Sustainability Reporting, Integrated Reporting, Analyst Coverage and the Cost of Equity Capital

A quantitative study on the effect of Information Asymmetry on the Cost of Equity Capital

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Abstract: This study examines whether superior disclosure of information on sustainability performance and integrated reporting can be associated with a financial benefit: a reduction in an organizations' costs of equity capital. Better disclosure reduces information asymmetry and, subsequently, the cost of equity capital. Financial analysts are expected to strengthen the effects by increasing understandability and credibility of sustainability disclosures. The combined environmental, social and governance score from the ASSET4 database was used as proxy for quality of information on sustainability performance and the format of sustainability disclosure was determined for a sample of organizations from five European countries during the period 2013-2015. The results show that superior quality of information on sustainability performance as well as integrated reporting play no significant role in decreasing the cost of equity capital. Furthermore, the results show that organizations with superior disclosure on sustainability performance in combination with a high level of analyst coverage have a significantly lower cost of equity capital. The findings suggest organizations can use voluntary sustainability disclosure as a legitimation tactic because the actual quality of those disclosures is insignificant or unobservable to shareholders. When analysts act as information intermediaries this adds credibility to the quality of disclosure. The findings further indicate that the impact of integrated reporting is not as big as previously predicted.

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Chapter 1. Introduction

Nowadays, organizations operating around the world face different challenges. The global population struggles with over-consumption of finite natural resources, climate change, and the need to obtain clean water, food and better living standards (IIRC, 2010). These challenges are important for organizations as there is a public consensus that organizations should play an important role in the environmental and social aspects of the world around them. Corporate scandals, such as those of Enron, Worldcom and BP, illustrate that when organizations behave unethically and this affects society and the environment, it has economic consequences too as share prices drop (Cheng, Lin & Wong, 2016). Shareholders criticize organizations for co-creating environmental problems and lacking corporate environmental responsibility (Braam, De Weerd, Hauck & Huijbregts, 2016). They urge organizations to become more responsible for the impact of their decisions and activities on the environment and thereby pressure them to focus more on sustainable development (Abeysekera, 2013). The worldwide growth in corporate responsible investments illustrates that organizations are aware of this pressure and are responding to it (Braam et al., 2016). However, in order to communicate their social and environmental performance to shareholders and other stakeholders, organizations need to be transparent about their activities (Buchholz & Rosenthal, 2005; Laplume, Sonpar & Litz, 2008). This need for increased transparency leads to greater information requirements that are currently not satisfied by traditional mandatory financial information alone, but requires additional (voluntary) non-financial information (Eccles & Serafeim, 2011; Adams & Simnett, 2011; Cohen, Holder-Webb, Nath & Wood, 2012). In an attempt to satisfy the demand for non-financial information, many organizations disclose their sustainability practices in the form of a standalone corporate social responsibility (CSR) report (Jensen & Berg, 2012). CSR disclosure, according to the Global Reporting Initiative (GRI), is the practice of measuring, reporting organizational performance towards the goal of sustainable development, and being accountable to internal and external stakeholders (GRI, 2006). This changing shareholder environment demands more information on sustainability performance and has led to a rise in voluntarily issued sustainability reports.

According to economics-based theories of disclosure, such as the voluntary disclosure theory, organizations use voluntary disclosure to differentiate themselves from other organizations given that the perceived benefits will outweigh the costs (Healy & Palepu, 2001). Organizations that have a relatively good sustainability performance reduce information asymmetry through disclosing information related to this performance. Information

asymmetry occurs when one party has relevant information while the other has not. In this study the information asymmetry is between managers and shareholders. The managers are informed with the real sustainability performance of an organization and shareholders have to rely on what is disclosed to them. Shareholders feel less need to price-protect against unknown surprises when there is reduced information asymmetry, leading to a decrease in the cost of equity capital (Easley & O'Hara, 2004). Research illustrates this by documenting a negative relation between disclosure of sustainability information and the cost of equity capital for organizations with superior sustainability performance (e.g. Dhaliwal, Li, Tsang & Yang, 2011; Plumlee, Brown, Hayes & Marshall, 2015). Having a good sustainability reputation thus helps organizations to gain competitive advantages, indicating non-financial information is indeed valuable (Lys, Naughton & Wang, 2015). Cost of equity capital plays a critical role in an organizations' financing and general operations decisions and thereby its profitability (Easley & O'Hara, 2004). Following this line of thought, this study focuses on the further exploration of whether superior disclosure of information on sustainability performance can be associated with lower information asymmetry and subsequently with lower cost of equity capital. In order to investigate this, the weighted average of environmental, social and governance (ESG) scores from the ASSET4 database are used as proxies for quality of disclosure of sustainability performance.

Organizations may further want to reduce information asymmetry concerning their sustainability performance through using a more appropriate format for their disclosures. Integrated reporting is presented by the International Integrated Reporting Committee (IIRC) as a format that can improve disclosure and provide shareholders with more complete information (IIRC, 2011). An integrated report is a single document that presents both an organizations' financial information and nonfinancial information in a clear, concise, consistent and comparable format (Eccles & Serafeim, 2011). Recent research finds evidence that integrated reporting reduces information asymmetry and subsequently has a negative relation with the cost of equity capital (e.g. Zhou, Simnett & Green, 2017; García-Sánchez & Noguera-Gámez, 2017). Following this new research, another main focus of this study will be investigating if these results also hold for a sample in the European Union (EU) and if integrated reporting differs from traditional CSR disclosure in the association with the cost of equity capital.

Furthermore, in this study the importance of financial analysts as moderators of information asymmetry is examined. Analysts are known to factor information on disclosure of

sustainability performance into their recommendations and thereby reduce information asymmetry (Luo, Wang, Raithel & Zheng, 2015; Ivković & Jegadeesh, 2004). As sustainability reports are often time consuming and challenging to read, shareholders in most cases are more likely to let their decisions be guided by industry experts, such as financial analysts (Ivković & Jegadeesh, 2004). Even when shareholders understand sustainability information provided by organizations, it is not clear if this information is credible as managers have the incentive to make self-serving voluntary disclosures. Financial analysts are potential mechanisms for increasing the credibility of sustainability disclosures (Healy & Palepu, 2001). Because analysts have a strong influence on shareholders, it is important to explore if these analysts influence the perceived information asymmetry reducing competences of disclosure on sustainable performance and integrated reporting (Ivković & Jegadeesh, 2004).

Having superior disclosure of information on sustainability performance and the compilation of integrated reports are both costly affairs. Therefore it is important to investigate whether pursuing sustainable activities leads to improved financial performance, or; does it pay to be green? The studies of Clarkson, Li, Richardson & Vasvari (2011) and Dhaliwal et al., (2011), among others, indicate that sustainable activities lead to improved financial performance. This study further investigates this by examining if an organizations' cost of equity capital is positively affected by a sustainable strategy. The goal of this study is therefore formulated as follows: "*This study aims to examine if the level of disclosure of information on sustainability performance and integrated reporting are associated with an organizations' cost of equity capital and how analyst coverage interacts in this relationship*".

Previous studies highlight the importance of extending the research on the financial benefits of voluntary sustainability disclosure. This current study will contribute to this research in several ways. Firstly, it adds to the field of research that investigates how disclosure of information on sustainability performance is related to the cost of equity capital. Therefore it is related to, but differs from, Dhaliwal et al. (2011) who examine if the decision to publish CSR reports influences the cost of equity capital. The ESG scores will be examined as a broader proxy for disclosure of information on sustainability performance. Secondly, this current study examines if the specific disclosure format of integrated reporting is of influence to the cost of equity capital. Therefore it is related to, but different from studies of Zhou et al., (2017) and García-Sánchez & Noguera-Gámez (2017). Zhou et al. (2017) examined the impact of integrated reporting on the cost of equity capital in a mandatory context for listed

organizations in South-Africa. In the current study, the impact of integrated reporting is studied in a voluntary context for organizations in the EU. This also differs from García-Sánchez & Noguera-Gámez (2017), who examined the impact of integrated reporting on the cost of equity capital in in a voluntary context in different countries for the time period 2009-2013. In addition to having other countries in the sample, the current study focuses on the time period 2013-2015 and therefore investigates if the effects of integrated reporting hold over time. If they do not, it might be that over time the benefits of integrated reporting are smaller than initially perceived. Thirdly, because of the voluntary character of sustainability disclosure, managers have incentives only to disclose self-serving information (Healy & Palepu, 2001). Therefore it is unclear which sustainability information is credible and which is not. Financial analysts are information intermediaries and known for increasing the credibility of disclosures (Healy & Palepu, 2001). Therefore adding research focused on how analysts add credibility to disclosures on sustainability performance and integrated reporting is relevant.

Throughout this study, the term sustainability disclosure is used as a collective name for CSR disclosure and integrated reporting. Following this, the terms sustainability information and sustainability performance are used for reasons of uniformity instead of CSR information and CSR performance.

Chapter 2. Literature overview and the development of hypotheses

2.1 Theoretical background

Organizational commitment to increased disclosure levels should lower the information asymmetry component of an organizations' cost of equity capital (e.g. Leuz & Verrecchia, 2000). Information asymmetry builds upon agency theory; the problem that arises when two cooperating parties have different goals and divisions of labor (Eisenhardt, 1989). The division of labor in this study mainly indicates the division between the manager (agent), who controls the organization and the shareholder (principal), who provides capital in the form of equity shares. The nature of this relationship can cause information asymmetry between managers and shareholders as managers are informed with the sustainability performance of the organization and the shareholders only know what is disclosed by management. Because the two parties have different goals, this information asymmetry can cause several problems (Ross, 1973). The manager controls the organization according to the interests of the shareholders, although they may have incentives to do differently. For instance, while shareholders might be interested in long-term organizational performance as they desire a solid investment, managers may have short-term monetary incentives to reach their bonuses. Also, managers have the possibility to leave the organization at any moment in time without being financially constrained. The same goes for relationships between individual shareholders. When organizations have less public information available, shareholders that are able to acquire more private information are better informed than others. Cho, Lee & Pfeiffer (2013) find that shareholders with private information on sustainability performance appear to exploit this information advantage, leading to increased information asymmetry between shareholders. The shareholders that are perceived to have less private information will price-protect themselves and thereby create barriers to the smooth exchange of assets at efficient prices (Akerlof, 1970). These trade frictions in the form of information asymmetry cause lower levels of stock liquidity and higher expected returns, which translates to higher expected cost of equity capital for organizations (Leuz & Verrecchia, 2000). Cost of equity capital therefore seems to include an information asymmetry component, that, when getting stronger, affects the cost of equity capital. In other words, lower information asymmetry reduces market illiquidity which is reflected in prices and thus lowers the cost of equity capital (Lambert, Leuz & Verrechia, 2011). For organizations a decreased cost of equity capital is desirable, therefore it is important to understand how information asymmetry can be reduced.

