as net income. Moreover, *Sales-to-Assets* and *Profit Margin* indicators help the analysts and investors to gauge the firm's efficiency in creating revenue and extracting a required share of profits in these revenues correspondingly. The more profitable and efficient the companies are, the more likely they are to carry on their operations in the next period and therefore the likelihood that the investors will produce a positive forecast regarding their future growth is higher (Penman, 2013).

However, profitability indicators describe only one of the dimensions of financial performance that could be useful for producing a forecast regarding the firm's long-term growth. In this study, a number of leverage and liquidity ratios is included to assess their impact on the long-term development of the companies analyzed. The *Cost of Liabilities* ratio allows the investors to assess the average interest that the company has to pay on its debt. The larger this indicator is, the more expensive the company's debt financing becomes, which may signal both poor negotiating power in regard to taking loans, higher burden on company's bottom line and the increased riskiness of the equity instrument (Binsbergen et al., 2010). Another liquidity indicator that is included into the regression analysis is *Cash to Liabilities*. The interpretation of the indicator is twofold: the higher its value is, the more likely the company is to be able to pay a higher share of its debt, but at the same time, higher values of the indicator may suggest

poor investing capabilities of the company analyzed (Koller, Goedhart and Wessels, 2010). Finally, *Capital to Assets* ratio is used to assess the financial leverage and health of a firms' balance sheet. This ratio measures the share of total assets owned by the shareholders. The higher share of equity in total assets may signal that the company is less likely to go bankrupt (Skogsvik, 1990). However, debt financing is usually cheaper than equity financing, so the companies need to find a balance between solvency and cost of capital, which could be defined by a business model and an individual situation. Overall, leverage and liquidity indicators help the shareholders draw conclusions on financial stability of the firms, which is a core factor in determining chances for future growth (Penman, 2013).

Another family of indicators introduced are growth indicators. The *Growth in Assets* and *Growth in Sales* may provide valuable insights on whether the companies' operations and revenues are growing or contracting. For example, growth in sales is likely to impact the companies' bottom line profit, which can in turn lead to more of this profit being retained to finance expansion of business or paying its debts (Nissim & Penman, 2001). The growth in assets could be a consequence of growth in sales, or it could also signal the increased economic activity, which could also lead to growth (Cooper et al., 2008). Therefore, analysis of these indicators could help the investor draw conclusions about the velocity of the company long-term growth in equity.

The final set of indicators are ratios describing the investor relations. For instance, the *Dividend to Equity* is a factor representing the share of profits that the company chooses to pay out to its shareholders relative to shareholder's equity. The smaller the amount of dividends paid out, the more funds the company would invest in business development, which could mean higher growth rates in the future periods (Rozeff, 1982). Another factor included in this category is *Market-to-Book* ratio, which is a good indicator of how much investors value the company at a given point of time relative to its book value. The market's valuation of a company could suggest a level of confidence that investors place in a company, and therefore it could influence their judgments about long-term growth (Penman, 1996).

As a separate way to assess ESG performance without materiality analysis, Thomson Reuters ESG ten category scores were included in regression analysis. As described in section 1.2.1 of Research Design, they are used to calculate the material and holistic ESG performance scores. These variables are included in regression analysis to examine whether one or more of the

original Thomson Reuters ten category ESG scores have a consistently stronger relationship with the growth rate. The description of these variables is available in the table below.

| Category                             | Description  |
|--------------------------------------|--|
| Resource Use<br>Score                | Resource use category score reflects a company's performance and capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management.  |
| Emissions<br>Score                   | Emission category score measures a company's commitment and<br>effectiveness towards reducing environmental emission in the production<br>and operational processes.   |
| Environmental<br>Innovation<br>Score | Environmental innovation category score reflects a company's capacity to<br>reduce the environmental costs and burdens for its customers, and thereby<br>creating new market opportunities through new environmental<br>technologies and processes or eco-designed products. |
| Workforce<br>Score                   | Workforce category score measures a company's effectiveness towards<br>job satisfaction, healthy and safe workplace, maintaining diversity and<br>equal opportunities, and development opportunities for its workforce.  |
| Human Rights<br>Score                | Human rights category score measures a company's effectiveness towards respecting the fundamental human rights conventions.  |
| Community<br>Score                   | Community category score measures the company's commitment towards<br>being a good citizen, protecting public health and respecting business<br>ethics.  |
| Product<br>Responsibility<br>Score   | Product responsibility category score reflects a company's capacity to produce quality goods and services integrating the customer's health and safety, integrity and data privacy.  |
| Management<br>Score                  | Management category score measures a company's commitment and effectiveness towards following best practice corporate governance principles.   |
| Shareholders<br>Score                | Shareholders category score measures a company's effectiveness towards equal treatment of shareholders and the use of anti-takeover devices.   |
| CSR Strategy<br>Score                | CSR strategy category score reflects a company's practices to communicate that it integrates the economic (financial), social and environmental dimensions into its day-to-day decision-making processes.  |

Table 6 Thomson Reuters ESG Score Components used in the analysis as ESG Controls. Source: Thomson Reuters Eikon

## **5.2 Descriptive Statistics Analysis**

The analysis of the provided variables' descriptive statistics is a primary point of defining the specification of data models. The descriptive statistics are analysed in two steps in this study. As in (Alfaro, L. et al., 2004), the first step entails the calculation and examination of group statistics such as mean values, standard deviation, minimum and maximum values as well as normality tests for all the selected factors used in regression analysis. This type of assessment helps to determine the potential outliers and data comparability issues. Comparison of mean values and standard deviations of the dependent variable and the forecasted value of the dependent variable can be a way to assess the accuracy of the regressions' estimates. The second
step entails the analysis of correlation matrixes, which include the factors and the dependent variable (Penman, 1996). This analysis may be helpful for primary determination of the potential linear relationships and the selection of variables for inclusion into the data model. Moreover, the analysis of correlation matrixes may identify the cases of multicollinearity in estimated regressions, which could distort the significance and accuracy of the coefficient estimates.

### **5.3 Regression analysis**

In order to test the hypotheses of the paper, panel regression analysis has been conducted. The data models of the estimated regressions were presented in three main types: i) unreduced regressions on a whole sample, which contain all the control factors and ii) reduced regressions with ESG performance variables on a whole sample, which contain only the ESG performance factors and iii) unreduced regressions on a sample split based on the external assurance of sustainability reports.

The factors included in the data models tested by the researchers are listed as follows:

 $g_t^i$  – the implied long-term growth of a company *i* at the time point *t*;

 $MESG_t^i$  – the material ESG performance variable of company *i* at the period *t*;

 $MESGH_t^i$  – the holistic ESG performance variable of company *i* at the period *t*;

 $SustRep_t^i$  – a dummy variable indicating whether a company *i* issues a sustainability report at the time *t*;

 $ExternAud_t^i$  – a dummy variable indicating whether a company *i* provides external assurance for the sustainability report at the time *t*;

*FinancialControls*<sup>i</sup> - a set of financial control variables, introduced in section 4.1 of methodology;

*PeriodFixed*<sup>i</sup> - a dummy variable indicating the time period of the observation (fixed effect);

 $CompaniesFixed_t^i$  – a dummy variable indicating the company representing the observation (fixed effect);

 $\varepsilon_t^i$  – the disturbance term.

Below, follows a presentation of the data models used in the analysis:

*i)* Unreduced family of data models, complete sample

(1) Unreduced regression including TR ESG ten category scores, Reporting variables and Financial Controls

$$\begin{split} g_{t}^{i} &= \alpha_{0} + \beta_{1} ExternAud_{t}^{i} + \beta_{2} SustRep_{t}^{i} + \beta_{3-12} ESGControls_{t}^{i} \\ &+ \beta_{13-22} FinancialControls_{t}^{i} + \beta_{23} PeriodFixed_{t}^{i} + \beta_{24} CompaniesFixed_{t}^{i} + \varepsilon_{t}^{i} \end{split}$$

(2) Unreduced regression including Material ESG performance score, Reporting variables and Financial Controls

$$\begin{split} g_{t}^{i} &= \alpha_{0} + \beta_{1}ExternAud_{t}^{i} + \beta_{2}SustRep_{t}^{i} + \beta_{3}MESG_{t}^{i} + \beta_{4-13}FinancialControls_{t}^{i} \\ &+ \beta_{14}PeriodFixed_{t}^{i} + \beta_{15}CompaniesFixed_{t}^{i} + \varepsilon_{t}^{i} \end{split}$$

(3) Unreduced regression including lagged Holistic ESG performance score, Reporting variables and Financial Controls

 $g_{t}^{i} = \alpha_{0} + \beta_{1}ExternAud_{t}^{i} + \beta_{2}SustRep_{t}^{i} + \beta_{3}MESGH_{t-1}^{i} + \beta_{4-13}FinancialControls_{t}^{i} + \beta_{14}PeriodFixed_{t}^{i} + \beta_{15}CompaniesFixed_{t}^{i} + \varepsilon_{t}^{i}$ 

The first family of data models comprehensively examines the relationship between the companies' ESG *performance* and growth rates, while introducing a set of financial ratios as controls. The material and holistic factors of ESG are highly correlated (and so are the Thomson Reuters ten category ESG scores that they are derived from). Therefore, including them into the regressions simultaneously would have cause severe multicollinearity, which could distort the estimates and their significance due to inflated variances. The first model includes the Thomson Reuters ten category ESG scores and reporting variables as factors mapping companies' ESG performance. The second model examines the relationship by including the Material ESG score and reporting scores to represent ESG performance. The third model includes a lagged Holistic ESG score and reporting scores as factors defining ESG performance.

ii) Reduced family of data models, complete sample

#### (4) Reduced regression including only ESG controls and Reporting variables

$$\begin{split} g_{t}^{i} &= \alpha_{0} + \beta_{1} ExternAud_{t}^{i} + \beta_{2} SustRep_{t}^{i} + \beta_{3-12} ESGControls_{t}^{i} + \beta_{13} PeriodFixed_{t}^{i} \\ &+ \beta_{14} CompaniesFixed_{t}^{i} + \varepsilon_{t}^{i} \end{split}$$

(5) Reduced regression including only material ESG performance score and Reporting variables

 $g_{t}^{i} = \alpha_{0} + \beta_{1}ExternAud_{t}^{i} + \beta_{2}SustRep_{t}^{i} + \beta_{3}MESG_{t}^{i} + \beta_{4}PeriodFixed_{t}^{i}$  $+ \beta_{5}CompaniesFixed_{t}^{i} + \varepsilon_{t}^{i}$ 

(6) Reduced regression including lagged holistic ESG performance score, Reporting variables and Financial Controls

$$\begin{split} g_{t}^{i} &= \alpha_{0} + \beta_{1} ExternAud_{t}^{i} + \beta_{2} SustRep_{t}^{i} + \beta_{3} MESGH_{t-1}^{i} + \beta_{4} PeriodFixed_{t}^{i} \\ &+ \beta_{5} CompaniesFixed_{t}^{i} + \varepsilon_{t}^{i} \end{split}$$

The second, reduced family of data models uses similar specifications, but does not include the financial ratios in order to examine the "pure" effect of ESG performance on implied long-term growth rates. For the first two examined families of data models, the research was conducted on a whole sample.

