Non-financial and integrated reporting from the perspective of the preparers, users, and standard setter

A research into the use and usefulness of non-financial information

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Preface

In 2014, after completing my post-master accountancy, I decided to combine my work as an auditor at PwC Amsterdam with a PhD study at the University of Amsterdam. I believe that the combination of academic research and practical professional experience is important for ensuring that academic research remains relevant.

In my daily work as an auditor, I noticed that I was intrigued by the story behind the numbers, while I was auditing the financial statements at large international firms. I was interested in the goals, strategy, activities, and prospects of firms. I was auditing the financial figures, but always wondered how the numbers I was auditing today would develop in the years to come. I had one burning question: How do these firms create value?

In December 2013, I read a news article about a new framework that was published by the International Integrated Reporting Council. The International Integrated Reporting Framework (IR Framework) promoted a more cohesive and efficient approach to corporate reporting that draws on different reporting strands and communicates the full range of factors that materially affect the ability of an organization to create value over time. That is when my interest in integrated and non-financial reporting started. My first thought was: “This is it! The future of corporate reporting! It is not only about the numbers, but there is also a story behind these numbers that needs to be told!”

With the upcoming Standards and regulations on non-financial reporting, my vision about corporate reporting became reality on April 21st, 2021, when the European Commission adopted an ambitious and comprehensive package of measures to help improve the flow of money towards sustainable activities across the European Union. One of the

proposals in this package was the adoption for a Corporate Sustainability Reporting Directive which would amend the existing reporting requirements.

In the meantime, since 2014 I have been working on my dissertation on integrated and non-financial reporting by writing three research papers that are included in this dissertation. The past couple of years have been very interesting and challenging. It was a journey in which I learned a lot. Both in knowledge and personally. The balancing act of combining priorities; working and doing a part-time PhD at the same time was challenging. It was a journey of ups and downs, but most of all a journey of perseverance in which I aimed to add knowledge to the existing field of academic literature on integrated and non-financial reporting. I am more than happy and grateful that I had the chance and opportunity to experience this journey.

A great journey it is!

A special thanks to my supervisors, Prof. Dr. Henk Langendijk and Prof. Dr. Arjan Brouwer RA, for giving me the opportunity to do this research and for their support, valuable advice, and patience during the full process also when it took a lot of time before there was visible and quality output. Thanks for keeping faith in me during the past years.

I would also like to express my gratitude to all those who helped in direct and indirect ways to make this dissertation possible. Especially my prior and current employers: PwC Amsterdam, the Dutch Authority for the Financial Markets (AFM), and Royal Ahold Delhaize NV for making this combination of work and academic research possible and supporting me in setting the right priorities and realize my ambitions.

Furthermore, my dissertation benefited from the input and advice from many people, including, but not limited to, Prof. Dr. Bart Dierijnck,

Prof. Dr. Victor Maas, Prof. Dr. Marcel van Rinsum, Prof. Dr. Bob Fennis, Brownbag seminar participants at the University of Amsterdam (October 2018), participants at the 14th EIASM Interdisciplinary conference on "Intangibles and Intellectual Capital, Value Creation, Integrated Reporting and Governance" at Ludwig-Maximilians University Munich (September 2018), Dutch Accounting Research Conference participants at Nyenrode Business University (June 2019), participants at the 15th EIASM Interdisciplinary conference on "Intangibles and Intellectual Capital, Value Creation, Integrated Reporting and Governance" at Coimbra Business School (September 2019), participants at the Doctoral Colloquium on Experimental Management Accounting Research held at Ruhr University, Bochum (December 2019), participants at the 43th European Accounting Association (EAA) virtual annual congress 2021, Brownbag seminar participants at the University of Amsterdam (April 2022), participants at the 2nd annual Academy of Sustainable Finance, Accounting, Accountability & Governance (ASFAAG) Conference held at Mediopol University, Istanbul (June, 2022), participants at the European Network for Experimental Accounting Research (ENEAR) held at Pablo de Olavide University, Seville (July, 2022), and participants at the 17th EIASM Interdisciplinary conference on "Intangibles and Intellectual Capital, Value Creation, Integrated Reporting and Governance" (September 2022).

Finally, I am grateful to my grandparents and parents who gave me the greatest gift of all: they always believed in me and supported me in this great journey to realize my dreams and ambitions. I also thank my brothers and my boyfriend for their interest and support in this journey of mine.

I hope you enjoy reading my dissertation!

Kavita Nandram

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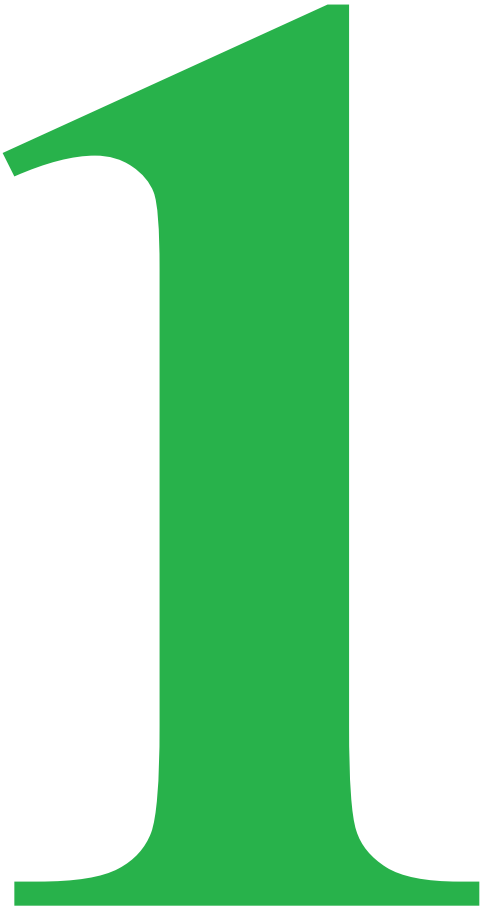


Introduction

1. Introduction

This dissertation contributes to our understanding of non-financial and integrated reporting. More specific, our goal is to better understand the value relevance and usefulness of non-financial and integrated reporting. In chapter 2, we focus on the quality indicators of non-financial reporting. In chapter 3, we research the use of impression management in an integrated report and in chapter 4, we investigate the presentation format of integrated reporting and the effect on the decisions of users of the report.

Chapter 2 began with our interest in the quality of non-financial information, the proposal for the Corporate Sustainability Reporting Directive (CSRD) and the International Sustainability Standards Board (ISSB) exposure drafts. In these proposals for sustainability standards, we noticed that both the CSRD and ISSB identified the same information quality dimensions for non-financial information as the ones that are included in the International Accounting Standards Board (IASB) Conceptual framework for financial reporting. We believe there is a difference between non-financial and financial information and reporting and therefore had the prediction that there are also other characteristics of information quality that are relevant to investors than the ones identified for financial information in financial reporting standards. We performed a literature review and a survey with investors and conclude that most information quality criteria that are applicable for financial reporting are also relevant for non-financial reporting. However, investors also identified other information quality characteristics that are important for non-financial reporting, next to the information quality characteristics that are identified for financial reporting. For example; ‘access to non-financial information’ is more important to investors’ assessment of

the firms' non-financial performance than to the assessment of financial performance. Our results are of relevance to the European sustainability reporting standard setter and the ISSB in the development of the standards for non-financial reporting.

In chapter 3, we investigate whether firms disclose reliable and complete information on their non-financial KPIs in a transparent manner in their integrated report, specifically when non-financial performance is weak. Additionally, the study investigates whether the disclosure of material non-financial KPIs is associated with firm financial performance. We came up with this topic, because an often heard critique in the past years is that firms mainly use integrated reporting to present a better or greener picture of the firm. The study examines whether managers tend to use impression management when they disclose non-financial information in the integrated report through an experiment with experienced professional controllers and part-time students in the Executive Master Finance and Control at universities in the Netherlands. The main finding in this paper is that impression management is not applied by including or excluding non-financial KPIs in the integrated report, but it is applied by using more prominent presentation forms for positive non-financial performance and non-prominent presentation forms for negative non-financial performance.

In chapter 4, we build forth on the findings of chapter 2 and 3. One of the findings in chapter 2 is that the format in which non-financial information is presented is least important, according to investors that participated in the survey. The results in chapter 3 however show that firms use impression management through presentation form in their integrated reports. By performing an experiment with professional investors and students in the Netherlands, we investigate in chapter 4 what the influence of connectivity

levels in an integrated report are on professional and non-professional investors' assessment of a firm's performance and prospects of future performance, and their willingness to invest. The main finding in this study is that non-financial information in an integrated report positively influences non-professional investors' assessments of current and future financial performance and their willingness to invest, but only when the report connects the non-financial information to the financial information. The strongest effect of integrated reporting appears when qualitative connectivity explains the link between non-financial information and its (future) financial impact. This is an interesting finding, because it indicates that for investors it is sufficient when firms connect their non-financial and financial information in the integrated report by using words instead of quantifying their impact.

The main connecting factor between the chapters is that all three chapters investigate a dimension of non-financial and integrated reporting. In chapter 2 and 4 the focus is on the view of the users of the report and the standard setter. In chapter 3 the focus is on the preparers of the report. This brings together different views from important stakeholders in the process of non-financial and integrated reporting and contributes to the stream of research on the value relevance of non-financial and integrated reporting.

CHAPTER

2

Characteristics of non-financial information quality - from the perspective of investors in the Netherlands

2. Characteristics of non-financial information quality – from the perspective of investors in the Netherlands

Abstract

In this paper we explore which characteristics of information quality are perceived to be important to investors with respect to non-financial information. More specifically, we explore whether the information quality characteristics in the International Accounting Standards Board Conceptual Framework (IASB), that forms the basis for financial reporting standard setting, are also relevant for non-financial reporting based on the Corporate Sustainability Reporting Directive (CSRD), and the International Sustainability Standards Board (ISSB) exposure drafts; and we examine which other quality characteristics are applicable to narrative non-financial information based on academic literature and a survey with institutional investors from the Netherlands. We conclude that most quality characteristics that are applicable for financial reporting are also relevant for non-financial reporting. However, investors also identified other information quality characteristics that are important for non-financial reporting, next to the information quality characteristics that are identified for financial reporting. Investors consider 'relevance' and 'accuracy' of non-financial information as most important to their investment decisions. Furthermore, 'access to non-financial information' is more important to investors' assessment of the firms' non-financial performance than to the assessment of financial performance. Our results are of relevance to the European sustainability reporting standard setter and the ISSB in the development of the standards for non-financial reporting.

2.1. Introduction

Non-financial information has become a part of mandatory corporate reporting within the European Union (EU) through recent regulatory actions. The interest in corporate disclosures of non-financial information has grown considerably (Haller et al., 2017). Investors and various types of stakeholders value the relevance of non-financial information about companies (ACCA, 2013; Stawinoga, 2013; Eccles et al., 2011; Ceres, 2007; Hesse, 2006). Therefore, there is a serious need for high-quality and concise non-financial information to enhance transparency and accountability in corporate reporting (Busco et al., 2013).

Information quality is often seen as relative since it is conceptualized subjectively. Data that is relevant and appropriate for one use might not possess sufficient quality for another use (Fehrenbacher, 2015; Wang and Strong, 1996). Information quality is a multidimensional construct (Lee et al., 2002) since it can be evaluated through various characteristics, such as accessibility, accuracy, timeliness, or completeness (Fehrenbacher, 2015). There are many different conceptualizations of information quality (Fehrenbacher and Helfert, 2008). Therefore, in this paper and in the literature on information quality (Fehrenbacher, 2015; Wang and Strong, 1996; Lee et al., 2002; Ballou et al., 2003), "quality is the degree to which a set of dimensions associated with the subject of interest (information), fulfills the need or expectation of interested parties, that is the users" (Fehrenbacher, 2015, p.254).

In this paper we explore which characteristics of information quality are perceived to be important to investors with respect to non-financial

information and whether their perceptions of the financial and non-financial performance, level of risk and the perceived level of trust they have in management influences this importance perception. We seek to contribute to the literature on information quality and the role of end users in the assessment process. Obtaining insights into these relationships could contribute to a better understanding of the factors that influence the perception of the quality of non-financial information in corporate reports.

Some recent developments related to improving the usefulness and quality of non-financial reporting is the Corporate Sustainability Reporting Directive (CSRD), which will amend the existing non-financial reporting directive (NFRD) (European Commission, 2021), the European Financial Reporting Advisory Group's (EFRAG) 'Proposal for a relevant and dynamic EU Sustainability Reporting Standard' (ESRS) (2021) and Draft ESRS (2022). Also, the formation of an International Sustainability Standards Board (ISSB) to develop a comprehensive global baseline of high-quality sustainability disclosure standards to meet investors' information needs is an important recent development (IFRS Foundation, 2021). The CSRD, Draft ESRS 1 General Requirements (EFRAG, 2022), and ISSB exposure drafts (2022) include qualitative characteristics of useful sustainability-related information. The qualitative information characteristics that are proposed in the CSRD (European Commision, 2021) , Draft ESRS 1 General Requirements (EFRAG, 2022), and ISSB exposure drafts (2022) for non-financial reporting are (except for timeliness of information) similar to the information quality characteristics in the International Accounting Standards Board (IASB) Conceptual Framework (2018), that is the basis for financial reporting standard setting.

This leads to the focus of this paper, which is on the characteristics of non-financial information quality and the perceived importance by investors. More specific, we explore whether the information quality characteristics in the IASB Conceptual Framework (2018) for financial information are also relevant for non-financial information, or if other information quality characteristics need to be considered. The research questions addressed in this study are:

1. *Are the information quality characteristics that are the basis for financial reporting standard setting also relevant for non-financial reporting according to investors?*
2. *Are there other quality characteristics in the academic literature that are relevant to non-financial information according to investors?*

Reporting quality is perceptual, it depends on the way in which both preparers and users perceive this quality. Hence, understanding the information quality characteristics that professional investors find most relevant for non-financial reporting is important for standard setting as well as for research about the quality of corporate reporting practice. This paper aims at that. The study contributes to both research and practice. The results extend prior research on information quality and offer useful information for those interested in non-financial and integrated reporting and for standard setters.

The analysis is based on a review of the literature and survey data. In the literature we identified information quality characteristics. These characteristics and the characteristics that are important to financial reporting quality are included in the survey questions. We administered the online survey to investors at institutional investment firms in the Netherlands to

enhance our understanding and complement prior research on the use of non-financial information (Amel-Zadeh & Serafeim, 2018; Sridharan, 2018).

We conclude that most quality characteristics that are applicable for financial reporting are also relevant for non-financial reporting. However, investors also identified other information quality characteristics that are important for non-financial reporting, next to the information quality characteristics that are identified for financial reporting. 'Faithful representation', which is considered one of the overarching important quality characteristics for financial information in the IASB Conceptual Framework (2018), is not considered as most important to investment decisions, according to investors. Investors consider 'relevance' and 'accuracy' of non-financial information as most important to their investment decisions. 'Access to non-financial information' is also important, according to investors. But this is not included as a separate information quality criterion in the IASB Conceptual Framework (2018), and not in the Draft ESRS 1 General Requirements (EFRAG, 2022) and exposure drafts of the ISSB (2022). Furthermore, the results show that the format in which non-financial information is presented is least important, according to investors.

This paper is structured as follows. In the next section, we explain the theoretical background with respect to non-financial information and information quality. Next, we explain the research design in section 3. In section 4 we review the relevant research. We present the results of the survey in section 5. The final section of this paper is devoted to the discussion and conclusion.

2.2. Theoretical background

Non-financial information and its inclusion in corporate reporting

Non-financial information has become a part of mandatory corporate reporting within the EU through recent and upcoming regulatory requirements. “The term ‘non-financial information’ has been used within various reporting concepts and areas over the last decades, including different interpretations that embrace narrative contextual business information, information on intangible assets and intellectual capital, environmental, social and governance (ESG) issues and data about key performance indicators (KPIs)” (Haller et al., 2017; Eccles and Krzus, 2010).

According to the European Commission (2013) Non-financial information is generally considered as ESG information, this includes information concerning diversity. The literature analysis by Haller et al., (2017) shows that the “term ‘non-financial information’ has different roots of conceptual origin and is heterogeneously interpreted”. Their questionnaire survey indicated that there is no common idea about the distinction between ‘financial’ and ‘non-financial information’ nor a generally accepted definition for non-financial information. All participants in their survey had a financial background, however they showed different views on the concept of ‘non-financial information’. Other demographic factors, such as nationality, professional background, or experience, did not have a significant influence in the study by Haller et al., (2017). In their questionnaire study approximately a third of the participants chose the definition "information about an entity’s performance that is not expressed in monetary units or financial terms" for non-financial information. Therefore, it seems that the notion ‘non-financial’ is perceived to have additional qualities than just

'monetary', which makes it different from financial information. These respondents stated that non-financial information is not related to financial and economic data (Haller et al., 2017). They note that non-financial information does not necessarily derive from the accounting system and is supplementary to financial information. "Non-financial information is about ESG information or, more generally, information about sustainability issues" (Tarquinio and Posadas, 2020, p.740).

Since non-financial information is supplementary to financial information and the European Commission adapted the information quality characteristics of financial reporting standard setting in the Draft ESRS 1 General requirements (EFRAG, 2022), our first hypothesis is:

H1: *The information quality characteristics for non-financial reporting are equal to financial reporting according to investors.*

The interpretation of the term non-financial most likely depends on the perception of the sender of the information (preparer) and its receiver (stakeholder) as well as their contexts. There is no generally accepted definition of this term (Tarquinio and Posadas, 2020). Tarquinio and Posadas (2020) performed a literature review and identified 28 definitions of non-financial information in the literature. They (Tarquinio and Posadas, 2020) find that "most academics define and understand non-financial information differently, as corporate social responsibility (CSR) issues, intellectual capital information and information that are external to financial statements". While financial information in current corporate reports focuses on the effects of past events and realized performance non-financial reporting embraces both the past performance but also forward-looking information. "Non-financial

information has increasingly been seen as an important tool for assessing the value of companies and their perspectives for future growth" (Tarquinio and Posadas, 2020; Krasodomska and Cho, 2017).

Based on prior literature (Tarquinio and Posadas, 2020; Haller et al., 2017) on non-financial information and the EU non-financial reporting Directive we will refer to non-financial information in this study as ESG information including intangible assets, or more general, sustainability issues in line with the EU non-financial reporting Directive 2014/95/UE i.e., information about diversity and inclusion, environment, social responsibility, human rights, anti-corruption, and bribery.

Theory and prior literature on CSR disclosure quality

Corporate annual reports are aimed at informing investors about the periodic performance of firms and their financial condition, as well as enabling investors and other stakeholders to monitor the activities and capabilities of managers. As such, corporate annual reports should contribute significantly to capital market efficiency and fund allocations. Current corporate annual reports still fall short of achieving these objectives (Lev, 2018, p. 485).

In the past years CSR disclosure had a voluntary nature, therefore earlier research often focused on factors associated with the decision to disclose (Stuart et al., 2022). Theories that were used by researchers to explain the motivation by companies to voluntarily disclosing non-financial information, include but are not limited to, legitimacy theory, voluntary disclosure theory, stakeholder theory and institutional theory (Stuart et al., 2022). "A common thread among these theories is that firms may use voluntary non-financial disclosures for self-interested purposes" (Stuart et al.,

2022). This raises concerns whether disclosure of non-financial information is an impression management strategy or if it improves the information environment beyond traditional financial reporting, which could lead to doubts on the quality of non-financial disclosures.

Prior literature reveals that investors consider non-financial information when making investment decisions (Amel-Zadeh & Serafeim, 2018) and they even consider non-financial information as financially material to investment performance. Non-financial information is important to assessing investment risk and opportunities (Amel-Zadeh & Serafeim, 2018). The perceived quality of non-financial disclosures is therefore very important to investors. Which makes it interesting to explore investors' needs regarding the quality of non-financial information in the corporate report.

Prior literature in this field (Stuart et al., 2022; Xiao and Shailer, 2022; Cohen et al. 2011; Cohen et al., 2015) for example explore and describe the information preferences of non-professional investors or investigate what non-financial information characteristics and sources professional investors prefer. Previous studies on non-financial information in this area mainly focused on information preferences and specific characteristics that relate to the quality of information. However, there is little research that specifically looked in the characteristics of non-financial information quality that are important according to investors and whether these are different than for financial information in corporate reporting. Research on non-financial disclosure quality is quite limited (Huang and Watson, 2015, p.11).

A study by Cohen et al. (2011) examined the perceptions about indicators of economic performance, corporate governance policies and performance, and CSR. Their study results show that professional investors prefer financial information over non-financial information. They also find

that these investors prefer CSR information that is concise, comprehensive, comparable, and credible.

Another study that aims to review the CSR disclosure literature to develop a comprehensive definition of disclosure quality shows that a comprehensive definition of CSR disclosure quality has yet to be developed and that proxies for CSR disclosure quality have evolved over time (Stuart et al., 2022). Instead, the authors developed a definition of CSR disclosure quality featuring the primary disclosure elements they identified throughout the literature. They identified nine characteristics of CSR disclosure quality and categorized these into three groups: content of disclosure (completeness, balance, and relevance), veracity of message (accuracy, transparency, and reliability) and usability of disclosure (comparability and clarity). These characteristics are broader than the ones that are currently identified for financial reporting in the Conceptual Framework (2018) of the IASB.

These studies are mainly focused on CSR disclosures and performed in a voluntary disclosure setting. Our study is different compared to prior literature because we try to gain insight into whether investors indicate different information quality characteristics for non-financial information compared to the ones for financial information in corporate reporting. By doing so we add to both academic literature and practice. From a practical point of view, it is interesting to gain an understanding about this because currently the draft European Sustainability Reporting Standards (2022) include the same information quality characteristics as the ones that are identified by the IASB in the Conceptual Framework (2018) for financial reporting.

Due to the different nature and meaning of financial and non-financial information we would expect that non-financial information has additional

characteristics to define the quality of the information. Therefore, the second hypothesis is:

H2: *In addition to the information quality characteristics for financial reporting, investors also value other information quality characteristics for non-financial reporting.*

Literature on the effect of information quality on trust and risk preference

A survey performed with investors by PwC (2014) reports that some firms could do more to improve the quality of their formal reporting. The report states that investor confidence will be maximized when firms provide a high-quality corporate annual report. They also state that a high-quality corporate annual report affects the perception of the quality of a firm's management.