Literature often connects an organizations' information disclosure structure to information asymmetry and cost of equity capital (e.g. Leuz & Verrecchia, 2000; Easley & O'Hara, 2004). Better disclosure essentially turns private information into public information, thereby reducing information asymmetry and the need for shareholders to price-protect themselves. Diamond (1985) in his study finds public information leaves all shareholders better off because it makes their beliefs more homogeneous and reduces the magnitude of speculative positions which informed shareholders take. If more publicly available information reduces an organizations' cost of equity capital, organizations can influence this by increasing the precision and quantity of information available to shareholders (Easley & O'Hara, 2004). Organizations that are able to reduce information asymmetry through, for instance, high quality of disclosure, thereby increase market efficiency and reduce their cost of equity capital (Healy & Palepu, 2001; Easley & O'Hara, 2004).

Although most research focused on information asymmetry related to financial information, an increasing amount of studies states that the conclusions also hold for non-financial information (e.g. Dhaliwal et al., 2011; Reverte, 2012). Increasing awareness, among shareholders and other stakeholders, of how organizational behavior influences the environment and social aspects, has led to greater information requirements on sustainability issues (Abeysekera, 2013; Braam et al., 2016). Information on sustainability performance has therefore become more valuable and is expected to have the same information asymmetry implications as information on financial performance (Orlitzky, Schmidt & Rynes, 2003; Al-Tuwaijri, Christensen & Hughes, 2004). Different studies illustrate this by showing how less information asymmetry through improved disclosure on sustainability performance leads to lower costs of equity capital (e.g. Dhaliwal et al., 2011; Reverte, 2012; García-Sánchez & Noguera-Gámez, 2017). Additionally it is implied that sustainability reporting just as regular financial reporting is part of an organizations' "toolbox" to decrease information asymmetries between managers and shareholders (Reverte, 2012).

The notion that an organizations' commitment to greater disclosure should lower the information asymmetry and therefore the costs of capital comes from economics-based theories (Leuz & Verrecchia, 2000). These theories suggest that in situations of information asymmetry, organizations voluntarily disclose (sustainability) information to differentiate themselves from others and making them more attractive to shareholders. Organizations with superior sustainability performance are more likely to disclose non-financial information in order to reveal how they are performing and thereby improve market-value (Clarkson,

Richardson and Vasvari, 2008). They will provide credible information that cannot be easily replicated by low performers (Braam et al., 2016). Voluntary disclosure theory expects good performers to employ more objective, verifiable sustainability performance indicators that are hard to imitate to convince shareholders (and other stakeholders) of the credibility of their sustainability performance (Clarkson et al., 2008). Reasoning from economics-based theories, organizations with good sustainability performance tend to disclose more sustainability information resulting in a lower cost of equity capital (Clarkson et al, 2008). These theories however, are not completely able to explain all factors. Alternative research argues socio-political theories are better able to explain the dynamic relations between power and politics among shareholders, society and government.

Socio-political theories, such as legitimacy theory, state that organizations have implicit contracts with society as a whole and that fulfilling these contracts legitimates the organization and its operations (Kolk & Perego, 2010). Legitimacy theory states organizations with low sustainability performance are more likely to disclose sustainability information because they have to meet certain socially constructed norms and expectations in order to legitimate their activities towards society. Not meeting these norms and expectations leads to legitimacy threats, in the form of social and political pressures (Clarkson et al., 2008). Due to the increasing challenges of today's economy and recent corporate scandals, social and political pressures have increased, thereby putting more pressure on organizations with low sustainability performance. Legitimacy theory states that low performing organizations try to reduce this pressure by using sustainability disclosure as a legitimation tactic to influence public perceptions with regard to their sustainability performance (Hummel & Schlick, 2016). Reasoning from legitimacy theory, organizations often use voluntary non-financial disclosure for making their sustainability performance look better than it actually is. When organizations experience public pressure and threatened legitimacy, they can voluntarily and selectively disclose environmental and social information in order to reduce the negative effects of low non-financial performance on their corporate reputation (Freedman & Patten, 2004; Boiral, 2013). Thereby they mostly use low-quality, or "soft" information that is not easily comparable, incomplete and superficial in order to mask their actual low performance (Clarkson et al., 2011). Sustainability disclosure, according to socio-political theories is used to enforce organizational legitimacy, thereby helping the organization to retain its 'public license to operate' (Deegan, 2002).

Both economic-based and socio-political theories are widely used in previous studies on sustainability disclosure and performance (e.g. Al-Tuwaijri et al., 2004; Clarkson et al., 2008; de Villiers & van Staden, 2006; Patten, 2002). While acknowledging both, this study primarily adheres to economics-based theories because it seems most appropriate for studying the direct interest in the effect of information asymmetry on the cost of equity capital.

2.2 Disclosure of information on sustainability performance

Reasoning from voluntary disclosure theory, unraveling private information can be seen as the main motive for voluntarily disclosing sustainability information (Hummel & Schlick 2016). As shareholders demand a lower return when holding stock with less private information (Easley & O'Hara, 2004), voluntarily disclosing information is expected to lower the cost of equity capital. Sustainability reporting is part of an organizations' tools for communication that they can use in order to decrease information asymmetries, and, subsequently the cost of equity capital (Dhaliwal et al., 2011; Reverte, 2012). Following voluntary disclosure theory, actual sustainability performance drives transparency because it motivates voluntary disclosure (Clarkson et al., 2008). More transparent organizations have less private information and thus have reduced information asymmetry (Diamond & Verrecchia, 1991). Organizations have a core profit-making responsibility, therefore lowering information asymmetry is only interesting to them if the perceived benefits outweigh the costs (Friedman, 1970). As previously noted, there is a close connection between information asymmetry and the cost of equity capital (Healy & Palepu, 2001; Easley & O'Hara, 2004). This study examines the relationship between disclosure of information on sustainability performance and the decrease in the cost of equity capital. Thereby it does not measure the quality of information on sustainability performance from organizations' own sustainability disclosures. The quality of disclosure on sustainability performance is measured with the use of ESG scores, which apart from an organizations' own sustainability disclosures, obtain information from other sources. Prior studies provide evidence that scores on disclosure of sustainability performance such as the ESG score are reliably related to actual sustainability performance (e.g. de Villiers & van Staden, 2011; Cho, Guidry, Hageman & Patten, 2012). This study argues that superior disclosure of information on sustainability performance leads to a reduction in information asymmetry and therefore shareholders require lower returns on their investment. Hence, the following hypothesis has been formulated:

H1 Organizations with superior disclosure of information on sustainability performance have lower cost of equity capital than organizations with inferior disclosure on sustainability performance.

2.3 Integrated reporting

Instead of preparing both a financial and a standalone CSR report, some organizations have started to publish integrated reports. Integrated reporting is a new reporting paradigm that is holistic, strategic, responsive, material and relevant across the short-, medium- and long term (Adams & Simnett, 2011). The integrated report combines financial information with sustainability information in one, understandable report. The main philosophy behind integrated reporting is that it gives a richer picture of the organization by incorporating qualitative as well as quantitative information (Owen, 2013). Thereby the main goal is to encourage long-term thinking by providing a different approach to corporate reporting. This is achieved by moving away from retrospective tradition of corporate reporting and towards a continuous, future-oriented and transparent process that is used for all communication to stakeholders (Holder-Webb, Cohen, Nath & Wood, 2008). With integrated reporting, corporate commitment to sustainability is of great importance. By bringing together financial, environmental, social and governance information in a clear, concise, consistent and comparable format, the responsibility towards society and the environment that goes beyond the maximization of profit is prioritized (Eccles & Krzus, 2010). This study pays special attention to integrated reporting because, according to the current literature, it is the next step in the evolution of corporate reporting (Cohen & Simnett, 2015). Integrated reporting has a stakeholder oriented view and argues that lenders, employees, customers, suppliers, the local community and the general public to all have legitimate rights to published information (Owen, 2013). Therefore it gives a better overview of the organization to all stakeholders and enhances the way organizations think about, plan and report the story of their business. Organizations use integrated reporting to communicate a clear, concise and integrated story that explains how all of their resources are creating value. It also helps these organizations to think holistically about their strategy, improve performance and increase stake- and shareholder confidence (IR, 2016). The integrated reporting movement is led by the IIRC, a global coalition of regulators, shareholders, organizations, standard setters, accounting professionals and NGOs (IIRC, 2013). The IIRC has developed the <IR> conceptual framework for helping organizations to expand their reporting to include all of the resources they use as inputs to their business activities (Cheng, Green, Conradie & Romi, 2014). The

three fundamental aspects of this framework are; (1) the six capitals that an organization uses and affects, (2) the organization's business model and (3) the creation of value over time. The six capitals: i.e., financial; manufactured; intellectual; human; social and relationship; and natural, stand for the resources an organization uses as input for their business activities and should be integrated with an organizations business model and underlying strategy (Cheng et al., 2014).

Disclosing CSR information has been largely motivated by increased information requirements of shareholders, the stakeholders that have the most economic power (Deegan, 2002; de Villiers, Rinaldi & Unerman, 2014). Although information in standalone CSR reports has been shown to be value relevant (Orlitzky et al., 2003; Al-Tuwaijri et al., 2004; Dhaliwal et al., 2011), much of the reported non-financial information included in such reports is often overwhelming in quantity and hard to understand for most stakeholders, including shareholders (Cheng et al., 2014). The use of an integrated report, as opposed to a standalone CSR report, can be beneficial to shareholders to overcome these complications and reduce information asymmetry. The level of detail in the integrated report is reduced by focusing on concision, reliability and materiality (Owen, 2013), reducing the length of the report and making it more convenient to read. Also, information in an integrated report is more clearly described and arranged more systematic throughout the report. Stakeholders can easily choose to read the part that is of interest to them, improving the overall reading experience. Greater disclosure to the public, development of a common language and greater collaboration between different functional areas of the organization all cause various advantages that are presented by integrated reporting (Frias-Aceituno, Rodríguez-Ariza & Garcia-Sánchez, 2014). The integrated report gives organizations the opportunity of a more in-depth understanding of their own business and learns them to communicate their process of value creation in a concise and straightforward way to their stakeholders.

This study expects that organizations with integrated reports have further reduction of information asymmetry than organizations that communicate their sustainability performance through a (standalone) CSR report. This reasoning is in line with García-Sánchez & Noguera-Gámez (2017) who have studied sustainability disclosures in integrated reporting form and confirm a negative relationship between the cost of equity capital and the disclosure of an integrated report. They thereby add that for industries with problems of high cost of capital because of asymmetric information, issuing an integrated report could be a solution. The cost of equity capital is expected to decrease for organizations that issue sustainability disclosures,

irrespectively if the format is in (standalone) CSR form of in integrated reporting form (Dhaliwal et al, 2011; García-Sánchez & Noguera-Gámez, 2017). This study however expects that organizations that use the integrated reporting format have a greater reduction in cost of equity capital than organizations that use (standalone) CSR reporting formats. Hence, the second hypothesis is as follows:

H2 Organizations that disclose an integrated report have lower cost of equity capital than organizations that do not disclose an integrated report*.*

2.4 Analyst coverage

This study expects analyst coverage to interact with the main information asymmetry reducing effects. The information environment of an organization can be measured through analyst coverage. Analysts help reduce information asymmetry between managers and shareholders, but also among shareholders. Higher analyst coverage lowers information asymmetry because it provides shareholders with more and better information (Lang & Lundholm, 1996). Analysts overall have a big influence on equity markets. Stock prices either adjust up five percent for changes to buy recommendations or eleven percent for changes to sell recommendations (Womack, 1996). This is of interest to sustainability information because research shows that most analysts are aware of disclosure of sustainability performance and consider this important enough to factor into their recommendations (Luo et al, 2015). Analysts appreciate superior disclosure of sustainability performance and organizations that disclose sustainability information seem to attract more analyst coverage than non-disclosers. Also, voluntary sustainability disclosure is associated with improved forecast accuracy and a reduction in forecast dispersion among organizations with superior disclosure on sustainability performance (Dhaliwal et al., 2011).