- iii) Unreduced family of data models, sample split based on external assurance factor
- (7) Unreduced regression including material ESG performance score and Financial controls, on a sample with external assurance of sustainability reports

$$\begin{split} g_{t}^{i} &= \alpha_{0} + \beta_{1} MESG_{t}^{i} + \beta_{2-11} Financial Controls_{t}^{i} + \beta_{12} PeriodFixed_{t}^{i} \\ &+ \beta_{13} CompaniesFixed_{t}^{i} + \varepsilon_{t}^{i} \end{split}$$

- (8) Unreduced regression including material ESG performance score and Financial controls, on a sample without external assurance of sustainability reports  $g_t^i = \alpha_0 + \beta_1 MESG_t^i + \beta_{2-11} Financial Controls_t^i + \beta_{12} PeriodFixed_t^i + \beta_{13} CompaniesFixed_t^i + \varepsilon_t^i$
- (9) Unreduced regression including lagged holistic ESG performance score and Financial controls, on a sample with external assurance of sustainability reports  $g_t^i = \alpha_0 + \beta_1 MESGH_{t-1}^i + \beta_{2-11} FinancialControls_t^i + \beta_{12} PeriodFixed_t^i$  $+ \beta_{13} CompaniesFixed_t^i + \varepsilon_t^i$

# (10) Unreduced regression including lagged holistic ESG performance score and Financial controls, on a sample without external assurance of sustainability reports

 $g_{t}^{i} = \alpha_{0} + \beta_{1}MESGH_{t-1}^{i} + \beta_{2-11}FinancialControls_{t}^{i} + \beta_{12}PeriodFixed_{t}^{i} + \beta_{13}CompaniesFixed_{t}^{i} + \varepsilon_{t}^{i}$ 

The third family of data models includes unreduced regressions with financial controls. The reporting aspect factors are absent from the specifications of these regressions because they determine the sample split. The third group of regressions is different from the other examined families of regressions because of the analysed samples: the complete sample is split according to the presence of the external assurance of sustainability reports. This is done in order to examine the relationship between the reporting aspect of the ESG performance and the industry-driven material and holistic approaches to ESG performance in a more detailed way.

The introduced data models account for the specialties of the time series. This is done by introducing the fixed effects on time and company cross-sections (Cai et al., 2012, Nelling & Webb, 2009). The economic and political situation in the region as well as in the world economy is known to highly impact market values of companies, which were used to derive the dependent variable values. Therefore, the fixed effect on time captures the common effects of the time, which is likely to be present in a financial dependent variable. Moreover, since the sample includes different companies in size, industry, management style, marketing strategies and country of origin, the researchers included fixed effect on companies to make the relationship between the growth and ESG performance easier to capture.

### **IV. DISCUSSION OF THE RESULTS**

In this section, results of the statistical analysis are presented and discussed. First, the section deals with the two-stage analysis of descriptive statistics. Thereafter, the section covers the obtained estimates of the relationship between the dependent variable and chosen factors. Conclusively, the results of the statistical analysis are summarized and discussed in the context of the existing academic literature.

### **1. Descriptive statistics**

#### **1.1 Examination of descriptive statistics**

The descriptive statistics on all the variables used in regression analysis are available in the Table 5-6 in Appendix. It includes separate tables with financial indicators (including reverse-engineered growth), ESG factors and Thomson Reuters ten category ESG scores as well as a comparative table covering the actual and forecasted reverse-engineered growth.

The properties of reverse-engineered growth rates are within the expected range, although they exhibit a rather high standard deviation. The mean value of obtained growth rates is around 3,41%, which is not surprising, as it could reflect positive market expectations. The standard deviation of the growth rate is around 7,56%, which could be rather high for long-term growth, but since the values are based on ever-changing stock prices and expectations, it is not alarming.

The material and holistic ESG performance indicators generally exhibit similar properties. However, the mean value of the material ESG performance factor is at the level of 58.04, while the holistic ESG performance factor is lower, 51.94. The difference is explained by the scandal factors, included in the calculations of the holistic ESG performance variable. However, the standard deviations of these variables are very similar: 17.42 and 17.00 respectively for material and holistic ESG factors. This is largely explained by the similarities in calculations of these factors.

It is interesting to examine the main properties of the forecasted growth rates, obtained by using a set of estimates provided by the data models (1) through (6) for the entire sample during the period of 2007-2016. The mean values of the estimates and actual values are almost identical (given the average of the dependent variable of 3.41%). Such properties of mean values suggest

that the estimates are likely to be unbiased. The standard deviation of the forecasted value is generally a bit lower compared to the actual growth standard deviation level of 7.56%. All the series are not normally distributed, according to Jarque-Bera test, but their skewness and kurtosis values are strikingly different: -0.23 and 5.76 for actual growth, and within the ranges of 0.57-0.65 and 3.00-3.48 for forecasted values respectively. This suggests that despite having similar mean properties, the estimated values and actual growth rates follow different distributions.

### **1.2 Examination of correlation matrixes**

As in case of descriptive statistics tables, the correlation matrixes computed for all of the factors used in regression analysis are available in the Table 7-9 in Appendix. There are two separate matrixes for financial indicators and ESG factors and controls.

The highest level of correlation in relation to growth rates is shown by the *Profit Margin*. It is negative 13.72%, which is not considered to be strong. Higher values of *Profit Margin* may indicate the growth stage of the companies' development, which is imminently followed by competitive equilibrium, which is characterized by lower growth. However, this correlation is still rather weak and it could not conclusively imply the existence of such a relationship. None of the ESG scores or ESG controls exhibited strong correlation with the growth rate.

The highest level of correlation among the factors of ESG is exhibited by a number of variables: holistic ESG variable (77%), resource use score (66%), emissions score (62%) and CSR strategy (70%). Therefore, inclusion of these variables into the regression simultaneously may cause multicollinearity issues. For a more accurate analysis, it makes sense to review each of the variables relationship to the dependent variable separately.

Upon analyzing the correlation matrix of the Growth and ESG performance, it can be concluded that the sustainability report and external assurance dummies (reporting variables) also demonstrate moderate levels of correlation with material and holistic ESG scores. Since reporting variables and material/holistic ESG factors represent different elements of ESG performance, both classes of variables were included in the data models (1) through (6). However, moderate-to-strong correlation between these factors suggests that a separate analysis of the two reporting and two ESG performance scores needs to be conducted to avoid the distortion of estimates by multicollinearity.

# 2. Regression analysis

Table 5 below presents the results of conducted regression analysis. The researchers estimated ten regressions, examining the impact of the companies' ESG performance on the implied long-term growth rates using a combination of different aspects of sustainability as factors.

|  | (1)               | (2)              | (3)            | (4)             | (5)          | (6)            | (7)            | (8)            | (9)             | (10)        |
|--|-------------------|------------------|----------------|-----------------|--------------|----------------|----------------|----------------|-----------------|-------------|
| Intercept                                  | 0.018391          | 0.031937         | 0.008551       | -0.010005       | 0.004161     | 0.011574       | -0.294723      | 0.139467***    | -0.195336**     | 0.058075    |
| SustRep                                    | -0.024125         | -0.015922        | -0.013034      | -0.022418       | -0.012812    | -0.012739      |                |                |                 |             |
| ExternAud                                  | -0.001048         | -0.008279        | -0.012597      | 0.001995        | -0.005759    | -0.008937      |                |                |                 |             |
| MESG                                       |                   | 0.000663*        |                |                 | 0.000738*    |                | 0.001920***    | -1.73E-06      |                 |             |
| MESGH(t-1)                                 |                   |                  | 0.000528*      |                 |              | 0.000703**     |                |                | 0.000312        | 0.000907*   |
| Resource Use                               | -0.002282         |                  |                | 0.003043        |              |                |                |                |                 |             |
| Emissions                                  | 0.081650***       |                  |                | 0.080692***     |              |                |                |                |                 |             |
| EnvironInn                                 | -0.008121         |                  |                | -0.011111       |              |                |                |                |                 |             |
| Workforce                                  | 0.019132          |                  |                | 0.022848        |              |                |                |                |                 |             |
| Human Rights                               | 0.027358          |                  |                | 0.023766        |              |                |                |                |                 |             |
| Community                                  | -0.026624         |                  |                | -0.028015       |              |                |                |                |                 |             |
| ProductResp                                | -0.032961         |                  |                | -0.036473       |              |                |                |                |                 |             |
| Management                                 | 0.030698*         |                  |                | 0.0309009**     |              |                |                |                |                 |             |
| Shareholders                               | 0.011940          |                  |                | 0.014885        |              |                |                |                |                 |             |
| CSR Strategy                               | -0.021540         |                  |                | -0.015020       |              |                |                |                |                 |             |
| ROE  | -0.002733         | -0.001845        | -0.002229      |                 |              |                | -0.003727      | -0.001675      | 0.036334        | -0.002532   |
| Sales/Assets                               | 0.012982          | 0.020599         | 0.020895       |                 |              |                | 0.097694**     | -0.030605      | 0.083002        | -0.032633   |
| Profit Margin                              | -0.19374***       | -0.1814**        | -0.1412*       |                 |              |                | -0.172336      | -0.252571**    | -0.181174       | -0.205985** |
| Equity/Assets                              | 0.001236          | -0.012739        | 0.080790       |                 |              |                | 0.145306       | -0.075724      | 0.254991**      | 0.038639    |
| Cash/Liab                                  | -0.071844*        | -0.0713*         | -0.0898*       |                 |              |                | 0.022225       | -0.092483*     | -0.026991       | -0.15124*** |
| Cost of Liab                               | -0.251314         | -0.305594        | -0.592155      |                 |              |                | 1.662714*      | -0.063533      | 0.966558        | -0.150056   |
| Growth in Sales                            | 0.004984          | -3.44E-05        | 0.013790       |                 |              |                | -0.008198      | -0.027220      | 0.009081        | -0.007168   |
| Growth in Assets                           | 0.024014          | 0.020779         | 0.043836*      |                 |              |                | -0.058101      | 0.049717*      | -0.007271       | 0.069177**  |
| Market to Book                             | -2.32E-06         | -4.41E-05        | -0.000194      |                 |              |                | 0.003749       | 4.27E-05       | 0.001480        | -7.90E-05   |
| Dividends/Eq                               | 0.004435          | 0.005277         | 0.007406       |                 |              |                | 0.157161       | 0.003132       | 0.218441        | 0.007306    |
| Fixed effect on time                       | Yes               | Yes              | Yes            | Yes             | Yes          | Yes            | Yes            | Yes            | Yes             | Yes         |
| Fixed effect on<br>company                 | Yes               | Yes              | Yes            | Yes             | Yes          | Yes            | Yes            | Yes            | Yes             | Yes         |
| $R_{Normal}^2$                             | 0.473663          | 0.454265         | 0.501927       | 0.452554        | 0.432809     | 0.478987       | 0.538936       | 0.563930       | 0.564368        | 0.649041    |
| $R_{Adjusted}^2$                           | 0.324487          | 0.316050         | 0.359167       | 0.315693        | 0.307248     | 0.350342       | 0.365650       | 0.393486       | 0.390770        | 0.485418    |
| Observations                               | 481               | 481              | 405            | 481             | 481          | 405            | 206            | 275            | 187             | 218         |
| *- Coefficient is sign<br>of significance. | ificant on 10% le | evel of signific | ance; **- Coel | ficient is sign | ificant on 5 | % level of sig | gnificance; ** | * - Coefficien | t significant o | n 1% level  |