Amel-Zadeh and Serafeim (2018) performed a survey on why and how investors use non-financial information and show that the primary reason mainstream investment organizations consider this information in investment decisions is because they consider it financially material to investment performance. For asset managers, integration of non-financial factors into the investment process aims to better assess long-term risks or risks that have a high impact but a low frequency of occurrence (Briand et al., 2011).

However, there continues to be a disparity between what is being reported and what investors consider material to making investment decisions. A study by Amaeshi and Grayson (2008) investigated the enablers and barriers of diffusing the integration of non-financial risks in investment decisions across different business jurisdictions and financial markets. They performed a meta-analysis and noted that quality of data is considered as a

challenge by investors. Their meta-analysis shows that investors are challenged by data inconsistencies, regional differences in policy focus, and degrees of integration across the value chain, and they do not believe that sufficient quantifiable and comparable data exists to objectively measure non-financial indicators like human rights, training, biodiversity, and local waste (Amaeshi & Grayson, 2008, p. 3).

A study by the World Business Council for Sustainable Development (WBCSD) and PwC (2018) reveals that investors want to have confidence in the reliability of non-financial information, and that there are four key elements that contribute to their confidence in assessing the usefulness of the information. First, their perception of management and the board is considered the most significant factor influencing their confidence in a firm's reported information. Second, investors are more confident about the quality and reliability of information when it tells a balanced, consistent story. Third, investors will assess whether the information is plausible given the context; and last, investors note that they view independent assurance positively because it improves their confidence in reported information.

"Trust and risk are pervasive phenomena in market interactions, given the level of uncertainty and volatility that is inherent in the financial markets. Trust enables investors and organisations to interact without fear of getting exploited or taken advantage of" (Dirks & Ferrin, 2001). From a user or investor perspective, Hsueh (2016) reports that sustainability or CSR report credibility increases with perceptions of corporations' thrustwortiness and awareness of sustainability reporting. "Perceived risk, on the other hand, appears to be an integral part of people's cognitive processes when dealing with risky situations" (Nicolaou et al., 2013).

"The firm's ability to provide accurate and up-to-date non-financial information confirms its skills and expertise, and its ability to provide high quality non-financial information indicates that the firm utilizes its expertise to evaluate information needs effectively and is committed to report about this information. Accordingly, the ability to provide accurate non-financial information is expected to increase perceptions of trust" (Nicolaou et al., 2013). Therefore, we included questions in the survey to verify what the effect of the different elements of information quality is on investors' perceived level of trust in the non-financial information.

"In recent years, many institutional investors have been increasingly recognizing that non-financial factors are becoming important considerations to focus on, given their influence on a portfolio's risk and return profile" (Briand et al., 2011; Sridharan, 2018). "Perceived risk relates to what could go wrong" (Das & Teng, 2001).

"Information quality is expected to reduce the uncertainty and risk, because receiving high quality information indicates the firm can measure the performance of its internal processes and provide transparency" (Nicolaou et al., 2013). Such transparency can enable investors to decide whether the firm's performance is acceptable. Following recent research on the theoretical properties of transparency, Schnackenberg et al. (2020, p. 3) define transparency as the perceived quality of intentionally shared information from a sender. "Research has documented different attributes of received information quality that indicate whether a source is acting transparently, including whether information is seen as accessible, reliable, truthful, comprehensible, correct, consistent and understandable" (Schnackenberg et al., 2020; (Fernandez-Feijoo et al., 2014; Dubbink et al., 2008; Williams, 2005).

Accordingly, information quality is expected to reduce uncertainty and ambiguity regarding the firm's performance and inherently decrease perceived risk. Therefore, we included questions in the survey to verify what the effect of the different elements of information quality are on investors' perceived level of risk.

2.3. Practical background

Corporate information quality in the conceptual framework of professional accounting standards offered by the International Accounting Standards Board (IASB)

According to the IASB Conceptual Framework, corporate information quality depends on the extent of decision usefulness for users. In the Conceptual Framework for Financial Reporting, the IASB (2018) discusses what makes financial information useful. It states that the fundamental qualitative characteristics of useful financial information are that it must be relevant and provide a faithful representation of what it purports to represent. The usefulness of financial information is enhanced through comparability, verifiability, timeliness, and understandability. Relevance means that the corporate information provides users with information about the firm's future economic prospects. Reliable financial statement information faithfully represents, without bias, what it is intended to represent.

These characteristics are applicable to financial disclosures. Table 1 includes, e.g., an overview of the quality characteristics as suggested in the IASB Conceptual Framework (2018). However, these characteristics might not be appropriate for measuring non-financial disclosure quality as it is

different from financial reporting information. Therefore, through a literature review, we investigate which other information quality characteristics might be useful to non-financial information. In the next part, we identify through a survey whether the information quality characteristics that are the basis for financial standard setting are also relevant for non-financial reporting, and we explore the relevance of the other information quality characteristics, that we identified based upon prior literature, to investors.

Developments in the non-financial reporting landscape

"The information needs of users have increased significantly. There is a widening gap between the sustainability information that firms report and the needs of the intended users of that information" (European Commision, 2021). "The current legal framework does not ensure that the information needs of users of the corporate report are met. This is because some firms from which users require sustainability information do not report such information, while many that do report sustainability information do not report all the information that is relevant for users. When information is reported, it is often neither sufficiently reliable, nor sufficiently comparable between firms. The information is often difficult for users to find" (European Commision, 2021, p. 2). In response to the evolving needs of investors and other stakeholders, several firms are disclosing non-financial information in their corporate annual report, but until recently this was on a voluntary basis. They could choose from many different frameworks and guidelines, like the GRI or the International Integrated Reporting Framework (IIRC) and many more.

In April 2021, the European Commission adopted a proposal for a CSRD (2021), which would amend the existing NFRD (European

Commission, 2021). The CSRD introduces more detailed reporting requirements, and a requirement to report according to mandatory EU sustainability reporting standards. The aim of CSRD is that reported sustainability information should be comparable, reliable, and easy for users to find and make use of. The CSRD brings in more extensive mandatory sustainability reporting for a wide range of firms and requires assurance on this information (The European Parliament and the Council for the European Union, 2022).

Article 19b of the proposal for a CSRD (European Commission, 2021) mentions the qualitative characteristics for sustainability information. The quality characteristics identified in the proposal for the CSRD (European Commission, 2021) are like the quality characteristics identified in the IASB Conceptual Framework (2018), except for 'timeliness of information'. This information quality characteristic is only mentioned in the IASB Conceptual Framework (2018) and ISSB [Draft] IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information (2022). It is not included in the proposal for the CSRD (European Commission, 2021) or the ESRS.

The CSRD envisages the adoption of EU sustainability reporting standards (ESRS). In the 'Proposal for a relevant and dynamic EU Sustainability Reporting Standard' (2021), EFRAG considered insufficient quality of sustainability reporting as the key challenge in the EU and globally. According to EFRAG, "addressing this challenge is a priority, and the standard setter should adopt conceptual guidelines to define the necessary characteristics of reported sustainability information, which includes relevance, faithful representation, comparability, understandability and reliability/verifiability". "Sustainability reporting that meets these quality

characteristics would be on equal footing with financial reporting", according to EFRAG (2021, p. 7). Draft ESRS 1 General Requirements (EFRAG, 2022) is one of these standards and includes the same characteristics of information quality as the ones that were included in the proposal for the CSRD (European Commission, 2021).

Next to the mandated CSRD and ESRS there is the formation of a non-mandated ISSB to develop a comprehensive global baseline of high-quality sustainability disclosure standards to meet investors' information needs (IFRS Foundation, 2021). The ISSB (2022) published their first two exposure drafts: [Draft] IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information and [Draft] IFRS S2 Climate-related Disclosures. Exposure draft S1 includes qualitative characteristics of useful sustainability-related financial information. The identified qualitative characteristics are equal to the qualitative characteristics that are identified in the IASB Conceptual Framework (2018) and are included in Table 1. In contrast to the CSRD, the ISSB exposure drafts are voluntary to apply and thus not mandatory to comply with.

A difference in the information quality characteristics that are included in the CSRD, ESRS and ISSB exposure drafts, is that timeliness of information is included in ISSB [Draft] IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information (2022), but it is not identified as an information quality characteristic in the mandated CSRD - Draft ESRS 1 General Requirements (EFRAG, 2022). A reason for this could be that under the mandated CSRD, sustainability information needs to be included in a clearly identifiable dedicated section of the management report. In addition, firms that are required to report sustainability information should in no case be exempted from the obligation to publish the management report

and it is important to ensure that sustainability information is publicly available (The European Parliament and the Council for the European Union, 2022, p. 41). With this requirement the timeliness of information is also covered since the management report is part of the corporate annual report that is published annually. Under the ISSB, firms are allowed to present the information in the management report or cross-reference to where the information is available, provided that the information is available to users of general-purpose financial reporting on the same terms and at the same time as the information to which it is cross-referenced.

2.4. Literature review

Methodology of the literature review

This research paper consists of both a review of existing prior literature and a survey on information quality and information quality characteristics. The information quality characteristics are partly based on the ones mentioned in the conceptual framework of the IASB (2018). These quality characteristics provide insight in different techniques to define financial disclosure quality. However, these characteristics might not be appropriate for measuring non-financial disclosure quality, as it differs from financial reporting information. Therefore, we added information quality characteristics that we consider valuable to non-financial information, based on the qualitative information characteristics that are identified in the literature. As mentioned in section 2.2. previous studies in information quality in this field focused on information quality in the context of CSR disclosures. To make sure that we include a broad spectrum of information quality characteristics in the survey for

investors, we decided to perform the literature review on information quality characteristics in a broader setting. Therefore, we also included literature in other areas than only accounting.

We searched for literature in the period 1997 to 2021 since the Global Reporting Initiative (GRI) was founded in 1997. In the University of Amsterdam Catalogue Plus database, we searched for papers that are published in journals. The search was carried out using the terms: 'information quality', 'information quality characteristics', 'quality of financial reporting', 'quality of environmental reporting', 'quality of environmental, social and governmental (ESG) reporting', 'quality of sustainability reporting', and 'quality of integrated reporting'. The information quality characteristics that were mentioned in the reviewed literature are included in Table 1. We used the English language filter and stopped searching for more literature once we noted that the same quality characteristics were repeatedly referred to in the literature and in prior literature review studies. At that point adding more literature did no longer provide new insights in information quality characteristics[1].

Information quality theory and literature in other fields

Information quality is perceived to be essential to decision-making. The financial market is changing all the time (Lacalle, 2014). Society is demanding information about non-financial matters and investors are

[1] We are aware that this approach is slightly different from the methodology on literature reviews. However, since our literature review is only carried out to provide input to the survey, we choose to use this alternative approach which provided sufficient input to get an overview of the information quality characteristics. Also, since we included extensive literature review studies in our selection and overview, we already cover the broader spectrum.

expected to act according to this demand in their investment decisions. They make choices and decisions in a complex environment. Information quality is a significant factor in their decision making. For information to be effective, it is important that it meets information quality characteristics. There is, however, no universal definition of information quality.

In their review of existing literature on information quality, Eppler and Wittig (2000, p. 87) identified seven different approaches for defining information quality. Their evaluation (2000) revealed that information quality frameworks are often domain-specific (i.e., corporate communications etc.), and that the frameworks rarely analyse interdependencies between information quality characteristics.

Based on the search terms 'information quality' and 'information quality characteristics' we found many studies in different research areas. Our review of the literature on information quality and its characteristics reveals that the studies are performed in the following fields[2]: Information technology and big data (Huang et al., 1999; Long & Seko, 2002; Gable et al., 2003; Nicolaou & McKnight, 2006; Petter et al., 2008; Blake & Mangiameli, 2011; Nicolaou et al., 2013; Batini & Scannapieco, 2016; Sharma & Sharma, 2019; Ramasamy & Chowdhury, 2020; Afful-Dadzie et al., 2021), data mining (Wixom & Watson, 2001; Nelson et al., 2005; Rogova, 2019), data quality management in the field of business and trade (Mukherjee, 2019; Kahn et al., 2002), information quality, processing and management (Yoon et al., 2000; Lee et al., 2002; DeLone & McLean, 2003; Lillrank, 2003; Sadera & Gable,

[2] Please note that we only included literature based on the search criterium that are mentioned in the research design section. Therefore, some studies that are referenced here are not specifically in a non-financial information context. However, since these studies are in a broader context related to the identification of information quality characteristics (which is the goal of our literature review) we decided to use these papers as a reference.

2004; Gorla et al., 2010; Ge et al., 2011; Laudon & Laudon, 2012; Woudstra et al., 2012; Floridi, 2013; Hyun Lee & Haider, 2013; Todoran et al., 2015; Zarraga-Rodriguez & Alvarez, 2015; Batini & Scannapieco, 2016; Schnackenberg et al., 2020), and information quality in relation to transparency (Williams, 2005; Dubbink et al., 2008; Fernandez-Feijoo et al., 2014).

Literature on the quality of financial reporting

Based on the search term 'quality of financial reporting' we identified accounting literature that investigated the information quality characteristics in a financial reporting setting. "Providing information that is useful for various investors in decision-making is the primary objective of financial statements (Azar et al., 2019; Dimitropoulos & Asteriou, 2010). Providing high-quality financial reporting information that supports investors and other stakeholders to make investment decisions is important to enhance the efficiency of the capital market (Norwani et al., 2011), as the quality of financial reporting can enhance the allocation of resources in capital markets" (Azar et al., 2019). Moreover, the quality of financial reporting also influences investors in their valuation of the firm and their view about future performance" (Norwani et al., 2011). Therefore, corporate annual reports are expected to contain high quality information because participants in the capital market use the information as a basis for their investment decisions.

Lev (2018) notes that "there is a wide-spread and growing dissatisfaction with the relevance and usefulness of financial reporting information, particularly among investors and corporate executives. Investors increasingly seek more reliable and timely information sources for valuation

purposes (Lev, 2018, p. 466). Lev (2018, p. 468) also note that the reliability of financial information can decrease investors' 'information risk'."

Other literature in this field (Maines and Wahlen, 2006; Belkaoui, 2002) states that financial reports should present information that is relevant, verifiable, understandable, neutral, timely, comparable, and complete. The usefulness of accounting information is enhanced if it is comparable, verifiable, timely and understandable. Relevance and representation of faithfulness are fundamental quality characteristics to improve the usefulness of financial reporting information for investors (Azar et al., 2019).

Our literature search also identified a literature review on financial reporting quality containing twenty-four papers (Herath and Albarqi, 2017). Based on their literature review they note that to achieve a high level of quality, financial reports must be faithfully represented, comparable, verifiable, timely and understandable. The emphasis is on having transparent financial reports, that are precise and predictable (Herath and Albarqi, 2017).

Literature on the quality of sustainability, ESG, environmental and integrated reporting

Based on the search terms 'quality of environmental reporting', 'quality of ESG reporting', 'quality of sustainability reporting', and 'quality of integrated reporting' we identified some studies on investors needs in relation to non-financial reporting. These studies were not specifically focused on the information quality characteristics but for example describe some challenges that investors face in the non-financial reporting landscape.

"Defining the quality of narrative reporting requires reflection upon the purpose of corporate annual reporting which can be summarized into three

perspectives: valuation, stewardship, and accountability" (Michelon et al., 2021, p.8). "Quality is often defined in terms of how much narrative reporting is able to convey 'meaning' to investors and stakeholders." With meaning Michelon et al. (2021) refer to that the narrative information helps to explain the underlying financial performance of other non-financial impacts.

Venturelli et al. (2020) investigated the factors that impact non-financial restatement in the context of Directive 95/2014/EU. They noticed that comparability of non-financial information is one of the main principles. Also, the external audit of non-financial information represents one of the main practices to increase the reliability of these reports.

"The greatest challenges investors face in integrating non-financial information into their investment processes are the lack of cross-firm comparability and the lack of standards governing the reporting of non-financial information". Investors also have strong concerns about data reliability (Amel-Zadeh & Serafeim, 2018).

More specific, in the field of climate risk disclosures investors and regulators have argued that current climate risk disclosure is insufficient. They mentioned that there is a need to develop more consistent, comparable, reliable, and clear climate risk disclosures. Firms need to increase the quality of their disclosures and the access to this type of data needs to improve (Ilhan et al., 2020).

Comyns and Figge (2015) embedded the principles of good reporting from relevant guidelines (e.g., GRI) in their quality measures of narrative information. They identify accuracy, completeness, consistency, credibility, relevance, timeliness, and transparency as quality characteristics. "Often the quality of reporting is specific to the topic that is being reported and therefore

different characteristics apply to the definition of quality" (Michelon et al., 2021).

2.5. Results of the literature review

By reviewing the literature on information quality, we identified several characteristics of information quality. Important to note is that the key component for information quality is whether the information addresses the users' needs (Miller, 1996). In our study we focus on the user group 'investors'. We include the quality characteristics that are identified based on prior literature in Table 1. Some information quality characteristics have been mapped together, even though they have different names, because they have the same meaning.

The overview in Table 1 shows that, according to prior literature, 'relevance', which is sometimes also described as 'conciseness' of information, is most often (N= 41) mentioned as an important information quality characteristic in prior literature. This information quality characteristic is also identified in the IASB Conceptual framework (2018).

Next, 'verifiability'/ 'reliability' (N= 38), 'comparability across timeframes'/ 'consistency' (N= 34), 'timeliness of information' (N= 33), 'understandability' (N=33), 'accuracy' of information (N=31), 'completeness' (N= 30), and 'access to information'/ 'availability' (N=29), are often mentioned in prior literature.

We identified that the information quality characteristics 'completeness', 'accuracy', and 'access to information' are often mentioned in prior literature. However, these information quality characteristics are not separately included in the IASB Conceptual Framework (2018).

‘Comparability between firms’ (N= 17), 'faithful representation’ (N= 16) and ‘presentation format’ (N=12), are less often mentioned in prior literature. This is remarkable, since ‘faithful representation’ is considered as one of the most important information quality characteristics in the Conceptual framework of the IASB (2018). Also, comparability between firms and presentation format are important in the context of the development of new sustainability standards and integrated reporting. Therefore, we decided to include these in the survey as well.

Overall, we decided to only include the information quality characteristics that are often mentioned in prior studies, and the information quality characteristics that are useful in a non-financial reporting setting. Therefore, we excluded the information quality characteristic ‘security’ and we added the quality characteristics ‘accuracy’, ‘access to information’, ‘completeness’, and ‘presentation format’ to the survey in addition to the quality characteristics that are already identified in the IASB Conceptual Framework (2018). Security was mentioned in 17 other papers, but those papers were in a different context (mostly related to information technology) and we evaluated that this characteristic is not very relevant in a non-financial reporting setting.

Lee et al., (2002) developed a methodology to form a basis for information quality assessment and improvement. They empirically derived information quality dimensions that are important to users of information, using methods of market research. They grouped information quality dimensions into four categories of information quality: intrinsic information quality (accuracy, objectivity, credibility, reliability, consistency), contextual information quality (completeness, relevance, timeliness, usefulness), representational information quality (understandability, conciseness, format,

comparability) and accessibility information quality (convenience of access, ease of use, availability). Information accessibility dimensions are critical with voluntary information and relevant for example when the information is published online. Therefore, they decided to include accessibility of information as a dimension of information quality. Since, non-financial information is still mainly voluntarily published by firms, we included this information quality dimension in the survey.

Based on the literature review only, the research questions that are addressed in this study are answered as follows: we conclude that the information quality characteristics 'relevance', 'verifiability', 'comparability across timeframes', 'timeliness of information', and 'understandability' that are mentioned in the IASB conceptual framework (2018) and are the basis for financial reporting are also most relevant according to prior literature on information quality in other fields. This might suggest that these information quality characteristics can also be important according to investors in a setting of non-financial reporting. 'Comparability between firms' and 'faithful representation' are less often mentioned in prior literature than 'accuracy', 'completeness', and 'access to information'. The last three are not included in the IASB conceptual framework (2018) but might be important according to investors in a setting of non-financial reporting.

Table 1 – Information quality characteristics

		Information quality dimensions *														
	Research field / paper type	Relevance / conciceness	Verifiability by an external party/ believability/ credibility/ reliability	Comparability across timeframes / consistency	Timeliness of information	Understandability / readability/ clarity	Accuracy	Completeness	Access to information / availability	Comparability between firms in the same sector	Security	Faithful representation / balance / objective representation	Presentation format	Usefulness	Appropriate amount of data / sufficiency	Uniqueness
IASB Conceptual Framework (2018)	Framework	V	V	V	V	V				V		V				
Proposal for the CSRD art. 19b lid 2 (2021)	Proposal for Directive	V	V	V		V				V		V				
ESRS 1 - General principles (2022)	Standard	V	V	V		V				V		V				
ISSB - (2022)																
[Draft] IFRS S1 General Requirements for Disclosure of Sustainablity-related Financial Information (2022)	Standard	V	V	V	V	V				V		V				
[Draft] IFRS S2 Climate-related Disclosures (2022)	Standard									V						
	Prior literature on information quality dimensions:															
Huang et al. (1999)	Information technology and big data						V	V	V							
Yoon et al. (2000)	quality, processing and management	V	V	V	V	V	V	V	V		V		V			
Eppler & Wittig-Christ (2000)	Information Quality	V		V			V	V	V			V				
Wixom & Watson (2001)	Data mining	V	V	V	V	V	V	V	V		V		V			
Belkaoui (2002)	Accounting information	V	V	V	V	V		V		V		V				
Kahn et al. (2002)	Data quality management in the field of business and trade	V	V	V	V	V	V	V	V		V		V			
Lee et al. (2002)	quality, processing and management	V	V	V	V	V	V	V	V		V		V			
DeLone & McLean (2003)	quality, processing and management	V	V	V	V	V	V	V	V		V		V			
Lillrank (2003)	quality, processing and management	V		V	V	V	V	V	V		V	V			V	
Sadera & Gable (2004)	quality, processing and management	V	V	V	V	V	V	V	V		V		V			
Nelson et al. (2005)	Data mining	V	V	V	V	V	V	V	V		V		V			
Williams (2005)	Information quality in relation to transparency	V	V		V											
Maines and Wahlen (2006)	Accounting information	V	V	V	V	V		V		V		V				
Nicolaou and McKnight (2006)	Information technology and big data	V	V	V	V	V	V	V	V		V		V			
Dubbink et al. (2008)	Information quality in relation to transparency	V	V	V	V	V		V		V						
Gable et al. (2008)	Information technology and big data	V	V	V	V	V	V	V	V		V		V			
Petter et al. (2008)	Information technology and big data	V				V			V				V	V		
Gorla et al. (2010)	quality, processing and management	V	V	V	V	V	V	V	V		V		V			
Ge, Helfert and Jannach (2011)	quality, processing and management	V	V	V	V	V	V	V	V		V	V				

Blake and Mangiameli (2011)	Information technology and big data			V	V		V	V								
Laudon & Laudon (2012)	quality, processing and management			V			V	V	V	V						
Woudstra et al. (2012)	quality, processing and management	V	V						V							
Floridi (2013)	quality, processing and management	V			V	V	V		V		V	V				
Hyun Lee & Haider (2013)	quality, processing and management	V	V		V	V	V	V	V			V				
Nicolaou et al. (2013)	Information technology and big data	V	V				V	V								
Fernandez-Feijoo et al (2014)	Information quality in relation to transparency	V	V	V	V	V	V	V		V		V				
Comyns & Figge (2015)	Narrative information	V	V	V	V		V	V								
Long and Seko (2015)	Information technology and big data	V		V	V		V	V		V		V		V		
Zarraga-Rodriguez & Alvarez (2015)	quality, processing and management	V	V	V	V	V	V	V	V		V		V			
Todoran et al. (2015)	quality, processing and management	V	V	V	V	V	V	V	V		V					
Batini & Scannapieco (2016)	Information technology and big data	V	V	V		V	V	V	V	V				V		
Herath & Albarqi (2017)	Financial reporting quality / literature review	V	V	V	V	V				V		V				
Amel-Zadeh & Serafeim (2018)	quality	V	V		V	V				V						
Lev (2018)	Financial reporting quality	V	V		V	V			V							
Azar et al., (2019)	Financial reporting quality	V	V	V	V	V				V		V				
Sharma & Sharma (2018)	Information technology and big data	V			V		V								V	
Rogova (2019)	Data mining	V	V	V			V	V	V							
Mukherjee (2019)	Data quality management in the field of business and trade	V	V		V		V	V	V		V					
Ilhan et al., (2020)	Narrative information		V	V		V			V	V						
Ramasamy & Chowdhury (2020)	Information technology and big data	V	V	V	V	V	V	V	V		V					V
Schnackenberg et al. (2020)	quality, processing and management		V			V	V		V							
Venturelli et al. (2020)	Narrative information		V	V						V						
E. Afful-Dadzie et al. (2021)	Information technology and big data	V	V				V		V			V		V		
Total		41	38	34	33	33	31	30	29	17	17	16	12	4	2	1

* Please note that the header includes the information quality characteristics. Based on prior literature we grouped together the information quality characteristics that are similar to each other.