The interest of analysts in sustainability information is important because despite the availability of sustainability information in for instance CSR reports, such information is often too complex to be directly understood and priced by shareholders. The average shareholder is no certified industry expert and is bound by time and other resources (Surroca, Tribo & Waddock, 2010). Reading and understanding financial statements is more or less the same for a lot of different organizations. Sustainability disclosures however, are often complex and unstandardized, making it difficult to understand them for most shareholders. Because of this, not all sustainability information can be automatically incorporated into the financial performance of organizations (Godfrey, Merrill & Hansen, 2009). Stock analysts are certified

industry experts and are, more than shareholders, capable of assessing the disclosed sustainability information (Ivković & Jegadeesh, 2004). Through better understanding of sustainability information by shareholders this thesis expects information asymmetry to be reduced when more analysts cover the organization.

Shareholders rely heavily on analyst recommendations, not only because they may have little knowledge on sustainability specific matters, but also because analysts add to the credibility of disclosed information (Ivković & Jegadeesh, 2004). The importance of analyst coverage in professional guidance about the credibility of sustainability information is highlighted by Godfrey et al. (2009), who state that disclosure on sustainability performance is only substantial enough to be seen as a credible commitment when it is seen by outside evaluators such as stock analysts. Analysts are informed about the sustainability performance of other organizations in the industry and are aware of how "good" the performance of a particular organization really is in comparison to other organizations (Luo et al, 2015). Problems of information asymmetry may cause shareholders to be doubtful about self-reported disclosures on sustainability information. Analysts can reduce the information asymmetry between an organizations and shareholders by giving clarification on which sustainability information is credible and which is not (Easley & O'Hara, 2004). Through higher credibility of sustainability information by shareholders this thesis expects information asymmetry to be reduced when more analysts cover the organization.

Organizations benefit from having many analysts because while the forecast of any one analyst may have low precision, the collective forecast of many analysts should be much more accurate (Easley & O'Hara, 2004). Because of increased understandability and credibility of sustainability information, organizations that are able to attract active analyst following can reduce their cost of equity capital. Information asymmetry on disclosure of sustainability performance is expected to be reduced through better understandability and through verified credibility of ESG information. Hence, the third hypothesis is:

H3a Organizations with superior (inferior) disclosure on sustainability performance in combination with a high (low) level of analyst coverage have a lower (higher) cost of equity capital.

Integrated reporting in itself is expected to present sustainability information in a more clear, concise, consistent and comparable format and therefore to be more easily to understand for shareholders (Eccles & Serafeim, 2011). Because integrated reporting for all organizations in

this study happens on a voluntary basis, credibility is still questionable and can be increased by analyst coverage. Information asymmetry here is expected to be reduced mainly through enhanced credibility of the integrated information. Hence, the fourth hypothesis is:

H3b Organizations that (do not) disclose integrated information in combination with a high (low) level of analyst coverage have a lower (higher) cost of equity capital.

Chapter 3. Research method

3.1 Data sample

Weighted ESG ratings and social, environmental and governance scores are collected from the ASSET4 database in EIKON. The annual reports of the organizations are analyzed to determine whether or not there was an integrated report, a standalone sustainability report or financial report with a CSR chapter. This information is captured by searching on Google and by the use of the sustainability disclosure database of the Global Reporting Initiative. Primary organizational- and country-specific data for this study is collected using Thomson One and Eikon.

The total sample consists of 442 observations from 164 publicly listed organizations during the period 2013-2015. The sample is taken from the five largest countries in the EU as measured by GDP: i.e., France (114 observations, 41 organizations), Germany (100 observations, 37 organizations), Italy (76 observations, 27 organizations), Spain (90 observations, 34 organizations) and the Netherlands (62 observations, 25 organizations). These countries are selected for this study because they have comparable regulatory regimes with relatively strong legal enforcement (Danske, Hail, Leuz & Verdi, 2008). For all five countries, the 50 largest publicly listed organizations are selected, based on total sales in 2015 according to the Thomson One database. Due to limited availability of sustainability information and firm specific data it was not possible to use all 50 organizations from each country. Missing data on sustainability information might occur due to missing scores on environmental, social, governance or overall weighted ESG ratings. Further missing data was mainly caused by firm-specific data such as net income, total assets, etc.

Table 1 gives an overview of how organizations disclose sustainability information, both for the total sample and separately for every country in the sample. The first group is named CSR information and consists out of observations where organizations disclosed sustainability information either as a standalone CSR-report or as a separate part of their annual report. The second group is named integrated report and consists out of observations where organizations disclosed integrated information. In the total sample, 22% of the sustainability disclosures are in integrated reporting format. The Netherlands have the highest percentage (46%) of observations where sustainability information was disclosed in the integrated form. The last group is named 'no sustainability information' and consists of observations where organizations disclosed no sustainability information at all. This last group represents 31

observations. This small number is not surprising since the sample consists of the largest organizations in the EU and organizational size has often been distinguished as an important determinant for sustainability disclosure (Hahn & Kuhnen, 2013).

Table 1. Overview of types of reports issued by organizations as observed during the period 2013-2015

Country	FRA	GER	ITA	SPA	NLD	Total
	Obs.	Obs.	Obs.	Obs.	Obs.	Obs.
CSR information*	97	82	55	57	31	**322**
	93%	85%	83%	66%	54%	**78%**
Integrated report	7	15	11	30	26	**89**
	7%	15%	17%	34%	46%	**22%**
Subtotal	104	97	66	87	57	**411**
	100%	100%	100%	100%	100%	**100%**
No sustainability information	10	3	10	3	5	**31**
Total	**114**	**100**	**76**	**90**	62	**442**

*Either published a standalone CSR report or annual report contained separate CSR chapter.

Table 4 provides an overview of the sample distribution of the most important factors in this study during the years 2013-2015. The table consists of the means per variable for all separate countries and of the total sample. T-tests are used in order to analyze the differences per year and country. Over the years, no significant differences in average cost of equity capital or number of analysts following the firm are found. The average ESG score, although not significant, shows a slight increase over the years. This suggests that the average disclosure of information on environmental, social and corporate governance performance of organizations improved over the years.

Analyzing table 4 shows France has the highest number of total observations (114) and the Netherlands has the lowest number of total observations (62). The average percentage of cost of equity capital is given. Italy has the highest average cost of equity capital (16.96%) and T-tests show this significantly differs from other countries in the sample ($p < 0.01$). Germany has the lowest average cost of equity capital (12.17%), although this is not significantly lower than the cost of equity capital of the Netherlands (12.85%). The average analyst coverage per country is also specified. Here, Italy also significantly differs ($p < 0.01$) from the rest of the sample by having the lowest average analyst coverage (18.14). Germany has the largest average amount of analysts who follow the organizations in the sample (26.23). Furthermore, Table 4 provides the average ESG, environmental, social and governance scores. The ESG average score is lowest for Italy (70.31) and differs significantly ($p < 0.01$) from the rest of

the sample. France has the highest average ESG score in the total sample (87.94). The same pattern can be seen for both environmental scores and social scores, where Italy significantly (p<0.01) has the lowest average scores (67.68; 75.00) and France the highest average scores (90.01; 89.76). This is different for the average governance scores where Germany scores lowest (49.61) and significantly differs (p < 0.05) from the rest of the sample. The Netherlands have the highest average governance score (68.36).

During this study differences in industry characteristics are also controlled for. Organizations are separated into different industries based on their standard industrial classification (SIC) codes. Table 3 shows the industry classifications as used in this study. For the total sample per industry, a minimum of 15 observations is required in order to conduct an analysis on the differences. Therefore, some industries that have many similarities have been merged. This is the case for mining and construction but also for wholesale trade and retail trade. No observations of the industry categories 'Agriculture, Forestry & Fishing', 'Non-Classifiable' and 'Public Administrations' are found. The reason for absence of these organizations is most likely because they are not publicly-listed or not large enough to be included in the top 100 organizations per country.

Table 5 shows how many observations where conducted for each industry and their average values on different variables during the years 2013-2015. T-tests are used in order to analyze the difference between the different industries. 'Manufacturing' by far has the highest number of total observations (173) and the 'Services' industry has the lowest number of total observations (29). The average percentage of cost of equity capital is given. 'Finance, Insurance & Real Estate' has the highest average cost of equity capital (18.01%) and T-tests show this significantly differs from other industries in the sample (p < 0.01). 'Services' has the lowest average cost of equity capital (9.40%) and also significantly differs from other industries in the sample (p < 0.01). Further, no significant differences between the industries were found for the cost of equity capital. The average analyst coverage per industry is also specified. The combined industries 'Wholesale & Retail' have the highest average analyst coverage over the three sample years (25.42), although this does not significantly differ from the other industry groups. 'Mining & Construction' significantly differs (p < 0.05) from the rest of the sample by having the lowest average analyst coverage (18.38). Further, Table 5 provides the average ESG, environmental, social and governance scores per industry. The ESG average score is lowest for 'Finance, Insurance & Real Estate' (78.96) but does nog differ significantly from the rest of the sample. 'Mining & Construction' has the highest

average ESG score in the total sample (85.56). 'Services' has the lowest environmental score (78.44) and significantly differs ($p < 0.01$) from 'Mining & Construction', which here also has the highest score (88.21). The 'Mining & Construction' industry also scores highest on Social score (89.32). On the social score, the 'Services' industry scores lowest (82.18), but this industry in turn scores highest on governance score (68.57). 'Manufacturing' has the lowest average governance score (57.71).

Table 3. Country abbreviations.

		Number of observations			
Abbreviation	**Country**	**Total**	**2013**	**2014**	**2015**
FRA	France	114	36	39	39
GER	Germany	100	31	36	33
ITA	Italy	76	25	25	26
NLD	Netherlands	62	18	22	22
SPA	Spain	90	28	29	33

Table 2. Industry classifications.

			Number of observations			
Number	**Industry**	**SIC-code**	**Total**	**2013**	**2014**	**2015**
1	Mining & Construction*	1000 - 1799	32	10	12	10
2	Manufacturing	2000 - 3999	173	56	59	58
3	Transport, Communication, Electric & Gas	4000 - 4999	77	20	25	32
4	Wholesale & Retail*	5000 - 5999	39	13	13	13
5	Finance, Insurance & Real Estate	6000 - 6999	92	29	32	31
6	Services	7000 - 8999	29	10	10	9

* Merged industry

Table 4. Country characteristics observations 2013-2015.

