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CORPORATE SOCIAL RESPONSIBILITY INFORMATION ON STOCK PRICES

Event study on Corporate Knights' Global 100

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ABSTRACT

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Corporate social responsibility can be considered still as a black box when it comes to its implications on business outcomes. A vast body of literature has been built to examine the potential effects of corporate social responsibility initiatives and their effects on the financial performance and the risk level of companies, and the results have been unsystematic, showing correlations between everything from negative to positive. The more recent view has been that corporate social responsibility might affect positively to the financial performance of companies and that the mixed results of prior studies have been caused majorly by the unsystematic selection of samples and research methods.

Due to corporate social responsibility's ambiguous effects on business, the market reactions to information considering corporate social responsibility have been manifold. Since corporate social responsibility's capabilities in adding investor value have been open to interpretation the market has not been able to react coherently to information considering it in the past. A multitude of studies have recorded differing market reactions to different types and embodiments of news in increases and decreases in companies' corporate social responsibility performance. By studying how the stock market reacts to corporate social responsibility performance information, both the ambiguous relationships with financial performance and with stock market reactions could be further clarified, since the stock market reaction implicitly indicates how the market sees corporate social responsibility in affecting the company's future performance.

This study focused on the corporate social responsibility performance information produced by Corporate Knights with their annually disclosed Global 100 -list of 100 world's most sustainable companies. Due to its wide reach and the prominent position among non-academic audiences the publication of the list was seen as an important event in the markets which could have potential value implications for companies appearing on the list. The research questions which assessed the list's value implications were led into four hypotheses which were considering the characteristics of market responses regarding the appearance on the list, the relative ranking on the list, and the potential new information's effects of being ranked on the list for the first time.

The study was conducted as an event study, examining the abnormal returns created in the market around the event window of the publication of the Global 100. The abnormal returns were calculated using a market model and the abnormal returns were further analyzed cross-sectionally with a regression analysis. The results of the study showed a small but statistically insignificant positive response from the market during the event day. Therefore, it was concluded that the Global 100 -list has no value implications. Additionally, the supplementary hypotheses considering the relative rankings' and possible new information's effects on abnormal returns were rejected. This might be due to high market efficiency or that the corporate social responsibility information by Corporate Knights is considered to be irrelevant regarding the level of performance of companies.

Keywords: Event study, Corporate Knights, Global 100, corporate social responsibility, financial markets, value relevance, market efficiency

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1 INTRODUCTION

1.1 Background

Corporate social responsibility is a peculiar concept when it comes to defining its role in business. If it is imminent that business must become sustainable in order to achieve perpetuity, then there can be only one direction to which companies can move in the long run; they will need to introduce an increasing number of procedures of corporate social responsibility (CSR).[1] Because CSR actions are embedded in corporate behavior, it becomes essential to deeply understand how companies are financially affected by them. Since financial markets continuously measure and value companies, and since this process is said to produce the best and the most objective estimates of the values of companies (Fama, Fisher, Jensen & Roll, 1969), the stock market can be an able indicator whether the actions of CSR have an effect to companies' finances.

A large number of academic researches on the potential effects of CSR performance levels on companies' financial performance levels have been conducted (e.g. Ameer & Othman, 2012; Eccles, Ioannou & Serafeim, 2014; Zhao & Murrell, 2016), but due to the immense complexity of the objective, the results lack consensus. It can be extremely difficult to find causal relationships between CSR actions and financial performance, because as a variable CSR is extremely complex in almost every aspect, and because a vast number of organizational and environmental factors affect the financial performance of companies. (Grewatsch & Kleindienst, 2017, 383.)

However, the examination of financial markets can give an advantage in the interpretation of CSR actions' effects on companies' performance by augmenting the prior research on their effects on financial performance by providing a more decentralized and objective

[1] This is if CSR can be viewed as a concept of achieving sustainable development. This can also be a highly disputable topic, since CSR has notions attached to it that go beyond e.g. resource scarcity, and therefore it could be argued that CSR could have the incorrect set of assumptions to achieve sustainable development. This debate is however out of the scope of this study.

view to the subject matter. Market's reaction to CSR performance level information has been studied previously (by e.g. Aouadi & Marsat, 2018; Auer & Schuhmacher, 2016; Krüger, 2015), and as within the research examining CSR's relation to financial performance, the results have been diverse. The diversity of the reactions can be caused by the inconclusive relationship with CSR actions and financial performance and by the different interesses of market parties. The prior means that since there is not an overarching understanding of whether actions of CSR will increase or decrease the financial performance of companies the financial markets do not have a clear cause-effect relationship to react on. Additionally, it has been argued that markets in different continents have different levels of interest for CSR-related information (Eccles, Serafeim & Krzus, 2011, 127). Therefore, due to the differences of the results in the prior studies, further evidence and clarification can be provided by testing the financial relevance of CSR performance information using a global sample of companies and measuring CSR with distinctive and a well-established framework.

Due to the complex nature of CSR, the assessment of companies' CSR performance levels has been difficult, and assessment methods have had various measures throughout. Since companies have the incentive to legitimate their actions and keep a good public image for the society, the institution of CSR reporting has shifted further away from the actual reporting of one's actions and their consequences induced to the world. It is easier to serve the different interests of different stakeholders with appearance than with actions. That is, the levels of CSR reporting performance and CSR action performance i.e. CSR talk and CSR practice have shifted far apart from each other, complicating the assessment of the actual CSR action performance of companies. (Cho, Laine, Roberts & Rodrigue, 2015.)

In this study, it is considered that by measuring the levels of CSR practice, that is the concrete actions and their consequences the companies are producing, a measure of the levels of companies' CSR performance can be achieved. Therefore, when this study refers to the level of CSR performance of a company, it refers to the company's performance in the respective metrics of Corporate Knights' evaluation method based on the

consequences of the CSR practices of the company.[2] Therefore, the potential peril of using CSR reporting performance as a proxy for CSR action performance can be avoided.

That is, since CSR reporting has not achieved similar levels of standardization as financial accounting procedures, companies have been able to bend the CSR reporting practices to their wills. CSR disclosures have been assessing more companies' strategies and policies than providing information about CSR actions and the quantifiable results of those actions. It has been argued that companies have been using CSR reporting as a way of legitimation and as a preventing tool for further questions considering their CSR actions. (Hopwood, 2009, 437–438.) Furthermore, Delmas and Blass (2010) showed that companies that had the most advanced environmental management and reporting practices, inclined to have in fact lower compliance and performance levels in CSR-related environmental actions. Additionally, Cho, Guidry, Hageman, and Patten (2012) brought this finding into a larger context by illustrating similarly that companies' CSR reporting performance level is in fact negatively correlated to CSR action performance in the context of environmental aspects of CSR. Additionally, they argued that the membership of the Dow Jones Sustainability Index is more affected by the CSR reporting performance than the CSR action performance of companies. This suggests, that even by using a widely recognized but indirect measure as a proxy for CSR action performance one could be still be affected by the legitimating halo-effect of CSR reporting performance.

Therefore, one of the purposes of this study is to clarify whether, in the midst of this ongoing discrepancy between CSR reporting and CSR actions, the information of CSR performance in material actions has any relevance for the financial markets. Since the CSR performance measure by Corporate Knights weighs only a set of quantifiable CSR action performance indicating metrics, it is not affected by the often-qualitative aspects of CSR reporting performance. Though, to be noted is that CSR assessment by quantifying can have its complications in the end result quality and in the neutrality of displaying the results (Chelli & Gendron, 2013). The method of Corporate Knights will be more thoroughly introduced in section 1.3.2. Additionally, the CSR measures of the referred studies have been monitored so that CSR action performance levels are not mixed

[2] Additionally, with the concept of "CSR performance information" this study refers to the quantifiable information gathered from companies' CSR actions related to the CSR framework of Corporate Knights, not to the CSR disclosure as itself done by the studied companies.

with CSR reporting performance levels. Therefore, by using these methods this study's notion of CSR performance can be said to be fitting for the overall research purpose.

As in this study, scholars have sought to resolve the issue of using CSR reporting performance as a proxy by using third-party CSR ratings from company information databases. (For examination of the prevailing third-party CSR raters, see Semenova & Hassel, 2015) Such databases are trying to provide exact frameworks in measuring: they quantify their measurements in order to provide more objective views on companies' actual CSR performance levels. However, there has been evidence that for example the Kinder, Lydenberg, and Domini Research & Analytics' (KLD) –metrics are assessing the CSR reporting quality of companies (Delmas & Blass 2010, 250–254), which suggests that even some of the widely used third-party ratings are affected by CSR reporting performance of companies.

Additionally, since a single database does not have a ubiquitous position on CSR performance information, and since there are differences in the CSR frameworks of the databases, a more common and public CSR performance information could give a more informed response from the market. Amato and Amato (2012, 323) discuss the relevance of such more public third-party evaluations where the company's external stakeholders have welcomed it as a source to validate the company communications. In their case, the evaluation was a well-known newspaper's ranking of the greenest companies of the USA. This means that prior kinds of easily accessible third-party CSR performance evaluators might have an important role in ensuring the objectivity of the information under which the markets make their decisions about the levels of CSR performance and their implications to companies.

Research around the value implications of similar kinds of third-party lists have been conducted, but they have considered different third-party entities, such as the Sustainable Asset Management Group (Kaspereit & Lopatta, 2016) or dimensions of CSR performance, such as solely considering on the environmental aspects (Amato & Amato 2012; Yadav, Han & Rho, 2016). Therefore, this study can broaden the knowledge of how the market reacts to CSR performance information by using one of the most prominent and easily accessible CSR performance data as its measure: The Global 100 -list by Corporate Knights. It is a widely recognized third-party publication of the world's most sustainable companies, and quite interestingly the Global 100 -list has little research

considering its value implications for the market, considering the lists broad reach and established position among CSR performance raters. This research setting can contribute to the need for additional evidence in how the market appreciates CSR performance by examining the market's perception of the CSR performance information the list creates when it is published.

Furthermore, the market reactions to CSR performance information have been often studied by limiting the samples to a continent or a country (Kaspereit & Lopatta, 2016; Yadav, et al., 2016), this study observes a global sample of stocks, providing some further evidence of the differences of reactions in different geographies. The methodological consequences of this choice have been discussed and assessed exhaustively in the third section of this study. Thus, this study can provide contribution value to the academic discourse by further clarifying CSR performance's effects on business by measuring complementary elements to previous studies on CSR and by observing a very distinct sample.

1.2 Objective and scope

The objective of this study is to analyze the stock market's perception of CSR performance information released by Corporate Knights. The market's perception is defined in how it adjusts the prices of the stocks of the companies which the CSR performance information concerns. By examining the returns of the stocks of the companies during the exact timeframe around the publication of the information, this study can suggest an answer to its research questions:

1. Does Corporate Knights' Global 100 -list affect the market's perception of investor value for the companies appearing on the list?

2. Do the attributes of the Global 100 -list affect the perception of investor value?

3. Is Corporate Knights creating new information for the stock market with the Global 100 -list?

The study is examining the companies from the Corporate Knights' 2019 Global 100 -list, which has extremely limited if any prior research around its publications stock value implications. All in all, there has been little research considering free to access public CSR performance information considering worldwide data samples. Corporate Knights' Global 100 -list is used since it is creating an easily observable and precise event of CSR performance information disclosure with its annual publication in the World Economic Forum. Additionally, the CSR performance information consists of public companies, which are easier to observe regarding the value implications of new information. Therefore, this set of data is considered to be well suited for answering the research questions of this study. To clarify how the data is formed and what is the underlying notion of the data, the two key concepts of this study are introduced next.

1.3 Key concepts

1.3.1 Corporate social responsibility

The definition of CSR has been under an ongoing debate among academia for decades. CSR might be one of the subjects causing the most controversy in accounting research. The discussion of what motives, actions, and philosophical notions CSR contains might be the most disputed. (Crane, McWilliams, Matten, Moon & Siegel, 2008, 5.) This means that CSR does not have a strong agreement among scholars of what its definition represents (McWilliams, Siegel & Wright, 2006, 8), and the consensus has not majorly improved after the argument. This is because defining CSR is not just sake of defining what companies are doing in society, defining CSR requires also considering what companies should be responsible for in our society, and possibly even describing how society itself should be organized to control the corporate power (Marens, 2004, 80–82).

One of the notable CSR frameworks has been constructed by Carroll (1991, 42), who organized CSR into different levels of responsibilities and combined those levels into a pyramid describing CSR (Figure 1). The pyramid of CSR is founded with the fundamentals of being profitable and obeying the law. Then built on top are the blocks of ethical and philanthropical responsibilities. The pyramid can be used as an underlying structure to clarify the concept of CSR and to enable meaningful observation of the theoretical framework composed later.

The pyramid of CSR observes the concept from a high level, so the material actions required for accomplishing each level are left out. Due to the share impossibility of such ubiquitous framework, examining CSR across different studies can be complicated, since the acronym has historically comprised of various actions from various sets of levels from the pyramid of CSR; The definition of CSR can drastically alternate between studies, which can make a coherent understanding of its effects on companies over academic studies difficult.

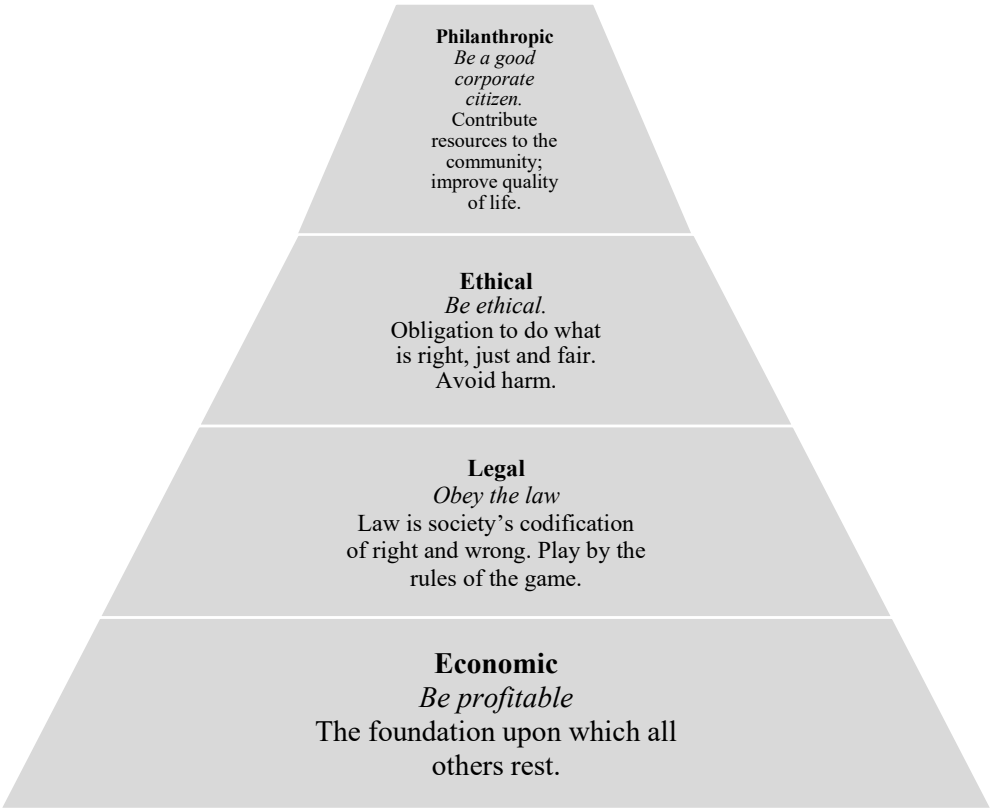

Figure 1 Pyramid of CSR (adapting Carroll, 1991, 42)

Therefore, it can be challenging to outline a theory based on the results of previous CSR studies, since the notion of CSR can vary between both previous studies and between the theory under construction. As mentioned earlier, this study does not take part in defining CSR, but rather observes the one created by Corporate Knights. Thus, in order to outline a theory, it is necessary to compare the Corporate Knights' measure to studies that consider one or several actions of CSR performance similarly. In that way, the different actions of CSR performance and their effects can be summed together in order to construct a hypothesis on how the Corporate Knights' view on CSR performance will affect the drivers of companies' stock price.

To be noted is that previous research has used a sum of different acronyms in order to describe frameworks similar to CSR, which partly cover parallel characteristics, but which incline to extend the concept into a certain specific framework of observation. For example: "CSP" (Orlitzky, Schmidt & Rynes, 2003), "SEP" (Ortiz-de-Mandojana & Bansal, 2016), "High sustainability" (Eccles et al., 2014), "CS" (Grewatsch & Kleindienst, 2017), "CRP" (Surroca, Tribó & Waddock, 2010), "SRI" (Auer & Schuhmacher, 2016), "ESG" (Zeidan & Spitzeck, 2015), and "ESGS" (Lo & Kwan, 2017) have been used. When prior kinds of notions of CSR are discussed in this study, they are simply referred with the acronym "CSR", but if material differences lay between the notions, such which might affect this study's theoretical framework, such differences are mentioned and characterized. Additionally, as mentioned earlier, when discussing the performance level in each metric (acronym), the CSR performance measures of these prior acronyms have been assessed to evaluate their relevance for matching their notions to the notions of this study.

1.3.2 Corporate Knights' Global 100

Corporate Knights Incorporated is a Canadian media company and a research entity. The company publishes a list of the 100 most sustainable companies in the world, which is disclosed annually at the World Economic Forum. In 2019 it was held at Davos, Switzerland between the 22nd and the 25th of January. The list, which is called "The Global 100", is comprised following the method of measurement Corporate Knights has

developed, which rates the companies according to their level of CSR performance. The Global 100 -list consists of 100 companies ranked from the most sustainable to the 100th most sustainable company in the world. The noteworthy aspect of the Global 100 -list is its widespread reach since it is published annually and free of charge at Corporate Knights' web page. Since there is no one widely accepted scientific method for measuring CSR performance, the Global 100 can be considered as one of the most prominent annual CSR disclosures for non-academic audiences.[3] It has been used in previous academic research as a framework of the level of companies' CSR performance, and it has been argued as one of the leading frameworks of evaluating CSR performance (Ameer & Othman, 2012, 65). The awareness of Corporate Knights has been increasing in the media after the argument.

The Corporate Knights' method of ranking the 100 most sustainable companies has four different phases (figure 2). Selecting the starting universe, screening the companies, selecting the best companies, and the final formation of the Global 100. The starting universe of companies is all the publicly listed companies which have made more than $1 billion in revenue in the previous year of measurement. All industries and geographies are considered as part of the selection process. The ranking is mostly based on publicly disclosed data, which is verified from the companies.

The screening of companies has four different steps: First, companies which are not disclosing at least 75% of the KPIs relevant for the industry are screened. Second, the financial health of the remaining pool of companies is evaluated using Piotroski's F-score (see Piotroski, 2000), the companies scoring less than 5 points are excluded. Third, companies that are doing harmful business counterproductive to sustainability are excluded. Lastly, the highest quartile of companies measured for money paid in fines compared to the industry group is screened.

[3] This is mainly due the usage of the Global 100 -list's results in companies internal reporting and press releases, e.g. Chr. Hansen A/S spoke of their first place in their Q2 2018/19 results (https://www.chr-hansen.com/_/media/files/chrhansen/home/investors/reports-and-presentations/2018-19/q2/chr-hansen-2-interim-report-201819.pdf) and Kone oyj. launched a press release of the list (https://www.kone.com/en/news-and-insights/releases/kone-ranked-among-the-world-s-most-sustainable-companies-by-corporate-knights-2019-01-23-3.aspx). These activities of stakeholder engagement are playing a role in shaping investor's opinion of CSR performance, though they can also rely on company information databases.

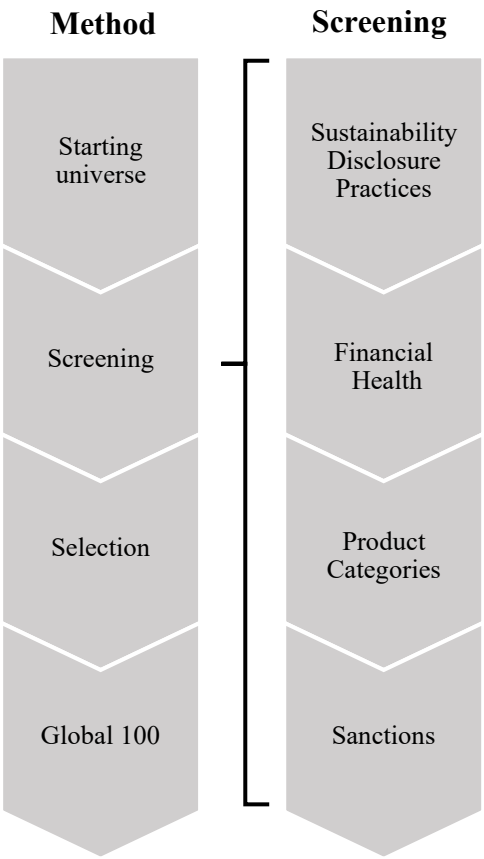

Figure 2 The Global 100 rating methodology (adapting Corporate Knights, 2018)

The remaining companies are scored on the industry-weighted set of KPIs relevant to the industry, which are developed to quantifiably measure the level of CSR performance of a company. The full list of the KPIs can be observed from appendix 2. The companies scoring the highest KPI-scores are evaluated against their industry peers, and the final Global 100 -list consists of top-performing companies within each industry sector delineated in a way that each sector has a fixed number of slots based on the sector's contribution to the total market capitalization of the Global 100 -financial benchmark.