2.6. Survey

Methodology of the survey

We performed a survey to verify how important the identified information quality characteristics are to investors' investment decisions with respect to their evaluation of non-financial information. This is interesting, because professional investors are an important stakeholder group to firms. Investment decisions are operationalized by asking questions about investors' trust in management, their perception of risk, and their assessment of financial performance and non-financial performance. The survey instrument is included in Appendix A.

Based upon the quality characteristics identified in the Conceptual framework of the IASB (2018) and prior literature (as listed in table 1), we performed a survey. In the survey we included the information quality characteristics that were most often referred to in (prior) literature. We followed an exploratory research design in which we utilized an online survey.

"Although data collected through survey instruments may suffer from several problems (selection bias, response bias, attribution bias), surveys still offer a way to collect data and provide insights into questions that cannot be addressed at a particular time by archival data" (Amel-Zadeh & Serafeim, 2018, p. 89). As Dichev et al. (2013) suggested, "surveys allow researchers to discover institutional factors that impact practitioners' decisions in unexpected ways and ask key decision makers directed questions about their behavior as opposed to inferring intent from statistical associations between proxy variables surrogating for such intent" (Amel-Zadeh & Serafeim, 2018, p. 89).

The survey questions were designed based on our research question and objective. To reduce biases in the questionnaire and to optimize the wording and tone of the questions we asked a group of investment professionals and academic researchers in the fields of finance and accounting for feedback. We excluded and redrafted survey questions based on the feedback received.

Next, the survey was pilot tested by 15 investment professionals and financial market experts. The pilot group was recruited via the Dutch Authority for the Financial Markets (AFM). The pilot group completed the pilot questionnaire and provided feedback on the understandability of the survey questions. We excluded and redrafted survey questions based on the feedback received.

The survey did not require participants to disclose personal information (e.g., sex, age, title, affiliation, years of work experience, current portfolio etc.), but did allow space if they choose to do so. About 80% of the respondents disclosed personal information.

The survey included questions about the importance and use of non-financial information, the importance of information quality characteristics of non-financial information for investment decisions, and concepts that are important to investors for their investment decisions (refer to appendix A for the questionnaire). To avoid a bias in the answers, we made sure that the answer options per question were randomly shifted per participant.

We distributed the survey via e-mail to investors at 100 institutional investment firms. Most of the institutional investors had the title of fund, asset, portfolio manager or investment analyst. The names of the institutional investment firms and the contact persons were obtained via the AFM. Therefore, we could trust that we reached out to the target respondents. Also,

the professional titles of the respondents were in line with our target respondents.

A limitation in this approach to use an online survey is that we could not verify whether participants searched for other information to make decisions when they filled out the survey, since the survey was registered online. Therefore, we had phone calls with the contact persons at these organizations to ensure that the survey was being send to the target respondents within the organization and that they understood that it was of utmost importance that these respondents filled out the survey and followed the guidance as described in the introduction to the survey. Furthermore, we send e-mails to reconfirm that the contact persons at the investment firms understood our request.

To avoid selection bias, we used the Qualtrics sample size calculator to calculate the necessary sample size. For a population size of 100, a confidence level of 95% and a margin error of 5% the calculator indicates that the ideal sample size is around eighty. We received 77 useable responses, which is close to the ideal sample size. Ten out of the 77 responses completed at least 60% of the survey questions. The questions that were not completed by these ten participants mainly were the demographic questions, therefore we decided to perform the analysis on the data of all 77 responses. In the presentation of the results, we clearly state the number of participants that answered the question.

To avoid sampling bias, we defined the target population and shared the survey with the target population and send out reminders to the participants after two weeks when we did not receive a response. Furthermore, we tried to prevent bias in our survey by framing a mix of open and closed questions and by keeping the questions short and clear. We tried

to avoid questions that influence respondents to answer a certain way and tried to formulate neutrally worded questions and the survey was anonymous.

2.7. Results of the survey

Population

The survey was sent out to contact persons at 100 institutional investment firms. These contact persons further distributed the survey within their organization.

The sample (N= 77) was skewed towards male (69%) respondents; 10% of the respondents was female, and 21% of the respondents did not want to disclose their gender. The average age of participants is 47 years old, with an average of 19 years of work experience as a professional investor. 66% of the participants work at an asset management firm. Participants indicated that the average total value of assets under management is 25 billion Euro and on average 48% of participants' current portfolio is allocated to responsible investments. We also asked participants about the main driver of the investment strategy at the firm where they work. 58% of the respondents answered that profit is the main driver at their organization, 16% mentioned contributing to society, and 13% recognized a mix of profit and contributing to society. The other 13% did not answer the question.

Importance of non-financial information quality characteristics to investment decisions

First, we asked participants how important non-financial information is for their investment decisions. 74% of the participants find non-financial information important for their investment decisions, and 79% of the group of 77 participants indicated that they always or most of the time use non-financial information for their investment decisions. 6% stated that they never or sometimes use non-financial information for their investment decisions. The remainder of 15% had other reasons[3]. Since participants have an affiliation with non-financial information, we assume that the participants are representative to answer the questions in the survey about the quality characteristics for non-financial information.

We asked participants to identify whether the quality characteristics of non-financial information are important for their investment decisions. The output in Table 2 shows that the quality characteristics 'accuracy' (mean score= 4.34) of the non-financial information and 'faithful representation' (mean score= 4.29) of information are identified as most important for investment decisions. Also, 'relevance of information' (mean score= 4.21) is considered as important for investment decisions. The 'format' in which the non-financial information is presented is considered the least important (mean score= 3). This is interesting in the light of greenwashing and impression management. Investors seem to pay less attention to the presentation format, while firms are sometimes blamed for using impression management

[3] The other reasons included, amongst others, that investors strive to take into account all material characteristics that can have a significant impact on future performance, or that the information is not always available and that it depends per sector whether they use non-financial information.

strategies (Melloni et al., 2016). Impression management is for example applied by using more prominent presentation forms for positive non-financial performance and non-prominent presentation forms for poor non-financial performance (Skinner, 1994; Clatworthy & Jones, 2006; Yang & Liu, 2017). This is also one of our findings in chapter 3 of this dissertation.

Table 2 – Importance of non-financial information quality characteristics for investment decisions

	Mean*	Std. Dev.	Min.	Max.
Accuracy	4.34	.718	2	5
Faithful representation	4.29	.723	2	5
Relevance	4.21	.784	2	5
Understandability	4.06	.848	2	5
Access to information	3.96	.733	1	5
Completeness	3.68	.910	1	5
Timeliness of information	3.64	.826	1	5
Verifiability by an external party	3.58	.864	1	5
Comparability between firms in the same sector	3.57	.992	1	5
Comparability across timeframes	3.57	.992	1	5
Presentation format	3.00	.960	1	5

Note: N=77.

* The quality characteristics are ranked in the order 1 is not at all important – 5 extremely important. The mean score in the table is calculated based on the rank scores. A higher mean score therefore indicates a higher level of importance.

Furthermore, we asked participants to rank how important the quality characteristics of non-financial information are to their investment decisions. The output in Table 3 shows that the quality characteristic 'relevance' has the highest rank (mean score= 3), followed by 'accuracy' (mean score= 4.09) and 'faithful representation' (mean score= 4.32). So, when participants were asked to identify whether the quality characteristics of non-financial information are important to their investment decisions, the most often selected is 'accuracy' of non-financial information as extremely important to investment decisions (Table 2). However, when participants had to choose and rank the information quality characteristics, they selected 'relevance' of non-financial information as more important than 'accuracy' of non-financial information (Table 3). Also, the output in table 3 shows that accuracy is ranked as more important than completeness. So, investors are mostly looking for accurate and relevant non-financial information.

Furthermore, the output in table 3 shows that investors consider 'access to information' (mean score= 5.13) as more important than 'understandability' (mean score= 5.45) of information in this situation when they were asked to rank the information quality characteristics based on importance to their investment decisions. Both 'accuracy' and 'access to information' are not mentioned in the IAASB conceptual framework (2018). But were often mentioned in prior literature as important information quality characteristics.

Again, the 'format' (mean score= 9.79) in which the information is presented was ranked the lowest, followed by 'timeliness' of information (mean score= 7.92) and 'comparability across timeframes' (mean score= 7.19). So, in other words investors seem to care less for how the non-financial

information is presented if it is presented in a timely manner and if it is comparable across timeframes.

Table 3 - Rank quality characteristics of non-financial information on importance to investment decisions

	Mean*	Std. Dev.	Min.	Max.
Relevance	3.00	2.405	1	10
Accuracy	4.09	2.389	1	10
Faithful representation	4.32	2.682	1	10
Access to information	5.13	2.915	1	11
Understandability	5.45	2.844	1	11
Comparability between firms in the same sector	5.85	2.744	1	11
Completeness	6.45	2.787	1	11
Verifiability by an external party	6.80	2.795	1	11
Comparability across timeframes	7.19	2.312	2	11
Timeliness of information	7.92	2.300	1	11
Presentation format	9.79	2.274	1	11

Note: N=75, because two participants did not answer this question.

* The quality characteristics are ranked in the order 1 is most relevant – 11 is least relevant. The mean score in the table is calculated based on the rank scores. A lower mean score therefore indicates a higher level of importance.

Next, we performed a non-parametric Chi-Square test (Table 4) to compare the importance of the information quality characteristics based on the data of the question to rank how important the quality characteristics of non-financial

information are to their investment decisions. Table 4 shows the difference between how often participants selected the quality characteristic on the top line versus the quality characteristics in the column at the left of the table.

According to investors, the non-financial information quality characteristic 'relevance' is significantly more important than all other information quality characteristics, except for 'understandability' of non-financial information. Table 4, for example, shows that investors in 65 instances choose 'relevance' of information over 'presentation format' when they were asked which of the two quality characteristics is more important to their investment decisions. The Chi-square test value $p< 0.001$ tells us that the null hypothesis that relevance and presentation format are equally important to investors' investment decisions is rejected.

Relevance of information is also included in the IASB Conceptual Framework (2018), proposal for the CSRD (2021), Draft ESRS 1 General Requirements (2022) and exposure drafts of the ISSB (2022). The test results show that this quality characteristic is also most important for non-financial information (table 4).

We see that the 'accuracy' of non-financial information quality characteristic is more important than all other quality characteristics, except for 'relevance' and 'faithful representation'. 'Accuracy of information' is not mentioned as a separate quality characteristic in the IASB Conceptual Framework (2018), proposal for the CSRD (2021), Draft ESRS 1 General Requirements (2022) and exposure drafts of the ISSB (2022). However, 'faithful representation' is included in the IASB Conceptual Framework (2018), proposal for the CSRD (2021), Draft ESRS 1 General Requirements (EFRAG, 2022) and exposure drafts of the ISSB (2022). To be a perfectly faithful representation, a depiction would be complete, neutral, and free from

error (IASB, 2018, p. 14). Therefore, we consider accuracy and completeness as part of this information quality characteristics.

Furthermore, 'access to non-financial information' is considered an important information quality criterion and is considered as more important than the information quality characteristics 'completeness', 'comparability across timeframes', 'comparability between firms', 'timeliness', 'verifiability by an external party', and 'presentation format'.

Table 4 - Chi-square test on information quality characteristics

	Faithful representation	Completeness	Accuracy	Relevance	Understandability	Comparability across timeframes	Comparability between firms in the same sector	Access to information	Timeliness of information	Presentation format	Verifiability by an external party
Faithful representation	x	-31***	-8***	+23**	+23*	-27**	-12	-11	+57***	-69***	-24
Completeness	+31***	x	+30***	+47***	+19*	-9	+9	+19*	-46***	-51***	-7
Accuracy	+8***	-30***	x	+30***	-7	-31***	-14***	-31***	-57***	-53***	-21*
Relevance	-23**	-47***	-30***	x	-13	-45***	-26***	-29***	-61***	-65***	-37***
Understandability	-23*	-19*	+7	+13	x	-23*	-1*	-11	-47***	-57***	-13*
Comparability across timeframes	+27**	+9	+31***	+45***	+23*	x	+29	+22***	-39***	-60***	+3
Comparability between firms in the same sector	+12	-9	+14***	+26***	+1*	-29	x	+11***	-39***	-55***	-15
Access to information	+11	-19*	+31***	+29***	+11	-22***	-11***	x	-51***	-63***	-19***
Timeliness of information	-57***	+46***	+57***	+61***	+47***	+39***	+39***	+51***	x	-41***	+21***
Presentation format	+69***	+51***	+53***	+65***	+57***	+60***	+55***	+63***	+41***	x	+44***
Verifiability by an external party	+24	+7	+21*	+37***	+13*	-3	+15	+19***	-21***	-44***	x

Note: The table shows the difference between how often participants selected the quality characteristics on the top line versus the quality characteristics in the column at the left of the table.

* Chi-Square test significant at $p < .05$

** Chi-Square test significant at $p < .01$

*** Chi-Square test significant at $p < .001$

Non-financial information quality characteristics and level of trust in management, perceived risk, financial, and non-financial performance

To gain an understanding of how participants evaluate the importance of trust in management, perceived level of risk to invest in the firm, and financial and non-financial performance, we asked them to indicate how they evaluate

these concepts on a 5-point Likert scale. The output shows that the assessment of 'firm financial performance' is considered most important to investment decisions, followed by the 'perceived level of risk' and 'level of trust in management'. The assessment of the firm's non-financial performance is considered least important to participants' investment decisions (Table 5). Firm financial performance was, until recently, most important to investment decisions. In the past years the focus shifted more and more towards the non-financial concepts, like perceived level of risk, trust in management and the present non-financial performance.

Therefore, it's interesting to gain insight in the development and level of importance of these non-financial concepts against the historically important assessment of financial performance. We performed a Chi-Square test on the concepts. The output in Table 5 shows that assessment of financial performance is statistically significantly more important to investment decisions than the assessment of non-financial performance and the level of trust investors have in the firm's management. The assessment of financial performance is not significantly more important than the perceived level of risk. So, this might indicate that the level of risk is also very important to investors investment decisions.

We asked participant follow-up questions in which they had to decide which concept was more important to their investment decision. We performed Mann-Withney U tests as a validity check on the answers to the question in which participants decided on the importance of the concepts (Q8 in Appendix A) and the questions where they had to choose between concepts (Q9 – Q12 in Appendix A). The result of the Mann-Withney U test is in line with the results presented in table 5.

Table 5 - Importance of concepts

Concept	Mean*	Assessment of financial performance	
		Difference between assessment of financial performance and the other concepts**	Assymp. Sig.***
Assessment of financial performance	4.36	x	x
Perceived level of risk	4.25	+17	0.053
Level of trust in management	4.23	+37	< 0.001
Assessment of non-financial performance	3.74	+53	< 0.001

Note: N=77.

* The quality characteristics are ranked in the order 1 is not at all important – 5 extremely important. The mean score in the table is calculated based on the rank scores. A higher mean score therefore indicates a higher level of importance.

** Difference between how often participants selected assessment of financial performance versus how often they selected a concept on the vertical axis.

*** Performed a Chi-Square test on importance of assessment of financial performance and the other concepts.

Next, we asked participants to rank the information quality characteristics per concept type. The output is summarized in Table 6. The table provides an overview of the importance participants attached to the information quality characteristics in their assessment of the firm's financial performance versus their assessment of non-financial performance, perceived level of risk to invest in the firm and level of trust in management.

Panel A - Assessment of financial performance versus assessment of non-financial performance

The output in Panel A of Table 6 shows that 'accuracy' (significance score= -0.62; $p < 0.05$) and 'timeliness of information' (significance score= -0.75; $p < 0.05$) are statistically significantly more important to investors' assessment of the firm's financial than non-financial performance. 'Access to information' (significance score= 1.18; $p < 0.05$) is significantly more important to investors' assessment of the firm's non-financial performance than to the assessment of the firm's financial performance. This might indicate that investors struggle more with access to the right information for the non-financial performance assessments than for the assessment of financial performance. This makes sense, since all firms need to publish financial statements, but not all firms provide sufficient non-financial information.

Panel B - Assessment of financial performance versus perceived level of risk to invest in the firm

The Wilcoxon signed-rank test output in Panel B in Table 6 shows that 'faithful representation' (significance score= 0.78; $p < 0.05$) of the non-financial information in the firm's corporate annual report is considered significantly more important to investors' perceived level of risk to invest in the firm than to their assessment of the firm's financial performance. So, in other words this means that a faithful representation of the information in the corporate annual report provides investors with insight in the riskiness of the investment.

Panel C - Assessment of financial performance versus level of trust in management

The test output in Panel C in Table 6 shows that 'completeness' (significance score= -0.75; $p< 0.05$), 'comparability across timeframes' (significance score= -0.71; $p< 0.10$), and 'comparability between firms in the same sector' (significance score= -0.79; $p< 0.10$) are considered significantly more important to investors' assessment of the firm's financial performance than to their level of trust in management. 'Faithful representation' (significance score= 1.16; $p< 0.05$), 'understandability' (significance score= 0.71; $p< 0.10$), and 'access to information' (significance score= 1.08; $p< 0.05$) are considered statistically significantly more important to investors' level of trust in management than to their assessment of the firm's financial performance.

So, on an overall level we conclude that the information quality characteristics 'faithful representation', 'understandability', and 'access to information' are important to the non-financial aspects (assessment of non-financial performance, perceived level of risk to invest in the firm, and level of trust in management). 'Accuracy', 'completeness', 'timeliness of information', and 'comparability across timeframes and between firms in the same sector' are considered important to investors' assessment of the firm's financial performance.

This is interesting, since the information quality characteristics 'accuracy' and 'completeness' of information, which investors' consider important to assess the firm's financial performance, are not separately included in the IASB Conceptual Framework (2018). Moreover, 'access to information' is considered important to investors' assessment of non-financial performance, but this information quality characteristic is not

included in the IASB conceptual framework (IASB, 2018), CSRD (2021), Draft ESRS 1 General Requirements (EFRAG, 2022) and exposure drafts of the ISSB (2022).

Table 6 – Wilcoxon signed-rank test between information quality characteristics and concepts

Panel A - Financial performance vs non-financial performance			
	Assessment of the company's financial performance	**Assessment of the company's non-financial performance**	
	Mean*	**Mean***	**Difference**
Faithful representation	4.93	4.44	0.49
Completeness	5.28	5.53	-0.25
Accuracy	3.60	4.22	-0.62*
Relevance	3.63	3.51	0.12
Understandability	5.68	5.61	0.07
Comparability across timeframes	6.94	7.13	-0.19
Comparability between firms in the same sector	6.40	6.50	-0.1
Access to information	6.82	5.64	1.18*
Timeliness of information	7.19	7.94	-0.75*
Presentation format	9.13	9.10	0.03
Verifiability by an external party	6.40	6.38	0.02

Panel B - Financial performance vs perceived level of risk			
	Assessment of the company's financial performance	**Perceived level of risk to invest in the company**	
	Mean*	**Mean***	**Difference**
Faithful representation	4.93	4.15	0.78*
Completeness	5.28	5.69	-0.41
Accuracy	3.60	3.81	-0.21
Relevance	3.63	4.00	-0.37
Understandability	5.68	5.64	0.04
Comparability across timeframes	6.94	7.22	-0.28
Comparability between firms in the same sector	6.40	6.89	-0.49
Access to information	6.82	6.12	0.7
Timeliness of information	7.19	7.19	0
Presentation format	9.13	9.38	-0.25
Verifiability by an external party	6.40	5.92	0.48

Panel C - Financial performance vs level of trust in management			
	Assessment of the company's financial performance	**Level of trust in management**	
	Mean*	**Mean***	**Difference**
Faithful representation	4.93	3.77	1.16*
Completeness	5.28	6.03	-0.75*
Accuracy	3.60	3.76	-0.16
Relevance	3.63	4.00	-0.37
Understandability	5.68	4.97	0.71**
Comparability across timeframes	6.94	7.65	-0.71**

Comparability between firms in the same sector	6.40	7.19	-0.79**
Access to information	6.82	5.74	1.08*
Timeliness of information	7.19	7.72	-0.53
Presentation format	9.13	9.12	0.01
Verifiability by an external party	6.40	6.05	0.35

Note 1: The test is performed at N=72 for assessment of the firm's financial and non-financial performance and N=74 for the perceived level of risk and level of trust in management. The reason for not using N=77 is because not all participants completed the survey.