Country	2013							2014							2015							Total						
	Obs.	CoEC*	AC	ESG	E	S	G	Obs.	CoEC*	AC	ESG	E	S	G	Obs.	CoEC*	AC	ESG	E	S	G	Obs.	CoEC*	AC*	ESG*	E*	S*	G*
FRA	36	14.93	22.69	87.84	89.31	89.44	63.75	39	13.60	23.44	87.56	89.17	89.24	67.93	39	12.65	22.82	88.40	91.49	90.57	67.28	**114**	**13.70**	**23.00**	**87.94**	**90.01**	**89.76**	**66.39**
GER	31	12.38	27.42	82.04	87.97	86.83	49.87	36	12.31	26.56	84.17	88.31	87.97	51.42	33	11.82	24.76	83.59	89.70	89.20	47.37	**100**	**12.17**	**26.23**	**83.32**	**88.66**	**88.02**	**49.61**
ITA	25	16.72	18.08	66.16	62.76	72.27	56.85	25	17.70	18.80	69.08	66.53	73.30	57.00	26	16.48	17.58	75.49	73.51	79.25	58.79	**76**	**16.96**	**18.14**	**70.31**	**67.68**	**75.00**	**57.56**
NLD	18	12.01	21.33	86.41	82.68	82.84	68.20	22	12.86	22.23	83.45	80.87	82.50	70.59	22	13.52	21.77	82.63	82.67	81.06	66.27	**62**	**12.85**	**21.81**	**84.02**	**82.04**	**82.08**	**68.36**
SPA	28	17.17	22.90	83.45	81.67	86.48	62.37	29	12.61	23.24	82.75	82.28	87.15	56.87	33	14.14	23.88	86.70	86.99	89.87	62.55	**90**	**14.59**	**23.37**	**84.42**	**83.82**	**87.94**	**60.66**
Total	**138**	**14.76**	**22.78**	**81.53**	**81.78**	**84.28**	**59.68**	**151**	**13.67**	**23.20**	**82.17**	**82.68**	**84.91**	**60.45**	**153**	**13.57**	**22.42**	**83.97**	**85.81**	**86.83**	**60.38**	**442**	**13.97**	**22.80**	**82.59**	**83.48**	**85.38**	**60.19**

* Cost of Equity Capital (CoEC) = (untransformed PEG ratio*100%). In further analysis, the transformed variable logwCoEC has been used (see table 8)

** See table 2 for the country abbreviations

See table 7 for the definitions of the variables

Table 5. Industry characteristics observations 2013-2015.

Industry**	2013							2014							2015							Total						
	Obs.	CoEC*	AC	ESG	E	S	G	Obs.	CoEC*	AC	ESG	E	S	G	Obs.	CoEC*	AC	ESG	E	S	G	Obs.	CoEC*	AC	ESG	E	S	G
1	10	11.67	20.00	86.02	86.51	90.08	58.10	12	11.47	18.67	84.63	86.51	87.93	62.61	10	15.87	16.40	86.22	91.94	91.34	58.41	**32**	**12.91**	**18.38**	**85.56**	**88.21**	**89.67**	**59.89**
2	56	13.82	22.55	81.89	85.63	83.52	55.77	59	14.48	22.76	82.70	86.26	84.73	58.86	58	12.29	22.09	85.35	88.77	87.43	58.41	**173**	**13.54**	**22.47**	**83.32**	**86.90**	**85.25**	**57.71**
3	20	14.04	23.30	83.85	81.73	88.42	60.50	25	13.26	23.32	81.01	81.03	85.85	59.03	32	13.46	23.66	83.19	84.55	88.12	60.78	**77**	**13.54**	**23.45**	**82.66**	**82.67**	**87.46**	**60.14**
4	13	12.77	24.54	81.04	79.39	85.40	57.95	13	10.96	25.54	83.88	82.73	84.70	58.91	13	10.88	25.85	85.12	85.80	87.59	56.40	**39**	**11.54**	**25.31**	**83.35**	**82.64**	**85.89**	**57.75**
5	29	20.85	22.34	76.41	75.08	80.94	64.79	32	15.91	24.16	79.64	77.87	84.89	60.84	31	17.51	21.94	80.65	81.01	83.54	64.65	**92**	**18.01**	**22.84**	**78.96**	**78.05**	**83.19**	**63.37**
6	10	9.39	24.80	85.93	78.15	82.70	69.00	10	8.90	24.80	84.85	76.45	80.34	71.51	9	9.97	23.67	85.17	81.00	83.66	64.83	**29**	**9.40**	**24.45**	**85.32**	**78.44**	**82.18**	**68.57**
Total	**138**	**14.76**	**22.78**	**81.53**	**81.78**	**84.28**	**59.68**	**151**	**13.67**	**23.20**	**82.17**	**82.68**	**84.91**	**60.45**	**153**	**13.57**	**22.42**	**83.97**	**85.81**	**86.83**	**60.38**	**442**	**13.97**	**22.80**	**82.59**	**83.48**	**85.38**	**60.19**

* Cost of Equity Capital (CoEC) = (untransformed PEG ratio*100%). In further analysis, the transformed variable logwCoEC has been used (see table 8)

** See table 3 for the industry classifications

See table 7 for the definitions of the variables

3.2 Measurement of variables

3.2.1 Dependent variable

Following Botosan & Plumlee (2005) this study determines the cost of equity capital with use of the Price/Earnings to Growth Ratio (PEG Ratio) based on the Easton (2004) model. Botosan & Plumlee (2005) in their study assess the relative reliability of five popular approaches to estimating the cost of equity capital. They find the Target Price Method and the PEG Ratio Method to dominate the alternatives and recommend individuals to rely on one of these two methods for estimating the cost of equity capital. The PEG ratio method seemed most appropriate because previous research concerning the influence of CSR disclosure on the cost of equity capital has also applied this model (e.g. Dhaliwal et al, 2011; Reverte, 2012; García-Sánchez & Noguera-Gámez, 2017). This study does not follow previous research which used the average cost of equity capital from different models (e.g. Daske et al, 2008; Dhaliwal et al, 2011), because of the greater likelihood of data elimination. The PEG model requires positive one year and two year ahead earnings forecasts as well as a positive change in the earnings forecast. The cost of capital is calculated as follows:

$$r = \sqrt{(eps_2 + rdps_1 - eps_1)/ P_0}$$

Where:

r   =   cost of equity capital

eps1 =   forecasted earnings per share one year ahead

eps2 =   forecasted earnings per share two years ahead

dps1 =   forecasted dividends per share one year ahead

P0   =   current price per share

3.2.2 Independent variables

Sustainability performance

This study uses ASSET4 ESG ratings from EIKON in order to measure the disclosure of information on sustainability performance of organizations. The ESG ratings give a consistent, objective and finely calibrated standard of an organizations environmental, social,

governance practices and combined ESG practices (Thomson Reuters, 2017). The combined ESG rating is used in the main analyses and calculated as follows:

$$ESG\ rating = \frac{1}{3} * Environmental\ rating + \frac{1}{3} * Social\ rating + \frac{1}{3} * Governance\ rating$$

The rating scale for every variable runs from 0 to 100. The higher the score, the better the disclosure of information on sustainability performance of an organization on the specific variable. The first ESG variable is environmental score and measures: "*an organizations impact on living and non-living natural systems, including the air, land and water, as well as complete ecosystems. The measure reflects how well an organization uses best management practices to avoid environmental risks and exploit environmental opportunities in order to generate long term shareholder value*" (Thomson Reuters, 2017). The environmental rating is compiled by 70 key performance indicators (KPIs) that are represented by three categories. The first category is emission reduction and measures commitment of management and effectiveness towards reducing environmental emission. The second category is product innovation and measures commitment of management and effectiveness towards support of research and development of environmentally friendly products and services. The third category is resource reduction and measures commitment of management and effectiveness towards efficient allocation of natural resources (Thomson Reuters, 2017).

The second ESG variable is social score and measures: "*an organizations capacity to generate trust and loyalty with its workforce, customers and society, through its use of best management practices. It is a reflection of the firm's reputation and the health of its license to operate, which are key factors in determining its capability to achieve long term shareholder value*" (Thomson Reuters, 2017). Social rating consists of seven categories and represents a total number of 88 KPIs. The first category is customer/product responsibility and measures commitment of management and effectiveness towards value-added product creation and service-related customer security. The second category measures society/community by commitment of management and effectiveness towards improving local, national and global organizational reputation. The society/human rights category measures commitment of management and effectiveness towards global human rights agreements. The workforce/diversity and opportunity category measures commitment of management and effectiveness towards diversification and equal opportunities among workers. The workforce/employment quality category measures commitment of management and effectiveness towards serving high-quality employment advantages and job conditions. The workforce/health and safety category measures commitment of management and

effectiveness towards maintaining safe and healthy working conditions. Lastly, the workforce/training and development category measures commitment of management and effectiveness towards training and development programs for its employees (Thomson Reuters, 2017).

The third ESG variable is Corporate Governance and measures: "*an organizations systems and processes, which ensure that its board members and executives act in the best interests of its long term shareholders. It reflects an organizations capacity, through its use of best management practices, to direct and control its rights and responsibilities through the use of incentives and checks and balances in order to generate long term shareholder value*" (Thomson Reuters, 2017). The governance rating is compiled by 68 key performance indicators (KPIs) that are represent four categories. The first category is board functioning and measured by looking at management commitment towards following best practice principles related to board activities and functions. The second category is board structure and measures the principles related to a well-balanced membership of the board. The third is compensation policy and reflects on the main principles of the compensation for the board of executive directors. The fourth is integration/vision and strategy and assesses management commitment to creating an overarching vision and strategy on financial and non-financial aspects (Thomson Reuters, 2017).

Integrated reporting

This study follows García-Sánchez & Noguera-Gámez (2017) in defining when a report can be considered integrated or not. The report has to be a single document, containing financial and management commentary, governance and remuneration information and sustainability reporting. These subjects all have to be presented in a way that reflects their interdependence. When an organization issues one report with segments that are actually independent reports, such as financial accounts, sustainability information and corporate governance statements, this does not make the report integrated. The information in an integrated report presents, in a holistic form, all financial and non-financial data necessary to understand all components of how an organization creates value (KPMG, 2011). In table 6 the minimum items required for the report to be considered an integrated statement in this study are presented (IIRC, 2011).

Table 6. Integrated report.