 Table 5 The results of regression analysis of the data models (1) to (10)
 Image: the second seco

To begin with, authors examined the relationship between the elements of ESG performance scores in an attempt to determine the most significant ESG factor impacting long-term growth

rates. The analysis of the estimation output of the regression (1) suggests that emissions score and management score are among the significant factors of the examined data model (at 1% and 10% levels of significance respectively). Furthermore, in both cases coefficients of these elements of ESG performance are positive. This means that ESG performance on these sustainability aspects impacts the long-term growth rates positively. The first regression also suggests the significance and negative relationships of a profit margin and the *Cash/Liab* ratio with the long-term growth.

The examination of the reduced version (excluding the financial controls) of the same regression (4) exhibits similar coefficients and levels of significance, although the  $R_{Adjusted}^2$  is reduced due to exclusion of a significant financial ratios. Therefore, it is safe to claim that among the Thomson Reuters ten category ESG scores, *Emissions* score and *Management* score impact the implied long-term growth of companies to a larger extent, and this impact is of a positive kind.

The second type of regressions, represented by regressions (2) and (5), includes three variables to measure the ESG performance impact on the reverse-engineered growth rates: material ESG performance score, computed by the authors, and two reporting dummy variables. The regression (2) includes financial indicators, while the regression (5) does not. There are three factors in regression (2) which are significant at 10% level of significance: the material ESG performance score and the financial ratios *Cash/Liab* and the *Profit Margin*. The material ESG performance score's coefficient exhibits a positive sign, which is in line which the initial hypothesis. The coefficients of the financial ratios are negative and quite close to the estimates of the regression (1). Examination of the coefficient estimates of the regression (5) reveals that only the ESG performance score. It still exhibits a positive sign, which suggests that the examined relationship holds both including and excluding financial controls.

The third type of regressions, (3) and (6), includes reporting dummies and a lagged holistic ESG performance score as factors defining companies' ESG performance. In both regressions, the lagged holistic ESG performance score is significant and it bears a positive sign. In case of a reduced regression (without financial controls), the lagged holistic ESG performance variable becomes significant at 5% level. There are four variables that exhibit significant coefficients in

regression (3) (at 10% level of significance): along with the holistic ESG performance, the *Profit Margin, Cash/Liab* and *Growth in Assets* are found to impact the growth rates. The impact of *Growth in Assets* is positive, while the impacts of *Cash/Liab* and the profit margin are negative and close to the coefficient estimates obtained in regressions (1) and (2).

The last four examined regressions (7) through (10) summarize the analysis of ESG performance through the lens of external assurance as a tool of reducing information asymmetry. The complete samples were split into two parts, according to the values of external assurance dummy variable: whether the company employed an external agent to review their sustainability reports or not.

The regressions (7) and (8) exhibit the results of such an examination in regard to the material ESG performance score. The regression (7), conducted on a sample of companies that audit their sustainability reports, suggests three significant factors among the analyzed financial controls and ESG factors: the material ESG score (significant at 1%, positive sign), financial ratio *Sales to Assets* (significant at 5%, positive sign) and *Cost of Liabilities* (significant at 10%, positive sign). It is notable that within the sample of companies that audit their sustainability reports, the coefficient of material ESG performance is 2.89 times higher than in regression (2) for general sample. On the other hand, in the environment of absence of external assurance, the regression (8) estimates suggest that the material ESG performance variable is not significant in determining the long-term growth, while the profit margin and *Cash/Liab* regain their significance and show similar relationships as in the regressions (1), (2) and (3).

Finally, the regressions (9) and (10) examine the impact of the lagged holistic ESG performance score on the long-term growth on different samples regarding the presence of external assurance of the sustainability reports. The regression (9), describing companies that audit their sustainability reports, suggests that the lagged holistic ESG score is not significant, and the only significant factor (at 5% level of significance) in this regression (except the intercept) is the *Equity/Assets* leverage ratio, which exhibits a positive sign. In the opposite situation, regression (10) exhibits significant at 10% and positive relationship between the lagged holistic ESG performance variable, along with the significant (at 5% and 10%, respectively) and negative relationships with the profit margin and financial ratio *Cash/Liab*, as well as the positive relationship with *Growth in Assets* indicator.

#### **3. Robustness check**

The comprehensive robustness check is conducted in order to assess the stability of the obtained statistical estimates. To begin with, the properties of regressions are tested for violations of Gauss-Markov theorem (Gujarati, 2009), in particular, for heteroscedasticity, serial correlation and multicollinearity. As a next step, the stability of estimates is assessed through testing the regressions with data models (1) through (10) on randomly selected 80%, 70% and 60% of the initial sample observations. The section goes on to elaborate on the aforementioned steps.

### **3.1 Heteroscedasticity**

Heteroscedasticity is a violation of one of the assumptions of Gauss-Markov theorem, which serves as an underpinning for Ordinary Least Squares estimation method employed in this study. In order for Gauss-Markov theorem to hold, the errors of the estimated model are required to exhibit constant levels of variance, a condition known as homoscedasticity. Contrary to homoscedastic errors, errors exhibiting heteroscedasticity do not show constant levels of variance. Such a violation does not lead to the bias of the coefficients estimates, but it makes the estimates of coefficients' variance biased. Therefore, using these estimates for testing hypotheses may lead to the distortion of the results (Gujarati, 2009). In this study, each of the estimated regressions was tested for the presence of heteroscedasticity using Koenker-Bassett test (Gujarati, 2009). The summary of the test's output for each of the regressions is summarized in Table 10 in Appendix. According to the Koenker-Bassett test, heteroscedasticity was detected only for the specification (10) of the analyzed regressions. Therefore, although its coefficient estimates are still unbiased, the calculated significance of the variables may be understated or overstated, and therefore, the results need to be used with caution.

# **3.2 Serial Correlation**

Autocorrelation (also known as serial correlation) is a violation of the assumption of an absence of correlation between the error terms of the regression ordered in time. This violation of Gauss-Markov theorem does not lead to biased coefficient estimates, but it usually underestimates the standard errors and overstates the t-statistics of the tested regressions (Gujarati, 2009). In this study, the Breusch-Godfrey test for the potential three lags in error terms is used to detect autocorrelation among the tested regressions. The test's output for all the regressions are available in the Table 11 in Appendix. The obtained test results suggest the presence of autocorrelation among all of the tested regressions. As noted above, such case does not make the coefficient estimates biased, but it may distort the significance levels of the factors of the model. Therefore, the obtained results are advised to be used with a degree of caution.

### **3.3 Multicollinearity**

Multicollinearity is a phenomenon indicating a linear relationship between one or more factors of the tested regression model. It leads to high variance of the affected factors, which makes the coefficients inaccurate and very sensitive to small changes in data (Gujarati, 2009). In this study, analysis of multicollinearity is embedded into the composition of data models in section 5 of the Research Design. It is conducted with the help of Spearman's correlation matrixes, which are available in Table 7-9 in Appendix. For instance, the ESG performance factors exhibit high levels of correlation, and therefore their effects were analyzed in different data models. Moreover, in order to test the potential effect of external assurance more accurately, the sample is split according to the value of the corresponding dummy variable. Otherwise, according to the analyzed correlation matrixes, no included factors exhibited significant levels of correlation.

#### **3.4 Random composition of Sub-Samples**

To further challenge the stability of the analyzed relationships, the specified data models (1) to (10) are estimated on randomly selected sub-samples, comprising 80%, 70% and 60% of the original observations. To begin with, the data models (2), (3), (7), (8) and (9) show the same estimation results in all the tested sub-samples. Meanwhile, the data models (1) and (4) show a stable significant and positive relationship between emissions score and long-term growth in all the sub-samples tested, while the management score was not significant in the chosen sub-samples. Finally, the data models (5), (6) and (10) show the same properties of relationship in one of three tested sub-samples. Overall, the analysis of tested relationships suggests reliable levels of coefficients stability.