Note 2: The quality characteristics are ranked in the order 1 is most relevant – 11 is least relevant. The mean score in the table is calculated based on the rank scores. A lower mean score therefore indicates a higher level of importance.

* Wilcoxon signed-rank test is significant at $p < 0.05$.

** Wilcoxon signed-rank test is significant at $p < 0.10$.

Regression analyses on information quality characteristics and concepts

Next, a logistic regression analysis is performed to investigate if there is a relationship between the information quality characteristics and the concepts.

The test output in table 7 shows that the concept assessment of non-financial performance is statistically significant associated with all the information quality characteristics except for presentation format. So, investors who find non-financial performance important to their investment decisions, also find it important that the non-financial information that is needed for their assessment is faithfully represented, complete, accurate, relevant, understandable, comparable, timely, accessible, and verified by an external party. But the way in which the non-information is presented is not statistically significant to their investment decision and assessment of non-financial performance.

The test output in table 7 furthermore shows that the concept assessment of financial performance is statistically significant (p= 0.005) associated with the information quality characteristics timeliness of information. So, investors who find financial performance important to their investment decisions also find it important that the non-financial information is available in a timely manner.

For the concept level of trust in management there is a statistically significant (p= 0.09) association with the information quality characteristic accuracy of information. So, investors who find level of trust in management important to their investment decisions also find it important that the non-financial information is accurate. This finding is in line with the results of Nicolaou et al., (2013) who show that the ability to provide accurate non-financial information is expected to increase perceptions of trust".

There are no statistically significant associations between perceived level of risk and the non-financial information quality characteristics.

Table 7 – Logistic regression results

Dependent Variable - Information Quality Characteristics	Independent Variable - Concept							
	Assessment of		Assessment of non-		Level of trust in		Perceived level	
	Coefficient	Sig.	Coefficient	Sig.	Coefficient	Sig.	Coefficient	Sig.
Faithful representation	-0.205	0.775	3.340	0.003*	-0.902	0.223	-0.737	0.310
Model Chi-Square (df) sig.	19.860 (4) <0.001							
Completeness	0.345	0.434	1.338	0.002***	-0.387	0.301	-0.166	0.707
Model Chi-Square (df) sig.	15.217 (4) 0.004							
Accuracy	-0.019	0.975	1.333	0.032***	-0.985	0.096	0.407	0.502
Model Chi-Square (df) sig.	7.166 (4) 0.127							
Relevance	-0.591	0.328	1.657	0.005***	-0.498	0.328	-0.303	0.599
Model Chi-Square (df) sig.	10.443 (4) 0.034							
Understandability	0.106	0.828	1.581	0.002***	0.133	0.753	-0.808	0.132
Model Chi-Square (df) sig.	15.362 (4) 0.004							
Comparability across timeframes	-0.189	0.642	1.021	0.009***	-0.288	0.392	-0.299	0.473
Model Chi-Square (df) sig.	7.829 (4) 0.098							
Comparability between firms in the same sector	0.351	0.389	0.675	0.067*	-0.372	0.282	-0.508	0.223
Model Chi-Square (df) sig.	5.336 (4) 0.255							
Access to information	0.565	0.236	0.911	0.039**	-0.370	0.383	-0.411	0.384
Model Chi-Square (df) sig.	7.233 (4) 0.124							
Timeliness of information	1.308	0.005***	0.728	0.062*	-0.578	0.144	-0.617	0.167
Model Chi-Square (df) sig.	15.268 (4) 0.004							
Presentation format	0.198	0.677	0.332	0.405	-0.114	0.758	0.215	0.654
Model Chi-Square (df) sig.	2.341 (4) 0.673							
Verifiability by an external party	0.162	0.702	1.478	<0.001****	-0.395	0.274	-0.707	0.121
Model Chi-Square (df) sig.	15.579 (4) 0.004							

Note 1: N=77

Note 2: To perform a logistic regression between the information quality characteristics and concepts we created a dummy for the level of importance of the information quality characteristics. Dummy=0 includes the categories not at all important, slightly important, and moderately important. Dummy = 1 includes the categories very important and extremely important.

Note 3: The Wald statistics are distributed Chi-square with 1 degree of freedom.

* Significant at p < .10

** Significant at p < .05

*** Significant at p < .01

**** Significant at p < .001

Exploratory factor analysis on information quality characteristics and concepts

The importance given to some variables by investors exhibit some similarities with respect to the type of variable, suggesting these may be manifestations towards some underlying construct. Therefore, we conduct an exploratory factor analysis to identify any commonalities in responses across the variables (Xiao and Shailer, 2022).

The analysis resulted in four factors based on 15 variables, as reported in table 8. These factors appear to have a strong alignment with recognized constructs as developed by Lee et al., (2002) and Stuart et al., 2022. The first factor is largely concerned with contextual information quality characteristics, the second factor emphasizes the veracity of disclosure characteristics, the third factor emphasizes to the concepts, and the fourth factor is largely concerned with representational information quality characteristics.

Table 8 – Factor loadings from an exploratory factor analysis

Variables	Factor 1 – Contextual information quality characteristics	Factor 2 – Veracity of disclosure characteristics	Factor 3 – Importance of concepts	Factor 4 – Representational information quality characteristics
Timeliness	.809			
Accessibility	.716			
Format	.521			
Completeness	.319			
Faithfull Representation		.837		
Accuracy		.669		
Relevance		.577		
Understandability		.539		
Level of trust in management			.694	
Perceived level of risk			.667	
Assessment of non-financial performance			.630	
Assessment of financial performance			.528	
Consistency				.593
Comparability				.578
Verifiability				.550

The table reports the factor loadings based on principal axis factoring using the full sample of 77 questionnaire respondents.

Next, we performed a reliability test and conclude that all four factors are reliable. The Cronbach's Alpha for the four factors is: factor 1 is 0.786; factor 2 is 0.749; factor 3 is 0.767; factor 4 is 0.658. Therefore, we are assured that the variables in each factor can be taken together.

Demographic effects

Prior research suggests that individuals' perceptions of non-financial disclosures may be affected by their demographic characteristics (Xiao and Shailer, 2022; de Villiers & van Staden. 2010). However, a study by Haller et al., (2017) shows that demographic factors, such as nationality, professional background, or experience, did not have a significant influence on investors choices.

We conducted a linear regression analysis as to whether the variables information quality characteristics and information quality concepts vary with demographic factors such as participants' years of work experience, the total value of assets under management (AuM), the percentage of their current portfolio that is allocated to responsible investments (RI), investment horizon and level of risk preference for their investment strategy.

We do not find any significant differences or correlations between respondents' perceptions on information quality characteristics and concepts for factor 1 and 2 based on the demographic characteristics. For factor 3 the linear regression analysis output shows that investors with more years of experience find the information quality characteristics in factor 3 (consistency, verifiability, and comparability) statistically significant ($p= 0.089$) less important to their investment decisions. For factor 4 the linear regression analysis output shows that investors with more years of experience find their assessment of the concepts: level of trust in management, perceived

level of risk, assessment of financial and non-financial performance important to their investment decisions. The linear regression results are reported in table 9.

Table 9 – Summary of linear regression analysis for factor 1 – 4

Variable	Factor 1		Factor 2		Factor 3		Factor 4	
	B	SE B	B	SE B	B	SE B	B	SE B
Years of experience	.003	.010	.004	.009	-.018*	.010	.020**	.008
Value of AuM	-3.995E-13	.000	8.721E-13	.000	6.608E-13	.000	-1.409E-13	.000
Percentage RI	-8.046E-9	.000	-1.319E-8	.000	-1.159E-8	.000	-1.986E-8	.000
Investment horizon	.002	.003	.004	.003	.005	.003	.000	.003
Risk preference	.001	.004	-.001	.004	-.002	.005	.003	.004
R2	.012		.059		.072		.119	

*Significant at p< .10

** Significant at p< .05

2.8. Summary and conclusion

In this study, which is an explorative paper on non-financial reporting, we tried to gain initial insights whether the information quality criteria in the International Accounting Standards Board (IASB) Conceptual Framework, that forms the basis for financial standard setting, are also relevant for non-financial reporting based on the Corporate Sustainability Reporting Directive (CSRD), and the International Sustainability Standards Board (ISSB)

exposure drafts. It examines which other quality criteria are applicable to narrative non-financial information by performing a literature review followed by a survey with institutional investors in the Netherlands.

Understanding the information quality characteristics that investors find most relevant for non-financial reporting is important for standard setting as well as for research about the quality of corporate reporting practice.

We performed a literature review and a survey with investors and conclude that most information quality characteristics that are applicable for financial reporting are also relevant for non-financial reporting. However, investors also identified other information quality characteristics that are important for non-financial reporting, next to the information quality characteristics that are identified for financial reporting.

Based on the literature review, we conclude that the information quality characteristics 'relevance', 'verifiability', 'comparability across timeframes', 'timeliness of information', and 'understandability' that are mentioned in the IASB conceptual framework (2018) are also most relevant according to prior literature on information quality in other fields. This might suggest that these information quality characteristics can also be important according to investors in a setting of non-financial reporting.

'Comparability between firms' and 'faithful representation' are less often mentioned in prior literature than 'accuracy', 'completeness', and 'access to information'. The last three are not included in the IASB conceptual framework (2018) but might be important according to investors in a setting of non-financial reporting.

Based on the results from literature review, we added the quality characteristics 'accuracy', 'access to information', 'completeness', and

'presentation format' to the list of information quality characteristics to include in our survey.

Some of the highlights from the survey are that the quality characteristic 'relevance' is considered most important according to investors. Next, 'faithful representation' and 'accuracy' are considered as important according to investors. So, investors are mostly looking for relevant and accurate non-financial information that give a faithful representation of the firms' non-financial performance for their investment decisions.

The 'format' in which the information is presented is considered as least important according to investors. This is an interesting finding in the light of greenwashing and impression management. Investors seem to pay less attention to the presentation format, while firms are sometimes blamed for using impression management strategies via the format in which information is presented (Melloni et al., 2016).

According to investors, the non-financial information quality characteristic 'relevance' is statistically significant more important than all other information quality characteristics, except for 'understandability' of non-financial information. So, relevance of information is also more often considered as important to investment decisions than faithful representation of the information. This might be explained by the division between main- and sub-criteria in the IASB Conceptual framework (2018). The information quality characteristics are not considered equal. Investors do not seem to notice the difference and seem to find relevant non-financial information more important than faithful non-financial information.

Furthermore, we asked participants to rank the information quality characteristics per concept. The output shows that 'access to information' is considered significantly more important to investors' assessment of the firms'

non-financial performance than to the assessment of financial performance. This might indicate that investors' struggle more with access to the right information for the non-financial performance assessments than for the assessment of financial performance. However, this information quality characteristic is not included in Draft ESRS 1 General Requirements (EFRAG, 2022), and exposure drafts of the ISSB. It is briefly mentioned in the Draft European Sustainability Reporting Guidelines 2 – Characteristics of information quality working paper (2022), under sub 24 and 25, as being part of faithful representation.

Based on this result we recommend that the European sustainability reporting standard setter and the ISSB should re-evaluate the information quality characteristics for non-financial information. Our recommendation to EFRAG and the ISSB is to include 'access to non-financial information' as a separate information quality criterion since this type of information is currently not as accessible as financial information.

Furthermore, the regression output shows that investors who find financial performance important to their investment decisions also find it important that the non-financial information is available in a timely manner. Non-financial reports until recently are still mainly published on a voluntary basis and is often published after the publication of the financial report. This already changed for large, listed firms with the introduction of the Non-financial Reporting Directive and with the introduction of the CSRD it will even become mandatory for all large firms to include non-financial information in the corporate annual report. This will help to address the information quality characteristics 'access to non-financial information' and 'availability of non-financial information in a timely manner'.

With respect to the information quality characteristics per concept we conclude that the information quality characteristics 'faithful representation', 'understandability', and 'access to information' are statistically significant more important to the non-financial aspects (assessment of non-financial performance, perceived level of risk to invest in the firm, and level of trust in management) than to investors' assessment of financial performance.

On an overall level, the regression output shows that investors who find non-financial performance important to their investment decisions, also find it important that the non-financial information that is needed for their assessment is faithfully represented, complete, accurate, relevant, understandable, comparable, timely, accessible, and verified by an external party. But the format in which the non-financial information is presented is not statistically significant to their investment decision and assessment of non-financial performance.

We also explored whether demographic characteristics are of influence on investors' preferences with respect to the information quality characteristics. The regression output shows that investors with more years of experience find all four concepts: assessment of level of trust in management, perceived level of risk, assessment of financial and non-financial performance important to their investment decisions. The regression also shows that these investors find the information quality characteristics consistency, verifiability, and comparability statistically significant less important to their investment decisions.

We believe that the results of this study offer academics, investors, firms and regulators a clearer picture of investor needs regarding the information quality characteristics of non-financial information. Our analysis is important because through our literature review and survey we shed more

light on important investor perspectives on non-financial reporting and information quality. This enables us to contribute to the literature on non-financial disclosure quality. Furthermore, we believe that the results of this study offer academics, investors, firms and regulators a clearer picture of investor needs regarding the characteristics of non-financial information. The results can be useful to the standard setter in deciding which regulatory approach might be best applied to non-financial reporting. The findings of this study may provide insights for firms on how to integrate non-financial data with financial data based on information quality characteristics that are relevant to investors.

A limitation of the study is that we used information quality characteristics that we identified based on our literature review, there could be more or other characteristics of non-financial information quality that investors find relevant to their investment decisions. Another limitation is that the survey is performed with a population of investors in the Netherlands. Future research can investigate other information quality characteristics that might be relevant to non-financial information according to investors in other countries.

Appendices

Appendix A – Survey questions

Q1 As part of a research project at the University of Amsterdam in cooperation with the Dutch Authority for the Financial Markets (AFM), we would like to ask you to participate in this survey. It takes on average 25 minutes to complete the survey.

Since there are no correct or incorrect answers, we ask you to respond truthfully based on the information that is presented to you and to the best of your ability. Your data will be treated anonymously and will only be used for this scientific research project and the follow-up on the AFM thematic exploratory study on the use of non-financial information by institutional investors.

The focus of the questions in this survey is on non-financial information and reporting. The aim of this research is to explore whether the information quality criteria that are the basis for financial reporting standard setting are also relevant for non-financial reporting.

It is important that you only use the information that is presented to you in the survey. You can only read the information that is presented to you once, implying that you cannot go back to previous screens. Next, for validity reasons, we would like to ask you not to talk to other people while participating in the survey and to do this preferably without breaks or interruptions.

Finally, we also ask you to only start up the experiment once.

Please feel free to contact the lead researcher Kavita Nandram via p.k.nandram@uva.nl in case of any questions.

Thank you for participating in this research project!

Q2 ***The next questions are related to your investment decisions:***

Q3 How important do you consider non-financial information (i.e. information about diversity and inclusion, environment, social responsibility, human rights, anti-corruption and bribery) for your **investment decisions**?

- Extremely important
- Very important
- Moderately importan
- Slightly important
- Not at all important

Q4 How often do you use non-financial information (i.e. information about diversity and inclusion, environment, social responsibility, human rights, anti-corruption and bribery) for your **investment decisions**?

- Always
- Most of the time
- About half the time
- Sometimes
- Never

Q5 Please identify whether the following quality dimensions of non-financial information are important to your **investment decisions.**

	Extremely important	Very important	Moderately important	Slightly important	Not at all important
The extent to which the non-financial information is **relevant** and useful for decision making	○	○	○	○	○
The extent to which the non-financial information is **consistent across different time frames**	○	○	○	○	○
The extent to which the non-financial information is **comparable between firms** in the same sector	○	○	○	○	○
The extent to which the non-financial information is **verifiable** to the users	○	○	○	○	○
The extent to which the non-financial information is available when needed in a **timely** manner	○	○	○	○	○

The extent to which the non-financial information is **understandable**	○	○	○	○	○
The extent to which the non-financial information is a **faithful representation** of reality	○	○	○	○	○
The extent to which the non-financial information is **accurate**	○	○	○	○	○
The extent to which the non-financial information is **accessible**	○	○	○	○	○
The extent to which the non-financial information is **complete**	○	○	○	○	○
The **format** in which the non-financial information is presented	○	○	○	○	○

Q6 Please rank how important the following quality dimensions of non-financial information in a company's integrated report are to your investment

decisions. Please drag and drop the quality dimensions in the order 1 is most relevant – 11 is least relevant to the box at the right.

- Comparability across time frames
- External verifiability
- Relevance and usefulness
- Timeliness of information
- Format in which the non-financial information is presented
- Access to the non-financial information
- Comparability between firms in the same sector
- Faithful representation
- Understandability of information
- Accuracy of information
- Completeness

Q7 Please provide your opinion on which information type is most important to your **investment decision**:

- Non-Financial Information
- Financial Information
- Other, namely ....

Q8 Please indicate how important the following concepts are to your **investment decision**:

	Extremely important	Very important	Moderately important	Slightly important	Not at all important
Level of trust in management	○	○	○	○	○
Perceived level of risk	○	○	○	○	○
Assessment of financial performance	○	○	○	○	○
Assessment of non-financial performance	○	○	○	○	○

Q9 Please decide what is more important to your **investment decision:**

- ○ Assessment of non-financial performance
- ○ Level of trust in management

Q10 Please decide what is more important to your investment decision:

- ○ Assessment of non-financial performance
- ○ Perceived level of risk

Q11 Please decide what is more important to your **investment decision**:

- ○ Assessment of non-financial performance
- ○ Assessment of a company's financial performance

Q12 Please decide what is more important to your **investment decision**:

- ○ Perceived level of risk
- ○ Level of trust in management

Q13 Please decide what is more important to your **investment decision**:

- ○ Perceived level of risk
- ○ Assessment of a company's financial performance

Q14 Please decide what is more important to your **investment decision**:

- ○ Level of trust in management
- ○ Assessment of a company's financial performance

Q15 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Comparability across time frames
- ○ Relevance

Q16 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Comparability between firms in the same sector
- ○ Relevance

Q17 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ External verifiability
- ○ Relevance

Q18 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Timeliness
- ○ Relevance

Q19 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Understandability
- ○ Relevance

Q20 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Faithful representation
- ○ Relevance

Q21 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Accuracy
- ○ Relevance

Q22 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Access to the non-financial information
- ○ Relevance

Q23 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Completeness
- ○ Relevance

Q24 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Format
- ○ Relevance

Q25 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ External verifiability
- ○ Comparability across timeframes

Q26 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Timeliness
- ○ Comparability across timeframes

Q27 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Understandability
- ○ Comparability across timeframes

Q28 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Faithful representation
- ○ Comparability across timeframes

Q29 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Accuracy
- ○ Comparability across timeframes

Q30 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Access to the non-financial information
- ○ Comparability across timeframes

Q31 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Completeness
- ○ Comparability across timeframes

Q32 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Format
- ○ Comparability across timeframes

Q33 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ External verifiability
- ○ Comparability between firms in the same sector

Q34 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Timeliness
- ○ Comparability between firms in the same sector

Q35 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Understandability
- ○ Comparability between firms in the same sector

Q36 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Faithful representation
- ○ Comparability between firms in the same sector

Q37 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Accuracy
- ○ Comparability between firms in the same sector

Q38 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Access to non-financial information
- ○ Comparability between firms in the same sector

Q39 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Completeness
- ○ Comparability between firms in the same sector

Q40 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Comparability across timeframes
- ○ Comparability between firms in the same sector

Q41 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Format
- ○ Comparability between firms in the same sector

Q42 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Timeliness
- ○ External verifiability

Q43 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Understandability
- ○ External verifiability

Q44 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Faithful representation
- ○ External verifiability

Q45 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Accuracy
- ○ External verifiability

Q46 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Completeness
- ○ External verifiability

Q47 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Format
- ○ External verifiability

Q48 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Access to the non-financial information
- ○ External verifiability

Q49 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Understandability
- ○ Timeliness

Q50 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Faithful representation
- ○ Timeliness

Q51 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Accuracy
- ○ Timeliness

Q52 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Access to the non-financial information
- ○ Timeliness

Q53 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Completeness
- ○ Timeliness

Q54 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Format
- ○ Timeliness

Q55 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Faithful representation
- ○ Understandability

Q56 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Accuracy
- ○ Understandability

Q57 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Access to non-financial information
- ○ Understandability

Q58 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Completeness
- ○ Understandability

Q59 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Format
- ○ Understandability

Q60 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Accuracy
- ○ Faithful representation

Q61 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Access to non-financial information
- ○ Faithful representation

Q62 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Completeness
- ○ Faithful representation

Q63 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Format
- ○ Faithful representation

Q64 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Access
- ○ Accuracy

Q65 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Completeness
- ○ Accuracy

Q66 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Format
- ○ Accuracy

Q67 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Completeness
- ○ Access to the non-financial information

Q68 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Format
- ○ Access to the non-financial information

Q69 Please decide which quality dimension of non-financial information that is provided by companies in their integrated report, is most important to your **investment decision**.

- ○ Format
- ○ Completeness

Q70 ***The next questions are related to the level of trust you have in management:***

Q71 Please rank how important the following quality dimensions of non-financial information in a company's integrated report are to your level of trust in management. Please drag and drop the quality dimensions in the order 1 is most relevant – 11 is least relevant to the box at the right.

- Format in which the non-financial information is presented
- Access to non-financial information
- Comparability across time frames
- External verifiability
- Relevance and usefulness
- Understandability of information
- Timeliness of information
- Completeness
- Comparability between firms in the same sector
- Faithful representation
- Accuracy of information

Q72 Please provide your opinion on which information type is most important to your **level of trust in management:**

- ○ Non-Financial Information
- ○ Financial Information
- ○ Other, namely ....

Q73 ***The next questions are related to your perceived level of risk to invest in the company:***

Q74 Please rank how important the following quality dimensions of non-financial information in a company's integrated report are to your perceived level of risk to invest in the company. Please drag and drop the quality dimensions in the order 1 is most relevant – 11 is least relevant to the box at the right.