To clarify the Corporate Knights' view on CSR, it can be compared with the pyramid of CSR (Figure 1) to examine how it differs from a typical notion. The economic and the legal blocks are measured with a company's F-score and the measures in taxes and sanctions paid. The third block is measured with the rest of the KPIs which can be seen as the main concentration of Corporate Knights' method. The philanthropic block is not considered in Corporate Knights' view on CSR, which can be a differentiator in some

cases to other notions on CSR. The method is however considered to be relatively throughout measure of CSR, and a good reference of CSR performance for the purpose of this study.

1.4 Method of research

To further clarify how this study is conducted, and how it relates to the concepts of CSR and Corporate Knights, the research philosophical notions and the methods of research are discussed next. The research method of this study is led from the implication on its research philosophical notions illustrated by Burrell and Morgan (1979, 3), which lay foundation in realism; the ontological interpretation of the world as a concrete construction lay the base for meaningful observation of the global economy where the reality can be seen functional and uniformly understood. The epistemological assumption of this study is based on a positivistic approach since the object of this study is to produce generalizations using a structured methodology on how the stock market reacts to CSR performance data. Human nature in this study is seen as semi-deterministic, where the market's response to the information is based on the previously existing rationalistic notion of investor value.

The research philosophy is thus reflected in the research approach, which is the examination of a phenomenon and the attempt to rationalize the phenomenon into a systematic principle via statistical generalizations. This orientation can be regarded as nomothetic. (Neilimo & Näsi, 1980, 67.) This study can be further specified as hypothetic-deductive where the purpose is to generalize the principles from a single sample to the whole population. This is done as usual in this type of research by outlining the theory and leading a set of hypotheses from it. Subsequently, the hypotheses are tested with statistical empirical models.

Neilimo and Näsi (1980, 72) argue that the nomothetic research approach needs a strong background of theoretic-methodologic doctrine and a broad selection of empirical data. The set of empirical data is considered to be adequately broad with a set of 100 companies under examination, and the literature is considered to be vast from CSR performance's potential effects to the financial performance of companies (e.g. Ameer & Othman, 2012;

Eccles, et al., 2014; Orlitzky, et al., 2003) to market's response to CSR performance information (e.g. Amato & Amato, 2012; Auer & Schuhmacher, 2016; Krüger, 2015). Additionally, Neilimo and Näsi (1980, 72–73) suggest that the relationships of the phenomena under examination must be relatively stable in order for the nomothetical research approach to be sufficiently exercised. However, since the literature around CSR's effects to companies and markets has been characteristically inconsistent, it is argued that the more quantitative iterations are done around this field of research, the relationship will at least implicitly stabilize over time, therefore examining the statistical results of the relationship between the stock market and CSR performance will be supported by the nomothetical approach. Moreover, since previous related research (e.g. Amato & Amato, 2012; Krüger, 2015) is using approaches that can be argued as nomothetic, it is seen that this study can follow correspondingly.

To illustrate more concretely, beyond research philosophical notions, the research method of this study called "event study" is outlined: The event study method is used to discover how the market reacts to new information caused by the publication of the Corporate Knights' Global 100 list. The event study method examines the impact of an unexpected event on the values of companies. By observing how the stock market reacts to an event, conclusions can be made about the financial impact of the event on the company. This is done by examining significant anomalous market fluctuations, i.e. abnormal returns (AR) from the stocks of the companies. Event study has gained a mainstream status of researching the capital markets from its first iterations by Ball and Brown (1968) and Fama, et al. (1969)[4], from there on it has gained more and more popularity in observing various events' effects to capital markets (McWilliams & Siegel, 1997, 626).

One of the reasons why the event study method is an effective tool for measuring the effect of an unknown variable to companies is because it focuses on market behavior. Rather by examining companies' accounting figures, it examines the price fluctuations of the respective company's stock on the stock market. Accounting figures have been criticized as an indicator of companies' financial performance since companies have the ability to influence them by selecting accounting procedures. (Benston, 1982.) In contrast, stock prices are not as feasibly manipulated by insiders, because in most cases the

[4] Although it is said by Bowman (1983) that Ashley (1962) was the first to conduct a first empirical method similar to an event study, it is often not referred as the first formal event study.

majority of the owning parties are outside owners with different interesses and the incentive to view the stock's value objectively. Therefore, stock prices should approximate the true value of companies because, in addition to all necessary information, they are assumed to reflect the total discounted value of the dividends the company will produce. (McWilliams & Siegel, 1997, 626-627.) Therefore, event studies have a solid theoretical base in measuring the financial impact of an unexpected event to a company more effectively than simply by observing its accounting measures. Event studies have proven to be remarkably powerful in generating reliable results (Brown & Warner, 1985).

Additionally, related to the method of research used in this study, this study's research ethics are considered to be on a high level. The samples, and additionally all the material used in this study is public and publicly accessible through online resources or company information databases. Therefore, no sensitive information has been processed in this study, which means that the good ethics of the research has been ensured by following the rules of good scientific practice. Complete transparency in the theoretical and methodological decisions made in this study has been attempted to achieve. This has been done to ensure the integrity of the research. Furthermore, the two key concepts which this study examines, Corporate Knights' definition of CSR performance and stock pricing, do not have any researcher-associated biases in them since they are pre-defined concepts of what CSR performance and company success are. Therefore, because the concepts which are measured are not created as well, the nature of the study should be more objective.

1.5 Structure of the study

This study is following the construction of typical hypothetic-deductive research. First, the theory is presented. This study's notion of investor value and the drivers of it are outlined in the first section of the theory. Then, the consensus of the academia on CSR performance's potential effect on companies' financial performance and risk levels generally is discussed. This is done mostly by examining the most prominent meta-reviews around CSR performance's effects on financial performance and company risk. Subsequently, a framework linking prior studies' and Corporate Knights' view on CSR performance and their potential effects on company performance is constructed.

Afterward, literature around past market reactions to CSR performance information is presented and sought to fit into the context of the Global 100. Concluding the theoretical part, hypotheses are generated based on the presented literature.

The event study methodology is illustrated in the third section, where first, the methods associated with an event study are presented. Then, the theoretical assumptions regarding this study due to its distinctive choices in its sample are outlined and discussed. Following the theoretical assumptions, the course of the research is presented. The empirical part's results are presented in the fourth section beginning with the abnormal returns of the event study models and continuing to the results of the cross-sectional examination of abnormal returns. The empirical part's results robustness is then tested in the fifth section with four distinctive tests, each assessing a potentially problematic part of the methodology. In the final section, the summary of the results is presented among the discussion of the validity and the reliability of the results. Finally, concluding remarks are presented.

2 CSR, A DRIVER OF STOCK PRICE?

2.1 CSR's relationship to investor value

The drivers of the value of a stock for an individual investor can be a diversified topic when the differing contexts of CSR are added to the discussion. It can be difficult to determine what dimensions besides the financial an investor weighs when he is valuating a stock (Zeidan & Spitzeck 2015, 331– 332), for example growing number of institutional investors have started using CSR-based criteria in their investment decisions, which incorporate dimensions of CSR into aspects that create value for the investor (Lo & Kwan, 2017, 606). It can be debated whether institutional investors are doing this purely for financial reasons. In other words, there is a possibility that an investor might consider that the factors which affect the perceived value of an asset could be more than just the amount of risk-adjusted financial gains it can generate to him.

This potential discord in perceiving investor value is resolved in this study by concentrating on investor value as in the neoclassical economic theories and then later on discussing the option of other types of investor value. Neoclassical economic theories propose that the companies, as well as individual investors, are trying solely to maximize their profits and their net worth over time (Jorgenson, 1963, 247). This means that the main object of a market participant is to invest his money by such means that it generates the highest amount of risk-adjusted return for him – the investment with the highest value. With this concept of investor value, the interpretations of CSR and their effects on investor value can be observed in a more straightforward and controlled way at first; observing the effects of CSR can be focused on measuring solely the financial effects to an investor.[5]

[5] This view of CSR can be therefore delineated among the framework of Brown and Fraser (2006) as "business case" method of observing CSR. Though this way of viewing CSR can be disputable, it serves the purpose of this study.

Investor value can be then further split into two different parts: cash flows generated by the investment and the risk connected to the cash flows. Therefore the valuation of an investment, in the case of this study a stock of a company, can be based on the net present value of the cash flows generated by the company.[6] The amount of cash flows are estimated and discounted with the expected return to give the stock its total value. (Knüpfer & Puttonen, 2018, 94.) To further clarify the drivers of cash flow and the expected return, two things need to be considered: First, in the case of stocks, the cash flow for the equity investor is the dividend of the stock. The dividend is based on the companies' capabilities to generate profit by their operations i.e. by their financial performance. [7] (Haugen, 1993, 591.) Second, the expected return, in turn, is associated with the risk level of the potential cash flows i.e. the riskiness of the company. The riskier the possible future dividends are, the higher the discount rate is, and therefore the lower the value of the stock.

The main goal of this section is to build an understanding of whether CSR performance can affect mechanisms that drive the generation of cash flow and the risk level of the company. From thereon, this understanding is compared to previous market reactions of CSR performance information in order to examine if the markets have seen CSR performance in a similar light to academia. Lastly, the hypotheses on how the stock market will react to CSR performance information by Corporate Knights can be drawn.

2.1.1 CSR's relationship to financial performance

CSR has been a widely researched and debated subject where two fundamental and opposite schools of thought of the effects of CSR performance to financial performance can be delineated: First one taking Friedmanite approach of the role of companies as entities existing solely for making profits for shareholders, which views CSR as a tradeoff

[6] In general, there are three main approaches of how investors can valuate a stock of a firm: relative valuation, contingent claim valuation, and intrinsic valuation i.e. discount cash flow methods (Damodaran, 2002, 11). However, it has been argued that cash flow methods are the most suitable in the context of sustainability issues (Zeidan & Spitzeck, 2015, 332), which has therefore been selected to be the overarching framework for the observation of investor value.

[7] The cash flow for the investor can be also considered as a function of two principal components: the stock's capital appreciation and the dividend of the stock. However the stock's dividend potential is the driver of the capital appreciation of the stock, hence the real driver of the cash flow for the investor.

and a value-destroying action because resources are directed towards the most sustainable option, not the most profitable (Friedman, 1970). The argument is that in a purely logical sense, two things cannot be both maximized. (see Endrikat, Guenther & Hoppe, 2014.) The other school of thought, applying the model of Freeman (2010), sees CSR as a way of maximizing the total value to all stakeholders which in the end gets rewarded as a higher profit in contrast on solely concentrating on just the stockholders. These two opposite ideologies have been called also as the theories of value creation and value destruction by CSR (Yu & Zhao, 2015). Although these theories have been tested by a vast amount of research, academia still lacks an explicit rationalization of whether the actions of CSR are value-destroying or value-adding.

Grewatsch and Kleindienst (2017) describe how results of previous studies examining whether CSR can cause companies to have better financial performance have been "inconsistent and disappointing". They point out studies representing six different classes of outcomes: positive, negative, insignificant, U-shaped, inverted U-shaped, and asymmetric. They point out that that completely different and even opposite results can suggest that researchers can forge CSR performance's correlation to financial performance into whatever shape they wish to be (Grewatsch & Kleindienst, 2017, 383). This can be also observed when scholars are discussing the consensus of previously conducted studies in CSR performance's relation to financial performance. It has been described as positive (see Ortiz-de-Mandojana & Bansal, 2016), positive or neutral (see Zeidan & Spitzeck, 2015) and, everything between positive and negative (see McWilliams & Siegel, 2001). The period of time when the research has been conducted can be a significant factor too, but in general, this discord in describing the consensus of the academia might suggest that, even among scholars, the understanding about the field could be somewhat imperfect.

Ortiz-de-Mandojana and Bansal (2016, 1615) suggest that there is a lack of systematic support because most research has been focusing on finding causal and immediate results, not focusing on the long-term. Quazi and Richardson (2012, 250) argue that evaluating CSR performance's correlation to financial performance with metrics such as company size, industry, and profitability can cause biases to the models. McWilliams and Siegel (2001, 118–120) argue that the conflicting results of the relationship are caused by several empirical and theoretical restraints of studies. Eccles, et al. (2014, 2852–2853) round up

all the previous arguments having found similar kinds of restraints in previous research: stakeholder mismatching, neglect of contingency, measurement errors, omitted variable biases and short timeframes of observation.

Grewatsch and Kleindienst (2017, 383) point out, that it is quite self-evident to have multi-directional results about CSR performance's correlation to financial performance, since a pervasive comprehension about the relationship may be totally pointless taken the enormous number of organizational and environmental influences on financial performance. Additionally, there is little evidence of the existence of other all-inclusive, simple causal relationships between whatever variable and increased financial performance of a company (Anderson & Zeithaml, 1984, 5–6).

However, a vast amount of studies trying to link the relationship between CSR performance and financial performance have been done. Several scholars have condensed the general consensus of the relationship from the multitude of studies e.g. Orlitzky et al. (2003) who suggested that high CSR performance could raise the level of financial performance.[8] They added that the relationship might be slight and some confounding factors, such as company size might affect the relationship of CSR performance and increased financial performance. Additionally, van Beurden and Gössling (2008) argued based on their review of the body of research that a large number of academic studies are showing clear evidence that there is a positive correlation between CSR performance and financial performance and that the studies showing vice versa are outdated or they have used biased measures in their methodologies. They found that 68% of the studies they reviewed showed a clear and positive relationship of high level of CSR performance and high financial performance.

Extending the work of Orlitzky et al. (2003), Wang, Dou, and Jia (2016) furthermore have stated that high CSR performance will cause better financial performance. The scholars emphasize the result as it is based on more recent empirical works of the relationship of CSR performance and financial performance which has had more rigor and fewer

[8] Interestingly enough, Semenova and Hassel (2015, 99) claimed that the work of Orlitzky, et al. (2003) showed an insignificant relationship between CSR performance and financial performance. However, e.g. Chernev and Blair (2015, 1413) and additionally Grewatsch and Kleindienst (2015, 383) have claimed the same study showing a positive relationship between the variables. Though determining what is insignificant and what is not can be a subjective semantical question, as the scholars themselves did not describe their results as being "insignificant", but quite the contrary, it is viewed that the relationship described in this study was positive.

inconsistencies in relation to prior research. They also point out that the relationship largely relies on how the research is built; what methods are used to weigh the performance level of CSR and what measures are used in defining financial performance (Wang, et al., 2016, 1103–1104). This view is in line with Grewatsch and Kleindienst (2017), who stated that the results of the study between two unclear variables could be bent in whatever direction the scholar wishes.

Additionally, Alshehhi, Nobanee, and Khare (2018, 507) stated that 78% of the studies examined reported a positive relationship between CSR performance and financial performance. This latest finding would follow the notion of Van Beurden and Gössling (2008, 407) who suggested that societies have changed from the beginning of the CSR debate, and the relationship over time has changed to positive. Since Orlitzky et al. (2003) illustrated the most complex and vague relationship, and Alshehhi et al. (2018) reported the most single-toned results, it might potentially be as the scholars suggested.

The prior means that discoveries about whether CSR performance can lead to increased financial performance have more generally shown a positive relationship. Previous can support the notion that some actions in some conception of CSR performance can contribute positively to financial performance. This does not however directly imply that the actions in Corporate Knights' view on CSR are those specific actions that had been found to affect positively the financial performance of companies. Although more comprehensive than some of the views of CSR in academic researches, it is possible that the Corporate Knights' view could measure only actions that are not linked to better financial performance. For example, some researches have defined CSR performance in their work consisting only from corporate philanthropy (see e.g. Chernev & Blair, 2015) and found that to be positively linked to higher financial performance, which is an area that Corporate Knights does not cover with their measures.

Lastly, to be noted is that a debated subject also among CSR has been the reverse causality in measuring CSR performance's correlation to financial performance. Waddock and Graves (1997, 314) gave primary evidence that a high level of CSR performance might increase the financial performance of companies and that a higher level of financial performance might increase the level of CSR performance. They called this effect the "virtuous cycle". Orlitzky et al. (2003, 427) continued that notion stating that CSR performance is correlated with financial performance and that the relationship inclines

towards being bidirectional and simultaneous. More recently, however, Wang, et al. (2016) have argued that only prior CSR performance is associated with subsequent financial performance and not vice versa, then contradicting the argument of reverse causality. It is out of the scope of this study to take part in the discussion of this reverse causality problem, and therefore, inclining towards the result of the most recent study, it is assumed that the stock market mainly reacts to CSR performance information because of its potential positive correlation with investor value, not because the market considers the news of high level of CSR performance as an indicator of good financial future foreseen by the management.

2.1.2 CSR's relationship to company risk

In order to obtain a complete view of CSR's potential effects on investor value, it is important to understand how CSR performance affects company risk, since the two factors of investor value, the financial factor, and the risk factor are interconnected. This means that the total investor value comes from the function of risk and financial performance of a company, and in order to form the high-level picture, the combined effect of CSR performance on financial performance and on company risk must be assessed. Although the capital asset pricing model claims that risk and expected return are positively correlated it is argued that CSR could affect financial performance in a way that risk would not automatically follow. (Orlitzky & Benjamin, 2001, 371.)

The risk of a company measures the volume of financial performance fluctuations that are caused to a company during a given period of time (Donaldson, 1998, 23). The fluctuations can be divided into two groups which describe increased volatility and uncertainty of cash flows due to external or internal factors. External factors are often called market risk or financial risk and internal factors are often called accounting risk or company risk. It has been argued that CSR can lower the total risk level of a company (Albuquerque, Koskinen & Zhang, 2018) and that the external risks are more effected by CSR (Orlitzky & Benjamin, 2001).

CSR has been seen as a preventive tool against devastations e.g. by the textile industry in relation to workforce treatment and by the petroleum industry in relation to environmental

disasters. This notion is what McWilliams and Siegel (2011, 1490) suggest, that CSR can be seen as a preventing mechanism for possible havoc from irresponsible behavior such as environmental disasters caused, frauds, or mistreatment of the workforce. With increased CSR performance, the risk of disasters such as the BP oil crisis in the Gulf of Mexico could be lower, which could cause the capital allocators to enhance their perspective of the company. In an early look into this matter, Klassen and McLaughlin (1996, 1213) showed that companies in their sample that caused environmental disasters on average lost 390 million USD from their market capitalization. More recently, Krüger (2015, 327) showed that financial markets have still shown similar reactions, devaluing corporate social irresponsibility with a median approximate of 76 million USD. This can signify that markets are at least sensitive to reacting to the consequences caused by potentially low levels of CSR performance.

It is however left undiscussed whether CSR performance has a descending marginal utility in lowering a company's risk level. It could be that past a certain level of CSR performance the added benefit of lowering the risk could be zero, and therefore not worth to pursue in lowering the riskiness of operations of a company. It has been stated that CSR performance and company risk are weakly related to each other, but that the lack of CSR actions are positively and significantly related to market risk (Oikonomou, Brooks & Pavelin, 2012). This could support the notion that efforts in achieving superior performance in CSR could not have as drastic consequences in the change in the risk level of a company than from changing from extremely low CSR performance to average CSR performance, therefore suggesting that there might be a so-called hygiene level, where CSR could adequately reduce the total risk of a company.

However, the previous view can be limited since for example, Albuquerque et al. (2018) have shown a significant negative correlation between CSR performance and external risk. They argue that CSR is a product differentiation strategy, which therefore lowers the systematic risk of companies. The lower systematic risk can be viewed that markets see companies with high-level CSR performance as more distinguishable and therefore more stable and better performing and therefore more unrelated to market-wide downturns and losses. This is supported by the argument that companies with a high level of CSR performance will have both lower costs overall and better capital allocation processes. (Ameer & Othman, 2012, 76; Kurucz, Colbert & Wheeler, 2008, 87–91.)