### 4. Interpretation of the Results

This section summarizes the results of the conducted research and places them within the relevant strands of academic literature. The hypotheses developed in the Literature Review employs Agency, Signaling and Impression theories in order to describe and explain the relationship between CSR and long-term growth. This section addresses the impact of examined ESG performance variables on long-term growth as well as the implications of the results on

the ongoing academic debate on value relevance of CSR performance. Conclusively, the chapter goes on to discuss the role of external assurance as a tool of decreasing information asymmetry, arising from the difference between the information possessed by the companies and the shareholders, and analyses it within the setting of the signaling theory.

# *Hypothesis I: The Relationship between ESG Performance and the Implied Long-term Growth*

Section 4 of the literature review adopts the setting of the signaling theory (the timeline of signaling process in Connelly et al., (2011)) to explain the mechanism of the relationship between the ESG performance and the implied long-term growth. The market usually receives the information about the enterprises' ESG policies through their sustainability reports, which contain self-assessed information on various sustainability aspects. Based on this information, the investors interpret and decide on the allocation of their investments in the next period. Consequently, this decision in turn affects the signalers, represented by corporations. The given research focused on investigating whether and how the investors would use the information on ESG performance in creating their forecasts of the long-term growth.

Overall, the obtained results suggest that the investors interpret good ESG performance as relevant and positive for their predictions of companies' long-term growth. This is underpinned by the stable significance and positivity of various ESG performance scores' coefficient estimates in tested relationships with the implied long-term growth rates. Since long-term growth is a common element of continuing value term of various valuation models (Penman, 2013), such finding is in line with a strand of research, which argues that high quality ESG performance is value creating (Borglund et al., 2017; Visser, 2011; Zadek, 2004; Schadewitz, Niskala, 2011; Berthelot et al., 2012; Verbeeten et al., 2016).

The bulk of analyzed academic literature and empirical trends suggest that investors attribute more value to ESG signals in their investment decisions. However, this study exhibits that some ESG aspects are more important to them in terms of formulation of the long-term growth predictions than the other. The analysis of the obtained regression estimates for Thomson Reuters ten category ESG scores suggests that emission and management category scores impact the reverse-engineered growth rates positively. Indeed, the company's commitment towards reducing environmental emissions in the production and operational processes signals the investors that the company is hedged against the risk of potential scandals. Moreover, this can further imply that the firm is contributing to preserving safe atmosphere for continuing operations in the long term (Borglund et al., 2017; Visser, 2011; Zadek, 2004). Furthermore, employing better management practices may be interpreted by the investors as an additional tool for reputational risk management (Borglund et al., 2017).

Not all the aspects of ESG performance are equally important in context of various industries. In particular, due to the nature of their business models, some industries may score lower on a sustainability aspect because they use the resources attributed to it, while the others do not. In this study, the fact that the material ESG performance coefficient estimates were statistically significant and positive suggests that the investors take the materiality of the reported ESG information into account while interpreting the sustainability information and forecasting the long-term growth rates. Therefore, it is safe to claim that the investors' interpretation of the material ESG performance is in line with Kiron et al., (2013) and Simanis, Hart, (2009) who argue that the ESG performance efforts are only effective if they are aimed at respective enhancement of business models.

Despite the fact that the material ESG performance factor encompasses the weighted average of all the material aspects of the companies' ESG performance, it leaves out one important issue, which would help to further define how well companies manage their sustainability policies. As noted in the literature review, Visser (2011) pointed out that the occurrence of CSR mismanagement scandals can be a good indicator of underperforming companies in this aspect. In line with this view, the results suggest that the holistic ESG performance factor's coefficient is significant and positive, which implies that the investors are likely to incorporate the information of the controversies from the previous period into their evaluation of future growth. Therefore, the better the holistic ESG performance is, the higher the investors' expectations of the implied long-term growth rates are. Contrary to Surendranath et al. (2015), who argues that that the ESG controversies are not remembered by the investors in long-term, this study suggests that the investors base their expectations on scandals and ESG performance, which occurred further in the past than one period.

Along with the various factors, defining ESG performance of the analyzed companies, this study included the analysis of sustainability reporting scores: dummy variables indicating the preparation of sustainability reports and the engagement of external parties into the assurance

of the information presented in sustainability reports. These reporting dummy variables' coefficients do not show acceptable levels of significance in the estimated regressions. However, their exclusion lowers the levels of  $R_{Adjusted}^2$ , which can be caused only by an exclusion of a significant variable. Such a situation is only possible in case of multicollinearity. Indeed, sustainability reporting and external audit dummies exhibit moderate-to-high levels of correlation with the material and holistic ESG scores as well as with some of the Thomson Reuters ten category ESG Scores (e.g. CSR strategy). Therefore, it is likely to be false to claim no relationship with growth in case of these variables, and therefore their effects on the studied relationships are analyzed in-depth in the next section of the thesis.

Overall, the significance and positivity of the coefficients of ESG performance factors suggests that the long-term equity growth is positively impacted by the efficiency and commitments to ESG policies. The only tested dimension of ESG, which consistently did not exhibit significant and stable coefficients, was the ESG reporting. However, that could be explained by high levels of multicollinearity in the models and therefore, a more detailed analysis was conducted, which revealed some insights regarding how the investors interpret the ESG performance information and the role of external assurance in this interpretation. Since the higher long-term growth rates impact valuation positively (Penman, 2013), the results are largely in line with value creation school of CSR.

#### Hypothesis II: The Role of External Assurance in Investors' Interpretation of CSR Reporting

The impression theory suggests that in case of the managerial opportunism, the company executives may prepare the sustainability reports in a way that creates untruthful positive impression of the company. This could be achieved, for example, by reporting on immaterial aspects of CSR in relation to business model or reporting inaccurate unverifiable values of ESG indicators. This idea appears in a critique of the current sustainability reporting practices (Gray & Milne, 2002), the investigations of CSR value relevance (Taylor et al., 2018) and even as an effective technique in the marketing research (Varadarajan & Menon, 1988).

As a result of such practices, the market could have obtained a wrong impression on the state of company's true CSR performance. Therefore, it is interesting to examine the mechanism of the receivers' interpretation of the signaling process. This can enrich the analysis with the insights on whether the Nordic market places any value in the external assurance of sustainability reports as a way to reduce the information asymmetry and risk of managerial opportunism. In order to test the significance of the role of external audit, the regression analysis has been conducted on the samples of companies which audited their sustainability reports and those who did not.

The results obtained for the material ESG score reveal that the external assurance of sustainability reports plays an important role in regard to the investor's interpretation of "signals" emitted by the corporations. The obtained estimates suggest that if companies audited their sustainability reports, the investors based their forecasts of the implied long-term growth on ESG performance. On the other hand, if the companies do not engage with external parties to verify their sustainability reporting, the investors do not use the ESG performance as a factor for their decision-making. Therefore, the external assurance of sustainability reports is one of the determining factors of whether the ESG performance impacted the companies' implied long-term growth rates or not.

The regressions with the lagged holistic ESG performance score, which is a modification of the material ESG score with incorporation of sustainability controversies impact reveal another interesting dynamic. On a sample of companies that audited their sustainability reports, the lagged holistic ESG performance variable is not significant, while in the opposite case, if the company chose not to audit its sustainability reports, it became significant. These results may suggest that in an environment characterized by an absence of a verified external party that could review the report, the investors are more likely to rely on alternative sources of impartial information, such as media, which usually reports the scandals. As in case described in a previous section, this result is in line with the Visser, (2011) argument that one of the signs of CSR performance success is the absence of failure, which is usually represented by a scandal occurrence.

The described results suggest that the investors tend to trust the information in sustainability reports, which have been externally assured. However, it is important to understand the scope and quality of modern sustainability reporting assurance. Based on the data provided by GRI's Sustainability Disclosure Database (Global Reporting Initiative, 2018), 207 listed companies in the analyzed region (Sweden, Denmark, Finland) prepared sustainability reports in 2016. Out of these companies, only 24.6% engaged with external agencies to provide assurance of their reports. Moreover, among those enterprises that chose to audit their sustainability reports, only

4% (or two companies) provided "reasonable/high" level of assurance. The overwhelming majority (92%) of audited reports exhibited "limited/moderate" level of assurance, and 33% of all externally assured were not assured in their entirety. These dynamics reflect the developing stage of the sustainability reporting assurance practices, which may still leave enough room for window-dressing practices.

Therefore, the examination of the external assurance role in investor's analysis of the signal (represented by sustainability report) revealed that shareholders tend to rely on the external parties (either media or auditors) before incorporating the ESG performance into their predictions of the long-term growth. However, since the sustainability reporting is largely in its emerging stage, it cannot be claimed that the market is safe from impression management within sustainability reporting.

#### Controls

In order to test the hypotheses more reliably, a set of financial ratios was introduced into the regression analysis. Most of these financial indicators did not display any significant coefficients, which is likely to happen due to inclusion of period fixed effects. Financial indicators tend to change along with the cycles of the economy, and therefore the period dummies incorporate much of these cyclical changes over the long term. However, the inclusion of financial indicators showed consistent relationships of a number of ratios with the implied long-term growth, despite the introduction of period fixed effects.

For instance, *Cash/Liab* ratio's coefficients were consistently significant and negative. This may be a bit counterintuitive, since the given financial ratio shows how much of liabilities could be repaid by company's cash balance. However, large amounts of cash balance in relation to corporate liabilities may signal poor investment management, which can be a detrimental factor for growth, especially in the universe of large companies, constituting most of the analyzed sample.

Another detected relationship concerned the *Profit Margin*. Interestingly, its coefficients in the tested relationship with growth rates were significant and negative. This phenomenon could be explained by the dynamics of companies' life cycles. In their growth stage, the companies tend to exhibit higher levels of profit margins and return of equity, but as they reach the

competitive equilibrium and steady state, their growth slows down along with the profit measuring ratios. Therefore, investors may interpret the higher profit margins as a sign of higher likelihood that the growth rates are going to diminish in the future.