- Accessibility
- Format in which the non-financial information is presented
- Comparability across time frames
- Understandability of information
- Relevance and usefulness
- External verifiability
- Faithful representation
- Completeness
- Timeliness of information
- Accuracy of information
- Comparability between firms in the same sector

Q75 Please provide your opinion on which information type is most important to **your perceived level of risk to invest in the company.**

- ○ Non-Financial Information
- ○ Financial Information
- ○ Other, namely ....

Q76 ***Non-financial information may affect your assessment of current financial performance. The next question is related to the impact of quality dimensions of non-financial information on your assessment of current financial performance.***

Q77 Please rank how important the following quality dimensions of non-financial information in a company's integrated report are to your assessment of current financial performance. Please drag and drop the quality dimensions in the order 1 is most relevant – 11 is least relevant to the box at the right.

- Timeliness of information
- Access to non-financial information
- Comparability across time frames
- Understandability of information
- Comparability between firms in the same sector
- Format in which the non-financial information is presented
- External verifiability
- Relevance and usefulness
- Faithful representation
- Completeness
- Accuracy of information

Q78 ***The next question is related to your assessment of non-financial performance:***

Q79 Please rank how important the following quality dimensions of non-financial information in a company's integrated report are to your assessment of the company's non-financial performance. Please drag and drop the quality dimensions in the order 1 is most relevant – 11 is least relevant to the box at the right.

- Comparability between firms in the same sector
- Timeliness of information
- Format in which the non-financial information is presented
- Access to non-financial information
- Comparability across time frames
- Accuracy of information
- External verifiability
- Relevance and usefulness
- Faithful representation
- Completeness
- Understandability of information

Q80 *Please note that the next questions are related to the **use of non-financial information** by professional investors. In this survey we consider information on environment, social and governance as non-financial information, including intangible assets. So for example, we consider environment, social and employee issues, human rights, anti-corruption and bribery as non-financial matters.*

Q81 For which purpose do you consider non-financial information? Please note that you can select multiple answer options.

- ○ Investment decisions
- ○ Engagement with companies
- ○ Voting
- ○ Reporting
- ○ I don't use non-financial information
- ○ Other, namely …..

Q82 Do you always consider non-financial information for your investment decisions?

- ○ Yes
- ○ No
- ○ It depends on the following factors

Q83 Please indicate how important financial and non-financial information is for your investment decisions. Please note that you can allocate 100% between:

- Financial information
- Non-financial information

Q84 Please provide your opinion on the following statements

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I consider non-financial information in investment decisions because it is material to investment performance	○	○	○	○	○
I consider non-financial information in investment decisions because of growing demand from clients or stakeholders	○	○	○	○	○
I consider non-financial information in investment decisions because it is part of our company strategy and policy	○	○	○	○	○

I consider non-financial information in investment decisions because it is part of our company believes and values	○	○	○	○	○
I consider non-financial information in investment decisions because of long-term benefits for people, planet and profit	○	○	○	○	○
I consider non-financial information in investment decisions because of (upcoming) law and regulations	○	○	○	○	○

Q85 What non-financial matters are most relevant for your investment decisions? Please rank the following items from 1 (most relevant) – 3 (least relevant).

- Environmental information
- Social information
- Governance information

Q86 Please indicate which environmental matters are most relevant for your investment decisions

Q87 Please indicate which social matters are most relevant for your investment decisions

Q88 Please indicate which governance matters are most relevant for your investment decisions

Q89 Are there any other non-financial matters that are relevant for your investment decisions? If so, please indicate which matters.

Q90 Please provide your opinion on the following statements.

Q90 Please provide your opinion on the following statements.	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I **do not** consider non-financial information for investment decisions because we lack access to **reliable** non-financial information	○	○	○	○	○
I **do not** consider non-financial information for investment decisions because we lack access to **comparable** non-financial information	○	○	○	○	○
I **do not** consider non-financial information for investment decisions because we lack access to **meaningful** non-financial information	○	○	○	○	○
I **do not** consider non-financial information for investment decisions because my investment model is focused on **financial information**	○	○	○	○	○

I **do not** consider non-financial information for investment decisions because of the **costs** (i.e. time, lack of knowledge) related to getting **access** to and **processing** the non-financial aspects	○	○	○	○	○

Q91 What could trigger you to use non-financial information for your investment decisions?

Q92 Could you please indicate how important the following information sources are to your investment decisions?

	Extremely important	Very important	Moderately important	Slightly important	Not at all important
Financial statements in the company's annual report	○	○	○	○	○
Non-financial information (in a separate report) on the company website	○	○	○	○	○
Non-financial information in the company's annual report	○	○	○	○	○
Non-financial information via data providers (e.g. Bloomberg, Refinitiv etc.)	○	○	○	○	○
Non-financial information about the company in the news or other media	○	○	○	○	○
Press releases	○	○	○	○	○
ESG-ratings provided by an ESG-rating agency	○	○	○	○	○

ESG-data provided by a voting company	○	○	○	○	○
Information about the company's financial performance in analyst reports	○	○	○	○	○
Information about the company's non-financial performance in analyst reports	○	○	○	○	○
Financial information obtained during one-on-one meetings (e.g. roadshows, seminars etc.)	○	○	○	○	○
Non-financial information obtained during one-on-one meetings (e.g. roadshows, seminars etc.)	○	○	○	○	○

Q93 Which of the following sources do you consider most relevant to gather non-financial information? Please rank the following items from 1 (most relevant) – 7 (least relevant).

- Earnings calls
- Annual shareholder meeting

- Capital markets day
- Intermediate report
- Annual report
- One-on-one meetings between companies and investors (e.g. roadshows, seminars etc.)
- Third parties (e.g. ESG-rating agencies, voting companies)

Q94 Please provide your opinion on the following statements	Strongly agree	Some what agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
It is up to investors to take action if non-financial information provided by companies is incomplete or absent	○	○	○	○	○
Assurance by an external party could contribute to making non-financial information reliable	○	○	○	○	○
Supervision of the assurance provider is essential in order to improve the reliability of the non-financial information	○	○	○	○	○
Laws and regulations on non-financial reporting enhance the use of non-financial information for investment decisions	○	○	○	○	○

Q95 Please provide your opinion on the provision of assurance on the non-financial information in the report.

- ○ It is important that the provision of assurance on the non-financial information is integrated with the statutory audit
- ○ It is important that the provision of assurance on the non-financial information is separate from the statutory audit

Q96 Please provide your opinion on the following statements.	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Having both financial and non-financial information presented in one document is important when performing an investment analysis	○	○	○	○	○
In addition to providing information on past performance, companies should disclose forward looking information in their reporting	○	○	○	○	○
Forward looking information should be provided in the form of scenario's	○	○	○	○	○
Non-financial information in the annual report is more reliable if it is accompanied by an assurance statement	○	○	○	○	○

An assurance statement is more valuable if it is prepared as an integrated part of the statutory audit	○	○	○	○	○
It is acceptable that some non-financial aspects are subject to different levels of assurance (e.g. mixed assurance: limited and reasonable assurance)	○	○	○	○	○
Limited assurance is sufficient for all non-financial aspects in the annual report	○	○	○	○	○
Full (reasonable) assurance should be provided for all non-financial aspects in the annual report	○	○	○	○	○
Insight into the continuity of a business model and the value it can create in the long term is important to my investment analysis	○	○	○	○	○

Q97 How should companies disclose non-financial information in the annual report in order to be useful for your investment decisions?

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
Financial and non-financial information should be integrated in one report	○	○	○	○	○
Companies should use a standardized reporting framework	○	○	○	○	○
The link between non-financial and financial information is essential to understand and include the information in investment decisions	○	○	○	○	○
Companies need to set clear targets in relation to non-financial matters and report on the achievement of and progress towards these targets	○	○	○	○	○

Q98 For which non-financial metrics (e.g. measurement of carbon emissions) would **standardization in reporting** be helpful in order for the non-financial matters to be more useful for investment decisions?

Q99 Which non-financial metrics (e.g. measurement of carbon emissions) are the bare minimum that companies need to include in their reporting in order for the non-financial matters to be more useful for investment decisions?

Q100 How could companies **improve** their r**eporting on non-financial matters** in order to be more useful for investment decisions?

Q101 **The next questions are demographic questions.**

Q102 What is your age?

- ○ My age is:
- ○ N/a

Q103 What is your gender?

- ○ Male
- ○ Female
- ○ N/a

Q104 How many years of work experience do you have since you first started to invest?

Q105 What is approximately the total value of assets under management? Please provide your answer in Euro's.

Q106 Can you give an indication of the percentage of your current portfolio that is allocated to responsible investments (e.g. sustainability, sectors that invest in living wages etc.)?

Q107 What is your current function / role?

Q108 What type of investment professional (e.g. equity, bond etc.) are you?

Q109 In the investment process your role is an integral part of

- ○ Engagement with companies
- ○ Investment decisions
- ○ Voting
- ○ Reporting
- ○ Other, namely

Q110 What type of organisation do you work at?

- ○ Asset Management company
- ○ Pension provider
- ○ Public / local authority pension fund
- ○ Insurance / financial institution
- ○ Other, namely

Q111 What is at the organization you work at, the main driver in relation to the investment strategy?

- ○ Contribute to society
- ○ Profit oriented
- ○ Other, namely

Q112 How do you evaluate your investment horizon?

	0 10 20 30 40 50 60 70 80 90 100
0 is short term investment horizon. 100 is long term investment horizon	

Q113 In general, please indicate your average investment horizon in terms of months?

Q114 How do you evaluate your own level of risk preference with respect to your investment strategy? Please provide your answer in percentages from 0-100. 0% is risk averse, 100% is risk taker.

CHAPTER

Do firms that perform well report differently compared to those that perform badly? impression management in integrated reporting

3. Do firms that perform well report differently compared to those that perform badly? impression management in integrated reporting

Abstract

This paper aims to investigate whether managers use impression management through the presentation of non-financial information in an integrated reporting setting. We performed an experiment with experienced professional controllers and part-time students enrolled in the executive master's degree in finance and control at universities in the Netherlands. In this experiment we manipulated the financial performance to test if managers present non-financial information differently based on the firm's financial performance. We found that impression management is not applied by including or excluding non-financial key performance indicators (KPIs) in the integrated report, but by using more prominent presentation forms for positive non-financial performance and non-prominent ones for negative non-financial performance. However, the use of impression management through the presentation form decreased when the firms' financial performance was positive. In that instance we noted that managers statistically significantly more often decided to present poor non-financial performance in a prominent presentation format in comparison to managers who were not aware of the financial performance. The results of this study are of importance for users of integrated reports, since it will provide more insight into whether firms are truly transparent in their integrated reports. Furthermore, the theoretical implication of this study is relevant to regulatory authorities, because it sheds light on the different forms of impression management used in integrated

reporting and the influence of positively or negatively performing KPIs on the decisions of preparers of integrated reports.

3.1. Introduction

Investors associate integrated reporting with managements' desire to portray a favourable corporate image (Atkins and Maroun, 2015). It is assumed that managers manipulate the presentation and disclosure of information in corporate narrative documents (Merkl-Davies and Brennan, 2011, p. 416). Therefore, in this paper we assess whether the disclosure of material non-financial key performance indicators (KPIs) is associated with a firm's financial performance. We aim to determine whether firms use impression management in integrated reporting and through which KPIs (positively/negatively performing KPIs). We rely on the theory of impression management and test this by performing an experiment with professional controllers.

In discretionary narrative disclosures, impression management is applied when it is assumed that management strategically selects the information to display and presents that information in a manner that is intended to positively influence readers' perceptions of corporate achievements (Merkl-Davies and Brennan, 2011, p. 415). We find that firms use impression management by utilizing prominent presentation forms for positive non-financial performance and non-prominent ones for negative non-financial performance.

By focusing on an integrated reporting setting, we extend the existing knowledge in the field of impression management and voluntary reporting. In this study, we add to prior literature (Haji and Hossain, 2016; Melloni *et al*.,

2017; Camodeca *et al.,* 2018; Roman *et al.,* 2019; Varachia and Yasseen, 2020; Mokabane and du Toit, 2022; Nicolo *et al.,* 2022) by investigating the concept of impression management in an integrated reporting setting. More specifically, we perform an experiment and focus on different forms of impression management (the presentation format and underreporting) through non-financial KPIs in an integrated reporting setting and link it to firm financial performance. In contrast to prior literature (Haji and Hossain, 2016; Melloni *et al*., 2017; Camodeca *et al.,* 2018; Roman *et al.,* 2019; Varachia and Yasseen, 2020; Mokabane and du Toit, 2022; Nicolo *et al.,* 2022) on impression management, we choose to use an experimental research method instead of content analysis because we want to discover the cause of certain reporting styles instead of only describing the data in the integrated report.

In the following sections, we will explain the theory, review the relevant research, and present the hypotheses and the results. The final section of this paper is devoted to the conclusions and contributions of this study.

3.2. Background

Reliability and completeness of information

"An integrated report should include all material matters, both positive and negative, in a balanced way and without material error" (IIRC, 2021, p. 7). In this way, the integrated report is seen as a tool for being transparent to investors and other stakeholders. This view is consistent with the incremental information view, which is rooted in agency theory and presumes that firms voluntarily disclose information to reduce information asymmetry, to lower the cost of capital, or to improve managerial reputation (Leung *et al*., 2015).

Nevertheless, firms use different ways to influence the impression of the firm's performance and prospects by manipulating the content and presentation of information in the corporate annual report, with the aim of presenting a self-serving view of corporate performance (Brennan *et al*., 2009; Pasko *et al*., 2020, p. 836). In the accounting literature, this practice is referred to as impression management (Clatworthy and Jones, 2006; Merkl-Davies and Brennan, 2007; Pasko *et al*., 2020).

3.3. Literature review and hypothesis development

Theoretical foundation

In a corporate annual reporting context, impression management refers to managerial behaviour involving strategically selecting, displaying and presenting narrative information in corporate documents in a manner that is intended to distort readers' perceptions of corporate achievements, and influence their impressions of firm performance and prospects (Godfrey *et al*., 2003; Merkl-Davies and Brennan, 2011; Pasko *et al*., 2020).

Prior literature shows that, from an accountability perspective, firms should provide information about their activities, even if this is not in their best interest (Comyns *et al*., 2013, p. 232; Gray, 2007; Gray *et al*., 2001). Previous accounting research used impression management theory to explore forms of corporate communication in firms' annual reports, forward-looking information, attributional statements in annual report narratives, chairman's statements and accounting narratives, such as directors' reports (Aerts, 2001; Aerts, 2005; Clatworthy and Jones, 2003; Merkl-Davies and Brennan, 2011; Rahman, 2012; Schleicher and Walker, 2010; Schleicher, 2012).

This concept was studied in the field of accounting and the context of corporate annual reporting by Courtis (1995), who found that management is not neutral in how it presents information, preferring to communicate in a manner that hides bad news. Impression management can occur in different forms. Prior accounting literature (Brennan *et al*., 2009; Clatworthy and Jones, 2006; Melloni *et al.*, 2015, p. 6; Merkl-Davies and Brennan, 2007, 2011; Ogden and Clarke, 2005; Pasko *et al*., 2020; Skinner, 1994; Yang and Liu, 2017) examined a variety of impression management methods, such as underreporting, downplaying, omitting, minimizing, concealing, positive language, visual/presentation format or signalling good performance.

Prior literature about textual narratives found that managers tend to present positive information in quantitative formats instead of qualitative statements (Skinner, 1994; Yang and Liu, 2017). This finding was also underlined by Clatworthy and Jones (2006, p. 504), who looked at the use of impression management in the chairman's statement and noted that profitable firms are significantly more willing to quantify their performance in terms of percentages.

Furthermore, graphical information is likely to receive greater weight than textual information when presented simultaneously (Lurie and Mason, 2007). Research on the extent to which firms use graphs in their annual integrated reports and if graphs are employed as an impression management tool shows that the presented graphs in the annual integrated reports of South African listed firms concludes that these firms use graphs as a tool of impression management, to portray a favourable image of the firm to users of the annual integrated report (Varachia and Yasseen, 2020).

In a worldwide sample, larger, most profitable firms and firms operating in highly polluting sectors make greater use of visual tools (i.e.,

graphs) within the integrated reports (Nicolo *et al.,* 2022). In a Spanish context prior literature (Garcia-Sanchez and Araujo-Bernardo, 2019) confirms that firms that are less motivated by sustainability use numerous impression management techniques associated with the visual rhetoric of the image and colour in order to persuade the users of the business commitment to sustainability.

However, the risk of litigation and its associated costs have the potential to reduce managers' incentives to provide misleading disclosures (Billings and Cedergren, 2015; Cazier *et al*., 2016; Kothari *et al*., 2009), and therefore might lead to less impression management through the inclusion or exclusion of certain non-financial KPIs. Litigation risk tends to constrain self-promotional behaviour, compels firms to write longer reports, offer more extensive elaboration to shield themselves from litigation when reporting poor performance, and manage disclosure tone (Aerts and Yan, 2017).

Our study differs from prior research on impression management in narratives in that we use and experiment and focus on different forms of impression management (the presentation format and underreporting) through non-financial KPIs (positively and negatively performing KPIs) in an integrated reporting setting and link it to firm financial performance. Our paper aims to examine the use of impression management, through opportunistic reporting/underreporting and the presentation format, based on firm financial performance in an experimental setting. Based on impression management theory, as described by Tedeseschi and Melburg (1984), the research question in our paper is: "Do managers use impression management when they disclose material non-financial information in their integrated reports?"

Consequently, this paper seeks to make the following contributions to the existing literature. First, we perform an experiment with controllers who have real-life experience with the topic to gain insight into the use of impression management in relation to integrated reporting. Second, we investigate the different forms of impression management in integrated reporting. Third, we examine the relationship between impression management and non-financial KPIs as well as financial performance.

Hypothesis development

Prior research resulted in varying findings regarding the use of impression management in relation to firm performance. For example, Clatworthy and Jones (2003) examined whether firms with improving and declining performance report good and bad news in different ways. They found that both groups of firms prefer to emphasize the positive aspects of their performance. Firms with improved performance report more good than bad news. Firms with declining performance report roughly the same amount of good and bad news, but still focus on the good type (Clatworthy and Jones, 2003, p. 181).

In another study, Clatworthy and Jones (2006) reported impression management use in differential patterns of reporting in the chairman's statement, contingent upon whether the firms are profitable or unprofitable. They found that unprofitable firms focus less on key financial indicators, use fewer quantitative results and more passive sentences, and concentrate more on the future than profitable ones. An earlier study by Abrahamson and Park (1994) showed that the larger the decline in the financial performance of the firm, the greater the disclosure of negative outcomes in annual narratives. This finding is not in line with the theory of impression management, but it is

consistent with stakeholder theory and the claim that accountants and certain types of investors and directors prompt firms to reveal negative outcomes, whereas others promote concealment (Abrahamson and Park, 1994, p. 1329).

Previous studies on voluntary disclosure often assume the existence of a high positive correlation between performance and disclosure, as managers prefer to disclose only good news (Healy and Palepu, 2001), but the literature on Corporate Social Responsibility (CSR) shows that managers disclose more positive environmental news when there is negative financial information to be disseminated (De Villiers and van Staden, 2011; De Villiers *et al*., 2017, p. 948). In contrast Leung *et al*. (2015) noted that firms with poor performance are expected to include minimal narrative disclosure in the annual report, and that this provides an alternative concealing tool for managers to hide adverse information in annual reports.

In an integrated reporting context, Melloni *et al.* (2017) examined a selection of performance determinants to gain insight into the factors associated with conciseness and completeness in integrated reporting. The results from a sample of early adopters of integrated reporting showed that in the presence of a firm's weak financial performance, the integrated report tends to be significantly longer, less readable, and more optimistic. They also noted that firms with worse social performance provide reports that are foggier and contain less information on their sustainability performance (Melloni *et al*., 2017). Roman *et al.,* (2019) investigated the determinants of readability and optimism which build the disclosure style of integrated reports. The result in their study shows that the higher the revenues of the reporting firm, the more balanced the integrated reports are. In line with Melloni *et al.* (2017) they found that firms with weaker financial performance display a higher level of optimism in the integrated reports. Melloni *et al.*

(2017) highlighted that the early adopters of integrated reporting employ quantity and syntactical reading ease manipulation, as well as thematic content and verbal tone manipulation, as impression management strategies. Their results suggest that these strategies not only depend on the level of a firm's performance, but also on the type of performance (financial versus non-financial).

Also, a study by Camodeca *et al.* (2018) concludes that integrated reporting does not provide the means for verifiable disclosure of corporate sustainability. This finding is consistent with another study by Melloni (2015) that integrated reporting is often associated to poor social and environmental performances, being it a practice of impression management (Camodeca *et al.*, 2018, p. 25).

Mokabane and du Toit (2022, p.8) examined whether the quality of integrated reporting is associated with various financial performance measures. The results of their study do not record a significant relationship between integrated reporting quality and financial performance. This may indicate that firms produce integrated reports to maintain organisational legitimacy and to manage the impressions of stakeholders.

Furthermore, Haji and Hossain (2016) explored the implications of integrated reporting on organizational reporting practices. They found that firms continue to use multiple impression management techniques such as use of rhetorical language to exaggerate positive outcomes while underplaying, even dismissing, negative comparisons and trends. Furthermore, they also noted that the use of various forms of visual presentation techniques to emphasize positive outcomes is pervasive in various organizational reporting channels following the adoption of an integrated reporting practice.

In this study we focus on impression management with non-financial KPIs in an integrated report through the presentation form as well as underreporting. Therefore, the first hypothesis consists of two parts:

H1a: *Managers will report positively performing non-financial KPIs more often in a prominent presentation format compared to poorly performing non-financial KPIs.*

H1b: *Managers will more often report positively performing non-financial KPIs in the integrated report than poorly performing non-financial KPIs.*

Next, we examine the use of impression management when managers know the *financial performance* of the firm. We test whether firms with weak financial performance are more opportunistic in reporting information about material *non-financial* KPIs. We draw on prior research and anticipate that firms with poor financial performance are more inclined to improve the image resulting from the non-financial information in their integrated report (Bakar and Ameer, 2011; Cho *et al*., 2010; Plumlee *et al*., 2015; Roman *et al.*, 2019; Wang and Hussainey, 2013). Based on the findings in these prior papers, we expect to find that managers of high-performing firms have no incentive to mislead in their external communication.

The results of the study by Bakar *et al.* (2019) showed that the higher the revenues of a reporting firm, the more balanced their integrated reports, and the less optimistic their tone. They concluded that firms with a weak financial performance display a higher level of optimism in their integrated report.