Organizational overview and business model
Mission, principal activities, markets, products and services
Business model, value drivers and critical stakeholder dependencies
Attitude towards risk

Operation context, including risks and opportunities
Description of the commercial, social, environmental and contexts
Description of the key relations with internal and external stakeholders
Description of the key risks and opportunities

Strategic objectives and strategies to achieve those objectives
Risk management of most important resources and their main relations
How the strategy is linked to other elements
Identification what gives the organization its competitive advantage

Governance and remuneration
Describes leadership and decision-making process
How corporate governance can influence strategic decisions
How the remuneration of executives is linked to performance

Performance
Identification of key performance and risk indicators (KPIs, KRIs)
Organizational impact on key relationships and resources
Most important external factors that impact performance
Comparison of targets and performance

Future outlook
Identification if organization is currently ready for future trends
How short- and long-term interests are balanced
Potential effects of the expected future in short- medium- and long-term

Source: IIRC (2011)

Analyst coverage

Following Lang & Lundholm (1996), Barron, Byard & Kim (2002) and Dhaliwal et al., (2011), analyst coverage is measured as the 12-month average number of analysts providing an annual earnings forecast. Data on analyst coverage is captured from the IBES database in EIKON. The 12-month average of an organizations fiscal year is taken because this is expected to give the most reliable and comparable reflection of an organizations information environment. It is hard to predict if a specific time of year has a significant impact on analysts. Although the sustainability report is issued at a single point in time, information in this report will influence analysts during the entire year (Lang & Lundholm, 1996).

3.2.3 Control variables

In accordance with previous research that have regression equations containing cost of equity capital or measures of sustainability performance, this study has a number of control variables. This study includes an organization's financial LEVERAGE as a first control variable. Higher financial leverage is associated with higher risk as creditors can protect their interests with contracts (Richardson & Welker, 2001). A positive relationship is expected between leverage and the cost of equity capital and several studies are followed by defining leverage as the ratio of total debt divided by total assets (Botosan & Plumlee, 2002; Dhaliwal et al, 2011). Return on Assets (ROA) is included in the model as a proxy for profitability because organizations with better financial performance are expected to have more free resources to practice sustainability activities and produce sustainability reports (Dhaliwal et al, 2011). Next to this ROA is expected to have a negative relationship with cost of equity capital because organizations with a higher ROA are expected to bear less risk (Daske et al., 2008). Following previous studies, ROA is computed as earnings before interest and taxes divided by total assets and a negative relation with the cost of equity capital is expected (Dhaliwal et al, 2011). This study also controls for SIZE. Organizational size in different studies has been proven to be significant in the relationship between disclosure of information and the cost of equity capital (Richardson & Welker, 2001; Botosan & Plumlee, 2005; Plumlee et al., 2010; Dhaliwal et al, 2011). Size is often seen as a reflection of an organization's level of disclosure of information. Larger organizations normally have greater disclosure obligations and also need more external funding, leading them to disclose more (Lang & Lundholm, 1993). Greater disclosure leads to lower information asymmetry which has an effect on the cost of equity capital. Following previous research, firm size in this study is measured by the natural logarithm of total assets and a negative relation with the cost of equity capital is expected (Daske et al., 2008). The last control variable is the book-to-market ratio (BMR) in order to control for differences in growth opportunities. Organizations with better growth opportunities are expected to disclose more information with the goal to reduce information asymmetry and decrease their financial cost. Botosan & Plumlee (2005) have found a negative and significant influence of BMR in the relationship between disclosure of information and the cost of capital. The BMR is calculated by dividing the book value of common equity by the market value of common equity.

Table 7. Definitions of variables and expected coefficient.

Variables *Dependent*	Definition	
CoEC	Cost of equity capital, measured as the PEG ratio. In the regressions the logarithm of this variable is used for a better normal distribution.	
Independent		*Exp sign*
ESG score	Weighted average environmental, social and governance score of an organization in year t. Presented as a score ranging from 0 to 100. Operationalized as the level of disclosure of information on sustainability performance	-/-
E score*	Environmental score of an organization in year t. Presented as a score ranging from 0 to 100. Operationalized as the level of disclosure of information on environmental performance	-/-
S score*	Social score of an organization in year t. Presented as a score ranging from 0 to 100. Operationalized as the level of disclosure of information on social performance	-/-
G score*	Corporate governance score of an organization in year t. Presented as a score ranging from 0 to 100. Operationalized as the level of disclosure of information on corporate governance performance	-/-
IR	Integrated Reporting - Dummy variable presenting if an organization issues an integrated report (1) or not (0) during year t.	-/-
AC	Analyst Coverage - Average number of analysts that are following the organization during year t.	-/-
Control variables		
SIZE	Size of the organization – Measured as logarithm of total year-end assets	-/-
LEV	Leverage – Measured by dividing debt by total assets. Higher value means higher leveraged organization.	+
ROA	Return on Assets – Operationalization of profitability. Measured by dividing annual net income by total year assets. Higher value represents higher profitability.	-/-
BMR	Book-to-market ratio – Operationalization of growth opportunities of an organization. Measured by dividing book value of equity by market value of equity. Higher value represents lower growth opportunities.	+

* Variables used only in the additional analysis.

3.3 Regression model

In this study a multilevel panel data regression analyses is used in order to examine the relationship between the variables. Multilevel models are used when population data is grouped in multiple categories. These regressions allow either the intercepts or slopes, or both, to vary across different levels (Field, 2009). In this study different organizations (level 1) at the meso-level are nested into countries (level 2) at the macro-level. By incorporating countries the model controls for the contextual variables that can arise because of country characteristics and might be able to cause dependency in the data. The classifications and relationships between the different countries may help to define the relation between disclosure of information on sustainability performance and the cost of equity capital (Field, 2009). Thereby the multilevel regression allows to control for both fixed and random effects and for binary and binomial variances. The model used for testing the hypotheses contains one dependent variables, three independent variables, three interaction variables and four control variables. This model is tested both with and without the interaction effects of analyst coverage. Interaction effects are included as the multiplication of the independent variable and analyst coverage variable. Continuous variables have to be centered before they are useable for studying interaction effects. A variable can be centered by transforming the observations into deviations around a fixed point, executed by subtracting the mean value from all scores. The continuous variables of interest here are analyst coverage and the ESG score. The following interaction variables are created: $ESG_{centerd}*AC_{centered}$, $IR*AC_{centered}$ and $ESG_{centered}*IR*AC_{centered}$. The three-way interaction tests the association between ESG score and cost of equity capital while integrated reporting and analyst coverage are held constant at different levels. These interactions are put into the model as fixed effects (Field, 2009). The following equation is developed, where β are the coefficients and ε is the error term:

$$CoEC = \beta_0 + \beta_1 ESG + \beta_2 IR + \beta_3 AC + \beta_3 ESG * AC + \beta_4 IR * AC + \beta_5 ESG * IR * AC + \beta_6 SIZEcontrol + \beta_7 LEVcontrol + \beta_8 ROAcontrol + \beta_9 BMVcontrol + \beta_{10} INDUSTRYcontrol + \beta_{11} YEARcontrol + \varepsilon$$

The ESG rating is an objectively and finely calibrated standard of an organizations environmental, social and governance practices (Thomson Reuters, 2017). As an additional analysis this study investigates the separate effects of these practices. The separate scores for three practices (Environmental score, Social score and Governance score) are collected from the ASSET4 database. Thereafter, all regressions are performed as they have been with the

combined ESG score. Table 8 presents the Pearson correlation matrix of the total sample. A highly significant and positive correlation of 0.7719 is found between the social score and environmental score. Also, highly significant and positive relations can be found between environmental score and ESG score (0.8285) and social score and ESG score (0.8386). Multicollinearity exists because the different measures of sustainability performance in ASSET4 are related to each other. Organizations that have a higher social score also tend to have higher environmental score and ESG score in general. No multicollinearity exists for corporate governance scores, indicating organizations that are high performers on this measure, are not per definition high performers on the other measures. Variables that are highly correlated cannot be included in the same model (Field, 2009). Therefore, the effects of environmental and social scores are tested separately. Although the effect of multicollinearity is smaller for corporate governance scores, this variable for uniformity reasons is also tested separately.

Table 8. Pearson's correlations.

	ESG	E score	S score	G score	IR	AC	Size	LEV	ROA	BMR
ESG	1.000									
E score	**0.8285***	1.000								
S score	**0.8368***	**0.7719***	1.000							
G score	0.6208*	0.3206*	0.3545*	1.000						
IR	0.1869*	0.1461*	0.1730*	0.1978*	1.000					
AC	0.3826*	0.3133*	0.3450*	0.3849*	0.2035*	1.000				
SIZE	0.2388*	0.2381*	0.2523*	0.2176*	0.0910***	0.2721*	1.000			
LEV	-0.0652	-0.0578	0.0393	0.0155	-0.0205	0.0558	-0.0534	1.000		
ROA	0.0705	-0.0218	0.0250	0.0756	0.0468	0.1577*	-0.2480*	0.2319*	1.000	
BMR	-0.1560*	-0.0892***	-0.0857***	-0.0418	-0.0869***	-0.1524*	0.3468*	0.0593	-0.1911*	1.000

***, ** and * indicate significance at the 10 percent, 5 percent and 1 percent levels respectively.
See table 7 for the definitions of the variables.

Chapter 4. Results

4.1 Descriptive statistics

Table 9 shows the descriptive statistics of all the variables used for the total sample. The table includes the 'Year', the dependent variable, the three independent variables and four control variables (442 observations). The table also includes the separate environmental, social and governance scores that are used for the additional analysis.

Table 9. Descriptive statistics of the total sample over period 2013-2015.

Variable	n	Mean	Std. Deviation	Min.	Max.
Year	442	2014.03	0.8116	2013	2015
Dependent variable					
CoEC*	442	-2.1041	0.4852	-3.1304	-0.5262
Independent variables					
ESG score	442	82.59	17.35	8.14	96.78
E score**	442	83.48	18.59	8.76	95.14
S score**	442	85.38	15.31	12.90	97.21
G score**	442	60.19	22.29	3.01	97.49
IR	442	0.20	0.40	0	1
AC	442	22.80	8.71	0	42
Control variables					
Size	442	17.16	1.68	11.67	21.45
LEV	442	0.74	0.54	0.06	7.99
ROA	442	0.03	0.08	-0.71	0.91
BMR	442	0.81	0.74	-0.77	7.85

*Cost of Equity Capital has been log-transformed in the analysis for a better normal distribution.
** Variables used only in the additional analysis.
Table 7 presents the definitions of variables.

4.2 Tests of hypotheses

Table 10 shows the results of the multilevel panel data logistic regression models with cost of equity capital as the dependent variable. The hypotheses are tested both with and without the interactions. Also, they are estimated for the whole sample and three sub-samples. For the first sub-sample, sustainability disclosers, the total sample of 442 is reduced by the number of organizations that did not communicate sustainability information (31), resulting in a sample size of 411 firm-year observations. The second and third sub-sample are representing non-financial organizations (350 firm-year observations) and financial organizations (92 firm-year

observations) respectively. Organizations that are grouped in the 'Finance, Insurance and Real Estate' industry are regarded as financial organizations. Organizations from all other industries are regarded as non-financial organizations. It is interesting to evaluate the differences between these groups because t-tests showed 'Finance, Insurance and Real Estate' organizations have a significantly higher average cost of equity capital (18.01%) than organizations from other industries.