In a number of analyzed regressions, *Growth in Assets* financial indicator's coefficient also becomes significant and positive, which means that the investors perceive growth in assets as a signal of the expansion of companies' operations and therefore, future growth in equity.

### V. CONCLUSION

#### **1.** Conclusion

This study examined the relationship between the companies' CSR performance and the implied long-term growth rates on the sample of companies listed in the main market of the Nasdaq OMX Nordics throughout the period of 2007-2016. The study adopted a multidimensional approach to measuring the companies' CSR performance by assessing the ESG performance on industry-level material aspects, incorporating the effects of relevant controversies and addressing the quality of sustainability reporting. The implied long-term growth rates were derived from the market prices using Residual Income Valuation model. The obtained panel data was used to conduct regression analysis. The obtained statistical evaluation results were analysed through the lenses of signalling and impression theories.

Our findings indicate that the long-term equity growth is positively impacted by the companies' ESG performance. In particular, the analysis of ESG performance on material aspects suggests that the investors use this factor as a favourable predictor of the long-term growth rate. Moreover, the results show the information on the ESG performance adjusted for controversies is valuable for investors for longer than for one year. Additionally, the study contributes to the literature with new insights on the role of external assurance of sustainability reports in incorporating the ESG performance into predictions of long-term growth. In particular, the findings suggest that the external assurance of sustainability reports makes the ESG performance reported more credible for the investors. Moreover, in the events of absence of external assurance of sustainability reports the investors were more likely to rely on the information on ESG performance adjusted for controversies, i.e. the media served as an external party validating the received information.

### 2. Limitations of the research

The limitations of the research have been addressed from the perspectives of validity, reliability and generalizability. The validity aspect of the thesis concerns the ability of drawing conclusions on the relationship between the CSR performance and the long-term growth rates upon the conducted analysis. Since neither CSR performance nor long-term growth can be directly observed, they have been proxied based on the findings of the previous studies. However, the occurrence of measurement errors from authors' side cannot be ruled out. Moreover, the conducted regression analysis, although revealing the correlation between the examined terms, does not imply causation, so it can only be suggested. Therefore, the results of our studies need to be used with caution.

The results of the presented research are possible to replicate if the same methodology described is used. The measurement errors mentioned above may concern the process of derivation of growth rates using the valuation model, whether the analysis of the statistical relationships is observed and interpreted correctly and the credibility of the Thomson Reuters data.

Finally, the generalizability of the obtained results outside the scope of the sample and the analysed period is considered moderate. Limitations may exist in the area of representation of small and medium-cap companies, as the study included mostly large listed enterprises on the Nordic market. The results could also be biased towards Swedish companies, as those were represented in larger quantities due to the availability of data. That said, one should apply caution to generalizing the obtained results beyond the scope of the conducted research.

### 3. Future research

This study investigated the relationship between companies' CSR performance and long-term growth rates. The findings of the research suggest a few potential contributions to the research in a given field. For instance, the analysed sample could be extended to the European or the global scale in order to examine the relationship on a larger sample. Moreover, a more comprehensive analysis could be conducted to research the mechanisms of causal relationship between the CSR and the long-term growth. Furthermore, the role and quality of external assurance of sustainability reports could be examined in a more detailed way, as the given research points to the discrepancy between the emerging state of the sustainability audit and the important assurance role it has already assumed for the investors. Finally, it could be of interest to explore the potential discrepancies between the reception of sustainability performance information within the EU and other parts of the world, given that it is mandatory for large EU firms to disclose their CSR performance.

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# **VII. APPENDIX**

# **RESEARCH DESIGN**

# Table 1. SASB issues converted to the Thomson Reuters ten category ESG Scores

| ESG issues    | SASB ISSUES  | THOMSON REUTERS CATEGORY SCORES |
|---------------|--|---------------------------------|
|               | GHG emissions  | Emissions Score                 |
|               | Air quality  | Emissions Score                 |
|               | Energy management                                    | Resource Use Score              |
| Environmental | Fuel management                                      | Resource Use Score              |
|               | Water and wastewater management                      | Emissions Score                 |
|               | Waste and hazardous materials management             | Emissions Score                 |
|               | Biodiversity impacts                                 | Innovation score                |
|               | Human rights and community relations                 | Community Score                 |
|               | Access and affordability                             | Product Responsibility Score    |
|               | Customer welfare                                     | Human Rights Score              |
|               | Data security and customer privacy                   | Human Rights Score              |
|               | Fair disclosure and labeling                         | Product Responsibility Score    |
|               | Fair marketing and advertising                       | Product Responsibility Score    |
| Social        | Labor relations                                      | Workforce Score                 |
|               | Fair labour practices                                | Workforce Score                 |
|               | Employee health, safety and wellbeing                | Workforce Score                 |
|               | Diversity and inclusion                              | Workforce Score                 |
|               | Compensation and benefits                            | Workforce Score                 |
|               | Recruitment, development and retention               | Workforce Score                 |
|               | Lifecycle impacts of products and services           | CSR Strategy Score              |
|               | Environmental, social impacts on assets & operations | CSR Strategy Score              |
|               | Product packaging                                    | Management Score                |
|               | Product quality and safety                           | Management Score                |
| Governmental  | Systemic risk management                             | Management Score                |
|               | Accident and safety management                       | CSR Strategy Score              |
|               | Business ethics and transparency of payments         | CSR Strategy Score              |
|               | Competitive behaviour                                | Shareholders Score              |
|               | Regulatory capture and political influence           | Shareholders Score              |
|               | Materials sourcing                                   | Management Score                |
|               | Supply chain management                              | Management Score                |