Therefore, high-level CSR performance companies can have better margins and more safety in operations due to a lower cost structure. Quite paradoxically, the lower cost structure is said to be the consequence of the lower risk level of doing business with a company with a high level of CSR performance due to a reduced risk of default of other inconveniences. Therefore, according to these views, CSR can act as a way of differentiation, which will reduce the perceived market risk of a company, which will lower the company's costs and ease the access to capital which will yet lower the risk level of the company. Though a bit different, this is one example of the potential virtuous cycle of CSR which scholars have been documenting (e.g. Orlitzky et al., 2003, 417; Waddock & Graves, 1997, 314). The virtuous cycle effects of CSR have, as stated earlier, been a highly debated concept, but which have also had support from academia.

As in the CSR performance's relationship with financial performance, the notion of CSR and what actions it holds has a significant effect in mirroring previous findings to hypothesizes of how the Corporate Knights' notion on CSR will affect the company risk level. For example, Godfrey, Merrill, and Hansen (2009) argued that only CSR activities which were directed to companies' secondary stakeholders, those who can influence the stakeholders essential to the operation of a company, were effective in reducing company risk level by creating "insurance-like benefits" for companies. Corporate Knights' notion of CSR does consider these stakeholders but is not heavily weighing them.

When observing the prior studies' notions on CSR, it can be discovered that Albuquerque et al. (2018) use Morgan Stanley Capital International's (MSCI) database values of CSR performance as a reference of the level of CSR of companies which they examine. These measurements share similarities with Corporate Knights' and therefore can be considered as a relevant indicator of the potential correlations to company risk. Oikonomou et al., (2012) use the KLD database used in many CSR studies which overlap with Corporate Knights' view of CSR also.[9] Finally, The notions of CSR by Ameer and Othman (2012) and McWilliams and Siegel (2011) also overlap with the notion of Corporate Knights and will be discussed in more detail in the following section.

It seems that scholars have had more of an agreement on how CSR performance affects company-wide risk than in CSR performance's correlation to financial performance. A

[9] KLD Research & Analytics, Inc. was acquired implicitly by MSCI Inc., the metrics thus spring from the same origin and share similar CSR performance evaluation system.

meta-analysis on CSR performance's correlation to company risk by Orlitzky and Benjamin (2001) shows a rather broad view on the scholars' consensus of the subject matter, which seems to be that CSR can lower company risk. The studies are to an extent coherent since there are not any relevant studies showing that a high level of CSR performance would increase company risk in the meta-review. The more recent studies (e.g. Albuquerque et al. 2018; Oikonomou et al., 2012) mentioned in prior seem to back this view additionally.

Therefore, it seems that what Orlitzky and Benjamin (2001) suggest, and what later studies confirm, that financial performance and company risk in the context of CSR are not directly correlated and that CSR might lower the risk level of companies, is backed by the academia. It then seems that a more mainstream view of an average interpretation of CSR is that it is positively correlated with investor value, which could mean it could also be a driver of the price of a company's stock. Prior is still necessary to observe in the context of Corporate Knights' definition of CSR.

The framework constructed in the next section concentrates on CSR performance's potential effect on financial performance since the total company risk-level factor seems to be less weighing in the function defining CSR's investor value. The framework of prior studies' linkage to Corporate Knights' definition of CSR and the results related are presented next in order to form hypotheses whether Corporate Knights' CSR performance information will cause the market to react to the information.

2.2 Potential investor value in Corporate Knights' view of CSR

Since CSR lacks a ubiquitous definition, the things that are measured in prior studies' notions of CSR can vary significantly. Therefore, using differing notions of CSR without examining what the notions contain can cause inconsistencies in interpreting the relationship between Corporate Knights' notion of CSR performance and investor value. Therefore the second part of the theory is constructed by comparing Corporate Knights' view of CSR with some of the most relevant and similarly CSR-defining studies, which

are examining the potential of CSR to create investor value.[10] This is done to clarify if the Corporate Knights' view on CSR could be affecting investor value. Academic studies from the last 20 years correspondingly linked to the Corporate Knights' KPIs are selected under further examination. The view of the respective studies on CSR can be seen from the second column of Table 1, where every study's notion of what measurements CSR contains is listed. These definitions have been used in the studies to evaluate the companies' level of CSR performance and to assess how each CSR performance affects the financial performance of the studied companies.

In the third column, the notion of each study on CSR is presented in the form of the KPIs of Corporate Knights' Global 100 -method which the study's notion is overlapping. In this way, the resemblance of each study's and Corporate Knights' view of CSR performance is exhibited. The similarity of the studies' measurements are compared to Corporate Knights' KPIs in a way that if the study's method of measuring CSR performance was congruent directly or in the same underlying logic to a group of Corporate Knights KPIs, the KPI group was mentioned in the "Resemblance to Corporate Knights' KPI" –column.

For example, Eccles et al. (2014, 2838–2873) have measured CSR performance with measures such as (Corporate Knights' corresponding measure in parentheses) waste reduction (waste productivity), emission reduction (GHG productivity), energy efficiency policy (energy productivity) and water efficiency policy (water productivity). Previous measures have been found to represent more than half of Corporate Knights' resource management KPI group, which has been entered into the "Resemblance to Corporate Knights' KPI" -column of the study. All the KPI categories of Corporate Knights are covered by the studies except for the "clean revenue" KPI category, which was partially

[10] The selection of studies has been an unsystematic research process, where the most relevant studies which notion of CSR performance is in parallel partly to Corporate Knights' have been selected as part of the framework. The relevance of the studies has been evaluated based on the number of academic cites of the study and on the relative rating in SCImago Journal Rank -website (https://www.scimagojr.com/journal rank.php) of the journal in which the study has been published. The past 20 years of academic studies have been sought to filter in order to best approximate the consensus of the academia in the context of Corporate Knights' CSR. Additionally, the study from Zhao and Murrell (2016) does not pass the previous filters but has been selected due to its method of repeating one of the most prominent and often referred early works in CSR performance's relationship to financial performance.

represented in the study of Eccles et al. (2014) but not in a way that would have been comprehensive enough to match Corporate Knights' clean revenue KPI.[11]

The effect of each study's comprehension of CSR performance to investor value measurement has been listed in the fourth column. The results of the studies have been summarized in the entries of the columns. The measures illustrating effects to investor value of the respective studies reveal that most of them show a positive relationship between CSR performance and financial performance, the possibly dominant function of investor value. This is in line with prior examination of the more comprehensive literature reviews suggesting that an improved level of CSR performance might raise the financial performance of a company. To be noted is that these indicators mostly represent accounting-based measures for financial performance, which have been argued to show stronger relationships than market-based measures (Wang, et al., 2016, 1100–1101), which will be examined in section 2.3. Therefore, the financial measures in this section can be biased towards providing a stronger relationship between the variables of CSR performance and financial performance.

Nevertheless, further examination of the effects on financial performance can reveal that the most repeated measurements that CSR has impacted positively have been total revenue, return on sales (ROS), and return on assets (ROA). These measurements would imply an increase in the number of customers or the amount of average purchase, an increase in profitability, and an increase in resource efficiency. These measures are often suggested when discussing the potential effects of CSR. To be noted is that two of the studies (McWilliams & Siegel, 2011; Ruf, Muralidhar, Brown, Janney, & Paul, 2001) have shown weak correlations of CSR performance and their metrics of financial performance, which has therefore led to the use of "may" in describing the potential effects to investor value.

[11] The clean revenue metric has been developed by Corporate Knights to assess the sustainability level of products made by companies. The total revenue of a company is evaluated by setting a factor of "cleanliness" from 0 to 100 for each product of the company. Afterward all the product-related revenues are multiplied with the respective factors which give the total clean revenue of a company. This metric does not, however, concern the entire population, but certain industries. No relevant research on CSR, discussing the specific clean revenue method of Corporate Knights, was found to fine down the hypothesis of how the "clean revenue" metric affects financial performance. However, the clean revenue measurement was not seen as such a weighty measure in forming the Global 100 that the formation of comprehension how investor value could be affected by the Corporate Knights' view on CSR performance could not be possible without it.

Table 1
CSR resemblance and suggested effects to investor value

Prior research	CSR resemblance	The resemblance to Corporate Knights' KPI	Effect to Investor value
Zhao & Murrell (2016)	CSR-expert-weighted KLD database rating in the areas of product, community, environmental, diversity, nuclear, military and foreign affairs	Resource management, employee management	Not positively associated
Eccles et al. (2014)	Tangible achievements in diversity, opportunity, resource management, employee welfare & safety, supply chain, product responsibility & innovation, and human rights.	Resource management, financial management, employee management, supplier performance	Better stakeholder relations leading to better financial performance
Ameer & Othman (2012)	Reporting in community, environment, diversity & ethical standards. Scored 0-4 considering whether tangible results had been mentioned.	Resource management, employee management	Higher EBT, ROA, and OCF
McWilliams & Siegel (2011)	Any “responsible” activity that allows a company to achieve sustainable competitive advantage	Financial management, employee management	May increase revenue and decrease personnel and capital costs
Wagner (2007)	Managers' perception of the level of environmental management's integration to core processes of the company	Resource management	Increases revenue and profit in manufacturing industries
Karpoff, Lott & Wehrly (2005)	Environmental sanctions caused to a company	Sanctions	Reduces potential cash flows by the amount of sanction
Ruf et al. (2001)	Stakeholder-weighted KLD database rating in the areas of product, community, environmental, diversity, nuclear, military and foreign affairs	Resource management, employee management	May increase revenue in the short term, increases ROE, ROS over the long term
Waddock & Graves (1997)	CSR-expert-weighted KLD database rating in the areas of product, community, environmental, diversity, nuclear, military and foreign affairs	Resource management, employee management	Higher ROA & ROS

CSR has been argued to increase revenues by three of the eight studies in the table. CSR's possible impact on revenue might be the most straightforward measure to examine. Ruf et al. (2001, 151) have argued that an increase in CSR policies of a company can generate growth in sales starting from the year in which the CSR actions have taken place. It has been also argued that CSR policies' correlation to increase in revenue has been stronger for companies selling business to consumers (B2C) than companies selling business-to-business (B2B) because of two main reasons: First, the companies competing in the B2C market are more focused on brand and reputation, so the CSR policies can act as an enhancer for the brand's image. Second, the consumers focus more attention on B2C companies' public perception in their decision-making than B2B which is seen as more rational. (Eccles et al., 2014, 2835–2857.) In addition, McWilliams and Siegel (2011, 1492) suggest that companies with a high level of CSR performance can introduce premium prices because the customers might value the sustainability of the products. CSR might cause increased sales and that increase in sales might be also long-lasting since companies operating with a high level of CSR have been argued having also higher sales growth in the long-term (Ameer & Othman 2012, 61; Ortiz-de-Mandojana & Bansal 2016, 1615).

Second, three of the eight studies have argued that CSR increases profitability or profits of a company by indicating a correlation between CSR performance and ROS, and CSR performance and earnings before tax (EBT). These studies have not discussed extensively though about the effects of why CSR performance might have contributed to the overall profits and profitability. It might be hard to explain the causality between any set of operational variables and profit because profit is affected by a vast amount of actions and phenomena inside the company. Ruf et al. (2001, 143) argue that companies may achieve increased profitability in the long run, which fits the common view of CSR, that companies must sacrifice quick gains in order to realize the benefits of CSR (Eccles et al., 2014, 2846).

Contrary to the previous Waddock and Graves (1997, 313) gave early arguments that an improved level of CSR performance increases profitability in the short term. According to them, it was caused by the immediate adaptation of stakeholders to these new policies. However, more recent studies have shown the opposite in this front: Ortiz-de-Mandojana and Bansal (2016, 1615) argued that CSR performance does not increase profitability in

the short term. They argue that views of CSR are often too short-terministic and that companies achieve long-term stability with the practices of CSR. Additionally, Zhao and Murrell (2016), suggesting that a time-bound discrepancy could lay between the studies of them and Waddock's and Graves' (1997), since they conducted the same tests with a larger sample, where they found that CSR performance had no effects in raising the level of financial performance of companies. They suggested that it might be causation of their differences in samples. However, they did find that an increase in financial performance increases the performance level of CSR of a company, the reverse causality -effect what was mentioned in section 2.1.1. This can further illustrate the complexity of measuring the relationship between CSR performance and financial performance, and that a slight variation in measuring can alter the results significantly.

Lastly, the measure that was one of the most recurring in the studies was ROA. Increased ROA due to CSR performance might suggest that companies have had more profits with the same amount of assets or as much profit with a reduced amount of assets. However, if the previous arguments of improved profitability are to be considered, the prior would be a more natural effect on the discovered consequence. Additionally, CSR actions create characteristically an intangible resource or capability such as a higher level of stakeholder commitment, an asset hard to measure and justify completely into a company's intangible assets in the balance sheet (McWilliams & Siegel, 2011, 1481). With this asset increased revenues might be generated, and since it could be that it has not been appreciated completely into a company's balance sheet a higher ROA would be achieved. It is still difficult to measure the drivers of the equation since the total added value created by intangible assets caused by CSR might be hard to identify and quantify. (McWilliams & Siegel, 2011, 1481). Therefore, the causality between these assets generated by CSR actions and their effect on financial performance can be hard to justify.

By comparing the second and the fourth column in table 1 a deeper understanding of how a single group of similar measures to Corporate Knights' KPIs can contribute to investor value; how the researchers have found the respective measurements affecting the company's financial performance and the risk level. As can be noted from the table, six out of eight of the studies have used similar measures than Corporate Knights' "resource management" KPIs in defining their approach to CSR performance. It has been argued that environmental aspects have been characteristic in historical definitions of CSR

performance (Orlitzky, et al., 2003, 411–412), which can be stated also from Corporate Knights' method, which is weighing environmental aspects to some extent. All in all, five of the six studies which have included environmental aspects in their measurements of CSR performance have found a positive correlation with financial performance. This makes studies that are defining part of their CSR performance with metrics similar to Corporate Knights' "environmental performance" the most supportive of CSR performance's positive correlation with financial performance.

The Corporate Knights' "resource management" KPIs are partially measuring, which is the case e.g. with "water productivity" -measurement, a set of actions that academia has called in the past "eco-efficiency", the act of reducing the usage of natural resources such as water in production processes for example. It would be logical that eco-efficiency related measurements could have a positive correlation to financial performance since the concept can be seen as a standard measure of a company to produce more with fewer resources. Other previous studies have also indicated that CSR can create economic benefits for companies with activities of eco-efficiency (e.g. Guenster, Bauer, Derwall & Koedijk, 2011).

The studies defining CSR performance similarly to the measures of Corporate Knights' "employee management" set of KPIs show that in five out of six cases CSR has been seen as a contributor to increased financial performance, Eccles et al. (2014, 2852) have argued that companies with higher CSR performance might outperform other companies because of their ability to get better employees and establish more reliable supply chains. However, they also argue that commitment to employee satisfaction could raise costs of operation due to a higher cost of labor and cost of provided benefits. However, the Corporate Knights' "employee management" set of KPIs is measuring things that could be assumed not to cause major additional costs such as preventing fatalities and injuries, reducing employee turnover, and encouraging promotions among women. However, the metrics could be viewed as suggested in the previous section as being a hygiene factor, where a certain level of commitment to it, such as preventing deaths and unnecessary resigns of staff, could bring the reputation of treating employees well in CSR studies, but where additional investments could not bring any material benefits.

The CSR performance measures similar to Corporate Knights' KPIs: "financial management", "supplier performance", and "sanctions" are not as widely represented in

the respective views of CSR performance of the studies. “Financial management” and “supplier performance” related measures have been associated with a positive relationship between CSR performance and financial performance. Suppliers’ level of CSR performance could contribute to the financial performance and risk levels of a company similarly than CSR performance contributes to the operations of the company, potentially by lowering the risks of the transactions between the companies as suggested by the risk-view of CSR. The measure related to the “sanctions” has however been seen as not relating to financial performance since Karpoff et al. (2005) suggested that the market capitalization of the companies is reduced only by the amount of sanction on average. This suggests that the stock market does not see the companies having a higher risk of exposing additional sanctions and that the incidents were simply one-off mishaps.

The lack of similarity between the “financial management” KPIs may be due to Corporate Knights’ process, where some steps before in the selection process they filter financially unstable companies out with Piotroski’s F-score measurements. Therefore, Corporate Knights’ financial measurements are more detailed, focusing for example on tax paid and pension fund statuses. The studies using similar financial measures to Corporate Knights’ set of KPIs are generally showing a positive relationship. Some of the “financial management” related measures can be counterintuitive since for example companies that pay more tax in relative terms to profit would be suggested achieving better financial performance. This can furthermore illustrate the high complexity of the effects of CSR on financial performance, and the complexity in interpreting them. Therefore, it is beneficial to examine market reactions to CSR performance information, since if the market has different opinions to academia in how CSR performance affects to financial performance, the hypotheses cannot be outlined directly as what has been suggested in this section.

2.3 Market reactions to CSR

As mentioned in prior sections, the market reacts to information by adjusting stock’s price to a consensus level of a company’s capabilities in generating cash flow to its investors under a certain level of risk. However, some views have been presented that some

investors might look beyond that by voluntarily paying for a higher level of CSR performance (Amato & Amato 2012, 323). The underlying logic then would be that if there is no mispricing and the prices of the stocks represent the correct cash flows under correct risk and if CSR performance could not provide any financial or risk benefits, then information of CSR excellence could raise stock prices because a certain set of investors would be willing to pay a higher price for higher CSR performance. It is, for example, stated that institutional investors might seek, additionally to risk-adjusted returns, companies with high levels of CSR performance, and therefore affecting the standard price equilibrium of the market (Lo & Kwan, 2017, 606). However, this study's hypotheses are constructed mainly by observing CSR performance's capabilities in effecting risk and financial performance, and less attention is given to this more behavioristic notion since it can be assumed that the neoclassical investor value is more prominent driver of stock prices.

The framework laid in the previous section showed that the most common set of metrics parallel to Corporate Knights' definition of CSR performance were the "resource management" metrics concentrating on environmental performance. It can be argued that the research body around CSR performance has been also most focused on environmental aspects. Various studies in market's reaction to environmental performance have been done: Konar and Cohen (2001) have given some early outlook of environmental performance's relation to companies' market capitalization via intangible asset value, when they argued that especially poor environmental performance lowers the value of company's intangible assets and that the relationship is somewhat symmetric another way round. This finding is in line with Klassen and McLaughlin (1996), who have shown the link of negative market reactions to environmental disasters. They also gave evidence that companies receiving awards from their environmental performance were given positive reactions from the market increasing the market capitalization of the companies.

Though environmental awards given could be regarded as somewhat similar events to the publication of the Global 100 -list, it lacks the similar nuances, e.g. the simultaneous large-scale representation of a comparison between companies. Favorable to the formation of this study's hypotheses is that the previous researches considering similar lists to Global 100 of corporate environmental performance show more unified responses from the stock market: Amato and Amato (2012) studied market reactions to Newsweek

magazine's "The Greenest Big Companies in America" -list's ratings and found that the top companies selected into the list received a positive market reaction. They claim this reaction is due to a higher reputation leading to competitive advantage and positive media exposure. Yadav et al. (2016) have also studied Newsweek's green ratings and discovered that the stock market reacted positively to the announcement. They suggested that the company's enhanced environmental performance causes the market to expect improvement in financial performance through increases in both efficiency and revenue growth (Yadav et al., 2016, 417). Orlitzky et al. (2003, 415) have argued that environmental performance has a smaller relationship with financial performance than all the other dimensions of CSR, which could, in turn, suggest that market reaction to more broad CSR performance data could be even more significant.

Though Yadav et al. (2016, 416) Point out that all the previous market reactions to positive environmental performance have not been positive. They illustrate a more complex picture, such as with CSR performance's correlation to financial performance, with positive and negative market reactions to positive environmental news. One negative market reaction, for example, has been presented by Fisher-Vanden and Thorburn (2011) who showed that the market reacted negatively to announcements of companies signing up to greenhouse gas reduction programs. To be noted is that this market reaction was anticipatory where the markets were reacting to announcements of future CSR actions, the situation in the context of Corporate Knights' context differs that the announcement considers the results of past actions.

Though the prior cases have been concentrated around environmental performance, they can illustrate the potential market reaction to the Global 100 -list, since the list can be also argued representing environmental aspects considerably well. It has been also argued that markets are more interested in environmental and governance information because of its comparative feasibility of implementation to valuation methods in comparison to social data (Eccles et al., 2011, 120–124). However, Lo and Kwan (2017) discovered that the market had reacted the most strongly to CSR initiatives concerning governance and social aspects, but their evidence was rather weak as the scholars themselves had assessed. Interesting finding considering governance and the "employee management" KPI set was when Krüger (2015, 314) pointed out that stock markets reacted negatively to positive information of CSR performance when the management of the company had

compensation incentives attached to CSR performance measures. The markets might have seen this as agency theory related actions of the management with the sole intent to increase their own CSR-policy linked salaries. A metric called "sustainability pay link" is one of the KPIs of Corporate Knights measuring if the management receives benefits from achieving CSR policy targets. Thus, high performance in this area would indicate, according to theory, a negative market reaction for a company.