4.2.1 Full sample

Main effects model

Table 10 starts with estimations of the full sample. The results show that the ESG score for the full sample has a negative, insignificant coefficient. The findings indicate there is no evidence organizations' disclosure of information on sustainability performance and cost of equity capital are related. Therefore, hypothesis 1 is not supported for the full sample. Integrated reporting also has no significant association with the cost of equity capital. This finding suggests there is no evidence that organizations providing integrated information have lower cost of equity capital. Therefore, hypothesis 2 is also not supported for the full sample. Analyst coverage in the main effects model also shows no significant association. This finding suggests analyst coverage on its own does not influence the cost of equity capital. The results of the full model do imply all control variables are significant at the 1 percent level. Size ($z = -2.91$, $p < 0.01$, two-tailed) has a negative and significant relationship with the dependent variable. This indicates larger organizations have a lower cost of equity capital. This finding is consistent with earlier studies that find larger organization disclose better information, leading to less information asymmetry and a lower cost of equity capital (Botosan & Plumlee, 2005; Plumlee et al., 2010; Dhaliwal et al, 2011). The second control variable, leverage ($z = 3.13$, $p < 0.01$) is also significantly influencing the cost of equity capital. This relationship is positive, indicating a more leveraged organization has a higher cost of equity capital. This finding is consistent with earlier literature that suggests higher financial leverage is associated with higher risk as creditors can protect themselves with contracts (Richardson and Welker, 2001). Profitability, as measured by return on assets ($z = -4.82$, $p < 0.01$) is also both negative and significant. This finding, consistent with previous literature, indicates organizations that are more profitable have lower costs of equity capital (Daske et al., 2008; Dhaliwal et al., 2011). The model further estimates how growth opportunities of an organization influence the cost of equity capital by including the book to market ratio ($z = 6.67$; $p < 0.01$), which is both positive and significant. A lower book to

market ratio implies higher growth opportunities. This finding suggests, consistent with earlier literature, that organizations with higher growth opportunities will disclose more in order to overcome problems of asymmetric information and thereby decrease their cost of equity capital (Botosan & Plumlee, 2005). Organizations active in the 'Finance, Insurance and Real Estate' industry ($z = 1.80$; $p < 0.1$) are significant and positively associated with the cost of equity capital. This is consistent with the earlier conducted T-tests indicating organizations from the financial industry have a higher average cost of equity capital than organizations from other industries.

Interaction effects model

The first interaction analysis for the full sample examines the relation between the ESG score and the cost of equity capital, while testing the interaction of analyst coverage. The interaction variable here is the multiplication of the centered ESG score and the centered average analyst coverage and is negative and significant ($z = -1.66$; $p < 0.1$). Hypothesis H3a therefore is supported for the full sample. This finding suggests that organizations with superior disclosure of information on sustainability performance in combination with higher analyst coverage have a lower cost of equity capital. The results in the interaction model further show a positive and significant relationship between analyst coverage ($z = 1.98$; $p < 0.05$) and the cost of equity capital. This finding suggests that when the centered ESG score is zero, higher analyst coverage leads to higher cost of equity capital. The second interaction analysis tests how the association between integrated reporting and cost of equity capital depends on analyst coverage. For this interaction, no significant effects were found indicating hypothesis H3b is not supported for the full sample. The three-way interaction between ESG score, integrated reporting and analyst coverage had no significant results.

4.2.2 Sustainability disclosers

The second sample estimates the model while leaving out the observations where organizations did not disclose any sort of sustainability information. The results show the coefficients for the independent variables do not differ much from the full sample in their significance and effect. The results for the relationship between the ESG score and the cost of equity capital show no significant effect. The findings therefore indicate hypothesis H1 is not supported for this sample. The results further show integrated reporting does not significantly influence cost of equity capital. Hypothesis H2 therefore is not supported. The control variables show many similarities to those in the full sample. Size ($z = -2.55$; $p < 0.05$) is both negative and significant. Leverage ($z = 3.64$; $p < 0.01$) is both positive and significant.

Profitability (z = -5.93; p < 0.01) is both negative and significant. Growth opportunities (z = 5.74; p < 0.01) is both positive and significant. The results of both interaction models show no significant effects. Therefore, hypotheses H3a and H3b are rejected for the sample without the non-disclosers. Although this differs from the full sample, this difference is not very substantial as the interaction effect between analyst coverage and the ESG score found there was very small. The three-way interaction between ESG score, integrated reporting and analyst coverage showed no significant results.

4.2.4 Non-financial organizations

The fourth sample consists of non-financial organizations. In this sample, all observations from organizations in the 'Finance, Insurance and Real Estate' industry are left out of the analysis. The results are very similar to the full sample and indicate the total sample is not heavily influenced by financial organizations. For this sample, hypotheses H1 and H2 are rejected because the results of both ESG score and integrated reporting do not show a significant association with the cost of equity capital. The control variables are all significant at the 1% level and similar to the full sample. Size (z = -3.07; p < 0.01) is both negative and significant. Leverage (z = 2.98; p < 0.01) is both positive and significant. Profitability (z = -4.50; p < 0.01) is both negative and significant. Growth opportunities (z = 6.82; p < 0.01) is both positive and significant. When the model is estimated for non-financial industries only, the results show no significant industry differences. This indicates that the 'Finance, Insurance and Real Estate' industry is the only deviating industry. Furthermore the results for both interaction models show no significant effects, indicating hypotheses H3a and H3b are rejected for the non-financial industries sample.

4.2.5 Financial organizations

The last sample consists only of financial organizations from the 'Finance, Insurance and Real Estate' industry. This industry shows some divergent results in comparison to the full sample. First, the results show the ESG score (z = -1.87; p < 0.1) in this sample is negative and significantly related to the cost of equity capital. Therefore, hypothesis H1 can be accepted for financial organizations. The findings indicate organizations in the financial sector with superior disclosure of information on sustainability performance have lower cost of equity capital. The results show no significant effect for integrated reporting. Thus, hypothesis H2 can be rejected for financial organizations. The findings suggest financial organizations do not have lower cost of equity capital when they disclose integrated information. The results show

the control variable size is insignificant and therefore deviates from the full sample. Other control variables are still significant, but the effects differ from the full sample. Leverage ($z = -1.70$; $p < 0.1$) is negative and significant. Profitability ($z = -1.85$; $p < 0.1$) is both negative and significant. Growth opportunities ($z = 2.58$; $p < 0.01$) is both positive and significant. The results show no significant interaction effects of analyst coverage on the relationship between the disclosure of information on sustainability performance and the cost of equity capital for the financial industry. Thus, no support for hypothesis H3a is provided. The findings suggest the association between disclosure of information on sustainability performance and the cost of equity capital does not significantly depend on analyst coverage. The second interaction analysis tests how the effect of integrated reporting on the cost of equity capital depends on analyst coverage. The results show the interaction variable here is negative and significant ($z = -1.69$; $p < 0.1$). This finding suggests organizations in the financial industry that issue integrated reports in combination with a higher analyst coverage have lower cost of equity capital, meaning hypothesis H3b is supported for the financial industry sample. The results in the interaction model further show a positive and significant relationship between integrated reporting ($z = 2.32$; $p < 0.05$) and the cost of equity capital. This finding suggests that when the centered ESG score is zero, the disclosure of an integrated report leads to a higher cost of equity capital.

Table 10. Results regression analysis with the logarithm of the CoEC as dependent variable.

	Full Sample		Sustainability Disclosers		Industry type — Non-Financial		Industry type — Financial	
		Interac.		Interac.		Interac.		Interac.
ESG score	-0.002	0.003	-0.001	0.002	-0.001	-0.007	**-0.005*****	-0.005
	(-1.29)	(0.88)	(-1.01)	(0.63)	(-0.55)	(1.49)	**(-1.87)**	(-1.11)
IR	0.005	0.207	-0.012	0.135	-0.034	0.095	0.143	**1.683****
	(0.09)	(1.04)	(-0.23)	(1.38)	(-0.57)	(0.46)	(1.18)	**(2.32)**
AC	0.004	**0.026****	0.003	0.021	0.001	**0.034*****	0.013	0.016
	(1.33)	**(1.98)**	(1.05)	(1.38	(0.19)	**(1.90)**	(1.35)	(0.53)
ESG score*AC		**-0.000*****		-0.000		**-0.000*****		-0.000
		(-1.66)		(-1.14)		**(1.87)**		(-0.05)
IR*AC		-0.007		0.001		-0.077		**-0.084*****
		(-0.31)		(0.05)		(-1.43)		**(-1.69)**
ESG score*IR*AC		-0.000		-0.000		0.000		0.000
		(-0.01)		(-0.33)		(1.43)		(0.87)
Size	**-0.052***	**-0.047***	**-0.047****	**0.045****	**-0.062***	**-0.061***	0.023	0.065
	(-2.91)	**(-2.60)**	**(-2.55)**	**(-2.43)**	**(-3.07)**	**(-3.02)**	(0.32)	(0.89)
LEV	**0.127***	**0.112***	**0.148***	**0.137***	**0.121***	**0.102****	**-3.208*****	**-3.591*****
	(3.13)	**(2.74)**	**(3.64)**	**(3.32)**	**(2.98)**	**(2.46)**	**(-1.70)**	**(-1.86)**
ROA	**-1.382***	**-1.332***	**-1.892***	**-1.879***	**-1.262**	**-1.242***	**-16.932*****	**-16.925*****
	(-4.82)	**(-4.65)**	**(-5.93)**	**(-5.89)**	**(-4.50)**	**(-4.44)**	**(-1.85)**	**(-1.78)**
BMR	**0.226***	**0.219***	**0.194***	**0.190***	**0.288***	**0.284***	**0.147***	**0.159***
	(6.67)	**(6.53)**	**(5.74)**	**(5.62)**	**(6.82)**	**(6.78)**	**(2.58)**	**(2.70)**
Year:								
2014	-0.002	-0.010	-0.011	-0.015	0.041	0.038	-0.185	-0.185***
	(-0.04)	(-0.19)	(-0.21)	(-0.29)	(0.75)	(0.71)	(-1.62)	(-1.66)
2015	0.008	-0.005	0.015	0.005	0.026	0.020	-0.060	-0.048
	(0.17)	(-0.10)	(0.29)	(0.10)	(0.47)	(6.78)	(-0.51)	(-0.41)
Industry:								
2	0.058	0.089	0.029	0.054	0.061	0.078		
	(0.69)	(1.04)	(0.32)	(0.57)	(0.75)	(0.93)		
3	-0.026	-0.004	-0.007	0.011	-0.011	-0.009		
	(-0.29)	(-0.05)	(-0.07)	(0.11)	(0.47)	(-0.10)		
4	-0.006	0.016	-0.011	0.009	0.009	0.008		
	(-0.05)	(0.15)	(-0.10)	(0.08)	(0.09)	(0.07)		
5	**0.180*****	**0.222****	0.164	**0.198*****				
	(1.80)	**(2.18)**	(1.54)	**(1.81)**				
6	-0.167	-0.139	-0.174	-0.150	-0.153	-0.174		
	(-1.50)	(-1.22)	(-1.51)	(-1.26)	(-1.41)	(-1.54)		
Wald chi2	152.88*	159.57*	149.74*	153.48*	108.76*	115.50*	26.40*	33.15*
_cons	-1.440*	-1.898*	-1.484*	-1.840*	-1.324*	-1.963*	0.628	0.127
	(-5.02)	(-5.18)	(-5.15)	(-4.80)	(-4.16)	(-4.13)	(0.42)	(0.08)

***, ** and * indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively. The values represent the regression coefficient and the Z-value (two-tailed) in brackets.