| $ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$   | UPONOR.HE | Uponor Oyj                                     |             |   | 1                 |                          |                 |  | ICAA.ST          | ICA Gruppen AB                 | CLASh ST      | Clas Ohlson AB                          |                   |                            |            |  |                          |          |
|--|-----------|--|-------------|---|-------------------|--------------------------|-----------------|--|------------------|--------------------------------|---------------|---|-------------------|----------------------------|------------|--|--------------------------|----------|
| $ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$   |           | JM AB<br>Assa Ablov AB                         |             | STEAST  | Oyj<br>ane Ovi    | Stora Enso<br>UPM-K vmme |                 |  | OKDBV.HE         | Kesko Oyj<br>Oriola Ovi        | HUSQLST       | Husqvama AB<br>Svenska Celhilosa SCA AB |                   |                            |            |  |                          |          |
|  |           | Nobia AB                                       |             | HOLMbST                                       | 8                 | Holmen A                 | CARLb.CO        | Carlsberg A/S                                    | AXFOST           | Axfood AB                      | ELUXb ST      | Electrolux AB                           | SWMA ST           | Swedish Match AB           | CHRH.CO    | Chr Hansen Holding A/S                     |                          |          |
| Image         Image <th< td=""><td></td><td>Company</td><td></td><td>RIC</td><td>ų</td><td>Compan</td><td>RIC</td><td>Company</td><td>RIC</td><td>Company</td><td>RIC</td><td>Company</td><td>RIC</td><td>Company</td><td>RIC</td><td>Company</td><td></td><td></td></th<>   |           | Company  |             | RIC   | ų                 | Compan                   | RIC             | Company  | RIC              | Company                        | RIC           | Company                                 | RIC               | Company                    | RIC        | Company                                    |                          |          |
| Image         Image <t< td=""><td></td><td>100%</td><td></td><td>9</td><td></td><td>100%</td><td>8</td><td>100%</td><td>15</td><td>100%</td><td>5</td><td>100%</td><td>3</td><td>100%</td><td>10</td><td>100%</td><td>Total</td><td></td></t<>   |           | 100%   |             | 9   |                   | 100%                     | 8               | 100%   | 15               | 100%                           | 5             | 100%                                    | 3                 | 100%                       | 10         | 100%                                       | Total                    |          |
| Image         Image <th< td=""><td></td><td>40%</td><td></td><td>0</td><td></td><td>0%</td><td>0</td><td>0%</td><td>0</td><td>0%</td><td>_</td><td>20%</td><td>0</td><td>0%</td><td>0</td><td>0%</td><td>CSR Strategy</td><td></td></th<>  |           | 40%  |             | 0   |                   | 0%                       | 0               | 0%   | 0                | 0%                             | _             | 20%                                     | 0                 | 0%                         | 0          | 0%   | CSR Strategy             |          |
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| Image: constrained with the state of the state |           | 01   |             | ء د   |                   | 762                      | n 1             | 70 0C  |                  | MUL<br>ACCT                    | n c           | 60¥                                     |                   | 01.76                      |            | 4.0%                                       | I routes responsioning   |          |
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| $ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$   |           | 20%  | _           | 0   |                   | 940                      | 0               | 0%   | . 0              | 0%                             | 0             | 0%                                      | 0                 | 0%                         | 0          | 0%   | Innovation               |          |
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|  |           | Lloma Buildane                                 |             | ces and Alternative Energy                    | enewable Resour   | Dunar & Dula I           | ao # mateiro    | A hosholoo haaana                                | H-matrice        | Ecol Datailase and Distributo  | to # materico | Consumption                             | #matrice II.      | Takaooo                    | # matrice  | Dennass ad finade                          | Sector                   |          |
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|  |           | Lindab International AB<br>Bergman & Beving AB |             |   |                   |                          |                 |  |                  |                                |               |   |                   |                            |            |  |                          |          |
|  |           | Nibe Industrier AB                             |             |   |                   |                          |                 |  |                  |                                |               |   |                   |                            |            |  |                          |          |
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|  |           | AB SKF   |             |   |                   |                          |                 |  |                  |                                |               |   |                   |                            |            |  |                          |          |
| $ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$   |           | Sandvik AB                                     |             |   |                   |                          |                 |  |                  |                                |               |   |                   |                            |            |  |                          |          |
| $ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$   |           | MESO UY  |             |   |                   |                          |                 |  |                  |                                |               |   |                   |                            |            |  |                          |          |
|  |           | Konecranes Abp                                 |             |   |                   |                          | NOL Ab ST       | Nolato AB  |                  |                                |               |   |                   |                            |            |  |                          |          |
|  |           | Kone Oyj                                       |             |   |                   |                          | HPOLbST         | Hexpol AB  | ENROST           | Eniro AB                       |               |   | NMANST            | Nederman Holding AB        | SASIST     | SAS AB                                     |                          |          |
| bit         matrix         matrix <td>~</td> <td>Cargotec Oyj</td> <td></td> <td></td> <td>IUHIV.HE</td> <td>Huhtamaki Oyj</td> <td>TRELbST</td> <td>Trelleborg AB</td> <td>SAA IV.HE</td> <td>Sanoma Oyj</td> <td></td> <td></td> <td>ISS.CO</td> <td>ISS A/S</td> <td>SFGR.CO</td> <td>Santa Fe Group A/S</td> <td></td> <td></td>   | ~         | Cargotec Oyj                                   |             |   | IUHIV.HE          | Huhtamaki Oyj            | TRELbST         | Trelleborg AB                                    | SAA IV.HE        | Sanoma Oyj                     |               |   | ISS.CO            | ISS A/S                    | SFGR.CO    | Santa Fe Group A/S                         |                          |          |
|  |           | Alfa Laval AB                                  | FING5.ST    | Fingerprint Cards AB                          | JB BILLST         | BillerudKorsnas A        | KEMIRA.HE       | Kemira Oyj                                       | AB MTGhST        | Modern Times Group MTG A       | AMEASHE       | Amer Sports Oyj                         | SECUEST           | Securitas AB               | MAERSKb.CO | AP Moeller - Maersk A/S                    |                          |          |
| Import   | 1         | 100%   | 7           | 140%  | 010               | Z00%                     | 10              | f amma nv  | BIC 3            | 43%                            | BIC 4         | 67%                                     | BIC 4             | Germany<br>30%             | <b>PIC</b> | 100%                                       | Total                    |          |
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|  |           | 9  | , _         | 20%   | . 0               | 9                        | ,               | 14%  | • •              | 0%                             | . 0           | 9                                       | . 0               | 9                          | . 0        | 0%   | ance Shareholders        | Governa  |
| Matrix         Instruction         <   |           | 25%  | . 2         | 40%   | 5 63              | 60%                      |                 | 14%  | 0                | 0%                             | 0             | 0%                                      | 0                 | 0%                         | -          | 14%  | Management               | ,        |
| Metry         Index         Index         Number         Number <td>í í</td> <td>0%</td> <td>0</td> <td>0%</td> <td>0</td> <td>0%</td> <td>0</td> <td>0%</td> <td>-</td> <td>14%</td> <td>0</td> <td>0%</td> <td>0</td> <td>0%</td> <td>0</td> <td>0%</td> <td>Product Responsibility</td> <td></td>   | í í       | 0%   | 0           | 0%  | 0                 | 0%                       | 0               | 0%   | -                | 14%                            | 0             | 0%                                      | 0                 | 0%                         | 0          | 0%   | Product Responsibility   |          |
| Work         Index         Index         Number         Number <td></td> <td>0%</td> <td>0</td> <td>0%</td> <td>al Community</td> <td>20 CH</td>   |           | 0%   | 0           | 0%  | 0                 | 0%                       | 0               | 0%   | 0                | 0%                             | 0             | 0%                                      | 0                 | 0%                         | 0          | 0%   | al Community             | 20 CH    |
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| Wert         Integration         Number of Lengen of L                   | - 1       | 25%  | 0           | 0%  | 0                 | 0%                       |                 | 14%  | 1                | 14%                            | _ •           | 17%                                     | 2                 | 18%                        | 2          | 29%  | Workforce                |          |
| Vert         Unit of the prime         Unit of the prime         Number of the prime of the prima of the prime of the prima of the prima of the prime                            |           | 9F 5   |             | 0%  | o 1               | 0%                       | e +             | 98   | • •              | 0%                             | 0 0           | 9 <u>8</u> 9                            | • •               | 98 9                       | 0 1        | 0%   | Innovation               |          |
| Vert         International         International <td></td> <td>25%</td> <td></td> <td>20%</td> <td></td> <td>20%</td> <td></td> <td>14%</td> <td>• •</td> <td>0%</td> <td>-</td> <td>17%</td> <td></td> <td>9</td> <td>, _</td> <td>14%</td> <td>Resource Use</td> <td></td>   |           | 25%  |             | 20%   |                   | 20%                      |                 | 14%  | • •              | 0%                             | -             | 17%                                     |                   | 9                          | , _        | 14%  | Resource Use             |          |
| Vert         Interv         Interv         Interv         Interv         Termination         Terminatin terminit   | 1         |  |             |   |                   |                          |                 |  |                  |                                |               |   |                   |                            |            |  | r Category               | Pillar   |
| Verty         Indexty         Finance         Finance <th< td=""><td>1</td><td>Industrial Machinery &amp; Goods</td><td># metrics</td><td>Kesourov<br/>Electrical &amp; Electronic Equipment</td><td>iging # metrics I</td><td>Containers and packa</td><td># metrics</td><td>Chemicals</td><td># metrics</td><td>Advertising &amp; Marketing</td><td># metrics</td><td>Services<br/>Leisure Facilities</td><td>#metrics</td><td>Professional services</td><td># metrics</td><td>I ransportation<br/>Air Freight &amp; Logistics</td><td>Industry</td><td></td></th<>  | 1         | Industrial Machinery & Goods                   | # metrics   | Kesourov<br>Electrical & Electronic Equipment | iging # metrics I | Containers and packa     | # metrics       | Chemicals  | # metrics        | Advertising & Marketing        | # metrics     | Services<br>Leisure Facilities          | #metrics          | Professional services      | # metrics  | I ransportation<br>Air Freight & Logistics | Industry                 |          |
| Ner.         Index.         Index. </td <td>1</td> <td></td> <td>T</td> <td>7</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>_</td> <td>6</td> <td></td> <td></td> <td></td> <td>Thereiter</td> <td>0</td> <td></td>   | 1         |  | T           | 7   |                   |                          |                 |  |                  |                                | _             | 6                                       |                   |                            |            | Thereiter                                  | 0                        |          |
| Verty         Indexty         Primate         Primate <th< td=""><td></td><td></td><td>TEL26-ST</td><td>Tele2 AB</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>EKTAbST</td><td>Elekta AB</td><td>SOBIVST</td><td>Swedish Onphan Biovitrum AB</td><td></td><td></td></th<>  |           |  | TEL26-ST    | Tele2 AB                                      |                   |                          |                 |  |                  |                                |               |   | EKTAbST           | Elekta AB                  | SOBIVST    | Swedish Onphan Biovitrum AB                |                          |          |
|  |           | Tom PLC  | ELISA.HE    | Elisa Ovj                                     |                   |                          | OF ALCORE       | occuta no  |                  |                                |               |   | GN.CO             | GN Store Nord A/S          | ORNBV HE   | Orion Ovj                                  |                          |          |
| Netry         Industry         Fundational system  |           | Lundin Petroleum AB                            | ERICLST     | Telefonaktiebolaget LM Ericsson               | BOCO              | Bang & Olufsen           | HEXAb ST        | Hexagon AB                                       | NOKIA.HE         | Nokia Oyj                      | RATOLST       | Ratos AB                                | GETILST           | Getinge AB                 | LUN.CO     | H Lundbeck A/S                             |                          |          |
| Vert         Indext         Index         Index         Index  |           | Company  | RIC         | Company                                       | RIC               | Company                  | RIC             | Company  | RIC              | Company                        | RIC           | Comp any                                | RIC               | Company                    | RIC        | Comp any                                   |                          |          |
| Vert         Index Current         Heads Large         France of Large         Heads Large   | 1         | 100%   | 5           | 100%  | 5                 | 100%                     | 7               | 100%   | 7                | 100%                           | 6             | 100%                                    | =                 | 100%                       | 13         | 100%                                       | Total                    |          |
| Vert         Induct Communication         Head Large Communication   | 4         | 27%  | -           | 20%   | -                 | 20%                      | 0               | 0%   | -                | 14%                            | 2             | 33%                                     | 2                 | 18%                        | 2          | 15%  | CSR Strategy             |          |
| Vetter         Industry         International state         Internatin   |           | 9%<br>770                                      |             | 20%   | 0 1               | 95                       |                 | 14%  | 0 -              | 1478                           | 0 -           | 95                                      | 0 3               | 0%                         | 0 1        | %0   | ance Shareholders        | Governa  |
| Vester         Tendeds         Tendeds <th< td=""><td>1</td><td>0%</td><td></td><td></td><td>° 0</td><td>401c</td><td>- 0</td><td>1/02</td><td>- 0</td><td>1.602</td><td></td><td>17%</td><td>2</td><td>7000</td><td>2</td><td>1.01</td><td>Product Responsibility</td><td></td></th<>   | 1         | 0%   |             |   | ° 0               | 401c                     | - 0             | 1/02   | - 0              | 1.602                          |               | 17%                                     | 2                 | 7000                       | 2          | 1.01                                       | Product Responsibility   |          |
| Vester         Indext Care         Number of the state         Number of   |           | 99   | • •         | 0%  |                   | 9                        |                 | 9  |                  | 0%                             | - 0           | 1.0%                                    | , 0               | 101                        | . –        | 1.50                                       | Community                |          |
| Veter         Industry         Production         Final of the Current of th                           |           | 9  | -           | 20%   | • <del>-</del>    | 20%                      | • <u> </u>      | 14%  | . 0              | 0%                             | 0             | 9                                       |                   | 99                         |            | 8%   | al Human Rights          | Socia    |
| Vetor         Tendency         Heads of Communications         Heads   |           | 9%   | 0           | 0%  | -                 | 20%                      | 2               | 29%  | 3                | 43%                            | 2             | 33%                                     | 0                 | 0%                         | 2          | 15%  | Workforce                |          |
| Vestor         Industry         Headback         Headback         Financial         Financial         Financial         Industry           Industry         Boochnology&Paranazorkals         #metris         Media Equipment & Supplies         #metris         Betwork         Services         #metris         Services         #metris         Boochnology&Paranazorkals         #metris         Media Equipment & Supplies         #metris         Betwork         Boochnology&Paranazorkals         #metris         Media Equipment & Supplies         #metris         Betwork         Boochnology & Paranazorkals         #metris         Media Equipment & Supplies         #metris         Betwork         Boochnology & Paranazorkals         #metris         Media Equipment & Supplies         #metris         Boochnology & Paranazorkals         #metris         Boochnology & Paranazorkals         #metris         Diad Gas Equipment & Paranazorkals         Boochnology  |           | 9%   | 0           | 0%  | 0                 | 0%                       | 0               | 0%   | 0                | 0%                             | 0             | 0%                                      | 0                 | 0%                         | 0          | 0%   | Innovation               |          |
| Netr         Netro   |           | 27%  | 0 .         | -0%   | 0                 | 9                        |                 | 14%  | 12 0             | 29%                            | 0             | 9                                       | 2                 | 18%                        | 2.2        | 15%  | mental Emissions         | Environm |
| Sebr Heaht Car-  |           | 04   | -           | 20%   | 0                 | 0%                       | _               | 14%  | 0                | 0%                             | 0             | 0%                                      | -                 | 9%                         | -          | 84   | Regiment lise            | 1 1140   |
| Setter Feinder auf der Berter und der Berter und der Berter der Berte   |           | and Gas Exploration & Production               | # methos UI | Telecommunications                            | # metrics         | raroware                 | ices # metnes   | Software and 11 Servi                            | VICES # IDEIDICS | ectronic Manufacturing & Ser   | # memos Ele   | et management & Custonal                | IDES # IDETICS AS | ntearcai Equipment & Suppl | # memos    | biotecrinology & Fraimaceuticals           | r Cataony                | paller   |
|  | 15        |  |             | -   | -                 | nmunications             | Technology & Co |  | -                |                                | -             | Financials                              | -                 | 26                         | Health Ca  | and a second conductor.                    | Sector                   |          |