Schleicher and Walker (2010) found that firms operating at a loss emphasize the firm's positive prospects to prevent investors from extrapolating the current loss into the future. In addition, firms with a weak financial performance are expected to report more opportunistically about their material non-financial KPIs, because they face greater exposure to social and political pressures, and they thus have an incentive to use disclosure to address these exposures (Cho *et al*., 2012, p. 14; Cho and Patten, 2007; Hughes *et al*., 2001; Patten, 2002).

We expect that if firms apply an impression management strategy in their integrated report, they will do this significantly more often when firm *financial performance* is weak, because they face greater exposure to social and political pressures. They have an incentive to use disclosures to address these exposures (Cho *et al*., 2012, p. 14; Cho and Patten, 2007; Hughes *et al*., 2001; Patten, 2002). The literature on voluntary environmental disclosures suggests that firms will compare the costs and benefits of non-financial disclosure, and they will only disclose if the predicted benefits, such as improved reputation or lower risk of legal exposure (political and social pressure), outweigh the costs (Li *et al.*, 2017).

Therefore, in this study we test the hypothesis that firms more often use impression management if their financial performance is weak than when they have a good financial performance. We will test the hypothesis for both forms of impression management, including underreporting and the presentation format:

H2a: *Managers will report positively performing non-financial KPIs more often in a prominent presentation format compared to poorly performing non-*

financial KPIs when the financial performance is weak than when the financial performance is positive.

H2b: *Managers will more often report positively performing non-financial KPIs in the integrated report than poorly performing non-financial KPIs when the financial performance is weak than when the financial performance is positive.*

3.4. Research design

Participants

We performed the experiment with 163 part-time students enrolled in the executive master's degree in finance and control at different universities in the Netherlands as well as members of the Society of Certified Controllers in the Netherlands (Vereniging van Register Controllers – VRC). The participants had 14 years of work experience on average, mainly as controllers at various firms. Their average age was 38 years. We conducted the experiment with controllers because they often prepare and deliver the data that are included in the firm's integrated report.

Design

With this experiment, we test impression management theory by manipulating firm financial performance (unknown, good, and poor). The experimental design is presented in Table 1. We used a mixed experimental design. The between-subject variables are no vs positive vs poor financial

performance. The within-subject variables are positive vs negative non-financial information.

The dependent variable is "impression management" in firms' integrated reports. This is measured through several questions that look at, for example, whether participants are willing to include information about poorly performing material non-financial KPIs. In each scenario we twice asked the participants to decide which non-financial KPIs they wanted to include in the integrated report. First, the question was asked before participants were informed about the non-financial performance (base question). Next, they were asked the same question again after they obtained information about the non-financial performance (test question).

Another indicator for measuring impression management is the form in which the information is reported. If they were applying impression management, participants were expected to be more inclined to include positive performance on non-financial KPIs in a more prominent or visual form (table or graph) in the report (Beattie and Jones, 1992). We asked the participants to indicate per KPI if they wanted to disclose the performance on that KPI in a visual form (table/graph) or in a textual form (qualitative/quantified). We expected that the participants would choose to report KPIs with a positive performance in a prominent (visual) form instead of a textual form (Clatworthy and Jones, 2007; Merkl-Davies and Brennan, 2007; Yang and Liu, 2017).

Table 1 – Experimental scenarios

Scenario	Financial Performance	Number of participants
1	Not provided	57
2	Provided - Good	52
3	Provided - Poor	54
Total		**163**

The participants were randomly assigned to one of the three conditions. The experimental procedures were as follows: the participants first obtained basic background information about the firm. Next, they received information about some key financial performance measures in year t, year t-1 and the difference between both years. In scenario 1, the participants did not have any information about the financial performance. In scenario 2, the firm's financial performance was higher in year t compared to year t-1. In scenario 3, the firm financial performance decreased in year t in comparison to year t-1.

After the financial information was presented, the participants received an overview of the non-financial KPIs without any further information about performance for those KPIs (refer to Appendix B). Then they were asked to decide which non-financial KPIs are important to include in the integrated report.

Next, the participants received information about the actual performance of the non-financial KPIs. Based on the financial and non-financial information that was presented to them, the participants were asked how likely it was that they would include information about the non-financial performance of the firm its integrated report.

The participants were then asked to decide in which form they would report the information in the integrated report for each of the non-financial KPIs. This part was similar in all scenarios.

Finally, we asked the participants to answer some post-questionnaire queries to test whether they understood the questions and to obtain more background on why they made certain choices in the experiment.

An overview of the experimental design is included in Appendix A.

Online experiment

The experiment was administered online via Qualtrics. The benefit of an online experiment is the access to the subject pool of participants who have practical work experience.

An important requirement for online experiments is to be able to control the pool of participants (Arnold *et al*., 2012; Birnhaum, 2004; Charness *et al*., 2007). As mentioned, we recruited the participants mainly through the executive master's in finance and control qualification at universities in the Netherlands and the VRC. The participants gained access to the experiment via an anonymous web link. When starting the experiment, they were asked for some specific information so that a unique code could be assigned to each participant and any double responses could be filtered out.

We also asked the participants for their current professional description, function level at their firm, and years of experience as a professional, to make sure that only the target group of participants was included in our sample. These procedures reduced the sampling bias risk. Moreover, the participants were asked to follow the experimental instructions.

3.5. Empirical results and discussion

Hypothesis 1a: Managers will report positively performing non-financial KPIs more often in a prominent presentation format compared to poorly performing non-financial KPIs

To test hypothesis 1a, we analysed the selected presentation format to ascertain whether managers use impression management when reporting non-financial KPIs. We performed non-parametric Wilcoxon signed-rank tests, because the data were skewed. Furthermore, the tests were performed on a total level irrespective of firm financial performance.

The statistics in Table 2 show that, on a total relative level, KPIs with good non-financial performance are reported in a prominent presentation format (table or graph) 10% more often compared to poorly performing non-financial KPIs. The Wilcoxon signed-rank test output indicates that positive non-financial KPIs are statistically significantly more often disclosed in a prominent presentation form than poorly performing non-financial KPIs: $Z = -4.237$; $p < 0.001$, with a moderate effect size of 0.44. KPIs with poor non-financial performance are recounted in a non-prominent presentation (quantified text or qualitative text) form 10% more often in comparison to positively performing non-financial KPIs. This difference, however, is not statistically significant.

Furthermore, the test output indicates that the participants 11% more often choose to report positively performing non-financial KPIs in a graph than poorly performing non-financial KPIs. This difference is statistically significant at $p < 0.001$. Poorly performing non-financial KPIs are 9% more often presented in a qualitative form in the text than positively performing non-financial KPIs. This difference is statistically significant at $p < 0.05$.

With respect to the prominence of reporting, the Wilcoxon signed-rank test output indicates that positive non-financial KPIs are reported in a prominent presentation format 33% more often than in a non-prominent presentation format. This difference is statistically significant at $Z = -5.493$; $p < 0.001$, with a large effect size, $r = 0.54$. Poorly performing non-financial KPIs are also described in a prominent presentation form more often (14%) than in a non-prominent presentation format, but this is not statistically significant.

Based on the test, we conclude that the participants implement impression management through the presentation format. The result is supportive of *H1a*. The participants emphasize good performance and downplay poor performance about material non-financial KPIs through the presentation form in their integrated report, irrespective of firm financial performance. Firms use positive presentational patterns to make a positive outcome more obvious to the users of the integrated report (Clatworthy and Jones, 2006; Merkl-Davies and Brennan, 2007; Yang and Liu, 2017, p. 676).

Table 2 – Wilcoxon signed-ranks test on the presentation format – Non-financial (NF) performance

Of those reported	Table	Graph	Prominent presentation	Quantified text	Qualitative text	Non-prominent presentation	Difference prominent – non-prominent	Prominent vs non-prominent presentation – asymp. sig. (2-tailed)
Positive versus negative NF performance								
Positive NF performance	17%	49%	*67%*	21%	12%	*33%*	**33%**	*< 0.001**
Negative NF performance	19%	38%	*57%*	23%	21%	*43%*	**14%**	*0.056*
Difference positive-negative	**-2%**	**11%**	***10%***	**-2%**	**-9%**	***-10%***	**19%**	
Asymp. Sig. (2-tailed)	*0.691*	*< 0.001**	*< 0.001**	*0.438*	*0.032***	*0.185*	*0.003**	

*Indicates statistically significant change at p< 0.01.

** Indicates statistically significant change at p< 0.05.

Hypothesis 1b: Managers will more often report positively performing non-financial KPIs in the integrated report than poorly performing non-financial KPIs

We also tested whether participants used impression management through over- or underreporting positively or poorly performing non-financial KPIs. For the situation when participants were informed about the non-financial performance, the test output (Table 3) indicates that positively performing non-financial KPIs are included in the integrated report statistically significantly more often (59%) than poorly performing non-financial KPIs: (47%) ($Z = -3.867$; $p = < 0.001$; medium effect size $r = 0.43$).

However, we noted that positively performing non-financial KPIs (65%) were already included in the integrated report statistically significantly more often than poorly performing non-financial KPIs (49%) before participants were informed about the non-financial performance. The Wilcoxon signed-rank test output even indicates that, on a relative level, the participants decided statistically significantly more often to exclude KPIs (6%) with positive non-financial performance from the integrated report ($Z = -4.39$; $p < 0.001$; large effect size $r = 0.54$) after they were informed about the non-financial performance. Poorly performing non-financial KPIs were also excluded more often from the integrated report after participants were informed about the non-financial performance, but the decrease of 2% was not statistically significant. The findings suggest that impression management is not exercised through the inclusion of positively performing non-financial KPIs and the exclusion of negatively performing non-financial KPIs.

We asked the participants what influenced their decision to include a non-financial KPI in the integrated report. They mentioned that they wanted

to select the KPIs that were relevant and most important. In addition, they noted that they wanted to include as few KPIs as possible to truly direct focus to the KPIs they considered most relevant, and to keep the message simple. This might explain why the numbers of both positively and poorly performing non-financial KPIs selected for inclusion in the report decreased after participants were informed about the non-financial performance.

Based on the results, we conclude that hypothesis 1b is not supported by the data. Our test results show that impression management is not exercised through the inclusion of positively performing non-financial KPIs and the exclusion of negatively performing non-financial KPIs. This finding might be explained by the prior literature, which states that litigation risk can influence disclosure choices (Cazier *et al*., 2016). The risk of litigation and its associated costs can reduce managers' incentives to provide misleading disclosures (Billings and Cedergren, 2015; Cazier *et al*., 2016; Kothari *et al*., 2009). Therefore, managers might estimate the risk regarding the inclusion or exclusion of certain information as higher in comparison to impression management through the presentation form.

To obtain an understanding on the views of the participants, we asked them in the post-questionnaire questions how they evaluate the quality of non-financial information that firms currently disclose in the integrated report. On average, 48.2% of the participants assessed the quality as good. They mentioned believing that there "is still quite some improvement to be made regarding the transparency of non-financial information. Firms are selective and cherry pick to present the positive results instead of a realistic view". On the other hand, some noted that the "quality of non-financial information is good, although sometimes too much information is added (especially when the information is positive)".

Table 3 – Wilcoxon signed-rank test on the inclusion of non-financial KPIs' performance in the integrated report – Non-financial performance

	NF performance not provided	NF provided	Difference NF performance provided - not provided	*NF performance not provided vs NF performance provided - asymp. sig. (2-tailed)*
	% of KPIs selected	% of KPIs selected	% of KPIs	
	Positive versus negative NF performance			
Positive non-financial performance	65%	59%	-6%	*<0.001**
Negative non-financial performance	49%	47%	-2%	*0.336*
Difference positive-negative	**16%**	**12%**	**-4%**	
Positive non-financial performance vs negative non-financial performance asymp. sig. (2-tailed)	*<0.001**	*<0.001**	*0.115*	

* Indicates statistically significant change at p< 0.01.

Hypothesis 2a: Managers will report positively performing non-financial KPIs more often in a prominent presentation format compared to poorly performing non-financial KPIs when the financial performance is weak than when the financial performance is positive.

Impression management through the presentation format based on financial performance

Next, we look at the impact of financial performance on the chosen presentation format and the use of impression management (Table 4). In the scenario where the *financial performance is not provided*, we see that positive non-financial KPIs are reported in a prominent presentation format 22% more often compared to poorly performing non-financial KPIs. The Wilcoxon signed-rank test output indicates that this finding is statistically significant at $Z = -3.742$; $p < 0.001$, with a large effect size $r = 0.61$. If we examine the results in detail, we see that the participants have reported positive non-financial information in a graph statistically significantly more often than

poorly performing non-financial KPIs. Furthermore, the Wilcoxon signed-rank test shows that the participants have related poorly performing non-financial KPIs in a non-prominent manner statistically significantly more often than positively performing non-financial KPIs (54% versus 31%; $Z = -2.473$; $p = 0.013$; $r = 0.46$). The preferred non-prominent presentation form is qualitative in the text. This finding is an indication of the use of impression management through the presentation format. When the financial performance is unknown, participants rely on the performance of the non-financial KPIs to portray a positive picture of the firm.

Furthermore, in this experimental condition (financial performance not provided) we see that the participants decided to report positive non-financial KPIs 37% more often in a prominent than non-prominent presentation format. The Wilcoxon signed-rank test output indicates that this finding is statistically significant at $Z = -3.488$; $p < 0.001$, with a large effect size $r = 0.46$. Poorly performing non-financial KPIs are reported 7% more often in a non-prominent presentation form. However, this is not statistically significant.

In the *good financial performance condition*, we find no difference between reporting positively and poorly performing non-financial KPIs in a prominent or non-prominent manner. We did not find a statistically significant difference between the presentation of positively and poorly performing non-financial KPIs in the good financial performance condition.

Furthermore, in this good financial performance condition we see that the positive non-financial performing KPIs are reported in a prominent form 32% more often than a non-prominent form. The Wilcoxon signed-rank test output indicates that this finding is statistically significant at $Z = -2.788$; $p = 0.005$, with a large effect size $r = 0.49$. The same difference is, however, found

for the poorly performing non-financial KPIs. These are also related 32% more often in a prominent rather than a non-prominent presentation form. The Wilcoxon signed-rank test output indicates that this finding is statistically significant at Z = -2.714; p = 0.007, with a large effect size r = 0.48. Since the financial performance is good, there is no incentive to use impression management through reporting non-financial performance. Both positively and poorly performing non-financial KPIs are more often reported in a prominent presentation form.

In the conditions where there is *poor financial performance*, we see that positively performing non-financial KPIs are reported in a prominent manner 7% more often compared to poorly performing non-financial KPIs. The Wilcoxon signed-rank test output indicates that this finding is statistically significant at Z = -2.150; p = 0.032, with a medium effect size r = 0.40.

In addition, positive non-financial KPIs are reported in a prominent presentation format 31% more often than in a non-prominent presentation format. The Wilcoxon signed-rank test output indicates that this finding is statistically significant at Z = -3.209; p = 0.001, with a large effect size r = 0.57. The output in Table 4 also shows that poorly performing non-financial KPIs are reported in a prominent presentation form 17% more often than a non-prominent one, but this is not statistically significant. Since there is poor financial performance, there might be an incentive to use impression management through the presentation form used for non-financial performance.

Table 4 – Wilcoxon signed-rank test on presentation format – Financial performance

Of those reported	Table	Graph	*Prominent presentation*	Quantified text	Qualitative text	*Non-prominent presentation*	Difference prominent - non-prominent	*Prominent vs non-prominent presentation - asymp. sig. (2-tailed)*
Financial performance not provided								
Positive NF performance	15%	54%	*69%*	10%	21%	*31%*	**37%**	*< 0.001**
Negative NF performance	13%	33%	*46%*	25%	29%	*54%*	**-7%**	*0.573*
Difference positive-negative	**2%**	**21%**	***23%***	**-15%**	**-8%**	***-23%***	**44%**	
Asymp. Sig. (2-tailed)	*0.319*	*< 0.001**	*< 0.001**	*0.536*	*0.024***	*0.013***	*0.072****	
Good financial performance								
Positive NF performance	16%	50%	*66%*	12%	22%	*34%*	**32%**	*0.005**
Negative NF performance	23%	42%	*66%*	16%	18%	*34%*	**32%**	*0.007**
Difference positive-negative	**-7%**	**8%**	***0%***	**-4%**	**4%**	***0%***	**0%**	
Asymp. Sig. (2-tailed)	*0.271*	*0.066****	*0.206*	*0.144*	*0.587*	*0.525*	*0.126*	
Poor financial performance								
Positive NF performance	23%	43%	*65%*	13%	22%	*35%*	**31%**	*0.001**
Negative NF performance	20%	39%	*59%*	21%	21%	*41%*	**17%**	*0.149*
Difference positive-negative	**3%**	**4%**	***6%***	**-8%**	**1%**	***-6%***	**14%**	
Asymp. Sig. (2-tailed)	*0.492*	*0.108*	*0.032***	*0.540*	*0.406*	*0.816*	*0.069****	

*Indicates statistically significant change at p< 0.01
** Indicates statistically significant change at p< 0.05
*** Indicates statistically significant change at p< 0.10

Hypothesis 2b: Managers will more often report positively performing non-financial KPIs in the integrated report than poorly performing non-financial KPIs when the financial performance is weak than when the financial performance is positive

Inclusion of non-financial KPIs based on financial performance

We performed a Wilcoxon signed-rank test on all experimental conditions based on financial performance (see Table 5). The results do not support hypothesis 2b. Firms are not more often using impression management by including or excluding non-financial KPIs in their integrated report when the financial performance is weak than when the financial performance is positive.

In all three financial performance conditions, we noted a statistically significant decrease in the percentage of positively performing non-financial KPIs that are included in the integrated report after the participants were

informed about the non-financial performance. The decrease in reporting of non-financial KPIs was not statistically significant for the poorly performing non-financial KPIs.

However, when we compared whether positively or poorly performing KPIs are more often reported, we found that positive non-financial KPIs are statistically significantly more often included in the integrated report than poorly performing non-financial KPIs in all three experimental conditions. At the same time, the test results also show that positive non-financial KPIs were already included statistically significantly more often in the integrated report before the non-financial performance was even known. Therefore, the evidence for impression management and underreporting or opportunistic reporting through the inclusion or exclusion of positively or poorly performing non-financial KPIs is weak.

Table 5 – Wilcoxon signed-rank test on the inclusion of non-financial KPIs' performance in the integrated report – Financial performance

	NF performance not provided	**NF provided**	**Difference NF performance provided - not provided**	***NF performance not provided vs NF performance provided - asymp. sig. (2-tailed)***
	% of KPIs selected	**% of KPIs selected**	**% of KPIs**	
Financial performance not provided				
Positive NF performance	66%	59%	**-7%**	*0.015***
Negative NF performance	49%	48%	**-1%**	*0.884*

Difference positive-negative	**17%**	**11%**	**-6%**	
Positive NF performance vs negative NF performance asymp. sig. (2-tailed)	*<0.001**	*0.060***	*0.208*	
Good financial performance				
Positive NF performance	64%	59%	**-5%**	*0.032***
Negative NF performance	49%	47%	**-2%**	*0.668*
Difference positive-negative	**15%**	**12%**	**-3%**	
Positive NF performance vs negative NF performance asymp. sig. (2-tailed)	*<0.001**	*0.019***	*0.495*	
Poor financial performance				
Positive NF performance	64%	57%	**-7%**	*0.002**
Negative NF performance	50%	46%	**-4%**	*0.222*
Difference positive-negative	**14%**	**11%**	**-3%**	
Positive NF performance vs negative NF performance asymp. sig. (2-tailed)	*0.004**	*0.011***	*0.497*	

* Indicates statistically significant change at $p < 0.01$.

** Indicates statistically significant change at $p < 0.05$.

*** Indicates statistically significant change at $p < 0.001$.

Furthermore, we performed Kruskal-Wallis and Mann-Whitney U tests to verify whether there are differences between financial performance conditions with respect to reporting the non-financial performance. There were no statistically significant findings. This outcome is also supported by participants' answers to the question regarding whether the firm's financial performance influenced their decisions about the non-financial KPIs they selected for inclusion in the report. In the poor financial performance conditions, 35% of participants on average agreed with the statement that financial performance influenced their decision, while the average was 34% for the good financial performance conditions. This seems to be consistent and therefore might explain why there is no statistically significant difference between financial performance conditions with respect to reporting the non-financial performance.

3.6. Summary and conclusion

The goal of this study was to investigate to what extent users of a firm's integrated report obtain reliable and complete information about the firm's material non-financial KPIs. With this research we tried to clarify whether firms disclose information about weak performance on their non-financial KPIs, in a transparent manner in their integrated report. Additionally, this paper explored whether the disclosure of material non-financial KPIs is associated with firm financial performance.

Based on the results of the experiment, we concluded that the participants use impression management through the presentation format. The participants emphasized good performance and downplayed poor performance about material non-financial KPIs through the presentation form

in their integrated report. Firms use positive presentational patterns to make a positive outcome more obvious to the users of the integrated report (Clatworthy and Jones, 2006; Merkl-Davies and Brennan, 2007; Yang and Liu, 2017, p. 676).

Furthermore, we find that firms report positively performing non-financial KPIs statistically significantly more often in a prominent manner compared to poorly performing non-financial KPIs in the weak financial performance condition. So, firms use impression management through the presentation format in their integrated report when the financial performance is weak. However, they do not use statistically significantly more impression management through the presentation format in the weak financial performance condition than in the good financial performance condition.

Our test results show that impression management is not exercised through the inclusion or exclusion of positively or negatively performing non-financial KPIs. We have found that positive non-financial KPIs are statistically significantly more often included in the integrated report than poorly performing non-financial KPIs in all three experimental conditions, but this was already the case before participants knew about the non-financial performance. Therefore, the evidence for impression management and underreporting or opportunistic reporting through the inclusion or exclusion of positively or poorly performing non-financial KPIs is weak. This finding can be explained by prior literature that states that litigation risk can influence disclosure choices (Cazier *et al.*, 2016). The risk of litigation and its associated costs can reduce managers' incentives to provide misleading disclosures (Billings and Cedergren, 2015; Cazier *et al.*, 2016; Kothari *et al.*, 2009). Therefore, managers might estimate the risk regarding the inclusion or

exclusion of certain information as higher compared to impression management through the presentation form.