See table 2 for the definitions of industries.

See table 7 for the definitions of the variables.

4.3 Additional analysis

In this part, the results of the additional analysis are explained. The additional analysis tests the hypotheses for the separate environmental, social and governance scores. Due to multicollinearity between the overall ESG score and its underlying scores (see table 8), these scores are estimated in separate multilevel panel data regression models.

4.3.1 Environmental score

The estimated models for environmental score are displayed in table 11. The first model tests the relation between disclosure of information on environmental performance and the cost of equity capital and the results show a significant and positive result ($z = 1.85$; $p < 0.1$). This indicates superior disclosure of information on environmental performance leads to higher cost of equity capital. This result differs from the expectations. In the environmental score model, integrated reporting and analyst coverage are both insignificant. The control variables however are significantly affecting the cost of equity capital. Size ($z = -3.86$; $p < 0.01$) is both negative and significant. Leverage ($z = 3.08$; $p < 0.01$) is both positive and significant. Profitability ($z = -4.88$; $p < 0.01$) is both negative and significant. Growth opportunities ($z = 6.85$; $p < 0.01$) is both positive and significant. The first interaction analysis examines how the relation between the environmental score and the cost of equity capital depends on analyst coverage and shows no significant results. The second interaction effect examines how the relation between the integrated reporting and cost of equity capital depends on analyst coverage and also shows no significant results. Furthermore, the three-way interaction between the environmental score, integrated reporting and analyst coverage shows no significant results.

4.3.2 Social score

The estimated models for social score are also displayed in table 11. The results show that social score does not significantly affect the cost of equity capital. The control variables are all significantly affecting the cost of equity capital and comparable to the full sample. Size ($z = -3.39$; $p < 0.01$) is both negative and significant. Leverage ($z = 3.11$; $p < 0.01$) is both positive and significant. Profitability ($z = -4.92$; $p < 0.01$) is both negative and significant Growth opportunities ($z = 6.87$; $p < 0.01$) is both positive and significant. The results show no significant outcomes for both interaction models. Furthermore, the three-way interaction between disclosure of information on social performance, integrated reporting and analyst coverage shows no significant results.

4.3.3 Corporate Governance score

Last to be displayed in table 11 is the corporate governance score. The governance score is not significantly affecting the cost of equity capital. Also in this model, integrated reporting and analyst coverage are insignificant. The control variables are all significantly affecting the cost of equity capital and similar to previous models. Size ($z = -3.26$; $p < 0.01$) is both negative and significant. Leverage ($z = 3.15$; $p < 0.01$) is both positive and significant. Profitability ($z = -4.84$; $p < 0.01$) is both negative and significant. Growth opportunities ($z = 6.85$; $p < 0.01$) is both positive and significant. The results show no significant outcome for the first interaction analysis, indicating analyst coverage does not interact in the relationship between disclosure of information on governance performance and the cost of equity capital. The results also show no significant outcome for the second interaction analysis. This indicates that analyst coverage does not interact in the relationship between integrated reporting and the cost of equity capital. The results furthermore show that the three-way interaction variable is not significant.

In all models in table 11 the industry sector 'Finance, Insurance and Real Estate' has a positive and significant effect. This suggests that organizations operating in this industry have a higher average Cost of Equity Capital.

Table 11. Results additional regression analysis with the logarithm of the CoEC as dependent variable.

	Environmental score (E)		Social score (S)		Governance score (G)	
		Interactions		Interactions		Interactions
E score	0.002***	0.004				
	(1.85)	(1.48)				
S score			0.000	0.002		
			(0.34)	(0.55)		
G score					-0.001	-0.000
					(-1.34)	(0.01)
IR	-0.011	0.112	-0.004	0.240	0.005	0.255
	(-0.20)	(0.57)	(-0.07)	(1.22)	(0.10)	(1.31)
AC	0.002	0.009	0.003	0.011	0.004	0.009
	(0.66)	(0.73)	(0.96)	(0.75)	(1.40)	(1.44)
E/S/G*AC		-0.000		-0.000		-0.000
		(-0.53)		(-0.52)		(-0.72)
IR*AC		0.021		-0.018		-0.015
		(0.91)		(-0.74)		(-1.29)
E/S/G*IR*AC		-0.000		0.000		-0.000
		(-1.29)		(0.41)		(0.72)
Size	-0.069*	-0.066*	-0.060*	-0.058*	-0.056*	-0.051*
	(-3.86)	(-3.68)	(-3.39)	(3.21)	(-3.26)	(-2.92)
LEV	0.125*	0.119*	0.127*	0.123*	0.128*	0.124
	(3.08)	(2.92)	(3.11)	(3.01)	(3.15)	(3.06)
ROA	-1.394*	-1.373*	-1.409	-1.374*	-1.387*	-1.3441
	(-4.88)	(-4.81)	(-4.92)	(-4.79)	(-4.84)	(-4.67)
BMR	0.228*	0.225*	0.229*	0.229*	0.228*	0.224
	(6.85)	(6.77)	(6.87)	(6.85)	(6.85)	(6.64)
Year:						
2014	-0.002	-0.007	-0.001	-0.004	-0.001	-0.007
	(-0.04)	(-0.15)	(-0.02)	(-0.09)	(-0.03)	(-0.14)
2015	-0.003	-0.011	0.005	-0.002	0.006	-0.004
	(-0.06)	(-0.22)	(0.10)	(-0.03)	(0.12)	(-0.09)
Industry:						
2	0.069	0.083	0.067	0.097	0.059	0.087
	(0.82)	(0.97)	(0.80)	(1.13)	(0.70)	(1.01)
3	-0.002	0.005	-0.016	0.012	-0.022	0.000
	(-0.02)	(0.05)	(-0.17)	(0.13)	(-0.24)	(0.00)
4	0.014	0.021	0.003	0.032	-0.007	0.017
	(0.14)	(0.20)	(0.03)	(0.30)	(-0.06)	(0.16
5	0.261*	0.265**	0.216**	0.246**	0.203**	0.226**
	(2.55)	(2.55)	(2.13)	(2.38)	(2.07)	(2.26)
6	-0.145	-0.135	-0.161	-0.131	-0.158	-0.129
	(-1.31)	(-1.17)	(-1.44)	(-1.13)	(-1.42)	(-1.122)
Wald chi2	155.21*	160.23*	150.80*	153.57*	153.06*	156.60*
_cons	-1.457*	-1.638*	-1.467*	-1.663*	-1.444*	-1.631*
	(-1.31)	(-4.62)	(-5.09)	(-4.54)	(-5.04)	(-4.96)

***, ** and * indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels respectively. The values represent the regression coefficient and the Z-value (two-tailed) in brackets.

See table 2 for the definitions of industries.

See table 7 for the definitions of the variables.

Chapter 5. Discussion

5.1 Interpretation

This study hypothesized that organizations with superior disclosure of information on sustainability performance would have a lower cost of equity capital. The results show significant and negative results, but only for the financial sample. Hypothesis 1 therefore is accepted for financial organizations, indicating that these organizations have a lower cost of equity capital when they have superior disclosure of information on sustainability performance. This finding suggests that financial organizations with superior sustainability disclosure, as opposed to other organizations in the sample, are able to reduce information asymmetry and therewith the cost of equity capital. For non-financial organizations, the results show no significant outcomes for the association between disclosure of information on sustainability performance and the cost of equity capital. This is the same for the entire sample and the sample that only consists out of sustainability disclosers. For all these samples, no convincing evidence for hypothesis 1 was found, indicating that the disclosure of information on sustainability performance does not lead to lower costs of equity capital. This finding suggests that shareholders do not value if organizations have a sustainable strategy or not, but specifically value short term financial performance. This however seems unlikely, as previous literature mostly finds that shareholders value sustainability information and sustainability performance (e.g. Dhaliwal et al, 2011; Plumlee et al., 2015; García-Sánchez & Noguera-Gámez 2017). Dhaliwal et al. (2011) for instance find that a sustainable strategy causes shareholders to have lower expected returns by documenting a negative relationship between CSR disclosure and the cost of equity capital. When theorizing about an alternative explanation for not finding supporting evidence for hypothesis 1, it is important to understand the difference in how sustainability information is measured in previous research. Studies like the one of Dhaliwal et al. (2011) generally examine if a sustainability report is issued or not, without further distinguishing between the differences in the quality of those reports. While the issuance of sustainability disclosure signals progress towards expanding current corporate reporting to include environmental, social and governance issues, these reports are not directly related to an organizations' actual sustainability performance (Zhou et al., 2017). The ESG score however does indicate the quality of organizations' sustainability disclosures by also obtaining sustainability information from third party sources. Therefore, the ESG score on sustainability disclosure is more closely related to an organizations actual sustainability performance (Cho et al., 2012). Not finding support for hypothesis 1 in this case suggests that

shareholders do not value the differences in quality of disclosures on sustainability performance, as measured by the ESG score. A potential explanation could be that the quality of disclosure of actual performance is either unimportant or unobservable for shareholders. According to previous research, shareholders value the situation when there is a sustainability disclosure over the situation when there is none (e.g Dhaliwal et al, 2011; Reverte, 2012). The findings in this current study suggest that differences in quality of sustainability disclosures and other factors that can indicate actual performance, are of no value. This finding is important because it implies that non-financial organizations with low sustainability performance are able to use sustainability disclosure as a legitimation tactic as it makes their actual performance unobservable or insignificant. This reasoning is consistent with socio-political theories that indicate organizations use sustainability disclosure to influence public perceptions of their actual sustainability performance (Hummel & Schlick, 2016). Because of the voluntary character of sustainability disclosures, organizations with a low sustainability performance are able to use it in a self-serving and manipulative way (e.g. Freedman & Patten, 2004). When organizations with an inferior sustainability performance can reduce their cost of equity capital by disclosing low quality information, because the quality of disclosure is unimportant, this does not incentivize them to improve their actual performance (Freedman & Patten, 2004). Therefore, sustainability disclosure on a voluntary basis may not have the desired effects. This conclusion however, has to be drawn with caution because this study does not actually test if the disclosure of sustainability reports has financial benefits. This has only been assumed by relying on previous research (e.g. Dhaliwal et al., 2011: Reverte, 2012). Further elaboration on this is included in the recommendations for future research.