# Table 2. Counted and weighted ESG issues at industry level

| Sector         | Industry                              | Firms | Percentage |
|----------------|---------------------------------------|-------|------------|
|                | Biotechnology & Pharmaceuticals       | 4     | 5%         |
| Health Care    | Medical Equipment & Supplies          | 4     | 3%         |
| Financials     | Asset Management & Custodial          | 1     | 1%         |
| T 1 1          | Electronic Manufacturing, Service     | 1     | 1%         |
| l echnology    | Software and IT Services              | 2     | 2%         |
| Communications | Hardware                              | 1     | 1%         |
|                | Telecommunications                    | 4     | 3%         |
| Non-Renewable  | Oil and Gas Exploration & Production  | 3     | 2%         |
| Resources      | Metals & Mining                       | 4     | 3%         |
| Transportation | Air Freight & Logistics               | 3     | 2%         |
|                | Professional Services                 | 3     | 2%         |
| Services       | Leisure Facilities                    | 1     | 1%         |
|                | Advertising & Marketing               | 3     | 2%         |
|                | Chemicals                             | 4     | 3%         |
| Resource       | Containers and Packaging              | 2     | 2%         |
| Transformation | Electrical & Electronic Equipment     | 1     | 1%         |
|                | Industrial Machinery & Goods          | 12    | 10%        |
|                | Aerospace & Defense                   | 1     | 1%         |
|                | Processed Foods                       | 1     | 1%         |
|                | Tobacco                               | 1     | 1%         |
| Consumption    | Household and Personal Products       | 4     | 3%         |
|                | Food Retailers and Distributors       | 4     | 3%         |
|                | Alcoholic Beverages                   | 1     | 1%         |
| Renewable      |                                       |       |            |
| Resource and   | Danag & Dula Droducto                 | 2     | 20/        |
| Alternative    | Paper & Pulp Products                 | 3     | 2%         |
| Energy         |                                       |       |            |
| Infrastructura | Home Builders                         | 4     | 3%         |
|                | Engineering and Construction Services | 4     | 3%         |
| Total          |                                       | 76    | 62%        |

Table 3. Sample distribution table across industries

# STATISTICAL ANALYSIS

| Profitability ratios   | Net Income <sub>t</sub>  |
|------------------------|--|
|                        | $ROE_t = \overline{Equity_{t-1}}$  |
| Sale                   | $s \ to \ Assets_t = \frac{Sales_t}{Total \ Assets_{t-1}}$                   |
| F                      | $Profit Margin_t = \frac{EBIT_t}{Sales_t}$                                   |
| Leverage and liquidity | ratios   |
| Cost of Li             | $abilities_t = \frac{Interest\ expense_t}{Total\ Liabilities_{t-1}}$         |
| Cash to Liabi          | $ilities_t = \frac{Cash and Cash Equivalents_t}{Total Liabilities_t}$        |
| Equity                 | $y to Assets_t = \frac{Equity_t}{Total Assets_t}$                            |
| Growth Measures        |  |
| Grow                   | $th(Sales)_t = ln\left(\frac{Sales_t}{Sales_{t-1}}\right)$                   |
| Growth(A               | $(ssets)_{t} = ln\left(\frac{Total  Assets_{t}}{Total  Assets_{t-1}}\right)$ |
| Investor relations     |  |
| Divide                 | ends to $Equity_t = \frac{Dividends_t}{Equity_{t-1}}$                        |
| Market to B            | $book Ratio_t = \frac{Market Capitalization_t}{Book Value_t}$                |
|                        |  |

# Table 4. Financial ratios used in the regression analysis as control variables

| Table 5. Descriptive statistics - Thomson Reuters ten category ESG Scores and Materi | ial |
|--|-----|
| ESG (MESG), Holistic ESG (MESGH) Performance Scores                                  |     |

|              | RES       | EMIS      | ENVIRON   | WORKF     | HUM       | СОМ       | PROD      | MANAG    | SHAREH    | CSRSTRAT  | MESG      | MESGH    |
|--------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|----------|
| Mean         | 0.688196  | 0.643333  | 0.587185  | 0.626485  | 0.763389  | 0.516138  | 0.527701  | 0.493456 | 0.509935  | 0.501956  | 58.03700  | 51.93822 |
| Median       | 0.723684  | 0.671053  | 0.559524  | 0.661290  | 0.820809  | 0.517857  | 0.548736  | 0.500000 | 0.517857  | 0.510417  | 58.85417  | 49.88483 |
| Maximum      | 0.995000  | 0.998305  | 0.989848  | 0.998299  | 0.997487  | 0.995192  | 0.992647  | 0.992537 | 0.990196  | 0.982143  | 95.96000  | 92.30714 |
| Minimum      | 0.009317  | 0.031250  | 0.004098  | 0.039683  | 0.189655  | 0.007752  | 0.009091  | 0.007886 | 0.007463  | 0.010417  | 17.96584  | 17.94481 |
| Std. Dev.    | 0.214835  | 0.232553  | 0.241469  | 0.248299  | 0.202789  | 0.279581  | 0.265184  | 0.289216 | 0.284987  | 0.273823  | 17.41719  | 17.00179 |
| Skewness     | -0.660878 | -0.521133 | -0.132555 | -0.371796 | -1.131822 | -0.006771 | -0.103300 | 0.036078 | -0.065680 | -0.026356 | -0.128422 | 0.323798 |
| Kurtosis     | 2.671291  | 2.407184  | 2.122266  | 2.064312  | 3.344085  | 1.899719  | 2.063520  | 1.848702 | 1.807433  | 1.766510  | 2.222513  | 2.468349 |
|              |           |           |           |           |           |           |           |          |           |           |           |          |
| Jarque-Bera  | 37.17905  | 28.81488  | 16.84904  | 28.62832  | 105.0680  | 24.26650  | 18.43190  | 26.66932 | 28.84939  | 30.54904  | 13.43705  | 14.06991 |
| Probability  | 0.000000  | 0.000001  | 0.000219  | 0.000001  | 0.000000  | 0.000005  | 0.000099  | 0.000002 | 0.000001  | 0.000000  | 0.001208  | 0.000881 |
| Sum          | 331.0222  | 309.4434  | 282.4358  | 301.3395  | 367.1903  | 248.2626  | 253.8240  | 237.3526 | 245.2787  | 241.4410  | 27915.80  | 24982.29 |
| Sum Sq. Dev. | 22.15399  | 25.95887  | 27.98751  | 29.59312  | 19.73923  | 37.51939  | 33.75479  | 40.15010 | 38.98445  | 35.98995  | 145612.2  | 138749.2 |
| Observations | 481       | 481       | 481       | 481       | 481       | 481       | 481       | 481      | 481       | 481       | 481       | 481      |

# Table 6. Descriptive statistics - Financial Ratios and Growth

|              | ROE       | SALESA   | EBITSAL   | EA        | CASHL    | COL       | GRA       | GRSALES   | МТОВ      | DIVEQ     | G         |
|--------------|-----------|----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Mean         | 0.218209  | 1.030853 | 0.108521  | 0.399742  | 0.157413 | 0.018030  | 0.023943  | 0.005071  | 3.995388  | 0.106509  | 0.034110  |
| Median       | 0.144124  | 0.919335 | 0.092635  | 0.405421  | 0.097783 | 0.015743  | 0.019294  | 0.027043  | 2.737862  | 0.068910  | 0.034181  |
| Maximum      | 20.41036  | 4.791616 | 0.567670  | 0.767567  | 0.955195 | 0.101090  | 0.973963  | 0.742939  | 146.5483  | 6.395786  | 0.296738  |
| Minimum      | -5.243802 | 0.089609 | -0.322045 | -0.306311 | 0.000545 | -0.006729 | -1.165487 | -2.015063 | -240.3750 | -2.888889 | -0.292911 |
| Std. Dev.    | 1.116126  | 0.587750 | 0.093552  | 0.134480  | 0.157911 | 0.011858  | 0.173816  | 0.208620  | 20.71604  | 0.439927  | 0.075648  |
| Skewness     | 13.50435  | 2.795763 | 0.993443  | -0.900589 | 1.970465 | 1.772291  | -0.758462 | -3.636177 | -3.927189 | 9.482679  | -0.227724 |
| Kurtosis     | 238.1126  | 16.55372 | 7.173536  | 5.887245  | 7.088799 | 9.920750  | 18.60010  | 32.42275  | 67.09190  | 145.0221  | 5.762514  |
| Jarque-Bera  | 1122481.  | 4308.327 | 428.2127  | 232.0911  | 646.3278 | 1211.736  | 4923.517  | 18409.98  | 83563.00  | 411454.9  | 157.1050  |
| Probability  | 0.000000  | 0.000000 | 0.000000  | 0.000000  | 0.000000 | 0.000000  | 0.000000  | 0.000000  | 0.000000  | 0.000000  | 0.000000  |
| Sum          | 104.9585  | 495.8402 | 52.19849  | 192.2757  | 75.71551 | 8.672462  | 11.51636  | 2.438989  | 1921.782  | 51.23088  | 16.40702  |
| Sum Sq. Dev. | 597.9541  | 165.8160 | 4.200991  | 8.680784  | 11.96917 | 0.067498  | 14.50169  | 20.89071  | 205994.0  | 92.89735  | 2.746867  |
| Observations | 481       | 481      | 481       | 481       | 481      | 481       | 481       | 481       | 481       | 481       | 481       |