Additionally, the research done by Krüger (2015) illustrated that no matter positive or negative, the stock market had reacted negatively to news considering CSR policies. Though the reaction with positive policies had been weaker, less systematic, and even positive when the situation was related in counteracting to prior corporate social irresponsibility. Auer and Schuhmacher (2016) have pointed out that both active and passive CSR criteria-based investment strategies do not generate better risk-adjusted performance than passive index investing. The prior finding could affect the market's zeal in reacting to CSR performance information since if CSR performance could not provide any extra financial benefit, only those investors who would be willing to pay for CSR performance would react positively. However, Kaspereit and Lopatta (2016) and Aouadi and Marsat (2018) both illustrate that high levels of CSR performance and high market valuations are positively linked, though in the latter research points out that this has only been viable with large, highly visible companies.

These prior findings have shown different outcomes in different markets. Since the Global 100 -list has a worldwide sample of companies the markets' geographical differences in reactions to CSR performance information can be also advantageous to observe. Contrary to what Kaspereit and Lopatta (2016) presented, Auer and Schuhmacher (2016) showed that though investment strategies taking CSR into accordance do not provide any excessive risk-adjusted returns, investors in Europe incline having lower risk-adjusted returns when CSR-criteria are used. This might indicate that European companies might receive more commonly a mixed reaction to positive news, though the big picture seems to be complex: The negative market response to environmental investments described in the prior study is partly contrasting the notion of Eccles et al. (2011, 127) when they stated that in comparison to European investors, investors from the USA are less interested of climate-related topics. Indubitably investors are investing across nations and continents, but for example, the ownership base of

Finnish companies is just half foreign (Euroclear, 2019), which suggests that the geographical location of the company could matter in the reaction of the stock market to CSR performance news.

Additionally, contrary to the claim of Eccles et al. (2011, 127), the findings of Amato and Amato (2012) and Yadav et al. (2016) stated that the stock market reacted positively to the greenest companies -list, which considered, for example, carbon dioxide emissions. Reaction to companies that are more efficient in their carbon footprint could be argued as climate concerned. However, in the case of companies originating in the USA, the ownership-base is much broader than for example for Finnish companies, and therefore the geographical locations' effects can be diluted. Additionally, Fisher-Vanden and Thorburn (2011), who discovered a negative market reaction to companies' environmental initiatives was based on companies from the USA, which contradicts the prior findings. However, the sample of the study had been recorded during a long time period and could be therefore biased by older and less informed views on carbon emissions by the general public. Nevertheless, prior findings can suggest that companies from the USA might receive a positive market reaction from positive CSR performance news.

2.4 Hypothesis generation

It is possible that the stock market can react to CSR performance information because of a certain set of investors could pay a higher price in order to invest according to their values. It is argued that researchers repetitively compare the response of the market to a concept of "value" the event creates, rather than the market's assessment of the value the event is expected to create (Oler, Harrison & Allen, 2007, 152). It is nonetheless presumed that the main driver of market reaction is driven by CSR's capability of creating investor value based on financial performance and company risk. Though there have been various claims of how CSR performance correlates to financial performance (Grewatsch & Kleindienst, 2017), it seems that the consensus of the academia has tilted to the direction of seeing CSR as positively correlating to the financial performance of companies (e.g. Wang, et al., 2016). And based on the efficient market hypothesis, it

should be indifferent whether the effect of CSR is immediate or lagged since efficient markets should react immediately and accordingly to the information concerning changes in risk level or future cash flows.[12]

Though it could be argued that there have been differences in the definition of CSR in academic research, and the CSR defined by Corporate Knights is simply one interpretation that can measure actions that generate different outcomes than average CSR definition of mainstream research would create. A framework examining the similarity Corporate Knights' view to notions of other academic CSR research was constructed and it was found that under the notion of Corporate Knights CSR performance can lead to an increase in revenue and efficiency which can lead to higher profits. CSR performance's correlation to company risk level was examined similarly, and since academia has had a more coherent view how CSR affects to company risk (Orlitzky & Benjamin, 2001), and since this view has been supported by the more recent studies (e.g. Albuquerque et al. 2018), it can be argued that CSR has either neutral or reducing effect to the risk level of the company.

The prior literature presented showed manifold results in the market's reaction to CSR performance. It could be that investors have had a hard time evaluating the effects of CSR performance on financial performance and risk level of companies and weighing the potential benefits and costs a high level of CSR performance could bring for the companies. Therefore, investors might have reacted to CSR performance information more cautiously, especially in the European markets where CSR based investment strategies have been less effective (Auer & Schuhmacher, 2016). However, additionally to other positive reactions recorded, Amato and Amato (2012) and Yadav et al. (2016) have shown that markets have reacted positively to similar third-party generated lists of CSR performance to Corporate Knights' list. Thus, a positive reaction can be presumed.[13] Therefore it is hypothesized that:

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[12] Efficient market hypothesis presented by Fama (1970) and its relevance for this study is discussed further onward in section 3.3.

[13] To be noted is that though the hypotheses are stated as one tailed, the hypothesis testing is done two tailed, because of the mixed previous relationships of CSR performance and financial performance and CSR performance information's past value implications. Brown and Warner (1980, 211) noted that both one tailed and two tailed tests work as well in the context of event studies, and it does not generate any theoretical issues.

H_1: *The release of the Global 100 -list will generate positive abnormal returns for the companies appearing on the list.*

Additionally, Amato and Amato (2012) showed that companies ranked in the first quartile of the Newsweek's list were showing significantly larger abnormal returns than other companies appearing on the list. It might be that the top companies receive significantly more attention, and that attention would create a competitive advantage as the prior study's scholars have suggested. Aouadi and Marsat (2018) have complementarily to the prior stated that CSR performance level is positively correlated with the value of companies that are highly visible. Finally, Yadav et al. (2016) discovered that companies' rankings and abnormal returns correlated for repeating companies in Newsweek's list. This leads to the formation of the second hypothesis:

H_2: *'The abnormal returns of a company are positively correlated with its relative Global 100 -ranking.*

Furthermore, there is evidence that markets have reacted more significantly to news of high CSR performance if the previous level of performance has been unknown. This has been the case for example with companies, which have received awards related to their CSR performance. (Klassen & Mclaughlin, 1996.) This early finding has been backed by Yadav et al. (2016, 417) who found that a set of companies which CSR performance-levels were previously unknown received a more positive market response in relation to firms that had been rated. The prior is in line with the efficient market hypothesis since because markets react to new and unanticipated information, ratification of a high level of CSR performance could suggest significant positive news. It is therefore hypothesized that if Corporate Knights and a prominent database of financial data have not rated the level of CSR performance of a company before, the news of high-level CSR performance can be significantly positive to markets. Therefore, the third hypothesis forms as:

H_3: *Previously unrated companies will have greater abnormal returns in comparison to previously rated companies*

This significant positive news is assumed to happen on the scale of the Global 100 -list since Yadav et al. (2016, 417) found that companies selected for the first time to Newsweek's list received greater abnormal returns than companies repeating their list appearance and not improving their rank significantly. This leads the final hypothesis being:

H_4: *Global 100 newcomers will have greater abnormal returns in comparison to list repeaters*

3 DATA AND METHODOLOGY

3.1 Event study methodology

The economic impact of an event to a company is quantified in event studies by abnormal returns. Since efficient markets should reflect all available information into the stock prices (Fama 1970), a price movement greater or less than the normal range can be considered as abnormal, which can be interpreted as a reaction from the market to information that affects the value of the company. Abnormal returns are calculated by subtracting so-called normal returns from the actual realized returns observed in the stock market. Normal returns are the returns that would have been realized if the event in question would not have taken place. Normal returns act as a benchmark relative to the observed to calculate abnormal returns. The abnormal return for company *i* and for day *t* is

$$AR_{it} = R_{it} - E(R_{it}|X_t) \qquad (1)$$

where AR_{it} is the abnormal return, R_{it} is the actual realized return and $E(R_{it}|X_t)$ is the normal return with the conditioning information X_t for the normal return model.

While the actual realized returns can be simply observed, the normal returns must be estimated with an expected return model. Expected return models are common among accounting research and there are several models that are acknowledged for the use of event studies among academia. (Brown & Warner, 1980; 1985; MacKinlay, 1997; McWilliams & Siegel, 1997). The most prominent expected return models are mean adjusted return models, market adjusted return models, market risk adjusted return models, and multi-factor models. Although the cruder market adjusted model can perform well, it has been shown that a market risk adjusted return model called “market model” performs extremely well under a wide variety of conditions in event studies (Brown & Warner, 1985). The market model is used in this study due to its widely recognized theoretical power and its fit for this study’s empirical context due to its theoretical and statistical advantages (Brown & Warner, 1985; Lee & Varela, 1997; Park, 2004).

The market model is still widely used in top research (e.g. Beber & Pagano, 2013; Krüger 2015). There have been arguments that more complex methodologies than the market model can generate inaccurate results and leave the study worse off (Brown & Warner, 1980, 249). MacKinlay (1997, 18) argued that unless the companies under study have common characteristics such as the same industry or similar market capitalization the marginal explanatory power of additional factors is small and therefore reduces the variance of abnormal returns very little. This study's population had differences in both industries and market capitalizations, which was among one of the reasons why multi-factor models are not applied to this study. [14]

The market model considers a linear relationship with the return of a stock and the return of a specific reference market which is selected to characterize the price movements of a selected stock. A reference market selected is in most cases a reference market index that has an impact on price movements of the stock under study. In the market model, it is assumed that the return follows a single factored model

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \qquad (2)$$

Where R_{it} is the realized return of the observed stock *i* during period *t*, R_{mt} is the reference market return on day *t*, ε_{it} is the error term with an expected value of zero and finite variance.[15] It is presumed that e_{it} is uncorrelated to the market return R_{mt} and to the return of a different stock R_{jt} with $i \neq j$ are not autocorrelated nor heteroskedastic. The β_i coefficient is a sensitivity measure of the reference market R_{it}. The α_i and β_i for the stock *i* are calculated with ordinary least squares (OLS) regression from the returns of the

[14] The 3-factor model by Fama and French (1992) is one of the most prominent multifactor models. The explanatory power of the Fama-French 3 factor model was also tested for this study. The R^2 of the model was significantly lower for the normal returns of the stocks on average than with the market model, even with the continent specific daily factors. To be noted the European and the Asian continent daily factors were not updated to match the event dates in Kenneth French's website database (see https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html), so the factors were first tested for a prior arbitrary event date and then created for the actual event date by using the technique created by Faff (2003) in order to test the compatibility. The theoretical advantages of the Fama-French 3 factor were little in the context of this study (Park, 2004), which left to the multifactor models to be discarded.

[15] When estimating returns with an expected return model, there will be cases when the realized return will differ from the predicted. However, efficient markets cannot be consistently different from estimations. Therefore the expected value of the error term cannot systematically differ from zero (Brown & Warner, 1980, 208–209). The variance of the disturbance term must be finite also in order for the model to work (MacKinlay, 1997). This is due to that the disturbance term itself is under examination in the subsequent observations and therefore needs to have the statistical properties which can be appropriately measured.

reference market m and the returns of the stock i. The abnormal return with the market model is therefore mathematically shown as

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt}) \qquad (3)$$

This demonstrates that the abnormal return calculated is the disturbance term of the market model. Under the null hypothesis, that the event under investigation has zero impact to the returns, abnormal returns are assumed to be jointly normally distributed with a zero conditional mean and conditional variance in condition to the market return in the period of the event window (Campbell et al., 1997, 159–161). When the estimation period is large, part of the conditional variance disappears, and thus any serial correlation in the model (MacKinlay, 1997, 21).[16]

The market model considers the event timeline to two distinct time windows: The estimation window, where the behavior of a stock is measured against a certain benchmark to create the α and β factors for the normal return model and the event window, where the normal returns generated with the information from the estimation window are measured against the observed returns. Figure 3 is illustrating the event study timeline graphically. The estimation window is from T_0 to T_1 during which a stock's relation to its benchmark is measured. The estimation window closes usually a couple of days before the event window so that the estimation will not be biased from the returns around the event (MacKinlay, 1997, 20). The event window starts from T_2 and continues throughout the event day τ to the end of the event window T_3. This means that the starting date T_2 of the event window can be set on a prior date compared to the event date to capture possible information leakages.

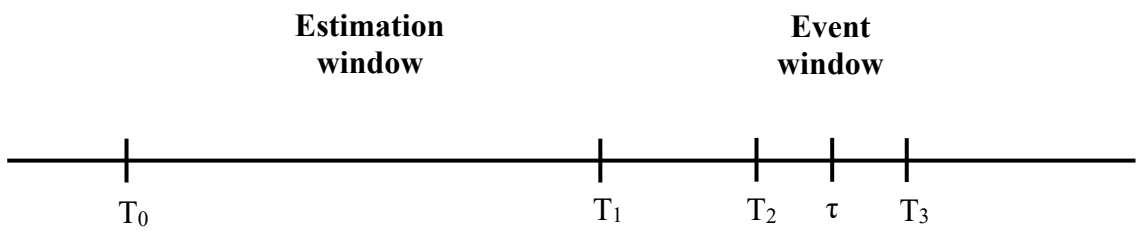

Figure 3 Event study timeline (adapting Campbell, Lo & MacKinlay 1997, 157)

[16] The two components of variance are the variance of the disturbance term and an additional variance caused by a sampling error in α_i and β_i terms (MacKinlay, 1997, 21)

To obtain a broader comprehension of the reactions of the stock market to the CSR performance information, all the sample daily abnormal returns are averaged. This way the stock market-wide reaction can be isolated to a possible single trading day. All day *t* returns are calculated from company i_1 to company i_n and then divided by the number of observations. Therefore, average abnormal returns (AAR) are defined as

$$AAR = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \tag{4}$$

There is evidence that the distribution of abnormal returns often differs from the normal distribution curve (Brown & Warner, 1985, 11; Fama, 1976, 21). However, the mean abnormal returns in a cross-sectional sample of stocks converge to normality as the stocks count increases (Brown & Warner, 1985, 25).[17] Nonetheless, this view according to the central limit theorem does not concern the cross-sectional t-test, which is applied for testing statistical significance due to small sample sizes in part of the tests. In order to test the statistical significance under the null hypothesis, the cross-sectional t-test for the average abnormal returns is

$$t_{AAR} = \sqrt{N}\frac{AAR_t}{S_{AAR_t}} \tag{5}$$

Where S_{AARt} is the standard deviation of the abnormal returns among all the sample companies at day *t* for $\sqrt{N}$ observations.

To measure the total event window wide average returns from the total sample of companies, the concept of cumulative average abnormal returns (CAAR) must be examined. They represent the event window wide average daily abnormal returns across the sample companies and are expressed as

$$CAAR = \frac{1}{N}\sum_{i=1}^{N} CAR(T_2, T_3) \tag{6}$$

[17] This is according to the central limit theorem, which states that as the size of the sample increases the sampling distribution of the mean starts to approximate normal distribution. This has generally considered to be the case when the sample size is above 30. (Naghshpour, 2012, 107–108)

Where $CAR(T_2,T_3)$ is the cumulative abnormal return of company *i* from time window T_2 to T_3

To test the significance a cross-sectional t-test for CAARs is

$$t_{CAAR} = \sqrt{N}\frac{CAAR}{S_{CAAR}} \tag{7}$$

where S_{CAAR} is the standard deviation of the cumulative abnormal returns across the sample. To be noted is that it has been argued that the cross-sectional t-test can be prone to volatility which is induced by the event under study. For that reason, the test is argued to have low power, which is the test's probability of distinguishing a given level of statistical significance. (Brown & Warner, 1985.) However, the t-test is still considered as an effective tool of measurement in current studies (see e.g. Michaelides, Milidonis, Nishiotis & Papakyriakou, 2015), and it is characterized as a standard test statistic for different variations of abnormal returns (Kothari & Warner, 2007, 15). For previous reasons, the test is seen as an applicable tool for this study.

Since the t-test may be prone to volatility, and since standard parametric test statistics often applied in event studies incline being sensitive to outliers, it is crucial to assess if the results are affected by them. Merely deleting these outliers can be an extreme move, since these terms can contain important signals regarding the result. (McWilliams & Siegel, 1997, 635.) Therefore, additionally to the t-test, generalized rank test (see Kolari & Pynnönen, 2011) is applied. The generalized rank test is a nonparametric method of testing statistical significance and it eliminates the effects of abnormal return serial correlation, cross-correlation due to event day clustering, and event-induced volatility (Kolari & Pynnönen, 2011, 954). Using the prior nonparametric test significantly aids the testing significance of abnormal returns in the principal empirical model, since it might be affected by cross-correlation. By using the generalized rank test this study follows Krüger (2015), who uses the test to assess the levels of statistical significance of abnormal returns. The complete walkthrough of the generalized rank test is too extensive for this study to describe; therefore the test's formation and theoretical assumptions can be viewed from the original study (see Kolari & Pynnönen, 2011).

3.2 Regression analysis methodology

Following the suggestion of McWilliams and Siegel (1997, 652) after the calculation of the abnormal returns, this study tests the returns and their cross-sectional variation with regression analysis. Regression analysis can be used to interpret the correlation and effect of multiple independent variables on a dependent variable. The assumption in regression analyses is that the independent variables correlate sufficiently with the independent variable but not heavily with each other since that causes distortions to the models in the form of multicollinearity (Metsämuuronen, 2002). Variables with a nominal scale can be coded to be so-called dummy variables in order to meet the assumptions of regression analysis. As with forming the market model, the OLS regression analysis is used. The regression line is similar to the market model, mathematically shown as

$$Y = \beta_0 + \beta_1 x_i + \varepsilon_i \tag{8}$$

Where Y is the dependent variable, β_0 constant, β_1 the coefficient of the independent variable, x_i the independent variable, and ε_i the residual term of the model. The value of the constant tells where the regression line intersects the y-axis and the coefficient of the independent variable tells how much on average the dependent variable changes when the independent variable changes a single unit of measurement. Since the OLS regression model can be extended to include multiple variables it can be expressed as

$$Y = \beta_0 + \beta_1 x_i + \beta_2 x_i^2 + \ldots + \beta_n x_n + \varepsilon_i \tag{9}$$

where β_1 to β_2 are the coefficients of the independent variables x_i to x_n. As mentioned, the difference of the model is in the number of the independent variables and their respective coefficients making able the simultaneous observation of how the set of different independent variables affect the dependent variable.

Multiple regression analysis using the OLS method is in level with previous academic event studies (e.g. Krüger, 2015) where the objective is to analyze the possible causing factors of abnormal returns. This study follows the previous studies' method and the

notion of a well-conducted event study by McWilliams and Siegel (1997) by analyzing the calculated abnormal returns with OLS regression in the empirical section of this study.

Therefore, in order to examine the effect of different aspects of the Global 100 -list of 2019 to the abnormal returns, models of regression which attempt to describe the formation of abnormal returns are formed. The regression models which are named correspondingly are shown in the formulas 10–13. The models 10 and 11 are examining effects of rankings, previous ratings, and appearances on the list to the principal test's event day ARs, and the models 12 and 13 are examining the effects of prior variables to the principal test's three-day CARs.[18] Models 10 and 12 are used to test the third hypothesis and models 11 and 13 are used to test the second and fourth hypothesis. The variables presented and their explanations are listed in table 2.

$$AR[0] = \beta_0 + \beta_1 \text{Newinfo} + \beta_2 \text{LnAssets} + \beta_3 \text{Leverage} + \beta_4 \text{EV/EBITDA} + \beta_5 \text{P/B} + \varepsilon \tag{10}$$

$$AR[0] = \beta_0 + \beta_1 \text{Rank} + \beta_2 \text{Newcomer} + \beta_3 \text{LnAssets} + \beta_4 \text{Leverage} + \beta_5 \text{EV/EBITDA} + \beta_6 \text{P/B} + \varepsilon \tag{11}$$

$$CAR[-1,1] = \beta_0 + \beta_1 \text{Newinfo} + \beta_2 \text{LnAssets} + \beta_3 \text{Leverage} + \beta_4 \text{EV/EBITDA} + \beta_5 \text{P/B} + \varepsilon \tag{12}$$

$$CAR[-1,1] = \beta_0 + \beta_1 \text{Rank} + \beta_2 \text{Newcomer} + \beta_3 \text{LnAssets} + \beta_4 \text{Leverage} + \beta_5 \text{EV/EBITDA} + \beta_6 \text{P/B} + \varepsilon \tag{13}$$

The "new info" -independent variable is used to examine the ARs and CARs, as it was hypothesized that the stock market's reaction to positive CSR performance information would be larger since the high level of performance could be higher than anticipated. The "rank" variable is used to answer the second hypothesis and the "newcomer" variable is used to test the fourth hypothesis.