This study also hypothesized that organizations that disclose an integrated report would have lower cost of equity capital than organizations that do not disclose an integrated report. The results show that integrated reporting, for the full-sample and all sub-samples, is not significantly associated with the cost of equity capital. Hypothesis H2 therefore cannot be accepted, indicating that organizations that provide an integrated report do not have lower cost of equity capital than organizations that do not provide such a report. This finding suggests that shareholders do not see the added value of integrated reporting over other forms of CSR reporting. This is inconsistent with the expectations and recent findings of Zhou et al., (2017) and García-Sánchez & Noguera-Gámez (2017) who find a significant negative relation between the alignment with the <IR> framework and a subsequent reduction in the cost of

equity capital. These studies also used IIRC (2011) guidelines to determine if a report was integrated or not and also used the PEG-ratio for determining the cost of equity capital. A potential explanation for the unexpected results could be associated with the difference in research sample. Zhou et al. (2017) studied the years 2009-2012 for organizations listed to the JSE (Johannesburg Securities Exchange). Organizations listed to the JSE are obliged to disclose integrated reports which is different from the EU sample in this study, where integrated reporting is used on a voluntary basis. Whether an organization is disclosing information on a voluntary or a non-voluntary basis could possibly explain the difference in findings. When disclosures are voluntary, managers have incentives to make self-serving disclosures. Therefore, in situations of voluntary issued integrated reports it is unclear whether management disclosures are credible (Healy & Palepu, 2001). Integrated reports that are mandatorily disclosed are expected to be perceived more credible by shareholders because they are subject to regulatory guidance that oversees how well they comply with the <IR> framework (Zhou et al., 2017). When shareholders value mandatory disclosures more than voluntary disclosures, this could explain the difference in findings of the study of Zou et al. (2017) and this current study. The findings however are also inconsistent with García-Sánchez & Noguera-Gámez (2017), who studied listed organizations that disclosed integrated reports on a voluntary basis. A potential explanation for these different findings is the difference in timeframe. The sample of García-Sánchez & Noguera-Gámez (2017) consisted of the years 2009-2013, whereas the sample in the current study consisted of the years 2013-2015. In the years 2009-2013, integrated reporting was still very new and therefore the actual benefits could not exactly be distinguished yet. Organizations that provided integrated reports were rewarded with a lower cost of equity capital because the disclosure signaled they were working on a sustainable strategy. In later years the possibility exist that shareholders, who were enthusiastic at first, started to see that the actual benefits of integrated reporting are smaller than perceived. This places more emphasis on the downsides of disclosing more information, such as the high costs of preparing an integrated report and the potential use of information by competitors (García-Sánchez & Noguera-Gámez, 2017). When shareholders valued integrated reports more in the beginning than in later years, this explains the difference in findings between the study of García-Sánchez & Noguera-Gámez (2017) and this current study.

The first interaction model hypothesized that organizations with superior disclosure on sustainability performance in combination with a high level of analyst coverage would have a

lower cost of equity capital. The results show that analyst coverage as a main effect is significantly and positively related to the cost of equity capital for both the full sample and the non-financial industries sample. This finding suggests when the centered ESG score has a value of zero, which is the average, more analysts following the organization leads to a higher cost of equity capital. The results further show that the interaction variable, analyst coverage, has a significant negative effect on the relationship between disclosure of information on sustainability performance and the cost of equity capital for both the full sample and the non-financial sample. This is consistent with the expectations of hypothesis H3a and indicates that organizations with superior disclosure on sustainability performance in combination with a high level of analyst coverage have a lower cost of equity capital. This finding indicates when financial analysts act as information intermediaries this adds credibility to the quality of disclosures. Consistent with previous literature, this suggests that when there are more analysts that consider the quality of disclosure of information on sustainability performance, shareholders find this information more credible (e.g. Easley and O'Hara, 2004; Luo et al., 2015). However, when the organization has a mediocre disclosure of information on sustainability performance and more analysts follow the organization this leads to a higher cost of equity capital. A potential explanation for this is that when there are more analysts, this lowers information asymmetry because shareholders are provided with better information (Lang & Lundholm, 1996). Therefore the, not very desirable, mediocre score is more effectively communicated to shareholders leading them to expect higher returns on their investments. This finding is only significant for the full sample and the sample with organizations from the non-financial industry. For financial organizations, analyst coverage does not add a significant amount of credibility to ESG scores. The finding suggests that shareholders value the presence of analysts more when they deal with non-financial organizations than when they deal with financial organizations. A possible explanation to why shareholders rely more on analysts for non-financial organizations, could be that these organizations are more susceptible to sustainability claims as they generally have a bigger direct impact on the environment.

The second interaction model hypothesized that organizations that disclose an integrated report in combination with a high level of analyst coverage would have a lower cost of equity capital. The results show integrated reporting as a main effect to positively and significantly relate to the cost of equity capital for the financial industries sample. This finding suggests that when the centered analyst coverage has value zero, which is the average, organizations

that disclose integrated reports have higher costs of equity capital. The results also show the association between integrated reporting and cost of equity capital depends on analyst coverage in the financial sample. This is consistent with the expectations of H3b and indicates that financial organizations that disclose integrated information in combination with a high level of analyst coverage have a lower cost of equity capital. This finding suggests that integrated reporting for financial organizations leads to a lower cost of equity capital when analysts review and add credibility to the disclosed information. When, however, the organization has a mediocre amount of analysts following the organization and issues integrated reports this leads to a higher cost of equity capital. This is consistent with the findings of Godfrey et al. (2009) who state that sustainability performance is only substantial enough to be noticed as a credible commitment when it is seen by enough outside evaluators such as stock analysts. When the amount of analysts is average, the information disclosed by financial organizations in an integrated report is not perceived as credible and therefore the cost of equity capital increases. This finding is only significant for the sample with organizations from the financial industry. For non-financial organizations, analysts do not add a significant amount of credibility to integrated reports. These findings thus suggest that shareholders value the presence of an integrated report more when they deal with financial organizations than when they deal with non-financial organizations. A possible explanation for these finding could be that the sustainability performance of financial organizations is harder to observe than that of non-financial organizations as they do not have, for instance, clear physical manufacturing processes and therefore integrated reports make a bigger difference.

In this study, an additional analysis has been conducted in which the environmental-, social- and governance score were tested separately. These results show that a higher environmental score leads to a higher cost of equity capital. This finding is inconsistent with the expectations and suggests that organizations that have better disclosure of information on environmental performance have a higher cost of equity capital. This unexpected result is in line with Cho et al. (2013), who argue that both low and high environmental performance leads to lower information asymmetry because they both motivate organizations to provide private information. Low performers have an incentive to explain or contextualize their performance (Patten, 2002; Clarkson et al., 2008) and therefore also reduce information asymmetry. The additional analysis further finds no significant results on the main effects or interaction effects.

5.2 Limitations

This study is subject to several limitations. First, the organizations that have been taken into account are only the largest, publicly listed organizations of the five biggest EU countries. Because these organizations are so large and well known, they are under strong societal pressure to improve their sustainability performance/disclosure. Their ESG scores are relatively close to each other and almost all of them organizations disclose some sort of sustainability information. When a more diverse set of organizations had been taken into account, it is expected that the results would be more significant. Secondly, only the PEG-ratio is used as a proxy to measure the cost of equity capital. Using more proxies would have reduced the sample size too much for the limited amount of observations available. However, according to previous literature, the use of multiple proxies would make the results more reliable (e.g., Daske et al, 2008; Dhaliwal et al, 2011). Third, the observations in the analysis are based on only three years of data. It is expected that the results would be more significant when a longer time period could be studied. Fourth, integrated reporting in this study is treated as a binary variable in which it could either be "integrated" or "not-integrated". This does not allow for very sophisticated analyses and differs from the reality in which integrated reporting takes place in different degrees. In hindsight, it would have been better to examine integrated reporting measured by the level of "integratedness" instead of as a dummy variable. Last, the role of analysts could have been further examined by including analyst recommendations and analyst forecast accuracy, instead of only estimating the model for analyst coverage.

5.3 Recommendations for future research

There are several possibilities for future research recommended on the basis of this research. Firstly, future studies are encouraged that further explore the differences between voluntary issued sustainability disclosures and mandatory issued disclosures. Such research would be beneficial for regulatory purposes and could be conducted both for CSR disclosures and integrated reports. Secondly, this study examines analyst coverage as an information intermediary that adds to the credibility of sustainability disclosures. Another important factor to examine could be assurance over sustainability disclosure. Nowadays, more than half of the world's largest organizations have some sort of assurance over their sustainability disclosures (Cohen & Simnett, 2015). If an organization has their sustainability disclosures assured or not could very well influence the credibility of sustainability disclosures. Thirdly, future studies are encouraged to analyze the financial benefits of disclosure of sustainability information and

the financial benefits of having high quality disclosure of sustainability information. In this study, only the quality of disclosure of information on sustainability performance was measured. The assumption that the disclosure of sustainability information has financial benefits was derived from previous studies (e.g. Dhaliwal et al., 2011; Reverte, 2012). This makes it impossible to form generalizable claims, as there is no certainty that, for the sample used in this study, the disclosure of a sustainability report really does cause financial benefits. Fourthly, in this study, the results showed differences in outcomes for non-financial and financial organizations. Future research is encouraged to, more in depth, investigate how the effects of a sustainable strategy differ for these two groups.

Chapter 6. Conclusion

This study explored two main effects; whether disclosure of information on sustainability performance is associated with an organizations' costs of equity capital, and; whether integrated reporting is associated with an organizations' costs of equity capital. Better disclosure by organizations essentially turns private information into public information and thereby reduces information asymmetry and subsequently the cost of equity capital.

The results of this study show that organizations with superior disclosure of information on sustainability performance do not have lower cost of equity capital than organizations with inferior disclosure on sustainability performance. This suggests that organizations can use voluntary sustainability disclosure as a legitimation tactic because the actual quality of those disclosures is insignificant or unobservable to shareholders. When the cost of equity capital can be reduced by disclosing low quality, self-serving sustainability information, this does not incentivize organizations to improve their actual performance. Furthermore, organizations that disclose an integrated report do not have lower cost of equity capital than organizations that do not disclose an integrated report. This indicates that the impact of integrated reporting is not as big as suggested in previous studies.

This study also explored the interaction of analyst coverage in the relationship between the main effects. Financial analysts, as information intermediaries, were expected to increase understandability and credibility of sustainability disclosures. The first interaction model shows that organizations with superior disclosure on sustainability performance in combination with a high level of analyst coverage have a significantly lower cost of equity capital. This suggests when there are more analysts that clarify and analyze the quality of disclosures, shareholders find this information easier to understand and more credible. The second interaction, for financial organizations showed that disclosing an integrated report in combination with a high level of analyst coverage leads to a lower cost of equity capital. This suggests that shareholders for financial organizations think the information in an integrated report is valuable and credible, but only when analyst coverage is above average.

Overall, the findings were unexpectedly conform to socio-political theories. The voluntary character of sustainability disclosure makes it easy for organizations to disclose in a self-serving manner and hard for shareholders to identify credible disclosures of actual sustainability performance. Although analysts do add some credibility to sustainability disclosures, this effect was found to be limited.

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