# **CORRELATION MATRICES**

|         | ROE       | SALESA    | EBITSAL   | EA        | CASHL     | COL       | GRA       | GRSALES   | MTOB      | DIVEQ     | G         |
|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| ROE     | 1.000000  | 0.031422  | 0.084374  | -0.118361 | 0.032799  | 0.045252  | 0.002324  | 0.029488  | -0.091496 | 0.361530  | -0.045277 |
| SALESA  | 0.031422  | 1.000000  | -0.246760 | -0.086822 | 0.090999  | -0.161742 | 0.202820  | 0.184741  | 0.017328  | 0.059731  | -0.136492 |
| EBITSAL | 0.084374  | -0.246760 | 1.000000  | 0.029812  | 0.061343  | 0.110030  | 0.136890  | 0.204920  | 0.092041  | 0.125747  | -0.137242 |
| EA      | -0.118361 | -0.086822 | 0.029812  | 1.000000  | 0.227912  | -0.112279 | -0.003726 | -0.068097 | 0.282181  | -0.194037 | -0.090369 |
| CASHL   | 0.032799  | 0.090999  | 0.061343  | 0.227912  | 1.000000  | -0.158173 | 0.007134  | -0.001900 | 0.012681  | 0.074512  | -0.072217 |
| COL     | 0.045252  | -0.161742 | 0.110030  | -0.112279 | -0.158173 | 1.000000  | 0.210759  | 0.138481  | -0.114776 | 0.019480  | 0.116687  |
| GRA     | 0.002324  | 0.202820  | 0.136890  | -0.003726 | 0.007134  | 0.210759  | 1.000000  | 0.342742  | 0.056714  | -0.003205 | -0.028567 |
| GRSALES | 0.029488  | 0.184741  | 0.204920  | -0.068097 | -0.001900 | 0.138481  | 0.342742  | 1.000000  | -0.018216 | 0.013416  | -0.049578 |
| МТОВ    | -0.091496 | 0.017328  | 0.092041  | 0.282181  | 0.012681  | -0.114776 | 0.056714  | -0.018216 | 1.000000  | -0.026842 | -0.003349 |
| DIVEQ   | 0.361530  | 0.059731  | 0.125747  | -0.194037 | 0.074512  | 0.019480  | -0.003205 | 0.013416  | -0.026842 | 1.000000  | -0.022188 |
| G       | -0.045277 | -0.136492 | -0.137242 | -0.090369 | -0.072217 | 0.116687  | -0.028567 | -0.049578 | -0.003349 | -0.022188 | 1.000000  |
|         |           |           |           |           |           |           |           |           |           |           |           |

# Table 7. Correlation matrix - Growth and Financial Ratios

**Table 8. Correlation Matrix - Growth and ESG Performance** 

|           | MESGH     | MESG      | EXTERNAUD | SUSTREP   | G         |
|-----------|-----------|-----------|-----------|-----------|-----------|
| MESGH     | 1.000000  | 0.770571  | 0.372252  | 0.419233  | -0.034707 |
| MESG      | 0.770571  | 1.000000  | 0.561058  | 0.534893  | -0.031842 |
| EXTERNAUD | 0.372252  | 0.561058  | 1.000000  | 0.412401  | -0.036732 |
| SUSTREP   | 0.419233  | 0.534893  | 0.412401  | 1.000000  | -0.090093 |
| G         | -0.034707 | -0.031842 | -0.036732 | -0.090093 | 1.000000  |

Table 9. Correlation matrix - Growth and Thomson Reuters ten category ESG scores

|          | G         | MESG      | MESGH     | RES       | EMIS      | ENVIRON  | WORKF     | HUM       | СОМ       | PROD      | MANAG    | SHAREH    | CSRSTRAT  |
|----------|-----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|
| G        | 1.000000  | -0.031842 | -0.034707 | -0.119374 | -0.091980 | 0.014425 | -0.072443 | -0.051851 | -0.109395 | 0.023601  | 0.027278 | 0.067330  | -0.005863 |
| MESG     | -0.031842 | 1.000000  | 0.770571  | 0.658953  | 0.623435  | 0.330674 | 0.599177  | 0.518238  | 0.367631  | 0.476626  | 0.435296 | 0.002062  | 0.697337  |
| MESGH    | -0.034707 | 0.770571  | 1.000000  | 0.479785  | 0.475615  | 0.239582 | 0.437676  | 0.348665  | 0.175701  | 0.349931  | 0.324653 | 0.030865  | 0.463891  |
| RES      | -0.119374 | 0.658953  | 0.479785  | 1.000000  | 0.576178  | 0.367197 | 0.544565  | 0.530397  | 0.398057  | 0.373068  | 0.073497 | -0.041677 | 0.499145  |
| EMIS     | -0.091980 | 0.623435  | 0.475615  | 0.576178  | 1.000000  | 0.373375 | 0.445949  | 0.401224  | 0.244394  | 0.346624  | 0.057180 | -0.049209 | 0.390782  |
| ENVIRON  | 0.014425  | 0.330674  | 0.239582  | 0.367197  | 0.373375  | 1.000000 | 0.158475  | 0.250828  | 0.178587  | 0.198563  | 0.083285 | 0.083458  | 0.206973  |
| WORKF    | -0.072443 | 0.599177  | 0.437676  | 0.544565  | 0.445949  | 0.158475 | 1.000000  | 0.361821  | 0.268847  | 0.471769  | 0.091045 | -0.043763 | 0.468612  |
| HUM      | -0.051851 | 0.518238  | 0.348665  | 0.530397  | 0.401224  | 0.250828 | 0.361821  | 1.000000  | 0.390133  | 0.243463  | 0.073941 | -0.165628 | 0.400794  |
| COM      | -0.109395 | 0.367631  | 0.175701  | 0.398057  | 0.244394  | 0.178587 | 0.268847  | 0.390133  | 1.000000  | 0.225719  | 0.127591 | -0.114325 | 0.334038  |
| PROD     | 0.023601  | 0.476626  | 0.349931  | 0.373068  | 0.346624  | 0.198563 | 0.471769  | 0.243463  | 0.225719  | 1.000000  | 0.084357 | -0.030754 | 0.406237  |
| MANAG    | 0.027278  | 0.435296  | 0.324653  | 0.073497  | 0.057180  | 0.083285 | 0.091045  | 0.073941  | 0.127591  | 0.084357  | 1.000000 | 0.102677  | 0.208031  |
| SHAREH   | 0.067330  | 0.002062  | 0.030865  | -0.041677 | -0.049209 | 0.083458 | -0.043763 | -0.165628 | -0.114325 | -0.030754 | 0.102677 | 1.000000  | -0.108882 |
| CSRSTRAT | -0.005863 | 0.697337  | 0.463891  | 0.499145  | 0.390782  | 0.206973 | 0.468612  | 0.400794  | 0.334038  | 0.406237  | 0.208031 | -0.108882 | 1.000000  |
## ROBUSTNESS CHECK

| Specification | Coefficient | <b>T-Statistics</b> | P-value | Heteroskedasticity |
|---------------|-------------|---------------------|---------|--------------------|
| 1             | 0.019302    | 0.304885            | 0.7606  | No                 |
| 2             | 0.002854    | 0.043943            | 0.9650  | No                 |
| 3             | 0.036740    | 0.605193            | 0.5454  | No                 |
| 4             | 0.053362    | 0.802230            | 0.4228  | No                 |
| 5             | 0.018609    | 0.264331            | 0.7916  | No                 |
| 6             | 0.039142    | 0.575834            | 0.5650  | No                 |
| 7             | -0.046805   | -0.584379           | 0.5596  | No                 |
| 8             | 0.062556    | 1.205550            | 0.2290  | No                 |
| 9             | -0.019899   | -0.270174           | 0.7873  | No                 |
| 10            | 0.113524    | 2.936085            | 0.0037  | Yes                |

## Table 10. Koenker-Bassett – test for heteroscedasticity table

## Table 11. Breusch–Godfrey test for serial correlation LM

| Specification | <b>R2</b> of Auxilary Regression | Number of Lags | Observations | Chi-Squared | Critical  | Serial Autocorrelation |
|---------------|----------------------------------|----------------|--------------|-------------|-----------|------------------------|
| 1             | 0,466095                         | 3              | 274          | 126,311745  | 0,3518463 | Yes                    |
| 2             | 0,443481                         | 3              | 274          | 120,183351  | 0,3518463 | Yes                    |
| 3             | 0,521817                         | 3              | 216          | 111,147021  | 0,3518463 | Yes                    |
| 4             | 0,39319                          | 3              | 274          | 106,55449   | 0,3518463 | Yes                    |
| 5             | 0,377475                         | 3              | 274          | 102,295725  | 0,3518463 | Yes                    |
| 6             | 0,454989                         | 3              | 216          | 96,912657   | 0,3518463 | Yes                    |
| 7             | 0,635867                         | 3              | 103          | 63,5867     | 0,3518463 | Yes                    |
| 8             | 0,628468                         | 3              | 135          | 82,957776   | 0,3518463 | Yes                    |
| 9             | 0,570542                         | 3              | 112          | 62,189078   | 0,3518463 | Yes                    |
| 10            | 0,52389                          | 3              | 104          | 52,91289    | 0,3518463 | Yes                    |