The research question "Do managers use impression management when they disclose material non-financial information in their integrated reports?" can be answered as follows. Firms use impression management via prominent presentation forms for positive non-financial performance and non-prominent ones for negative non-financial performance. The use of impression management through the presentation format was particularly statistically significant in the conditions when the financial performance was unknown and where it was weak. The results also show that the participants in the group with a positive financial performance decided to present poorly performing non-financial KPIs in a prominent presentation format statistically significantly more often compared to the group that did not know the financial performance. A reason for this could be that because the financial performance is positive, they therefore believe it is safe to be more transparent about the poor non-financial performance than in the condition where the financial performance was unknown.

Previous studies (Haji and Hossain, 2016; Melloni *et al*., 2017; Camodeca *et al.,* 2018; Roman *et al.,* 2019; Varachia and Yasseen, 2020; Mokabane and du Toit, 2022; Nicolo *et al.,* 2022) on the quality of disclosures and reported information in firms' annual reports mainly focused on the opportunistic reporting of financial or environmental data. We have performed an experiment focusing on different forms of impression management (presentation format and opportunistic/underreporting) through non-financial KPIs in an integrated reporting setting and linked it to firm financial performance. We contribute to prior literature by highlighting what

KPIs (positively/negatively performing KPIs) might be used as impression management.

This work adds value by examining whether firms are transparent in disclosing performance of material non-financial KPIs in their integrated report. The results are of importance for users of the integrated report, since they will provide more insight into whether firms are truly transparent in their integrated reports. Furthermore, the theoretical implication of this study is relevant to regulatory authorities and standard setters, because it provides insight into the different forms of impression management used in integrated reporting and the influence of positively or negatively performing KPIs on the decisions of preparers of the integrated report. A limitation of this paper is that we focused on only two impression management strategies (opportunistic/underreporting and the presentation form). This analysis shows that the use of impression management mainly seems to occur through the presentation format. Future research could investigate other impression management strategies in an integrated reporting setting.

Appendices

Appendix A – Experimental design

Experimental scenario and group	Description of report content
Scenario 1 – No financial information	**(1) Background information Alpha** **(2) Financial information Alpha** · Not provided **(3) Non-Financial information Alpha** · Performance
Scenario 2 – Good financial performance	**(1) Background information Alpha** · Same as above **(2) Financial information Alpha** · Good financial performance **(3) Non-Financial information Alpha** · Performance
Scenario 3 – Poor financial performance	**(1) Background information Alpha** · Same as above **(2) Financial information Alpha** · Poor financial performance **(3) Non-Financial information Alpha** · Performance

Appendix B – Non-financial information provided in the experiment

Non-financial area	KPI	Measure	2019	2020	Change 2019-2020	% Change 2019-2020	Target 2025	Expectation: will the 2025 target be met based on 2019-2020 performance?
Improving health and well-being	Health and hygiene	Number of people with improved health hygiene	510.000.000	650.000.000	140.000.000	27%	> 1.000.000.000	Yes
	Improving nutrition	% of the portfolio that meets the highest nutritional standards	17%	19%	2%	11%	20%	Yes
	Clean water and sanitation	Number of people that have access to clean water and sanitation	700.000.000	775.000.000	75.000.000	11%	> 1.000.000.000	Yes
	Empowerment of women	% of women that have access to initiatives that aim to promote their safety, develop their skills and expand their opportunities.	61%	60%	-1%	-2%	70%	No
	Inclusive business	Number of smallholder farmers (F) and small-scale retailers (R) that have access to initiatives that improve their agricultural practices or their incomes	F: 410.000 R: 521.000	F: 411.000 R: 522.500	F: 1.000 R: 1.500	F: 0.24% R: 0.29%	F: 550.000 R: 720.000	No
Enhancing livelihoods	Fairness in the workplace	Employee engagement score	6.5	6.23	-0.28	-4%	7	No
	Opportunities for women	% of female managers	36%	41%	5%	12%	50%	Yes
	Employee satistfaction	Employee satisfaction score	8.8	8.5	-0.3	-3%	9.5	No
	Inclusive workplace	% of disabled people in the workplace	3%	4%	1%	25%%	5%	Yes
	Customer satistfaction	Customer satisfaction score	8.2	8	-0.2	-2%	10	No
Reducing environmental impact	Greenhouse gases	CO2 production from energy per ton of manufactured production in kg	88.49	88.49	4.97	6%	< 60	No
	Water use	Water use per ton of manufactured production in m3	1.4	1.3	-0.1	-7%	< 1	Yes
	Waste	Kg of total waste per ton of manufactured production	0.21	0.18	-0.03	-14%	< 0.1	Yes
	Sustainable sourcing	% of sustainably sourced products	55%	60%	5%	8%	75%	Yes
	Recycling of packages	% of recycled packages	77%	80%	3%	4%	80%	Yes

CHAPTER

Non-financial and financial information in an integrated report: how connectivity affects professional and non-professional investors' assesment of a firm's performance, prospects, and their willingness to invest

4. Non-financial and financial information in an integrated report: how connectivity affects professional and non-professional investors' assessment of a firm's performance, prospects, and their willingness to invest

Abstract

This study examines how connectivity in an integrated report would influence professional and non-professional investors' assessment of a firm's performance and prospects of future performance, and their willingness to invest. By performing an experiment we find a positive influence of connectivity in an integrated reporting setting on non-professional investors' assessments of current and future financial performance and their willingness to invest. For professional investors' the experimental output shows that prospects of future performance and their willingness to invest are statistically significant more positive when based on an integrated report. For both professional and non-professional investors the strongest effect of integrated reporting appears when qualitative connectivity explains the link between non-financial information and its (future) financial impact.

4.1. Introduction

In 2013 the International Integrated Reporting Council (IIRC) developed the integrated reporting (IR) framework which has the primary objective to improve information for the providers of financial capital (IIRC, 2013). Revisions to the IR Framework were published in January 2021 to enable

more decision-useful reporting (IIRC, 2021)[4]. The IR framework will be used as one of the baseline input documents for the Sustainability Reporting Standards that are under development (European Commission, 2021; IFRS Foundation, 2021).

"A distinguishing feature of an integrated report is the connection between non-financial and financial performance indicators". This "connectivity of information", which is the label used in the IR Framework (IIRC, 2021), is seen as a way to report on the extent to which the firm internally thinks in an integrated manner. Also, EFRAG included connectivity in their 'Proposal for a relevant and dynamic EU Sustainability Reporting Standard' (2021). If sustainability reporting and financial reporting are to be placed on an equal footing under an identical timing requirement, connectivity between them becomes essential.

Clear links between a firm's strategic goals, risks, key performance indicators (KPIs) and financial statements are helpful for investment analyses (PwC, 2014, p. 4). However, the degree of connectivity that firms use in their integrated reports varies. Firms can either opt for 'no connectivity', implying that non-financials and financials are not linked in the integrated report, or select qualitative connectivity, meaning that they link non-financials and financials without explicitly quantifying the links. Alternatively, they can prefer quantified connectivity, which implies that they also quantify the links between non-financials and financials based on firm-specific data. When we look at present practice, we see that firms tend to prefer qualitative connectivity, as it presents a reasonable compromise between the fulfilment

[4] In this paper we mainly use the 2013 IR Framework, since the experiment was performed before the introduction of the revised IR Framework 2021.

of investors' increased information needs and the cost of fulfilling these needs.

The goal of our research is to investigate the effect of different degrees of connectivity in the integrated report on the firm valuation decisions made by professional and non-professional investors. We differentiate between professional and non-professional investors, because individuals are susceptible to biased decision making based on for example their level of experience (Cohen, 2012). We hope our findings provide relevant input to the standard setters for the development of sustainability reporting standards.

By performing an experiment with experienced professional and less experienced non-professional investors we find a positive influence of connectivity in an integrated reporting setting on non-professional investors' assessments of current and future financial performance and their willingness to invest. For professional investors' the experimental output shows that prospects of future performance and their willingness to invest are statistically significant more favourable when based on an integrated report.

For both professional and non-professional investors the strongest effect of integrated reporting appears when qualitative connectivity explains the link between non-financial information and its (future) financial impact. For non-professional investors we find this positive association with respect to their assessment of a firm's performance and prospects, and their willingness to invest. For the professional investors, qualitative connectivity does not affect their assessment of current performance, but it does positively affect their assessment of the firm's prospects and their willingness to invest.

To our knowledge, the pros, and cons of quantifying the linkages of non-financial and financial performance indicators in the setting of an integrated report have not yet been investigated in existing academic

literature. A gap we want to address through this study. The findings offer useful information for those interested in non-financial information as part of a system of integrated reporting. The results might be useful in the context of the development of EU sustainability reporting standards and ISSB standards. Although integrated reporting improves the quality of information, if investors do not find that the improvements are sufficiently relevant or that the report's benefits are offset by the proprietary costs of providing integrated information (García-Sánchez & Martinez-Ferrero, 2017; Fuhrmann et al., 2019), integrated reporting does not serve its intended purpose. This study's findings show whether investors consider the information in their valuation decisions and, therefore, whether integrated reporting realizes its potential.

In the next section, the theory will be explained, the relevant research will be reviewed, the hypotheses, research design and the results will be presented. The final section of this paper is devoted to the discussion and conclusion.

4.2. Theory and hypotheses

4.2.1. A short literature review on integrated reporting and connectivity

The current landscape of non-financial reporting is one with a large number of parties, each with a different focus or angle. Stakeholders are demanding reporting on non-financial aspects, since financial reports alone cannot explain the value gap between the balanced equity and the firm value (Velte, 2022). Many firms therefore publish a sustainability or environmental, social, governance (ESG) report next to the financial statement. However, the usefulness of non-financial reporting for decision-making has been discussed critically, due to greenwashing policy and information overload (Velte, 2022;

Huang and Watson, 2015). Financial and ESG reporting are usually not linked within business reporting. Stakeholders' interest in connecting these elements, ideally within one (integrated) report, is therefore often not realized (Velte, 2022).

Prior literature state that connectivity of non-financial and financial value creation aspects in corporate disclosures reveal the interdependencies between non-financial and financial value creation and provide insights into the sustained value creation ability of a firm (Grassmann et al., 2019; Hsiao and Kelly, 2018; Setia et al., 2015). This may lead to further benefits such as better incorporation of non-financial information into valuation models and thus improved decision making by report users (Eccles et al., 2015; Zhou et al., 2017).

Connectivity is a key feature that distinguishes integrated reporting from other reporting formats. As mentioned by the IIRC in the International IR Framework (IIRC, 2013, p. 7), connectivity of information is one of the six guiding principles. Within the context of integrated reporting, connectivity is defined as *"the combination, interrelatedness and dependencies between the factors that affect the organization's ability to create value over time."* (IIRC, 2013, p. 26).

In this sense, in an integrated report connectivity is seen as a way to translate the internal integrated thinking into external corporate annual reporting to investors and other stakeholders, in order to provide a better understanding of the organization's business model. Therefore, to present a more holistic picture of the organization's value creation 'story', a firm should indicate how, with the 'big picture' in mind, it creates value over time by utilizing its unique capitals in its own business model (IIRC, 2013b, p. 5). In its International IR Framework (IIRC, 2013) the IIRC notes that

"connectivity of information and the overall usefulness of an integrated report are enhanced when the report is logically structured, well presented, written in clear, understandable, and jargon-free language, and includes effective navigation devices such as clearly delineated, linked sections and cross-referencing".

There are, however, various degrees of connectivity. Connectivity can be achieved through qualitative connectivity and/ or quantified connectivity. They are both equally important according to the EFRAG (2021, p.85). These degrees of connectivity are also mentioned in the IR connectivity background paper (IIRC, 2013b, p. 5). However, they added the base scenario of no connectivity. The three degrees of connectivity mentioned by the IIRC are: no connectivity, qualitative connectivity, and quantified connectivity.

We use the presence of links between non-financials and financials and the quantification of these links to distinguish between the degrees of connectivity. In the case of no connectivity, the firm only provides non-financial and financial performance measures without indicating how these non-financials and financials are linked to each other. In the case of qualitative connectivity, the firm links their non-financials and financials, but the links are not quantified. In the case of quantified connectivity, the firm reports quantified links between non-financials and financials. The quantification of the links between their non-financials and financials are based on firm-specific data.

According to Eccles et al., (2015), the disclosed connectivity of the capitals is a distinguishing feature of an integrated report that extends prior isolated reports (Grassmann et al., 2019). Research examining the concept of connectivity in current integrated reporting disclosure practice is scarce and

focuses on selected dimensions of the guiding principles in the IIRC Framework (2013) (Grassmann et al., 2019).

Only a few papers analyze integrated reporting with regard to the capital market and firm valuation. Most of these studies use archival capital market data and are focused on a South African context, since integrated reporting is mandatory for public-listed firms in South Africa (Landau et al., 2020; de Villiers et al., 2016). Lee and Yeo (2016), Zhou et al., (2017), Barth et al., (2017) examine the link between integrated reporting and firm valuation in a South African context and find evidence for a higher firm valuation of firms with a high-quality integrated report than firms that publish low quality integrated reports. Baboukardos and Rimmel (2016) "examine the value relevance of integrated reporting by comparing the period before and after mandatory adoption in South Africa and find an increase of value relevance of the earnings valuation" (Landau et al., 2020, p1751). On the other hand, Bucaro et al., (2020) find that reporting financial and CSR information in separate reports made the CSR information more salient, because it led to investors having a multidimensional perspective that included a financial dimension and a non-financial dimension. Integrating financial and non-financial information in one report caused investors to adopt a unidimensional perspective of financial information only diminishing the vividness of non-financial information (Haji et al., 2021). Haji et al., (2021) find that separate reporting causes stronger reactions from investors. They find that firm value estimates are more negative when poor corporate, social, responsibility (CSR) information is reported in a separate report compared to an integrated report. Investors who consider positive CSR information derive comparable firm value estimates, regardless of the reporting format of this information (Haji et al., 2020).

Hence, existing prior literature shows initial insights of the value relevance and association between integrated reporting and firm valuation. Integrated reports show considerable variation in the extent of disclosed connectivity, which calls for further exploration. Our paper adds to this existing literature stream by going one step further to explore how different forms of connectivity in integrated reporting have an influence on professional and non-professional investors' firm valuation decisions.

4.2.2. Professional and non-professional investors information preferences

Prior literature confirms professional investors have a preference for financial information over non-financial information (Cohen et al., 2011) and that these experienced professional investors prefer more traditional, fundamental analysis when analyzing financial statements (Cohen, 2012, p. 11). The results of the study conducted by Cohen (2012, p. 11) indicate that less experienced non-professional investors believe less in a long, time-consuming fundamentals analysis than experienced professional investors and rather use a faster method that demands less effort and knowledge. Therefore, we expect that a qualitative or quantified form of connectivity will have a greater effect on the investment decisions of non-professional investors.

With respect to the information preferences, a study by Cohen et al., (2015) shows that professional investors demand greater detail than non-professional investor and non-professional investors have a higher increase in demand for CSR information. The variation in preferences suggests potential

differences in perspectives and information processing by professional and non-professional investors.

Cohen et al., (2015) find in their paper that "professional investors prefer non-financial information that is concise, comprehensive, comparable, and credible. In other words, they prefer non-financial information that is streamlined, but wide in scope and content, consistent between companies and assured by a neutral third party."

Prior literature shows that more experienced investors frequently utilize existing knowledge as a basis for their investment decisions, rather than only relying on available information as it is presented (Kida at al., 2010). Moreover, prior literature on decision-making behaviour shows that older people are taking less risks, have greater commitment to the status quo and may have less mental and physical stamina or are less able to grasp new ideas and learn new behaviours (Taylor, 1975; Serfling, 2014, p. 253). Based on these findings we expect that if there is connectivity between non-financial and financial information in the integrated report, less experienced non-professional investors will be inclined to take more account of this information in their valuation decisions than experienced professional investors.

Rzeszutek (2016) mentions that professional investment experience could facilitate rational decisions, although professional investors are often equally susceptible to various behavioural biases (i.e. overconfidence, anchoring bias etc.), sometimes even to a greater extent than naive individuals (i.e., non-professional investors). Another example of suspectible behaviour is that professional investors relatively often attach importance to past costs, which statistically significant influence both present and future decisions (Rzeszutek, 2016).

A higher level of investment expertise does not prevent irrational behaviour on the stock market. This conclusion is in line with the findings of Rzeszutek (2016) and might explain why professional investors in Cohen's study (2012) prefer more traditional fundamental analysis based on a firm's financial information. It is an implicit (automatic), unconscious process. Since a vast majority of decisions are driven by this implicit (automatic) process, individuals are susceptible to biased decision making (Rzeszutek, 2016).

4.2.3. Elaboration Likelihood Model

Based on the Elaboration Likelihood Model (ELM) of Yalch & Elmore-Yalch (1984), we developed predictions regarding the effect of the degrees of connectivity in the integrated report on professional and non-professional investors' valuation decisions. The basic argument of this theory is that there are two ways of information processing: central processing and peripheral processing. Information processing is thought to occur via a central route when the information is considered to be personally relevant. The decision maker cares more about the message, will pay more attention to it, and will scrutinize the quality and strength of the argument (Petty et al., 1981, 1983; Yocco, 2014). We assume that professional investors will use the central route for information processing of financial information. Fundamental tools are based on the firm's financial information to predict performance. Therefore, we expect a lower impact of the connectivity between non-financial and financial information on professional investors.

When message information is of little personal relevance, individuals act to conserve cognitive resources and judgement is based primarily on

peripheral message cues such as the perceived credibility and reliability of the communicator (Yalch & Elmore Yalch, 1984). A highly credible and reliable source is deemed more persuasive (Petty et al., 1981).

Furthermore, the idea is that individuals switch to peripheral processing when the demanded cognitive resources are too high. Arguably, investors need to invest a lot of cognitive resources to analyze connections between non-financials and financials, inducing them to switch to a peripheral processing strategy. Quantification is an important anchor of this peripheral processing strategy and it is expected that quantification will have a positive effect on valuation decisions.

Based on the ELM peripheral processing strategy it can thus be argued that the quantification of links between non-financials and financials (quantified connectivity) will positively influence investor valuation. However, quantified connectivity can also add complexity and the (perceived) benefits may not outweigh the perceived costs (Lee & Yeo, 2016, p. 1226). As the literature does not lead to a consistent prediction of the effect of the level of connectivity on the firm valuation decisions of professional and non-professional investors, we do not formulate a directional hypothesis for the firm valuation decision per investor type. Therefore, we will investigate the following research question:

RQ: *How are professional and non-professional investors' assessment of a firm's performance and prospects, and investment decisions influenced by the level of connectivity in the integrated report?*

4.2.4. Integrated reporting and firm valuation

The IIRC identified two aims of integrated reporting: "improving the quality of information available to outside providers of financial capital; and supporting integrated thinking, decision making and actions that focus on value creation for the firm" (Barth et al., 2017). This paper aims to investigate the effect of different degrees of connectivity in the integrated report on the firm valuation decisions of experienced professional and less experienced non-professional investors.

Lee and Yeo (2016, p. 1226) identified two competing views on the relationship between integrated reporting and firm valuation. According to the first view, proponents of integrated reporting argue that it improves the quality of information available to providers of financial capital and enables a more efficient and productive allocation of capital. According to the IIRC, by providing material information that is linked to value creation in an integrated manner, integrated reporting reduces the information acquisition and processing costs of suppliers of external capital (investors). Therefore, if integrated reporting is beneficial to investors, firm valuation is expected to be positively associated with integrated reporting (Lee & Yeo, 2016). However, the second view posits that the disclosures associated with integrated reporting "can be costly in terms of revealing proprietary information to competitors, foregoing valuable business opportunities that do not fit their values or norms, and increasing direct compliance costs" (Lee & Yeo, 2016, p. 1226). Thus, if integrated reporting compels firms to adopt organizational processes that are costly and that do not benefit them much, then integrated reporting will negatively affect firm valuation (Lee & Yeo, 2016, p. 1226).

As mentioned in section 4.2.3 in this paper professional investors have a preference for financial information over non-financial information and

therefore based on the ELM theory, we assume that professional investors will use the central route for information processing by using fundamental tools based on the firm's financial information to predict performance. Therefore, we formulate the following hypothesis:

H1a: *Professional investors' assessment of a firm's performance and prospects, including their willingness to invest, is – compared to annual financial reporting only – not influenced when the firm issues an integrated report.*

Non-professional investor on the other hand have a higher demand for CSR information (Cohen et al., 2015). According to ELM theory, information processing is thought to occur via a central route when the information is personally relevant. We therefore expect that non-professional investors care more about the message and will pay more attention to it. Therefore, we formulate the following hypothesis:

H1b: *Non-professional investors' assessment of a firm's performance and prospects, including their willingness to invest, is – compared to annual financial reporting only – positively influenced when the firm issues an integrated report.*

Integrated reporting can reduce information asymmetry about the capitals that affect value (Barth et al., 2017, p. 47). There is even "a significant negative association between the connectivity of the capitals and information asymmetry" (Fuhrmann et al., 2019). This implies that investors honour the idea of a holistic description of the value creation process within an integrated

report and that the connectivity of the capitals further decreases information asymmetry (Fuhrmann et al., 2019). Behavioural theory suggests that because investors have limited attention spans and insufficient processing power, an increase in the salience of information will affect their perceptions (Hirshleifer & Hong Teoh, 2003). Integrated reporting can provide new value-relevant information and can present information in a more concise and useful manner (Zhou et al., 2017). Disclosure can reduce information asymmetry, improve investors' awareness of non-financial aspects of the firm and reduce estimation risk (Barth et al., 2017, p. 47).

Separate financial and non-financial information makes it difficult for investors to find "the material impacts because they are not receiving the information in a way which allows them to make better decisions and it requires them to make a lot of assumptions about the business environment" (Stubbs et al., 2014, p. 5). Information processing consists of two tasks: information acquisition and information integration. Information acquisition is described as the task of finding information, whereas information integration is described as the task of assessing implications and arriving at a decision (Maines & McDaniel, 2000). According to the IIRC (2021), a benefit of integrated reporting is that it reduces information processing costs by presenting the connectivity of non-financials and financials in an integrated manner. Therefore, it is argued that integrated reporting is likely to help investors to make accurate assumptions about future earnings, since they have more access to information on corporate value-drivers and material issues (Suhee et al., 2017, p. 6).