[18] Karafiath (1994) illustrated that the OLS regression model fits well in examining abnormal returns as dependent variables, and that there is not a problem with heteroskedasticity or collinearity of the variables.

Table 2
Description of regression variables

Variable	Description
AR [0]	Company's event day abnormal return
CAR [-1,1]	Company's cumulative abnormal return from the three-day event window
Newinfo	Dummy variable which will receive value 1 if the company has been previously unrated by Corporate Knights and have no CSR rating in Thomson Reuters' database, 0 otherwise[19]
Rank	Company's relative ranking in Corporate Knights' 2019 Global 100 -list
Newcomer	Dummy variable which will receive value 1 if the company has not been in the previous year's Corporate Knights' Global 100 -list, 0 otherwise
LnAssets	Natural logarithm of the company's assets. Assets represent the sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment, and other assets
Leverage	Company's long-term debt and short-term debt divided by common equity
EV/EBITDA	Company's enterprise value divided by analysts' forecasts of earnings before interest, taxes, depreciation, and amortization
P/B	Company's market capitalization divided by the book value of equity

Additionally, a set of control variables is selected. Following Yadav et al. (2016), the natural logarithm of the company's size is used to control abnormal returns, since the company's size could be one of the drivers of visibility, and since CSR was argued to correlate to the company's value only if it was highly visible (Aouadi & Marsat, 2018). The natural logarithm of the values is used due to its distributional advantages in regression analysis (Heikkilä, 2004, 252). According to Krüger (2015, 315) market might be reacting differently to CSR performance news considering companies in financially problematic situations, since the CSR performance information might be more good news. Therefore, following Krüger (2015) company leverage is controlled. Additionally,

[19] The Thomson Reuters database is a prominent source of CSR performance information used for research purposes e.g. (Aouadi & Marsat, 2018; Eccles et al., 2014) It is therefore considered that the database can illustrate the general market's awareness of CSR performance information, and the information, which is not in the database can be considered as "new".

measures of companies' valuation relative to their capital structure and capability of generating cash flow are used to control the abnormal returns, hence the P/B and EV/EBITDA measures are expected to correlate negatively with abnormal returns suggesting that potentially undervalued companies or companies from industries which have lower multiples e.g. due to heavy depreciation costs might gain more positive abnormal returns.

Additionally, to analyzing the abnormal results the statistical correctness of the model's variables must be assessed. Autocorrelation of residuals and multicollinearity of the variables are tested with the Durbin-Watson test (Durbin & Watson, 1950) and the Variance inflation factor (VIF) tests respectively. The Durbin-Watson test measures the similarity of time series over consecutive time intervals and the VIF is a measure of how much the variance of a coefficient in regression analysis is increased because of collinearity to the other variables. As with the generalized rank test, this study does not extensively go through the procedures of the tests.

3.3 Theoretical assumptions

A set of theoretical assumptions regarding the empirical tests' validity and the proper execution of the research design must be met for the event study analysis and regression analysis methods to work. First, the theoretical assumptions for the event study method are discussed followed by the discussion of theoretical assumptions of the regression analysis.

The most crucial assumptions for an event study are efficient markets, unanticipated event, and the lack of simultaneous events distorting the event window or the estimation window (McWilliams & Siegel, 1997, 650). Additionally, there are other assumptions regarding the market model and the functional aspects regarding the reference market index, the liquidity of the stock, and the timeline of the information's diffusion to the markets. These assumptions will be discussed in this section.

The first assumption, efficient markets have been thoroughly studied in the economic literature and the premise of efficient markets lies in the basis of the event study. As

mentioned in prior, market efficiency indicates that all stock prices incorporate all the information that is available to investors. Whenever new information considering a stock emerges, stock prices will quickly incorporate the information by setting to a price level that mirrors the value of the future cash flows of the company. (Fama, 1970.) Therefore, additional information that results in the adjustment of a stock's price can be considered as an event in event studies (McWilliams & Siegel, 1997, 630). Previous indicates that the market reactions are quick and accurate in reflecting the information's effect.

Since stock prices incorporate all available information, the timeframe of the effect of the information taking place is irrelevant. Therefore, according to the efficient market hypothesis, only things that have not been anticipated by the market can cause the market to react. An event that has an effect on a company must be an unknown ex-ante for the event study method to work.[20] (McWilliams & Siegel, 1997, 634.) This makes measuring abnormal returns feasible from the point in time where new information to the public became available. Sometimes due to information leakages, it can be difficult to determine when the market became aware of the information, therefore the event window can be extended prior to the event to capture the possible effect of the leaked information (see e.g. Krüger, 2015).

The third assumption in event studies considers the isolation of the studied event from other events which could create a bias in the model. It is critical that no confounding events, which have a material effect on a company's market capitalization are happening during the estimation or the event windows. Such events could be for example declaration of a merger or additional dividend. With estimation windows controlling confounding events can mean a paradoxical selection between sufficient amount of data and the accuracy of the data, since long estimation windows will include more probably confounding events in them, distorting the market model α and β parameters. (Bromiley, Govekar & Marcus, 1988, 33.) The case is more straightforward with the event window, where the efficient market hypothesis justifies a short window of measurement. These

[20] In the context of this study, though the event dates (the publications of the global 100 -list) had been known in the market, the content of the list was unknown. Since the content of the global 100 -list is essential part of the event (without the content there could not be any reaction) the event can be considered as unexpected. Such is with e.g. earnings announcements, where the dates are known for the public, but the content of the announcement is not (see e.g. Ball & Brown, 1968). Previous is seen as sufficient for the validity control for the assumption that the event had been unanticipated by the market, since usually only with corporate control issues the assumption of unanticipated information is a concern which needs a more thorough examination (McWilliams & Siegel, 1997, 634).

assumptions are thus interconnected to efficient market assumption, since the more efficient the market is the smaller the estimation window can be, lowering the probability of material outside events happening during the event window.

Accompanying assumptions regarding the functionality and the accuracy of the market model are considering the relationship and liquidity base of the stocks and the reference market indices. Infrequent trading in both the stocks' and indices' cases could lead to difficulties estimating the parameters of the market model during the estimation window and potential bias caused by non-efficient markets during the event window. Additionally, the relationship between the reference index and the observed stock must remain stable. The time series between the stock and the index needs to be similar in order to effectively and accurately estimate the relationship between the two components. Infrequencies such as market holidays and missing data need to be at a minimum to justify accurate modeling of the relationship of an index and a stock. Previous has been controlled in this study by extending the beginning date of the estimation period by the number of days such infrequencies have happened to make sure the parameters are not biased.

Additionally, there is a number of statistical assumptions with abnormal returns calculated by the market model. Brown and Warner (1985, 26) discuss the most prominent ones. They show that autocorrelation among AARs in hypothesis tests over multi-day intervals can be mitigated with certain procedures, but the improvement is small and only apply for special cases such as with non-synchronous trading which does not happen in the context of this study. Therefore, it is assumed that the small-scale autocorrelation is not material for the results and not controlled in calculating the abnormal returns.

However, this study's empirical part is partly exposed to the cross-sectional correlation of market model residuals i.e. abnormal returns generated by the market model. One of the statistical assumptions of calculating abnormal returns is that residuals are not cross-sectionally correlated but independent measurements. Cross-sectional correlation happens when the event dates in an event study are clustered, which can cause cross-sectional metrics such as AAR and CAAR to be biased (Brown & Warner 1980, 1985). Cross-sectional correlation of residuals is widely discussed in event study literature (see e.g. Bromiley et al., 1988; Armitage, 1995; Campbell et al., 1997; Lee & Varela, 1997).

The standard market model assumes independence among observations of abnormal returns. Selecting events with similar event window dates can cause biases in the results for the lack of such independence (Bromiley et al., 1988, 35). Such potential bias can be generated, since the publication of the Global 100 -list happens during the same date for most of the events. The bias can increase the probability of type 1 error, the rejection of a true null hypothesis, in hypothesis testing. This can happen due to the increased variance of the abnormal returns compared to deviation from historical mean returns (Brown & Warner, 1980, 232).

Although event date clustering can cause disparities for the event study methodology, it is acknowledged that event studies can be performed with clustered dates (Kothari & Warner, 2007, 12). Contrary views have been also presented by Bromiley et al. (1988, 35) stating that event study methods are inappropriate for evaluating the effect of a single event to a sum of companies. However, clustered events have been used in academic research, even in the context of CSR (see e.g. Gupta & Goldar, 2005; Yadav et al., 2016). Additionally, it has been argued that the market model is the best method for examining clustered event dates, which is used in this study (Lee & Varela, 1997, 222–223). Due to this study's weighty clustering of event dates, the potential biases in measuring abnormal returns must be examined carefully. The correcting actions to cross-sectional correlation are implemented and discussed more thoroughly in the following sections of this study.

As for the regression analysis, there are also a set of assumptions needed to be met. The first one considers the multicollinearity of the model. The variables in the model cannot be heavily correlated with each other. If they are, it causes the model to be biased and unreliable in determining the individual correlations of the variables. All the other main assumptions consider the residuals of the regression model. The residuals must be normally distributed and homoscedastic in order for the regression model to produce reliable results. Lastly, the residuals cannot be heavily autocorrelated which can distort the model's effectiveness in determining the coefficients. These assumptions are tested in the second part of the empirical section. First, a correlation analysis is performed between all the variables in the regression analysis. Then the multicollinearity is observed with VIF and tolerance metrics, the normality and homoscedasticity are observed with normal probability plot and homoskedasticity plot graphs, and the autocorrelation is tested with the Durbin-Watson test.

3.4 Course of research

The announcement of the 2019 Global 100 -list is selected to be observed in this study, as it is considered to represent fairly appropriately unexpected news of the companies' levels of CSR performance. McWilliams and Siegel (1997,627) discuss the importance of reporting the steps taken in implementing the event study methodology. Thus, the readers of the study can confidently observe the validity of the inferences drawn. Therefore, this section discloses the steps taken in the empirical part of this study to make the examination of the validity and the reliability easier for the reader.

For the checking that the theoretical assumptions are met and for the empirical analysis of this study, all of the financial data regarding the sample companies are gathered from the Thomson Reuters Eikon Datastream. Thomson Reuters is a public Canadian information and media company, which offers, inter alia, data for finance professionals and scholars through its databases. The Thomson Reuters database is used as a source of company data in top research regarding CSR and financial markets (see e.g. Eccles et al., 2014), and therefore is perceived to be a suitable source of data.

The Global 100 -list of 2019 consisting of the 100 most sustainable companies according to Corporate Knights was announced on the 22nd of January. Brown and Warner (1980, 249) have discussed the importance of picking the right event date for the study since the event day outlines the result of the study by a considerable amount. After an exhaustive internet search, it was concluded that the first forum of publication of the Global 100 -list was an online social media platform Twitter, where Corporate Knights tweeted the announcement of the list at 8:51 GMT.[21] Since the sample of this study consists of companies from North and South America, Europe, Asia, and Oceania, the local time the list was announced ranged from 3:51 in the United States to 18:51 in Australia.

This disparity among the hours of the announcement causes a lack of synchronism in the trading hours of the stock market. As the announcement was made, the European stock market was opening, while the Americas had six hours until the market would be open.

[21] Reuters and other news entities followed the announcement in the approximate timeframe of 30 minutes. Therefore, it is assumed that the part of market which was not aware of the event date prior hand got aware of the data considerably quickly. The announcement can be found at Twitter (https://twitter.com/corporate knight/status/1087648997043593216).

Meanwhile, Asian and Australian markets were closed. This conflict in trading hours is resolved as Park (2004, 660–661) suggests, by lagging the dates of the event and estimation windows of the Asian and Australian sample companies of both the tests by one day of the models that have a world-wide sample of companies.

Since the event study method has a theoretical assumption of market efficiency and the liquidity of the stocks observed, it is necessary to measure the trading volumes of the stocks of the sample companies. All stocks were considered as liquid as the lowest turnover volume of a single stock in a single day of the estimation and event windows was 13 700. The stocks' turnover volume medians ranged from 93 900 to 143 520 100, which were considered as characteristically liquid.

Next, all the confounding events happening in the sample were controlled. All events unrelated to the subject matter which might have a major impact on companies' market capitalization were examined. McWilliams and Siegel (1997, 634) suggest multiple different sporadic events that might affect market capitalization, which were all controlled in this study: First, all the dividend payments were controlled by using price data that was adjusted accordingly to dividend payments. Second, announcements of mergers and acquisitions were controlled examining "Significant Company Transactions (M&A) Shareholders Approval" time series with Thomson Reuters Datastream, and since previous data did not cover the whole sample, a Datastream of companies' market capitalization changes were examined for augmentation of the first method. One company from the principal test sample, Takeda Pharmaceutical, had a material acquisition ongoing during the estimation window and therefore was left out from the sample.

Third, changes in key executives were controlled by examining "Management Departures" time series in Thomson Reuters Datastream. Novo Nordisk A/S, Tesla Inc., and ING Groep N.V. were having turnaround among their top executives, but after more detailed examination to the effect of market capitalizations only Tesla's capitalization had a material disturbance caused from the turnaround of top management, therefore Tesla was left out from the sample. Additional confounding events, such as announcing major government contracts, new products, damage or lawsuits, or unexpected earnings were controlled by examining the peak fluctuations in market capitalizations of the sample companies. All intraday capitalization changes larger or smaller than 20%, were examined. Several companies had material events happening during their estimation

windows: Outotec oyj had an accident with their blast furnace, Valeo S.A. had a major negative earnings announcement, and quite paradoxically, Bombardier Inc. had a government investigation due to suspected insider trading among other turbulence, therefore the three prior companies were left out from the sample.[22]

There are several noteworthy issues when selecting the indices for an event study with a global sample of companies. These include selecting the provider, the weighting, and adjusting the effects of the global economy. The leading index providers used in prior global scale event studies have been Standard & Poor's (S&P), Morgan Stanley Capital International (MSCI), and Financial Times Stock Exchange. (Park 2004, 659.) In this study indices by the MSCI are applied in the empirical models. The MSCI indices are argued to be a paramount group of international indices, and when the same index provider is used, necessities such as rebalancing are happening systematically and similarly for each index without causing any biases in estimation (Chakrabarti, Huang, Jayaraman & Lee 2005, 1239). Although the S&P 500 -index is one of the most followed equity indices and used in several recent event studies as a benchmark (see e.g. Amato & Amato, 2012; Yadav et al., 2016), this study uses MSCI USA index as its benchmark for companies from the USA. Tests were made with both the indices as benchmarks, and similar results were obtained. Therefore, it is seen that using a single index provider could generate better comparability between models and reduce the risk of omitted variable bias in the respective front.

While Brown and Warner (1980, 248) argue that in comparison to equally weighted indices, the value-weighted indices, such as the MSCI indices, reject the null hypothesis too often, Armitage (1995, 33–34) describes that there are no significant differences to the end result when using value or equal weighting. Early event study scholars have developed their own indices and saw the use of accessible indices as an "ad-hoc

[22] Theory suggests that a company with high level of CSR performance has less risks for foregoing harmful events due to dishonesty. Thus, when a company with alleged high level of CSR performance is dishonest and suffers the consequences, and when that same company is removed from the study, a question of the objectivity of the study can be raised. The case of removing Bombardier Inc. could be seen as a procedure affecting to the integrity of the study, since removing a CSR-awarded company from the sample which acts contrarily could be seen as biased and as an attempt to influence in the results of the study. Nevertheless, as the foundation works of event study method (e.g. MacKinlay, 1997; McWilliams & Siegel, 1997) suggest removing all the simultaneous events without discussing whether it is related to the studied event or not, it is seen in this study that the major corrections stock market did with the stock of Bombardier caused the estimation window to be inaccurate and biased and therefore the normal returns of Bombardier were seen as not suitable for the study.

procedure" (Brown & Warner, 1980, 248), while more recent studies have used the indices provided by established companies such as S&P. This study's method follows the more recent literature picking the most suitable established indices in its models.

Park (2004, 659) suggests using a model where both global and local indices are used among the exchange rate factor of the currency of the country to control the global effects in event studies. However as mentioned earlier, the problem with such multifactor models can be that the explanatory and statistical significance of the added factors can be low, thus causing unnecessary complexity to the model (MacKinlay, 1997, 18). It is seen in this study that country and currency specific indices already act as a buffer for exchange rates and worldwide events when measuring the normal returns since the indices reflect the fluctuations in exchange rates similarly and are fairly interconnected with worldwide equity markets. Country specific indices have also the ability to reflect country-specific events such as political decisions that affect the market (Park, 2004, 660). Additionally, random samples of stocks from the sample were generated to test the coefficients of determination with a given set of indices in the market model. The MSCI country-specific indices performed consistently well, giving r^2 values that ranged from 0,054 to 0,893. All the reference indices used in market models are listed in appendix 1.

The estimation and event windows are a crucial part of event studies and their lengths need to be well-argued (McWilliams & Siegel, 1997). For the estimation period of this study, a common window length of 120 days is used following the work of Campbell et al. (1997, 152). Armitage (1995, 34) examines the differences in estimation window lengths and their effects on the event study method and argues that an estimation period of approximately 100 days is a secure way to establish an estimation window. The estimation window in this study is set that it ends ten days prior to the event day so that the estimation parameters would not be biased from the possible fluctuations of the event. The dates of the estimation and event windows can be observed from appendix 3.

Although Amato and Amato (2012) and Gupta and Goldar (2005) use event windows of 10 days in similar researches to this study it is noteworthy to acknowledge that the power of the test is substantially reduced as the time period of the event window lengthens (Brown & Warner, 1980, 225–226). The longer the event window is, the greater is the possibility of confounding events happening during the period of examination (McWilliams, Siegel & Teoh, 1999, 354). Since there are not any specific theoretical

arguments why the event window should be extremely long, three different event windows of three, two, and five days are used in this study. This method of multiple event windows is common among event study research (see e.g. Krüger, 2015), and it raises the probability of capturing the market reaction to the event.

Since it is argued that well-designed event studies hardly ever exceed three trading days in their event window (McWilliams et al., 1999, 353), the three-day model acts as the main framework of investigation of abnormal returns. The three-day event window is used for example by Klassen and McLaughlin (1996) and Yadav et al. (2016). The three-day window captures a day before the event day τ to ensure the possible information leakages being obtained in the three-day CAARs. There are not any strong arguments for the leakage of information, but the publication of the Global 100 -list happened on Tuesday, a day after the World Economic Forum had started, which could have caused an increase in the probability of the information leaking in the conference before the publication.

McWilliams and Siegel (1997, 636) discuss the advantages of measuring abnormal returns with a short event window noting that scholars have captured significant effects even with 15- and 90-*minute* windows. This is backed by Campbell et al. (1997, 176) arguing that since expanding the event window lowers the power of the model, a two-day event window is worth bearing that cost in order to not miss the event. Thus, a two-day event window is used as an alternative measure of CAARs to get more precise results around the event day. However, the two-day model does not deal with any information leakages.

A five-day window acts as the third window of capturing the abnormal returns in the event. It is constructed to check the robustness of the results of the prior two windows but also as a safety measure, since Oler et al. (2008) have argued that short event windows might not always capture the economic impact of highly complex situations. CSR might be a vague concept for the markets, requiring some time to digest the information and its usefulness for the companies. This contradicts the efficient market hypothesis.

As mentioned earlier, a noteworthy issue with this study's principal test is the cross-sectional correlation of the market model residuals i.e. abnormal returns due to event date clustering. To deal with this problem, a number of actions have been taken in order to

mitigate the distorting correlation: First, the market model is used to mitigate the correlation (Lee & Varela, 1997, 222–223). Next, short event windows are used, which have mitigating effects on cross-sectional correlation (Kothari & Warner, 2007, 50). Third, country-specific indices are used in part of the models to isolate the companies from each other. Additionally, the one-day lag of Asian and Australian stocks in the event and estimation windows mitigate the clustering slightly. Finally, the generalized rank test is used to test the results' statistical significance which is immune to cross-sectional correlation. Prior methods are seen as sufficient to mitigate the cross-correlation, and though there are models that specifically can adjust cross-sectional correlation, Brown and Warner (1985, 26) state that these tests lose half their power when they are utilized.

Next, three models are constructed based on the geographical locations of the companies in order to calculate the abnormal returns. [23] This is done to broaden the comprehension of geographical differences in the market's responses to CSR performance information, as it had been reported in earlier studies that the stock market could have geographical differences in reactions to different types of information. After the calculation of abnormal returns, the event day ARs and the three-day CARs of the global model are regressed with OLS regression analysis in order to test the potential drivers of the potential abnormal returns.

[23] Models considering the USA and Europe are constructed in parallel to observing all the companies in the "global" model. Though the global 100 had companies from rest of the North America, Asia and South America they did not have enough companies in order to fulfill some of the statistical requirements needed for the event study method. Europe was considered to be economically united, so that a model consisting European companies could be constructed. No companies from the countries of Africa were in the global 100 -list.

4 ANALYSIS AND RESULTS

4.1 Descriptive statistics

The sample for the "Global" abnormal return model consists of the Global 100 -list of 2019, with the five companies which were having confounding events during the event window removed. The descriptive statistics of the main sample are listed in table 3. The Asset and market capitalization characteristics are shown in millions of US dollars. The sample consists of fairly large companies, since Corporate Knights' method of selecting limited the universe to public companies with over $1 billion in revenue. The over two trillion of assets belong to the French BNP Paribas S.A., which is the largest company of the sample. The price to book values range is also quite extensive, HP Inc. had negative equity at the time of the event, so the P/B value was drawn down to -144,7. The CSR score is the Corporate Knights' Global 100 -score which can have values between 0% to 100%. The company with the highest level of CSR performance in 2019 Global 100 -list was Danish Chr. Hansen A/S, which is a global bioscience company.

Table 3
Abnormal return Global model's sample statistics

$N = 95$	Mean	Median	SD	Min	Max
Assets	162,7	22,4	387,9	1,4	2343,8
Market Cap	46,0	23,8	62,7	1,1	374,3
P/B	2,9	2,1	20,5	-144,7	110,3
Leverage	1,0	0,5	2,4	-10,3	7,7
CSR Score	64,4%	65,6%	10,7%	38,5%	83,0%

The additional abnormal return models, which measured only companies from the USA and Europe are not shown here due to the fair similarity of the statistics and in order to conserve space. The USA and Europe models had sample sizes of 22 and 48 respectively.

The sample of the cross-sectional analysis consists of the same 2019 Global 100 -list, but it differs slightly from the abnormal return sample, since all the banks, investment service companies, and insurance companies were removed due to their differences in their business models leading to different statistics in their metrics. For example, all the banks have characteristically high leverage compared to e.g. industrial companies, which markets can, but which the regression analysis cannot reconcile in its calculations. This removing of financial companies is following Eccles et al. (2014) and Yadav et al. (2016), who also removed financial companies from their samples when studying the value implications of CSR performance.

Table 4
Cross-sectional analysis' sample statistics

$N = 75$	Mean	Median	SD	Min	Max
Assets	41,5	15,3	72,3	1,4	465,8
Market Cap	45,6	22,7	63,8	1,1	374,3
P/B	3,3	2,9	22,9	-144,7	110,3
Leverage	0,6	0,4	2,2	-10,3	7,7
CSR Score	64,2%	65,8%	11,2 %	38,5%	83,0%

The regression sample can be observed in Table 4. The sample size is reduced by 20 since financial companies were a significant part of the Global 100 -list. This is an interesting characteristic in Corporate Knights' sample since it has been argued that financial companies have a business, where many of the environmental and social policies are not likely being material or applicable to them (Eccles et al., 2014, 2840). The elimination of financial companies can be observed in differences in the descriptive statistics of assets, otherwise, the characteristics of the two samples are fairly similar. An interesting finding is that when the banks are removed the statistics of the CSR score are barely affected.

4.2 Abnormal returns

The abnormal returns calculated from the event periods can be observed from table 5. It exhibits three models, which all are observed under the three different event windows.

The size and the statistical significance of the abnormal returns give evidence for the first hypothesis test. Each box in the table reports the size of the abnormal return on top, the cross-sectional t-statistic in the middle in parentheses, and the generalized rank test in the bottom in square brackets. The statistical significance of the t-statistic and the generalized rank test have been reported by sets of asterisks demonstrating three individual levels of statistical significance. The square brackets for the CAARs and the AARs represent the lengths of the event windows and the event window dates respectively. The reported AARs are taken from the corresponding CAAR [-2,2] -models and their matching AARs to different event window models are constant.

Table 5
Abnormal returns

	USA	**Europe**	**Global**
CAAR [-2,2]	-0,0019 (-0,2383) [0,2852]	0,0014 (0,5327) [-0,0331]	0,0010 (0,3696) [0,3548]
CAAR [-1,1]	0,0015 (0,4958) [0,0808]	0,0024 (1,2505) [0,5761]	0,0015 (0,8752) [0,2060]
CAAR [0,1]	0,0019 (0,6377) [0,2046]	0,0019 (0,9821) [0,9577]	0,0016 (1,0503) [0,9047]
AAR [-2]	0,0018 (0,6933) [0,8992]	0,0004 (0,2499) [0,6950]	0,0009 (0,6958) [0,7670]
AAR [-1]	-0,0005 (-1,7171) [-1,2750]	0,0004 (0,3322) [0,1610]	-0,0002 (-0,2383) [-0,0327]
AAR [0]	0,0039 (1,9511)* [1,7086]	0,0007 (0,5875) [1,1500]	0,0012 (1,3968) [1,4714]
AAR [1]	-0,0020 (-1,0029) [-1,0454]	0,0012 (0,8093) [0,7129]	0,0003 (0,2480) [0,0855]
AAR [2]	-0,0051 (-0,8082) [-0,3813]	-0,0012 (-0,6594) [-0,5982]	-0,0012 (-0,6438) [-0,3592]

*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level

The examination of the table numbers provides a picture of the size of the stock market's reaction to the Global 100 -list. Abnormal returns generated over the different event periods and during the event days are moderately small in absolute values. The two- and three-day windows show positive CAARs in all the models, whereas the five-day window's results are more manifold. The largest positive cumulative reaction is in the Europe three-day event window, with 0,24% total cumulative average abnormal return across sample companies. Though the positive CAARs could suggest that the market reaction during the event windows could be positive, all the CAARs lack strong statistical significance, which therefore gives no support for the first hypothesis.

The small values of CAARs show that the models have not captured powerful overall positive abnormal returns during the event windows. Furthermore, it suggests that there has not been a material reaction from the stock market to CSR performance information. Additionally, there is a possibility that the models have captured confounding events, which might disturb the total values of CAARs. It is possible that markets have reacted to other events that have created negative abnormal returns prior to the event day diluting the total value of the CAARs. Confounding events could have a higher marginal chance of occurring during the 5-day event window, since the -2 day on the event window was the Friday of the prior week, except for the companies from Australia and Oceania, stretching the date further from the actual event date. Therefore, the prior week might have had some events unrelated to this study. This distortion of results caused by longer event window would support the notion of McWilliams and Siegel (1997, 652) suggesting that scholars need to well justify the event window length if it exceeds two days because it has a much greater risk of capturing events unrelated to the one being studied. The cumulative formation of CAARs, which can illustrate the potential effect of confounding effects in more depth is observed later in this section.

During the event date, all of the models have captured positive AARs among the sample companies, from which the returns of the USA-model are significant at 10%-level. It could, therefore, suggest that the market has responded positively to CSR performance information considering the companies from the USA. However, this is not supported by the generalized ranked test, which shows no statistical significance for the USA event day AAR. The generalized rank test can be considered to be the better measure of statistical significance in this case, since it is immune to the cross-sectional correlation this model

could have. The Europe-model shows positive but weak AARs from the event day which are not statistically significant. The global model shows larger AARs, but they too lack statistical significance. It is possible that the companies from the USA are rising the average value of the global model giving it a higher value. Since only one of the models showed statistically significant abnormal returns and the statistical significance is only at the 10%-level which is often considered only as a "symptomatic" level of significance, the first hypothesis receives no material support.

Table 6 augments the nature of abnormal returns by showing in its first column first the number of positive returns at the numerator and the number of the negative on the denominator and then in the adjacent columns the relative amount of negative abnormal returns in the different models. This follows the suggestion of McWilliams and Siegel (1997, 652) and it has been calculated from the inner distribution of abnormal returns of each CAAR and AAR metric by dividing the amount of negative abnormal returns by the total number of abnormal returns calculated to form the respective metric. It gives a percentual value, where the closer to 50% the value is the more evenly distributed the abnormal returns calculated to form the metric in the first column of the table are. In other words, the 50% value signifies that there have been exactly as many negative abnormal returns as positive ones in the formation of the metric, which indicates that the potential market reaction to the information has been divided.

Table 6
Distribution of abnormal returns

	USA		**Europe**		**Global**	
	Amount	Negative	Amount	Negative	Amount	Negative
CAAR [-2,2]	11/11	50 %	26/22	46 %	51/44	46 %
CAAR [-1,1]	11/11	50 %	24/24	50 %	46/49	52 %
CAAR [0,1]	10/12	55 %	28/20	42 %	53/42	44 %
AAR [-2]	13/9	41 %	27/21	44 %	50/45	47 %
AAR [-1]	9/13	59 %	24/24	50 %	48/47	49 %
AAR [0]	16/6	27 %	30/18	38 %	58/37	39 %
AAR [1]	9/13	59 %	25/23	48 %	45/50	53 %
AAR [2]	9/13	59 %	25/23	48 %	44/51	54 %

Fairly even distribution among positive and negative abnormal returns can be observed. The CAAR models are close to being almost evenly distributed. This suggests that the values of individual company CAARs have been both negative and positive, which means that during these multi-day periods the market has not responded in synchronization. This means that though most of the values of the abnormal returns are positive, the general reaction to different companies has been diverse and has lacked consensus. However, the event day AARs show the lowest values of relative negative returns. This could suggest that markets have reacted, and the reaction has been on the positive side to the CSR performance information. Therefore, the reaction to the Global 100 -list is inclining towards positive during the event day, and the average values there are not simply driven by outliers. However, this finding as itself is not significant enough to support the first hypothesis so that the null hypothesis could be rejected.

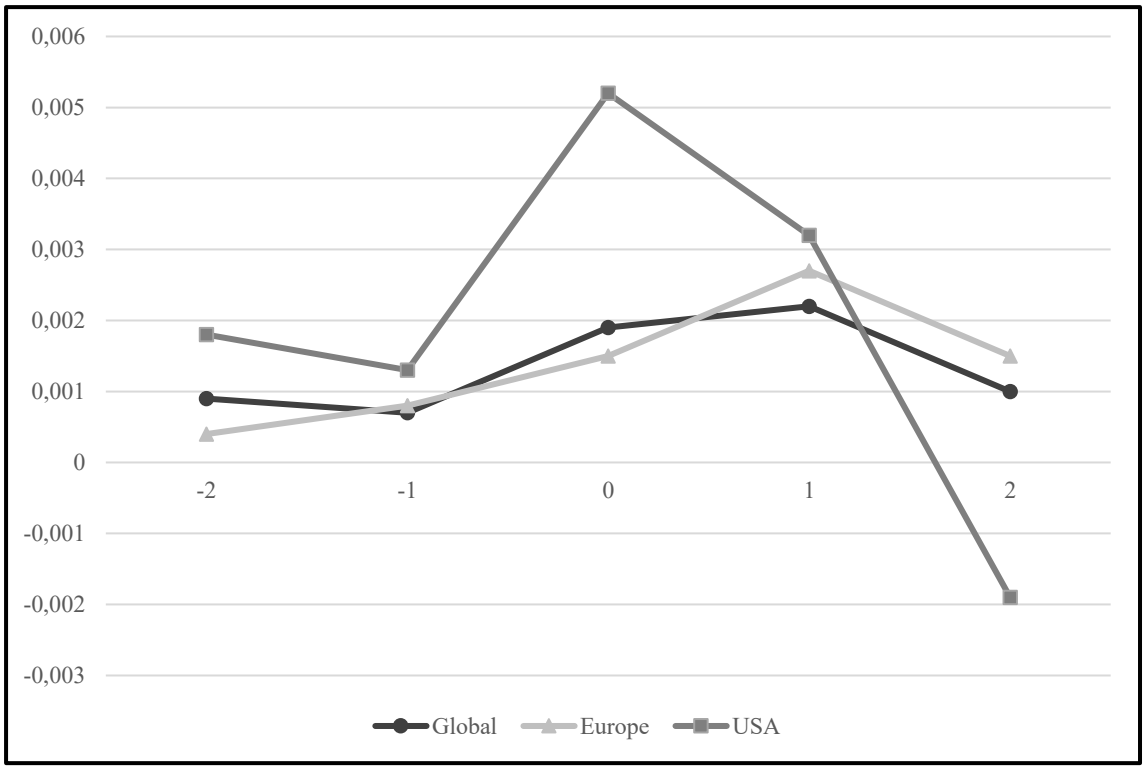

Figure 4 Cumulative average abnormal returns

Figure 4 illustrates the cumulative formation of AARs of the three models from the five-day event window. The USA model shows a cumulative increase of AARs between

companies during the event day following correction and a decline to an overall negative value. The USA model shows a market reaction followed by an immediate countering reaction on the following day. This might be due to increased attention towards the companies generated by the Global 100 -list and the publicity following it, followed by market sobering from the hype or market parties taking advantage of the possibly overstated price.[24] The Global and the Europe models show a slower reaction to the event, illustrating possible market inefficiency since the overall peak of the abnormal returns happens a day after the event day. This is followed also by a correction in the opposite direction, possibly for the same reasons as for the USA model. All in all, the overall trend of AARs seem to be a rise during the event day, followed by a decline caused by negative AARs.

It seems that the abnormal returns during the event have not been significantly large. Additionally, the lack of statistical significance of the results suggests that there has not been a material reaction from the market to the Global 100 -list's CSR performance information. Therefore, the is also a possibility that the above illustrations can be ripples caused by other events. However, the slight statistical significance of the USA model's event day AAR and the overall trends in the reactions around the event day suggest that the market might be reacting in a very subtle way to CSR performance information, and that certain types of companies or certain aspects considering the publication of the information have affected the formation of abnormal returns. Therefore, the abnormal returns are examined cross-sectionally to discover whether certain aspects have affected to market's reaction in the following section.

4.3 Cross-sectional analysis of abnormal returns

The possible originators of the returns are observed with OLS regression analysis in this section. The method and the formation of the variables were presented in section 3.2,

[24] This finding is a mirror image of what Halme and Niskanen (2001) showed. They argue, that CAAR values should randomly vary and not have a definite trend after the event, and that the explanation to corrective movements from initial reaction could be due to over-reaction or erroneous reaction from the market. Therefore, possibly due to attitude changes towards CSR performance, it can be that the market overreaction to CSR performance information has shifted from negative to positive over time.

where the different models' nuances are also discussed. The results are presented first followed by the examination of the robustness of the regression model.

Table 7 shows the results of the regression analysis. The regression coefficient and the t-statistic in parentheses are listed. As in prior, the statistical significance of the result has been reported by sets of asterisks demonstrating three individual levels of statistical significance. To be noted is that the regression coefficient values are small because the observed abnormal returns were small in absolute values.

Table 7
Results of cross-sectional analysis

Dependent variable		**Model 10** ($N = 75$) AR [0]	**Model 11** ($N = 75$) AR [0]	**Model 12** ($N = 75$) CAR [-1,1]	**Model 13** ($N = 75$) CAR [-1,1]
Constant		-0,0045	-0,0048	0,0182	0,0185
		(-0,4919)	(-0,5336)	(1,0383)	(1,0874)
	Expected				
New info	+	0,0006		-0,0029	
		(0,2514)		(-0,6483)	
Rank	+		2,21E-05		-3,42E-05
			(0,6105)		(-0,4961)
Newcomer	+		0,0029		-0,0081
			(1,3042)		(-1,9235)*
Ln Assets	+	0,0001	-3,48E-05	-0,0011	-0,0009
		(0,1552)	(-0,0739)	(-1,2244)	(-0,9833)
Leverage	+	-0,0003	-0,0002	-0,0015	-0,0016
		(-0,3890)	(-0,3263)	(-1,1963)	(-1,2933)
EV/EBITDA	-	0,0003	0,0003	0,0002	0,0002
		(2,1564)**	(2,0925)**	(0,6433)	(0,7784)
P/B	-	0,0001	4,58E-05	0,0002	0,0002
		(1,1783)	(0,8827)	(1,7412)*	(2,1359)**
R^2		0,0836	0,1251	0,0789	0,1451
Adjusted R^2		0,0172	0,0479	0,0122	0,0696
F-score		1,2593	1,6210	1,1828	1,9230*
Durbin-Watson		1,8412	1,8769	1,9377	2,0375

*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level

Based on the third hypothesis, it was assumed that the reaction of the stock market would be bigger for new information about CSR performance. Model 10 shows a weak but positive coefficient from companies' abnormal returns regarded as new information. Contrarily, model 12 shows a negative coefficient for new information, which is the opposite of what was expected. This difference between the models can be caused by the dependent variables since the three-day CAR models did not show as coherent values in abnormal returns, which can distort the measures of the independent variables. However, the coefficients of the "New info" variable in both the models lack statistical significance and have opposite coefficients, which therefore leaves hypothesis three unsupported.

Also, contrarily of what was expected, companies' EV/EBITDA multiple has a positive coefficient which is statistically significant at the 5% level in models 10 and 11. This discovery is highly interesting since it suggests that companies with higher valuations relative to their earnings had higher abnormal returns during the event day. This could be since the companies have higher expectations of future performance, any news considering present good performance triggers even bigger investor expectations. Additionally, it could relate to the capital intensity of the companies, in which EBITDA is higher to reconcile higher depreciation costs. It would then support the claim of Wagner (2007), who suggested that higher CSR performance leads to higher profits in manufacturing industries, which can have heavy investments in manufacturing machinery. This can, however, consider being unlikely due to the long chain of reasoning.

The regression models 11 and 13 examine the relation of companies ranking and their prior appearance in the Global 100 -list. The "rank" variable has both slightly positive and slightly negative coefficients in explaining the formations of ARs and CARs respectively. Both coefficients lack statistical significance, so the second hypothesis leaves also unsupported. The ranking has had no statistically significant effect on the formation of abnormal returns. However, the "newcomer" variable in the model 13 is significant at 10% level with a negative coefficient, which suggests that companies appearing on the list for the first time have received lower abnormal returns than companies repeating their appearance. This is contrary to what was expected, but slightly in line with Yadav et al. (2016, 414) who suggested, that companies which repeat their appearance in third-party lists considering CSR performance while improving their previous ranking receive a significant positive reaction from the market. To be noted is

that a prior type of dummy variable was also introduced to the regression models to test the previous claim but did not give statistically significant results. The results of that test are not reported in this study.

Contrary to model 13, model 11 shows a positive but not statistically significant coefficient for the "newcomer" variable. To be noted is that all the models considering ARs as a dependent variable show positive coefficients for all the independent variables while the models considering CARs as dependent variable show negative coefficients for all the independent variables. While the control variables, with one exception in the case of the logarithm of assets, show coherent coefficients between the models. Since all the explanatory variables in models 10 and 11 have the theory-led expected coefficients it might indicate that some aspect has disturbed the CARs of the companies leaving the event day ARs as a more reliable metric in capturing the effects of the event. This would further support the notion of McWilliams and Siegel (1997, 636) who discuss the importance of the length of the event window and of the evidence of market reacting to new information in a matter of minutes.

Additionally to examining the results, to discover if the regression models have met all the assumptions, several tests are executed. Correlation analysis is formed in order to examine the linear relationship between the variables and to control possible heavy correlations between the variables. The results of the correlation analysis can be seen in appendix 4. Correlation analysis shows no correlations above 0,8, as higher correlations are seen as problematic for the models' due potential multicollinearity (Field, 2009, 224). Additionally, the correlation analysis shows that the sample has a robust foundation for the regression analysis, where none of the variables are problematic. Therefore, based on the correlation analysis, the regression models have statistically and methodologically a solid base of variables.

Additionally, to cruder correlation analysis, the multicollinearity of the models is measured with VIF and tolerance measures. The results of the analyses can be seen in table 8. The tolerance values and the VIF values are robust, tolerances exceeding the critical value of 0,2 and VIF values remaining under 10. Therefore, the values underline the notion of correlation analysis. Additionally, Normal probability plots and line fit plots for the variables are constructed to check the residual normality and homoscedasticity. The graphs, which are not reported in this study show that the residuals are both normal

and homoscedastic. This further validates the robustness of the regression analysis. Lastly, the Durbin-Watson test is done to examine the potential autocorrelation occurring in the regression models. The results of the prior described tests are presented in table 7. All the values are in the acceptable range of 1–3 suggesting that autocorrelation is not distorting the models.

Table 8
Multicollinearity of the regression models

	Model 10 ($N = 75$)		**Model 11** ($N = 75$)		**Model 12** ($N = 75$)		**Model 13** ($N = 75$)	
Dependent variable	AR [0]		AR [0]		CAR [-1,1]		CAR [-1,1]	
	Toler	**VIF**	**Toler**	**VIF**	**Toler**	**VIF**	**Toler**	**VIF**
New info	0,9740	1,0267			0,9744	1,0263		
Rank			0,7999	1,2502			0,7999	1,2502
Newcomer			0,7864	1,2716			0,7864	1,2716
Ln Assets	0,9121	1,0964	0,8932	1,1196	0,9121	1,0964	0,8932	1,1196
Leverage	0,6929	1,4432	0,6892	1,4510	0,6929	1,4432	0,6892	1,4510
EV/EBITDA	0,9003	1,1108	0,8966	1,1153	0,9003	1,1108	0,8966	1,1153
P/B	0,6869	1,4557	0,6741	1,4836	0,6869	1,4557	0,6741	1,4836

However, the explanatory powers of the regression models, which are shown in table 7, are weak showing adjusted r squared values ranging from slightly above 1% to 7%. This means that the models' variables only explain a fraction of the abnormal returns occurring. Though the previous studies have not had substantial values in explaining ARs with the measures of CSR (see Krüger, 2015; Yadav et al., 2016), prior can be considered as restrained. Only the F-score of the model 13 is statistically significant at the 10% level, which suggests that other models have no predictive capability, and cannot explain the variations in the abnormal returns. Therefore, it can be concluded, that none of the dependent variables under interest were good at explaining the abnormal returns calculated and that the second, third, and fourth hypothesis leave unsupported. This rather modest finding suggests therefore that the characteristics of the Global 100 -list have had relatively little effect on the formation of the market's response to the CSR performance information.

5 ROBUSTNESS CHECK

5.1 Industry adjusted model

As the first check of the robustness of results, an industry adjusted model of the samples of the 2019 Global 100 -list is constructed. This is done to further control and check the potential cross-sectional correlation of the residuals in the principal test since Armitage (1995, 47) suggested that removing companies operating in the same industries can reduce the cross-sectional correlation of residuals when the event dates are clustered. Since the residuals of the principal test can be cross-sectionally correlated, the abnormal returns calculated can be artificially high due to increased variance (Brown & Warner, 1980, 232). Therefore, the observations of lower abnormal returns from the industry adjusted models would suggest a cross-sectional correlation in the main models.

The models are formed from the original sample by removing all the GICS industry peers, except for the highest-ranking company of each industry in the Global 100 -list of 2019. Otherwise, the test is constructed with the same methods and assumptions as of the principal test. The results of the models can be observed in table 9. Similarly to the principal test, each box is representing the value of the abnormal return, the t-statistic in parentheses and the generalized rank test in square brackets.

Table 9
Abnormal returns of industry adjusted models

	USA adjusted	Europe adjusted	Global adjusted
CAAR [-2,2]	-0,0054 (-0,4594) [-0,0485]	-0,0011 (-0,3025) [-0,3049]	-0,0010 (-0,2139) [0,1539]
CAAR [-1,1]	0,0002 (0,0446) [-0,4304]	0,0003 (0,1134) [-0,0504]	0,0002 (0,0937) [-0,0860]
CAAR [0,1]	0,0006 (0,1710) [-0,2664]	0,0005 (0,1689) [-0,0112]	-0,0009 (-0,3755) [-0,3300]
AAR [-2]	-0,0004 (-0,1153) [0,3136]	-0,0005 (-0,2684) [0,1385]	-0,0010 (-0,4849) [-0,5487]
AAR [-1]	-0,0006 (-2,1893)** [-2,3912]**	-0,0002 (-0,1166) [-0,4217]	0,0011 (0,7621) [0,8869]
AAR [0]	0,0010 (0,4306) [0,6746]	-0,0015 (-0,8532) [-0,5925]	-0,0009 (-0,6424) [-0,5920]
AAR [1]	-0,0004 (-0,1770) [-0,2982]	0,0020 (1,0622) [0,9403]	-1,25E-05 (-0,0088) [-0,3045]
AAR [2]	-0,0050 (-0,5089) [-0,1409]	-0,0009 (-0,3676) [-0,5790]	-0,0002 (-0,5337) [0,1968]

*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level

The abnormal returns show overall smaller values than in the principal test. 79% of the abnormal returns are smaller than in the principal test. More importantly all the CAARs and event day AARs are smaller in value. Therefore, it is possible that the principal models' results are biased by cross-sectional correlation of residuals. This finding can dilute the significance of the results. The industry adjusted USA model captures statistically significant negative abnormal returns a day prior to the event day, which can be hard to explain with the theoretical framework presented in section 2. It could be that the information had leaked day prior to the event and the markets had reacted to the information negatively, as Krüger (2015) illustrated. This would to some extent be on the contrary what Auer and Schuhmacher (2016) had shown, in this sample high CSR

performance companies would generate lower returns only in the USA. However, since the industry adjusted model sample was generated from the industry top performers among CSR performance, the smaller and more negative abnormal returns could suggest the opposite of what was hypothesized in the third hypothesis.

Therefore, the results of the industry adjusted model dilute the results of the principal test further, and additional tests of the general robustness of the results could provide further clarification to the results. Thus, an additional model consisting of historical top performers of the Global 100 -list is constructed next.

5.2 Global 100 top performers model

The test is constructed to examine if the abnormal returns of the principal test hold in comparison to historical returns generated by the publishing of the Global 100 -list. The test's sample is gathered from the top companies of the Global 100 -lists between 2010 and 2019. This implies that since the event dates of the sample are a year apart, no cross-sectional correlation in this model is potentially biasing the residuals. This means that compared to the industry adjusted test, this test has fewer potential biases with cross-sectional correlation. The test is constructed using the same methods and assumptions as of the prior two abnormal return tests.[25] As with the other tests, the results are gathered into table 10, where each box is representing the value of the abnormal return, the t-statistic in parentheses and the generalized rank test in square brackets.

The abnormal returns are behaving closely to the principal test's abnormal returns. The CAARs are shoving more varying results, but the event day AARs follow closely to the results of the principal test. This is interesting observation suggests that across the years, the reaction to the Global 100 -list has been characteristically quick. Though because the results lack statistical significance, the argument cannot be confirmed. Similarly, though

[25] The sample companies have been gathered from the top performers of the Global 100 -lists. In each geographical model, the highest-ranking company from the respective geographical area was selected. However, couple of confounding events disturbed the selection: In the Europe model, TNT N.V. was replaced with Hennes & Mauritz AB from the year 2010 and from the USA model, Life Technologies Corporation was replaced with The Coca-Cola Company from the year 2014, both due to disturbances in the Thomson Reuters data caused by corporate-level acquisitions.

to the principal test, the USA model shows larger returns than the Europe model, however not statistically significant as in the principal model. Additionally, a similar correction move to the principal test can be observed from the AARs of the USA model, where the AARs are highly negative after the event date.

Table 10
Abnormal returns of top performers model

	USA top performers	**Europe top performers**	**Global top performers**
CAAR [-2,2]	-0,0032 (-0,1838) [-0,1884]	0,0006 (0,0755) [0,0713]	0,0016 (0,2077) [-0,2343]
CAAR [-1,1]	0,0017 (0,2318) [-0,1713]	-0,0012 (-0,3196) [-0,1695]	0,0006 (0,0962) [-0,2545]
CAAR [0,1]	0,0003 (0,0341) [-0,3429]	0,0018 (0,4930) [0,5717]	0,0020 (0,2368) [0,4165]
AAR [-2]	0,0055 (1,0661) [0,5657]	0,0002 (0,0339) [0,4109]	0,0007 (0,2233) [0,7749]
AAR [-1]	0,0014 (0,3577) [0,1027]	-0,0030 (-0,8298) [-1,4017]	-0,0014 (-0,3477) [-0,6851]
AAR [0]	0,0043 (0,7990) [-0,2487]	0,0013 (0,6954) [0,6787]	0,0048 (1,1262) [1,0371]
AAR [1]	-0,0040 (-0,8158) [-0,2827]	0,0005 (0,1982) [0,4644]	-0,0028 (-0,5218) [-0,0392]
AAR [2]	-0,0104 (-0,9337) [-0,2649]	0,0016 (0,3727) [-0,3032]	0,0003 (0,1009) [-0,2156]

*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level

The results of the Global 100 history top performers test indicate fairly similar results to the principal test. This adds robustness to the results, and further suggests that the first hypothesis should not be accepted since there have not been characteristically significant responses from the market to Global 100 -lists. As the cross-sectional analysis also

suggested, it seems that the relative ranking of the companies has little effect on abnormal returns, since the top performer test consisted of companies appearing on the top of the lists and it did not show significantly larger abnormal returns.

5.3 Market adjusted model

The economic impact of the event examined in this study was quantified in the principal test using a normal return model called "market model". Following Gupta and Goldar (2005), in order to perform a methodological robustness check for the market model results, an alternative method for calculating abnormal returns called "market adjusted model" is performed. The market adjusted model has been argued to perform well in event studies, creating closely as reliable results as the market model (Brown & Warner 1985, 25–26). The market adjusted model does not require an estimation period since it is assumed that the abnormal return is the difference between the market index's return and the return of the stock. The market adjusted model is therefore:

$$AR_{it} = R_{it} - R_{mt} \tag{14}$$

Where R_{mt}, the return of the reference market m on day t is subtracted from R_{it}, the return of the stock i on day t. Therefore, the market adjusted model assumes implicitly that all the stocks have the same systematic risk since it does not weigh the relation of the stock and the market individually. The market adjusted model results are not presented in this study, but the most important results of the test are described.

The market adjusted model shows in all the three event windows positive CAARs, much like the principal model. However, the three-day CAARs of the Europe and the Global models show abnormal returns of 0,4% and 0,3% are statistically significant, at 5% and 10%-levels respectively. However, this statistical significance is only captured by the cross-sectional t-test, which indicates that the tests might have been biased by the cross-sectional correlation of the residuals. However, additionally to all event day AARs are positive in the market adjusted model, the USA and Global models show abnormal returns of 0,4% and 0,2% respectively. The returns are statistically significant, this time the

generalized rank test supporting the significance at 10% and 5%-levels respectively. Therefore, the market adjusted model suggests that there is a significant reaction from the stock market on the event day in the USA and Global models. The market adjusted model also shows similar market correction as in the principal test, where the USA and the Global models capture negative abnormal returns after the event date.

Therefore, the market adjusted model gives similar evidence to the principal test but has slightly more volatile and more statistically significant results. Brown and Warner (1985, 15–16) showed that the market adjusted model has slightly less power when there is a cross-sectional dependence of residuals, but in their test the difference between the models was small. Therefore, it can be argued that the market adjusted model slightly supports the first hypothesis but lacks powerful evidence.

5.4 Winsorization

In order to control that the principal abnormal return test has not been influenced by outliers, extreme values in the data which could mainly drive the averaged values of AAR and CAAR the samples are winsorized. It is a technique commonly used in statistics to remove the effect of outliers by setting the values of the outliers to a specified percentile. Since the principal model augmented by the prior tests suggest that there could be a vaguely positive reaction from the stock market to the USA and Global models during the event day, the USA and the Global samples are winsorized to the 90th percentile. This means that the values of the event day ARs below 5th percentile are given the value of the 5th percentile and above the 95th percentile ARs are given the value of the 95th percentile. The winsorization concerns the event day AARs because they were the only consistent measure where the values of the tests were always positive and faintly statistically significant. The winsorization is done to the respective event day ARs, from which the event day AAR is calculated.

Above 95th percentile of the global sample stocks are OSRAM Licht AG, Keycorp, VMware, Inc., Ansys Inc., and Workday, Inc. which event day AR values are transferred to 0,014, and below 5th percentile stocks are BNP Paribas S.A., Vestas Wind Systems A/S, Alstom SA, Ingersoll-Rand Inc., and Umicore N.V. which event day AR values are

transferred to -0,0135. After the winsorization the event day AARs of both the models are 0,0012 and statistical significance remained as statistically insignificant.

Above 95th percentile of the smaller USA sample are Keycorp and VMware, Inc. which event day AR values were transferred to 0,0175, and below 5th percentile stocks are Ingersoll-Rand Inc. and Analog Devices, Inc. which event day AR values were transferred to -0,009. After the winsorization the event day AARs of both the models were 0,0039 and statistical significance remained as statistically significant at 10%-level.

Therefore, the samples did not suffer from biases caused by outliers, and the principal test can be considered overall as robust. After the robustness checks, it can be said that the tests outlined in section 3 are fairly robust. After all the control tests it can be said that the results remain qualitatively the same and that the attention can be switched in examining the relevance of the results.

6 CONCLUDING REMARKS

6.1 Discussion

The results of the empirical analysis were quite surprising, considering the findings of previous researches. In most part, the results were relatively modest and not statistically significant. Therefore, it is determined that none of the four hypotheses received sufficient support; Thus, it is stated that the zero hypothesis is failed to reject in all of the four hypotheses. This result is somewhat inconsistent with the previous research, which has documented either significant negative or positive response from the stock market to CSR performance-related information. The hypotheses were constructed to be extensions from the findings of previous researches and to cover similar areas yet focus on areas that had received little attention from the prior studies. However, the method and the samples used did not provide significant support for the hypotheses.

The first hypothesis, which was tested in the univariate analysis with the market model, suggested that the companies appearing on the Global 100 -list would receive positive abnormal returns for their stocks. However, though there were some disturbances in the event day AARs, especially in the USA-model event day AARs which showed weak statistical significance, but which was not supported by the generalized rank test, no material coherent reaction was received from the stock market. Therefore, the results were partly in line with previous research indicating that different markets in different geographies might react differently to information related to CSR performance (e.g. Auer & Schuhmacher, 2016). There are two potential main avenues which could explain the results of this study in the context of the first hypothesis:

The first avenue would be that the markets do react to CSR performance information by corporate Knights, but the event windows of this study did not capture the reaction. However, it was considered to be quite unlikely to happen, since it would mean that there has been significant information leakage prior to the event date or that the stock market would have reacted only after two days from the event day. The latter would be highly

controversial to efficient market hypothesis and to the notion of McWilliams and Siegel (1997, 636), who discussed that there is evidence of the market reacting to new information in 15 and 90 minutes.

The second avenue would be that markets will not react to CSR performance information by Corporate Knights. This would be because markets are not interested in CSR performance information in general, or they are not specifically interested in Corporate Knights' information. The first claim would be contrarian to previous research since lots of previous research have found that CSR performance information has had value implications, either negative or positive (e.g. Halme & Niskanen, 2001; Kaspereit & Lopatta, 2016; Klassen & McLaughlin, 1996; Krüger 2015), and since Amato and Amato (2012) and Yadav, et al. (2016) illustrated the market reacting to environmental performance information in highly similar settings. Additionally, since Orlitzky, et al. (2003, 415) illustrated that environmental performance has a smaller relationship with financial performance than the other dimensions of CSR, markets should be increasingly interested in CSR performance information compared to just information considering environmental performance. However, the findings of Auer and Schuhmacher (2016) could back the argument that markets are not interested in CSR performance information in general since they found that CSR-criteria based investment generated no extra returns.

Nevertheless, the suggestion, that the markets are not specifically interested in Corporate Knights' information could be the most potential one. It can be because markets see that specifically, the CSR view of Corporate Knights has no value implications or that the CSR view of Corporate Knights does not generate any extra information for the markets. It could be controversial that markets would consider the Corporate Knights' notion of CSR performance as irrelevant for investor value since CSR defined in a similar context affected positively to investor value (e.g. Ameer & Othman, 2012; Eccles, et al., 2014; McWilliams & Siegel, 2011). Therefore, markets would not share the views of the prior studies by not reacting to the information. However, the disregard could be also because the markets see that the Global 100 -list provides little additional information considering the CSR performance levels of companies. This concept will be discussed more thoroughly with the third hypothesis.

The second hypothesis in which was assumed that the company's relative position in the list would affect the volume of abnormal returns. This hypothesis was tested in the cross-

sectional analysis. On the contrary to what Amato and Amato (2012) and Yadav, et al. (2016) showed, the relative position did not affect to abnormal returns. Additionally, this is somewhat contrary to the notion of Aouadi and Marsat (2018) who showed that CSR performance information has only value implications for highly visible companies since the top companies could be argued to have more visibility. Additionally, this notion was controlled by including a variable measuring company size in the regression, which was not statistically significant.

The third hypothesis was considering if the Global 100 can provide additional information to markets. The hypotheses were continuing the notion of prior studies (e.g. Klassen & Mclaughlin, 1996; Yadav, et al., 2016) which linked higher value implications to events where the markets received information for the first time about a company's level of CSR performance. Therefore, it was assumed that the companies, which had not any CSR performance information in Thomson Reuters Eikon -database and were not previously ranked by Corporate Knights would receive higher abnormal returns. However, this hypothesis was not supported by the cross-sectional analysis, which showed inconsistent and statistically insignificant results. The assumption that a single database would describe the CSR performance information available for the markets is rather naïve, and therefore it is possible that it could not provide a true illustration of what can be considered as new information for the markets. Conversely, if the information was new it could then suggest that the markets did not consider the information provided by Corporate Knights as important.

However, according to the efficient market hypothesis, even according to semi-strong terms, if the information is publicly available it is already valued in the stock prices. And since most of the information Corporate Knights use is publicly available, the part of the information which is public should be already valued to stock prices. The efficient market hypothesis is often counterargued by suggesting that with some information the costs of acquiring it will surpass the benefits of trading based on it (Grossman & Stiglitz, 1980). It can be argued that such a phenomenon did not happen with the CSR performance information made easily accessible by Corporate Knights. Therefore, the fourth hypothesis, which was an extension of the third hypothesis, was showing similar evidence, which supports the notion of efficient markets, since in the cross-sectional test the results were also inconsistent with the "newcomer" coefficient. Thus, the null

hypothesis was failed to reject with the fourth hypothesis, which was similarly the case for all the hypotheses.

Since all the null hypotheses were not rejected it suggests that the CSR performance disclosure by Corporate Knights does not have value implications. However, Corporate Knights can still have additional effects for the markets and to the society by publishing the Global 100 -list. First, CSR reporting activity has increased significantly throughout the years, and though superior CSR reporting performance does not have any value implications either, parties such as Corporate Knights can be able to steer the discourse of CSR performance towards more objective direction, since the CSR reporting purposes have largely stayed the same (Cho, Michelon, Patten & Roberts, 2015). Second, Corporate Knights can provide robustness checks to the information other CSR performance raters provide, which can be beneficial for the construct validity of all the measures, as Semenova and Hassel (2015, 250) argue. Finally, however, as Chelli and Gendron (2013) point out that idealizing the quantification of everything can have its risks. What certainly is not optimal for the entire ecosystem is that companies seek to better in the metrics of the rankings and not in CSR performance itself.

6.2 Research quality evaluation

The research quality of this study is assessed based on the study's validity and reliability and additionally by discussing the limitations this study has. The examination of validity and reliability is based on the framework of Kihn and Ihantola (2008), who outline the characteristics of validity and reliability, and how to assess them. The validity matters are discussed first, followed by the discussion of reliability and potential limitations in this study.

The comprehensive description of the processes and choices undertaken in the methodological section of this study has been done in order to assure that the process validity of this study has been overall at a satisfactory level. All the choices of the empirical part have been derived from the notions of previous researches, and if differed from suggested, the goal has been to keep the methods of research clean and robust. Such choices were done e.g. in the case of the global market model sample, where the currency

effects were considered to be mitigated with the national market indices, not by adding additional factors to the model. Such as with other studies, there is a risk of omitted variables causing biases to both sides of the equations of the models. This has been attempted to eliminate using a set of control variables following the work of previous studies, in order to construct as overarching models as possible. However, the risk of omitted variables affects the reliability of this study's results.

The predictive validity of the event study method suffers from the dimension of new information in this study. Since it is hard to determine what information of the Global 100 -list to the markets has been new, the predictive capability the measurements can therefore suffer. Therefore, it can be harder to assess whether CSR performance is seen as an investor value rising factor in the markets. However, it is seen that the measurements done in this study corresponded exactly to the purposes of this study since the research problem was straightforward. Thus, although the predictive capability of the model might have suffered, the main research problem is considered to be sufficiently answered, which can be considered as more important for the study's validity. This inner validity is therefore considered to be at an acceptable level, which derives from e.g. following the major ground rules of prior researches from the relative subject matters.[26]

Since the results from the empirical part to some extent differ from the theory, a question of the construct validity of the study can be raised. To be noted is though that the underlying consensus of the academia of the interaction between CSR performance and multiple financial variables remain inconsistent. Therefore the theoretical basis on which this study is constructed remains quite fragile, which therefore does not necessarily suggest that the methods used in this study have been invalid, but that the theory needs further evidence using coherent measurements in order to increase the structural validity of the methods in measuring CSR performance's potential value implications.

The reliability of the study can be viewed as consisting of the reliability of the data the research methods have used and the reliability of the methods themselves. It is possible that the CSR performance data used by Corporate Knights can cause concerns in

[26] To be noted is that the purpose of this study was not to create a model which could explain the best the formation of abnormal returns, but rather to derive the measures used in prior studies to the context of Corporate Knights' Global 100 -list. Therefore though the coefficients of determination remained low for this study's regression models, it is not considered to lower this study's inner validity, since the purpose was to test the explanatory power of the specific variables.

reliability since it is dependent partly on the reliability of what companies have disclosed in their CSR reports. Companies' CSR reports can be subjected to concerns of reliability since the assurance of the reports can be a limited tool assessing the complete truthfulness and materiality of the information in CSR reporting (Kaspereit & Lopatta, 2016, 4). On the contrary, the financial data gathered has been from Thomson Reuter's Eikon database, which consists of audited company information, which can be considered as highly reliable. As a causation of using the database, the empirical process of this study has had extremely few manual data insertions. When they have occurred, such insertions have been systematically checked to control the possibilities of human error. Though, as always this cannot be completely reconciled, but with great confidence, it can be said that the possibility of human errors in handling the data in this study has been low because of the rigorous controls used in the process.

Additional factors related to the methodology and the data can concern the reliability of this study. The cross-sectional correlation of residuals and the measures to control them was assessed in the empirical part of this study. However, though it was controlled in the event study method, the models had a potentially cross-sectional correlation in them which could lower the reliability of the models. However, the robustness of the results was checked with models that were not exposed to cross-sectional correlation, which showed primarily similar results to the principal test of this study. Furthermore, the global nature of the sample could have caused potential disturbances to the reliability of the results, since it brought complexity to the event study method. The complexity was controlled in the design of the models, but also with the individual samples of the USA and Europe, which acted also as a robustness check for the results of the Global model.

The sample sizes in the USA and the Europe models can raise some corresponding concerns. The USA and Europe models, which had 22 and 48 of stocks respectively in their samples could be biased due to the small sample size. In event studies with small samples, it is suggested that bootstrap methods are used to control the normality assumptions. However, when McWilliams and Siegel (1997, 634–635) discuss small sample sizes in need of bootstrapping they present studies with mainly less than twenty data points. Therefore, it is assumed that the models have remained relatively reliable, no matter that they have not been bootstrapped. Additionally, the tools used for this study

did not provide the option for bootstrapping an event study model, which was considered to be thus an overly extensive effort considering the scope of this study.

Lastly considering the external validity, this study is to some extent limited in assessing other instances of CSR performance's value implications. Firstly, this is caused by the elimination of financial companies in the cross-sectional analysis of abnormal returns. Secondly, it is caused by how Corporate Knights define CSR performance, which can be technically considered as unique and how the Global 100 -list is constructed and disclosed. However, this may be the case only to some extent, since Corporate Knights' methodology is relative to other methods used in academic literature and by other external raters. Additionally, removing financial companies is rather a common measure in relative studies which can be therefore considered as not affecting significantly to the external validity of this study. Therefore, this study can give additional clarity in the discussion of CSR performance's value implications.

6.3 Conclusion

This study examined the stock market's reaction to CSR performance information created by Corporate Knights in the form of the 2019 issue of the Global 100 -list of the most sustainable companies in the world. The market reaction documented with event study methodology was slightly positive, but not statistically significant. Therefore, it is suggested that the publication of the Global 100 -list has no material value implications. Though it can be the causation of several potential factors, the most prominent ones were considered to be that the market did not see any investor value increases provided by companies with a high level of CSR performance either in Corporate Knights context, or at all. Alternatively, efficient markets might have had already priced the correct levels of CSR performance into companies' stocks, thus making the CSR performance disclosure by Corporate Knights irrelevant.

The market's passive response to the Global 100 -list can be an illustration of the ambiguity related to CSR and its effects on companies. It can be that markets are extremely efficient in pricing CSR performance levels of companies, or it might be that

the market is cautious in its responses to CSR performance information, and the source from which the information is received can drive a significant role in market reactions.

It seems likely that the Global 100 -list is not considered disclosing substantial new information considering investor value. Therefore, the market potentially adopts CSR performance-related information in their valuation methods from other sources, such as from external databases, which information has generated more significant results in prior research of CSR performance's value implications. Alternatively, investors might not be willing to use CSR performance-related data which has been provided by external parties but rely on their private CSR-assessing valuation methods and raw CSR performance data.

A potential avenue for further research could be indeed examining the differences in the valuation methods which include the aspects of CSR performance in the valuation process and the differences in the users of such methods. This could further bring evidence from the breadth of the adoption of CSR-related measures into valuation processes and from the market's efficiency regarding CSR performance information. Alternatively, future research could examine the company-internal measures in assessing the profitability and the rationale of CSR investments. All in all, corporate social responsibility is a peculiar concept, which requires further comprehension due to its potential omnipresent nature in the business of tomorrow.

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APPENDICES

APPENDIX 1: Corporate Knights' 2019 Global 100 –ranking

Rank	Company	Country	GICS industry	Score	Reference index
1	Chr. Hansen Holding A/S	Denmark	Food or other Chemical Agents	82.99%	MSCI Denmark
2	Kering SA	France	Apparel and Accessories	81.55%	MSCI France
3	Neste Corporation	Finland	Petroleum Refineries	80.92%	MSCI Finland
4	Ørsted	Denmark	Wholesale Power	80.13%	MSCI Denmark
5	GlaxoSmithKline plc	United Kingdom	Biopharmaceuticals	79.41%	MSCI United Kingdom
6	Prologis, Inc.	United States	Real Estate Investment Trusts	79.12%	MSCI USA
7	Umicore	Belgium	Primary Metals Products	79.05%	MSCI Belgium
8	Banco do Brasil S.A.	Brazil	Banks	78.15%	MSCI Brazil
9	Shinhan Financial Group Co.	South Korea	Banks	77.75%	MSCI South Korea
10	Taiwan Semiconductor	Taiwan	Semiconductor Equipment	77.71%	MSCI Taiwan
11	Pearson PLC	United Kingdom	Personal Professional Services	76.91%	MSCI United Kingdom
12	Outotec Oyj	Finland	Machinery Manufacturing	76.53%	MSCI Finland
13	McCormick & Company	United States	Food and Beverage Production	76.20%	MSCI USA
14	Cisco Systems, Inc.	United States	Communications Equipment	76.12%	MSCI USA
15	Natura Cosmeticos S.A.	Brazil	Personal Care and Cleaning	75.55%	MSCI Brazil
16	ERG S.p.A.	Italy	Wholesale Power	75.39%	MSCI Italy
17	Analog Devices, Inc.	United States	Semiconductor Manufacturing	75.31%	MSCI USA
18	Novartis AG	Switzerland	Biopharmaceuticals	75.19%	MSCI Switzerland
19	CEMIG	Brazil	Electric Utilities	75.18%	MSCI Brazil
20	Sanofi	France	Biopharmaceuticals	75.16%	MSCI France
21	Ericsson	Sweden	Communications Equipment	74.92%	MSCI Sweden
22	Bombardier Inc.	Canada	Aerospace and Defense	74.79%	MSCI Canada
23	UPM-Kymmene Oyj	Finland	Forestry and Paper Products	74.42%	MSCI Finland
24	BNP Paribas SA	France	Banks	74.14%	MSCI France
25	City Developments Limited	Singapore	Real Estate Invest. Services	72.73%	MSCI Singapore
26	bioMérieux SA	France	Diagnostics and Drug Delivery	72.15%	MSCI France

Rank	Company	Country	GICS industry	Score	Reference index
27	Royal KPN NV	Netherlands	Wireless and Wireline Telecom	71.78%	MSCI Netherlands
28	Siemens AG	Germany	Industrial Conglomerates	71.35%	MSCI Germany
29	Valeo SA	France	Consumer Vehicles and Parts	71.15%	MSCI France
30	LG Electronics Inc.	South Korea	Computer Hardware	71.04%	MSCI South Korea
31	Amundi SA	France	Investment Services	71.01%	MSCI France
32	Ecolab Inc.	United States	Food or other Chemical Agents	70.70%	MSCI United States
33	CapitaLand Limited	Singapore	Real Estate Invest. Services	69.92%	MSCI Singapore
34	Vestas Wind Systems A/S	Denmark	Electrical Equipment + Power	69.54%	MSCI Denmark
35	ING Groep NV	Netherlands	Banks	69.41%	MSCI Netherlands
36	Electrolux AB	Sweden	Household Appliances and Furn.	69.22%	MSCI Sweden
37	Teck Resources Limited	Canada	Metal Ore Mining	69.11%	MSCI Canada
38	Dassault Systemes SA	France	Software	69.10%	MSCI France
39	HP Inc.	United States	Computer Peripherals	68.32%	MSCI USA
40	Comerica Incorporated	United States	Banks	68.11%	MSCI USA
41	Sun Life Financial Inc.	Canada	Insurance	68.06%	MSCI Canada
42	VERBUND AG	Austria	Wholesale Power	67.34%	MSCI Austria
43	Kone Oyj	Finland	Machinery Manufacturing	67.24%	MSCI Finland
44	Suncor Energy Inc.	Canada	Integrated Oil and Gas	67.04%	MSCI Canada
45	ABB Ltd.	Switzerland	Industrial Conglomerates	67.04%	MSCI Switzerland
46	Eli Lilly and Company	United States	Biopharmaceuticals	66.87%	MSCI USA
47	Nordea Bank AB	Sweden	Banks	66.70%	MSCI Sweden
48	Autodesk, Inc.	United States	Software	66.35%	MSCI USA
49	Metso Oyj	Finland	Machinery Manufacturing	66.17%	MSCI Finland
50	AstraZeneca PLC	United Kingdom	Biopharmaceuticals	65.79%	MSCI United Kingdom
51	KeyCorp	United States	Banks	65.63%	MSCI USA
52	Alphabet Inc.	United States	Internet and Data Services	65.56%	MSCI USA
53	MetLife, Inc.	United States	Insurance	65.27%	MSCI USA
54	Industria de Diseno Textil	Spain	Apparel and Accessories	64.98%	MSCI Spain
55	Danaher Corporation	United States	Medical Devices	64.87%	MSCI USA
56	Halma plc	United Kingdom	Machinery Manufacturing	64.72%	MSCI United Kingdom
57	Total SA	France	Integrated Oil and Gas	64.50%	MSCI France
58	Novo Nordisk A/S	Denmark	Biopharmaceuticals	64.38%	MSCI Denmark
59	PNC Financial Services	United States	Banks	63.71%	MSCI USA

Rank	Company	Country	GICS industry	Score	Reference index
60	Schneider Electric SE	France	Industrial Conglomerates	63.59%	MSCI France
61	Iberdrola SA	Spain	Wholesale Power	62.91%	MSCI Spain
62	Alstom SA	France	Transportation Equipment	62.51%	MSCI France
63	Bank of America Corp	United States	Banks	62.40%	MSCI USA
64	Nokia Oyj	Finland	Communications Equipment	62.19%	MSCI Finland
65	Unilever PLC	United Kingdom	Personal Care and Cleaning	61.89%	MSCI United Kingdom
66	Ingersoll-Rand Plc	United States	Machinery Manufacturing	61.69%	MSCI USA
67	Commerzbank AG	Germany	Banks	61.40%	MSCI Germany
68	Acciona SA	Spain	Facilities and Construction	61.34%	MSCI Spain
69	Tesla Inc	United States	Consumer Vehicles and Parts	61.28%	MSCI USA
70	Itron, Inc.	United States	Machinery Manufacturing	61.24%	MSCI USA
71	Westpac Banking Corp.	Australia	Banks	60.12%	MSCI Australia
72	ENGIE Brasil Energia S.A.	Brazil	Wholesale Power	60.04%	MSCI Brazil
73	Eisai Co., Ltd.	Japan	Biopharmaceuticals	60.03%	MSCI Japan
74	National Australia Bank	Australia	Banks	59.73%	MSCI Australia
75	AAK AB	Sweden	Food and Beverage Production	59.02%	MSCI Sweden
76	Lloyds Banking Group plc	United Kingdom	Banks	58.75%	MSCI United Kingdom
77	OSRAM Licht AG	Germany	Electrical Equipment + Power	58.56%	MSCI Germany
78	Takeda Pharmaceutical Co.	Japan	Biopharmaceuticals	58.05%	MSCI Japan
79	UCB S.A.	Belgium	Biopharmaceuticals	58.02%	MSCI Belgium
80	Intesa Sanpaolo SpA	Italy	Banks	57.93%	MSCI Italy
81	Workday, Inc.	United States	Software	56.92%	MSCI USA
82	Yokogawa Electric Corp.	Japan	Industrial Conglomerates	56.60%	MSCI Japan
83	Samsung SDI Co., Ltd	South Korea	Electrical Equipment + Power	54.23%	MSCI South Korea
84	Adidas AG	Germany	Apparel and Accessories	54.20%	MSCI Germany
85	Campbell Soup Company	United States	Food and Beverage Production	54.07%	MSCI USA
86	Advantech Co., Ltd.	Taiwan	Computer Hardware	53.45%	MSCI Taiwan
87	ANSYS, Inc.	United States	Software	51.25%	MSCI USA
88	Kesko Oyj	Finland	Food and Beverage Retail	50.73%	MSCI Finland
89	Sekisui Chemical Co., Ltd.	Japan	Other Materials	50.69%	MSCI Japan
90	VMware, Inc.	United States	Software	48.81%	MSCI USA
91	Canadian Tire Corporation	Canada	General Merchandise Retail	47.52%	MSCI Canada

Rank	Company	Country	GICS industry	Score	Reference index
92	Kao Corp.	Japan	Personal Care and Cleaning	45.81%	MSCI Japan
93	Accenture Plc	United States	Technology Consulting Services	45.05%	MSCI USA
94	Celestica Inc.	Canada	Manufacturing Equipment	44.84%	MSCI Canada
95	Toyota Motor Corp.	Japan	Consumer Vehicles and Parts	43.58%	MSCI Japan
96	Konica Minolta, Inc.	Japan	Computer Peripherals	43.08%	MSCI Japan
97	Spectris plc	United Kingdom	Machinery Manufacturing	41.63%	MSCI United Kingdom
98	L'Oréal SA	France	Personal Care and Cleaning	40.54%	MSCI France
99	Bayerische Motoren Werke	Germany	Consumer Vehicles and Parts	39.96%	MSCI Germany
100	Panasonic Corporation	Japan	Computer Hardware	38.46%	MSCI Japan

APPENDIX 2: Corporate Knights' method for 2019 Global 100

KPIs

Resource management (Only relevant industry groups scored)

Energy Productivity: $\frac{Revenue}{Energy\ use - \text{renewable energy use}}$

GHG Productivity: $\frac{Revenue}{Scope\ 1\ \&\ 2\ GHG\ Emissions}$

Water Productivity: $\frac{Revenue}{Water\ use}$

Waste Productivity: $\frac{Revenue}{Waste\ generated}$

VOC Productivity: $\frac{Revenue}{VOC\ emissions}$

NOx Productivity: $\frac{Revenue}{NOx\ emissions}$

SOx Productivity: $\frac{Revenue}{SOx\ emissions}$

Particulate Matter Productivity: $\frac{Revenue}{Particulate\ matter\ emissions}$

Financial management (Only relevant industry groups scored)

Innovation Capacity: $\frac{R\&D\ costs}{Revenue\ (3\ year\ trailing)}$

Percentage Tax Paid: $\frac{Cash\ tax\ amount\ paid}{EBITDA\ (5\ year\ trailing)}$

CEO-Average Employee Pay: $\frac{CEO\ compensation}{Average\ employee\ compensation}$

Pension Fund Status: *75%*(total DB and DC employer contributions/ FTE employees' percentile-ranked against peers) + 25%*(fair value of DB plan assets/FTE employees' percentile-ranked against peers - (1-(fair value of DB plan assets/liability percentile-ranked against peers))*

Employee management (Only relevant industry groups scored)

Injuries: $\frac{Incidents}{FTE's}$

Fatalities: $\frac{Fatalities}{FTE's}$

Employee Turnover: $\frac{Departures}{Total\ employees}$

Women in Executive Management: $\frac{\%\ of\ feemale\ excecutives}{\%\ of\ female\ excecutives\ among\ CK\ universe}$

Women on Boards: $\frac{\%\ of\ feemale\ board\ members}{\%\ of\ female\ board\ members\ among\ CK\ universe}$

Sustainability Pay Link: *Mechanisms linking senior executive pay to sustainability targets*

Sanctions (Only relevant industry groups scored)

Sanction Deductions: $\frac{Total\ fines\ and\ settlements}{Total\ revenue}$

Supplier Performance (Only relevant industry groups scored)

Supplier Sustainability Score: *CK Sustainability Score of a company's largest suppliers*

Clean Revenue (All the groups scored)

Clean Revenue: $\frac{Total\ revenue\ from\ \text{'clean'}\ products}{Total\ revenue}$

"Clean" products defined by Corporate Knights open-source clean revenue taxonomy, which is informed by synthesis of the following sources and best practices: Green Goods and Services (U.S. Bureau of Labor Statistics); Environmental and clean Technology Products Economic Account (Statistics Canada); Climate Bonds Taxonomy (Climate Bonds Initiative); Sustainable Taxonomy (High-Level Expert Group in Sustainable Finance); Environmental Goods and Services Sector (Eurostat); China Green Bond Endorsed Project Catalogue; Green Bond Principles; TCFD recommended metrics; Other private sector rating agencies with green or sustainability taxonomy; Industry experts consultation covering all relevant CKIG subsectors with solicited feedback on industry definition of clean from leading industry experts and government agencies.

(See https://docs.google.com/spreadsheets/d/1Yit1pphFcx-axawF_Y9G8ZBSJe9A-xft2CSWNuBxAkw/edit#gid=369534137)

Universal (All the groups scored)

Percentage Tax Paid

Pension Fund Status

Supplier Sustainability Score (except financial services organizations)

Women in Executive Management

Women on Boards

Sustainability Pay Link

Sanctions Deductions

The weights of the KPIs

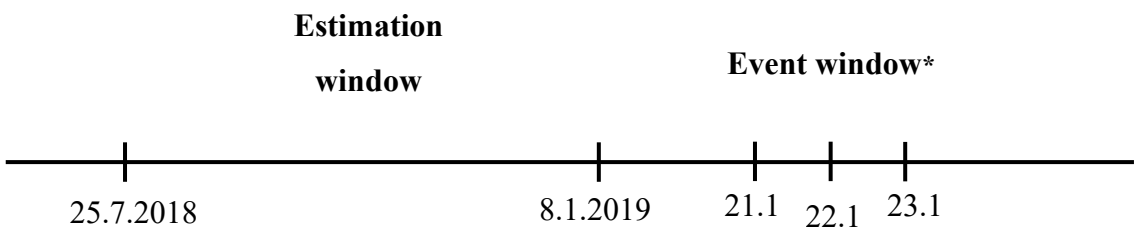
Each Corporate Knights (CK) Industry Group accounts for a unique share of global impact for each individual KPI. The bigger the CK Industry Group's impact for a given performance metric is in relation to others in the CK Industry Group, the higher the weight of that KPI. Of the 21 indicators, 17 are weighted according to their relative impact, and five are assigned predetermined fixed weights: For the actual weightings check: https://docs.google.com/spreadsheets/d/1HFwzQNeiB6V_WWQjsYfeP8NSZpumdi1HXK02zNeCJPc/edit#gid=715546756

The Corporate Knights Industry Groups

The Corporate Knights Industry Group (CKIG) is constructed using combinations of FactSet's Revere Business Industry Classification System (RBICS) sub sectors and Industry Groups. There are 100 Corporate Knights Industry Groups which can be found from Corporate Knights' dataset: https://www.corporateknights.com/wp-content/uploads/2018/10/2019-Global-00_Methodology-Final.pdf?v=20181205

APPENDIX 3: Event study dates

This graph depicts the dates of the CAR [-1,1] model, the other models' dates vary according to the lengths of event windows



*The event days of the Asian and Australian companies are lagged by one trading day

APPENDIX 4: Correlation analysis

	AR [0]	CAR [-1,1]	NEWINFO	RANK	NEWCOMER	LNASSETS	LEVERAGE	EV/EBITDA	P/B
AR [0]	1								
CAR [-1,1]	-0,0320	1							
NEWINFO	0,0342	-0,0657	1						
RANK	0,1680	-0,1487	0,2513**	1					
NEWCOMER	0,2144*	-0,2414**	0,6063***	0,4290***	1				
LNASSETS	-0,0498	-0,1676	0,0580	0,1291	0,1060	1			
LEVERAGE	0,0070	-0,0503	0,0717	-0,0154	0,0966	0,0169	1		
EV/EBITDA	0,2472**	0,1255	-0,0623	0,0321	-0,0213	-0,2916**	-0,1199	1	
P/B	0,1172	0,1275	0,1463	0,0935	0,2044*	0,0434	0,5484***	-0,0850	1

*: Significant at 10% level; **: Significant at 5% level; ***: Significant at 1% level