Integrated reporting increases the connectivity of non-financial and financial information and not only reduces professional investors' inability to link seperately reported value creation factors, but also reduces their

unwillingness to process non-financial information (Suhee et al., 2017, p. 6). The findings in the study of Suhee et al. (2017, p. 15) suggest that the integration of non-financial and financial information in a single report assists investors in making better and more concerted decisions on a firms' future earnings. "Moreover, prior research indicates that individuals can improve their decisions by using information displayed in a simplified format" (Elliott et al., 2010, p. 476). However, prior research also suggests that "more experienced investors tend to predefine their information needs, execute focused searches to acquire relevant information and use financial statement information to a greater degree than do less experienced investors" (Elliott et al., 2010, p. 477). In addition, as they gain experience, professional "investors tend to develop financial templates that help them organize information" (Elliott et al., 2010, p. 478). Also, experienced professional investors are expected to make more extensive use of well-known, sophisticated fundamental investment tools based on financial information (Cohen, 2012). Accordingly, we expect that the level of the connectivity of non-financial and financial information in the integrated report may impact experienced professional investors' firm valuation decisions to a lesser extent than those of non-professional investors. Based on the theory and literature, we formulate the following hypothesis:

H2: *Provision of non-financial and financial information that is not connected in a firm's integrated report – compared to annual financial reporting only – is not associated with investors'*[5] *assessment of a firm's performance and prospects, and their willingness to invest.*

[5] We expect no association for both professional and non-professional investors in the no connectivity condition. We expect that the no connectivity of non-financial and financial information in the

Previous studies suggest that, given the limited processing capacity of individuals (i.e. professional and non-professional investors), the complexity of information processing can lead to a significant delay in including the information in asset prices (Lee & Yeo, 2016). Information that is freely available to uninformed investors cannot be fully utilized, due to the limited information processing capacity of investors (Sims, 2006). "When information acquisition is costly, rational investors will only consider a subset of information and, therefore, only a subset of firm-specific information will be incorporated into stock prices" (Veldkamp, 2006).

"When firm-specific information becomes available to investors at a lower cost, they will increase their demand for firm-specific information, which eventually will be incorporated into stock prices" (Lee & Yeo, 2016). Thus, the reduction of information processing costs will increase the amount of information and the speed at which it will be incorporated into asset prices (Lee & Yeo, 2016). By producing a high-quality integrated report, the magnitude of investments are higher (García-Sánchez & Martinez-Ferrero, 2017). An integrated report with no connectivity of non-financials and financials (instead of a financial report) is expected to have an effect on investors' firm valuation because both non-financial information and financial information are presented in a single report. However, under this condition information processing costs are high, which could diminish the association. We expect this effect to be stronger for non-professional investors, because they have less experience and, therefore, their information acquisition and information integration costs are higher.

integrated report may impact experienced professional investors' firm valuation decisions to a lesser extent than those of non-professional investors.

Based on information processing theory, we expect this association to be positive on condition that the integrated report includes qualitative connectivity. Therefore, we formulate the following hypothesis:

H3: *Qualitative connectivity of non-financials and financials in a firm's integrated report – compared to annual financial reporting only – is positively associated with investors'*[6] *assessment of a firm's performance and prospects, and their willingness to invest.*

According to conventional wisdom, putting numbers to an argument enhances its persuasive power (Kadous et al., 2005). Also, investors' investment strategy and decision making are based on investment formulas with numerical input variables (Berk & DeMarzo, 2013). Therefore, in their investment decisions, both professional and non-professional investors might find non-financial information more useful if it is connected to the firm's (future) financial information in a quantified way.

Furthermore, prior studies in the field of management accounting, psychology, and consumer research show that quantified, statistical information is perceived to be more credible than non-quantified narrative statements, as numbers reduce one's perception of uncertainty (Yalch & Elmore Yalch, 1984; Allen & Preiss, 1997; Ju & Seong Park, 2013).

Also, quantification – for example in the form of a percentage – results in significantly more positive attitudes towards the information compared to

[6] We expect a positive association for both professional and non-professional investors in the qualitative connectivity condition. We expect this effect to be stronger for non-professional investors because they have less experience and, therefore, their information acquisition and information integration costs are higher.

narrative information, since specific and concrete information triggers cognitive processing (Baesler & Burgoon, 1994; Zhang & Buda, 1999). A range of studies reports that quantification has a direct impact on judgements and, therefore, is perceived to have greater persuasive effects compared to narratives (e.g. Boster, et al., 2000; Chang & Lee, 2010).

However, the voluntary disclosure of the quantified links between non-financials and financials could be considered as costly. Based on proprietary costs theory, disclosure reveals proprietary information (e.g., to competitors). If integrated reporting is detrimental to investors, then we expect firm valuations to be negatively associated with integrated reporting (Lee & Yeo, 2016).

Based on proprietary costs theory, professional and non-professional investors may evaluate the firm in less positive terms, since they feel that the firm is too transparent and that this leads to high proprietary costs. The cost of disclosing the real value creation model of the firm is that it could assist competitors to use the information to the firm's disadvantage, whereas the main benefit of disclosing the value creation model is to reduce information asymmetry in line with investors' expectations. The proprietary cost trade-off could be a reason why, currently, so few firms have quantified connectivity in their integrated reports, since these proprietary costs would present an important barrier to increased voluntary disclosure (Graham et al., 2005; Verrecchia, 1983). Because of the conflicting theories, we formulate the following null hypothesis:

H4: *Quantified connectivity of non-financials and financials in a firm's integrated report – compared to annual financial reporting only – is not*

associated with investors'[7] *assessment of a firm's performance and prospects, and their willingness to invest.*

Given that the literature (Kida et al., 2010; Dhaliwal et al., 2011; Rzeszutek, 2016) suggests that a firm's decision on what information to disclose and the format in which this is to be disclosed, influences professional investors differently than non-professional investors, we separately test all four the hypotheses for these two investor groups, respectively. However, for quantified connectivity we expect less positive firm valuation for both professional and non-professional investors.

4.3. Research design

The dependent variables: current performance valuation (of the firm), future prospect expectation (of the firms' performance) and (the investors') willingness to invest (in the firm) are operationalized through the level of connectivity (no, qualitative, quantified). Therefore, we examine the impact of a variation in the connectivity level of non-financial and financial information on investors' assessment of a firm's performance and prospects of performance, and their willingness to invest (in the firm), for both experienced professional and less experienced non-professional investor groups. Participants in the experiment are asked to evaluate a firm. The materials focus on the firm's financial and non-financial performance. To create an environment that is most appropriate to test our predictions, we provided the participants with information that is extracted from a real-world

[7] We expect no association for both professional and non-professional investors in the quantitative connectivity condition.

firm's integrated report. The financial and non-financial information content was constant under all experimental conditions (see Appendix B). All participants had access to exactly the same general introduction to the firm and financial information on the firm (see Appendix A). In line with the view that non-financial information can reflect future growth opportunities (Arnold et al., 2018; Goss and Roberts, 2011; Lev et al., 2010), we ask them for their assessment of both current performance and future performance as well as their willingness to invest.

The independent variables are the level of connectivity (no, qualitative and quantified) and investor type (professional and non-professional). Participants were randomly assigned to one of the three experimental conditions. The participants were questioned twice: first, after they were presented with financial information; and second, after they were also presented with additional non-financial information (including manipulation). Participants were also asked to answer some post-questionnaire questions to test whether they understood the questions and to get more background on why they made certain choices in the experiment. We also included questions on their role and function and how many years of work experience they must make sure that we could analyse whether the response was from an experienced professional or unexperienced non-professional investor.

The experiment was administered online via Qualtrics. The benefit of an online experiment is that it provides access to a subject pool of highly experienced investors (Arnold et al., 2018; Harrison & List, 2004). An important requirement for online experiments is to control the pool of participants (Arnold et al., 2018; Charness et al., 2007; Birnhaum, 2004). We recruited the professional investors mainly through the mailing lists of various

national and international professional investor associations, financial institutions and, in the case of non-professional investors, universities.

Participants gained access to the experiment via an anonymous web link. On entering the experiment, they were required to provide very specific information which helped us assign a unique code to each participant and to filter out double responses. To ensure that we only include the target group of participants in our sample, we also required the participants in the pool of professional investors to indicate their current professional function level in the firm, what type of investors they were, and their years of experience as an investor. These procedures reduced the risk of sampling bias. In addition, participants were required to adhere to the experiment's instructions[8].

4.4. Results of hypotheses testing

4.4.1 Descriptive statistics

Participants

The total population consists of 199 participants from the Netherlands: 96 professional investors and 103 non-professional investors. Most of the professionals are equity investors (see Table 1A). We recruited them through the mailing list of various professional investor associations (e.g. the Dutch association of investors (Vereniging van effectenbezitters, VEB), the Dutch association of investors and analysts (Vereniging van Beleggers en Analisten, VBA), the Dutch association of sustainable investors and entrepreneurs (Vereniging van Beleggers en Duurzame Ondernemers, VBDO) and the

[8] Prior to administration of the experiment, a pilot test was conducted to ensure the experiment is understandable, logically articulated readable and appropriate in layout. 15 non-professional investors and academics participated in the pilot. Changes were made to the questions based on their feedback.

Dutch Chartered Financial Analyst Institute, CFA) and several banks and financial institutions. Students enrolled in the Master of Finance at various universities (the University of Amsterdam, VU University and the Nyenrode Business University) in the Netherlands served as a proxy for non-professional investors.

Table 1A – Professional investors by occupation

Investor Type	Frequency	Percentage
Equity	32	33.3%
Sell side	9	9.4%
Buy side	10	10.4%
Analyst	7	7.3%
Fund manager	11	11.5%
Other	27	28.1%
Total	**96**	**100%**

The mean age of the professional investors is 57 years and the mean years of experience in their professional role is 21 years (median 20 years). The mean age of the non-professional investors is 25 years and these participants had little investor-specific, practical experience (mean=1.25 years). An overview of age and years of experience is included in Table 1B.

Table 1B – Population age and years of experience

	Professional investors (N=96)		Non-professional investors (N=103)	
	Age	**Experience**	**Age**	**Experience**
Mean	57	21	25	1.25
Std. Error of Mean	1.54	1.37	0.29	0.21
Median	58.5	20	24	0
Std. Deviation	15.12	13.38	2.9	2.16
Minimum	22	0	20	0
Maximum	83	60	36	10

Dependent variables

Participants were asked to evaluate the firm (Maines & McDaniel, 2000). As we perform an experiment and did not provide stock data, we did not ask for a stock price estimation but elicited a value judgment on a 0-100 Likert scale. This approach is comparable to the approach used by Arnold et al. (2018). The dependent variables are measured through three questions related to the current performance valuation and prospects of the firms' performance, and to the investor's willingness to invest in the firm. The questions were first asked after the financial information was presented to the participants (initial valuation) and again after the financial and non-financial information was presented to them (final valuation).

We also asked participants to give an appropriate indication of the percentage of their assets under management they would like to invest in the firm. The Pearson correlation between the value judgment and the indication of the percentage of assets under management that professional and non-professional investors decide to invest, is statistically significant positive (r=

0.026, $p < 0.05$). Therefore, we conclude that our dependent variable closely reflects the recommendations our participants would give in similar real-world settings and thus has a high external validity.

Table 2 presents the descriptive statistics for the professional investor group, and the non-professional investor group. In table 2 we present the descriptive statistics for the dependent variables before and after participants received the non-financial information. See appendix A for an overview of the provided information.

The descriptive statistics in Table 2 show that non-professional investors are generally more positive in their assessment of current performance, future prospects and willingness to invest than professional investors. The access to non-financial information had a mixed impact on investors' assessment of the firm's current performance. Under all three conditions (no connectivity, qualitative connectivity, quantified connectivity) the assessment made by professional investors of current performance decreased when adding non-financial information. For non-professional investors, the assessment decreased in respect of the no connectivity group, whereas it increased in the qualitative and quantified connectivity group. However, the assessment of future prospects and willingness to invest increased in both professional and non-professional investor groups. Therefore, the investors' (both professional and non-professional) more positive assessment of future prospects and willingness to invest after receiving an integrated report, compared to when they only had financial information, do not seem to be the result of a more positive assessment of the firm's current performance as such.

Since each of the experimental conditions, for the purpose of testing our hypotheses, had a different starting position relative to their assessment

of current performance, future prospects and willingness to invest, we specifically focus on the changes in their assessment that result from the addition of non-financial information and from the level of the connectivity of the reported financial and non-financial information.

Table 2 – Descriptive statistics dependent variables

	N*	Mean professional	Mean non-professional	Mean total population	Std. Error of Mean	Median	Std. Deviation
Panel A – Before participants obtained the non-financial information							
Current performance financial information							
1) No connectivity	67	77.76	71.85	74.85	1.57	74	12.87
2) Qualitative connectivity	65	73.14	73.44	73.31	1.79	76	14.42
3) Quantified connectivity	67	74.64	75.18	74.91	1.32	76	10.84
Future prospects financial information							
1) No connectivity	67	63.44	68.18	65.78	1.86	69	15.25
2) Qualitative connectivity	65	66.14	71.61	69.17	2.11	72	17.00
3) Quantified connectivity	67	68.03	70.12	69.09	2.08	71	17.04
Willingness to invest financial information							
1) No connectivity	67	63.29	66.15	64.70	1.82	70	14.93
2) Qualitative connectivity	65	61.00	66.19	63.88	2.13	65	17.19

3) Quantified connectivity	67	65.15	74.24	69.76	1.76	71	14.43
Panel B – After participants obtained the non-financial information							
Current performance integrated report							
1) No connectivity	67	76.00	71.15	73.61	1.48	73	12.13
2) Qualitative connectivity	65	72.52	78.11	75.62	1.99	80	16.05
3) Quantified connectivity	67	74.55	77.91	76.25	1.44	79	11.77
Future prospects integrated report							
1) No connectivity	67	68.32	70.91	69.60	1.52	70	12.40
2) Qualitative connectivity	65	70.41	78.83	75.08	2.06	80	16.64
3) Quantified connectivity	67	70.42	77.68	74.10	1.56	77	12.73
Willingness to invest integrated report							
1) No connectivity	67	67.18	67.67	67.42	1.82	70	14.88
2) Qualitative connectivity	65	67.69	74.00	71.18	2.20	75	17.71
3) Quantified connectivity	67	70.39	73.29	71.87	2.00	75	16.39

* Total N= 199

4.4.2. Mixed Anova on assessment annual financial report versus integrated report between and within conditions

We performed a mixed Anova test for both the non-professional and professional investor group to understand if there is an interaction between

the within-subjects factor (financial report vs integrated report) and between-subjects factor (experimental conditions) on investors' assessment of current performance, prospects of future performance and their willingness to invest.

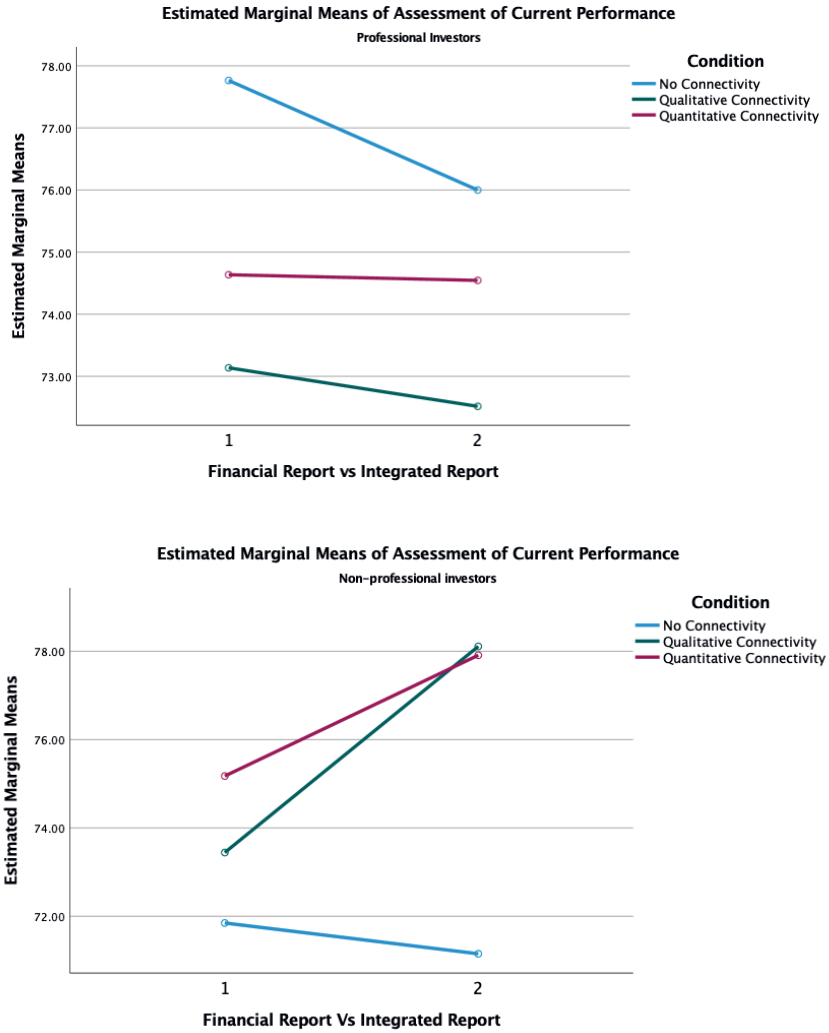
Assessment of current performance

For *non-professional investors* there is a significant main effect of financial vs integrated reporting, $F(1, 100)= 4.715$; $p= .032$. This effect tells us that if we ignore the experimental condition, assessments of current performance based on only the financial information (financial report) were rated significantly different from the assessments of current performance based on both the financial and non-financial information (integrated report). But this interaction effect is not significant between conditions $F(2, 100)= 2.315$; $p= .104$.

Within conditions the assessment of current performance based on only the financial information (financial report) were rated significantly lower from the assessment of current performance based on both the financial and non-financial information (integrated report) by *non-professional investors* in the qualitative connectivity condition (mean difference=4.667; p=.009). Refer to figure 1 for the profile plot.

For *professional investors* there is no significant main effect of financial vs integrated reporting for assessment of current performance $F(1, 93)=0.688$; $p=.409$. The interaction effect between conditions is also not significant for professional investors $F(2, 93)= 0.259$; $p=.772$.

Figure 1 – Profile plots 'assessment of current performance' by non-professional and professional investors



Prospects of future performance

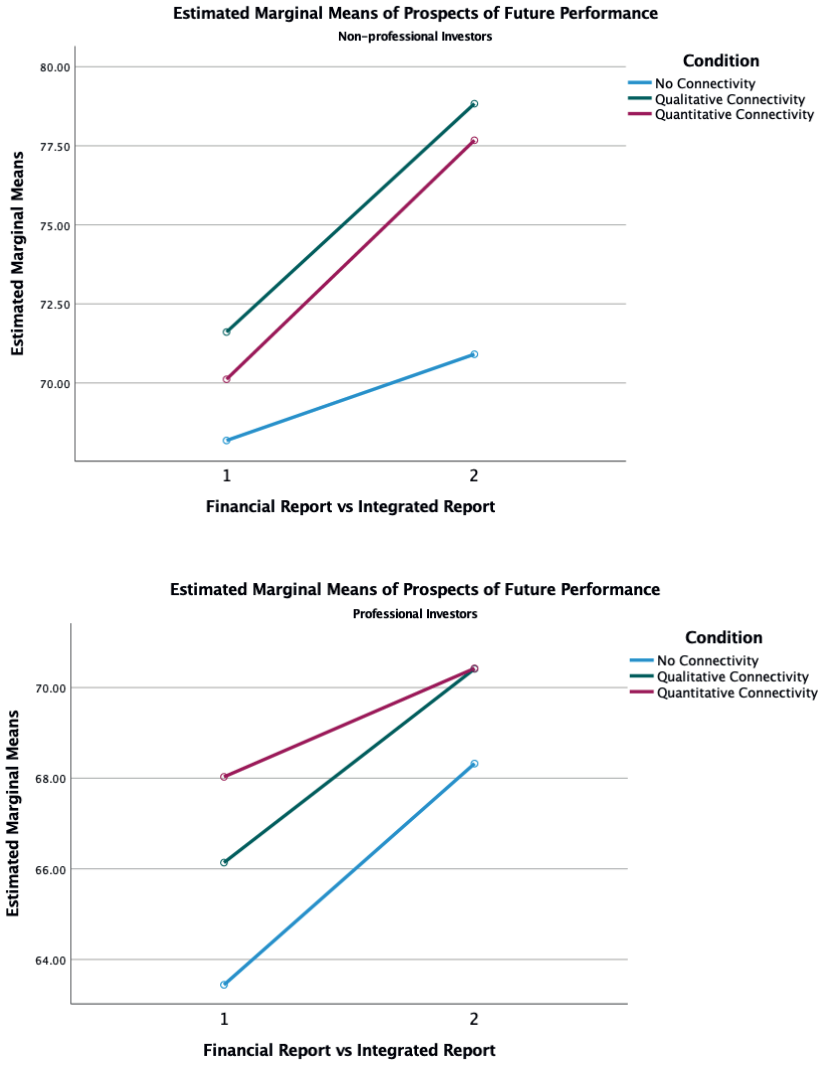
For *non-professional investors* there is a significant main effect of financial vs integrated reporting, $F(1, 100) = 13.011$; $p < .001$. For *professional*

investors there is also a significant main effect of financial vs integrated reporting, F(1, 93)= 11.607; p< .001. This effect tells us that if we ignore the experimental condition, prospects of future performance based on only the financial information (financial report) were rated significantly different from the prospects of future performance based on both the financial and non-financial information (integrated report) by non-professional and professional investors. But for both investor groups this interaction effect was not significant between conditions (non-professional investors F(2, 100)=0.907; p=.407) (professional investors F(2,93)=0.457; p=.635).

Within conditions the prospects of future performance based on only the financial information (financial report) were rated significantly lower than the prospects of future performance based on both the financial and non-financial information (integrated report) by *non-professional investors* in the qualitative connectivity condition (mean difference=7.222; p=.01). Also, in the quantitative connectivity condition the pairwise comparison output is significant (mean difference= 7.559; p= .008). So, the prospects of future performance based on only the financial information (financial report) were rated significantly lower than the prospects of future performance based on both the financial and non-financial information (integrated report) by *non-professional investors* in the quantified connectivity condition. Refer to figure 2 for the profile plot.

For the *professional investors* the pairwise comparison was statistically significant in the no connectivity condition (mean difference = 4.882; p= .012) and in the qualitative connectivity condition (mean difference = 4.276; p= .040). Professional investors prospects of future performance were higher in the situation when they received both the financial and non-financial information (integrated). Refer to figure 2 for the profile plot.

Figure 2 – Profile plots 'prospects of future performance' by non-professional and professional investors



Willingness to invest

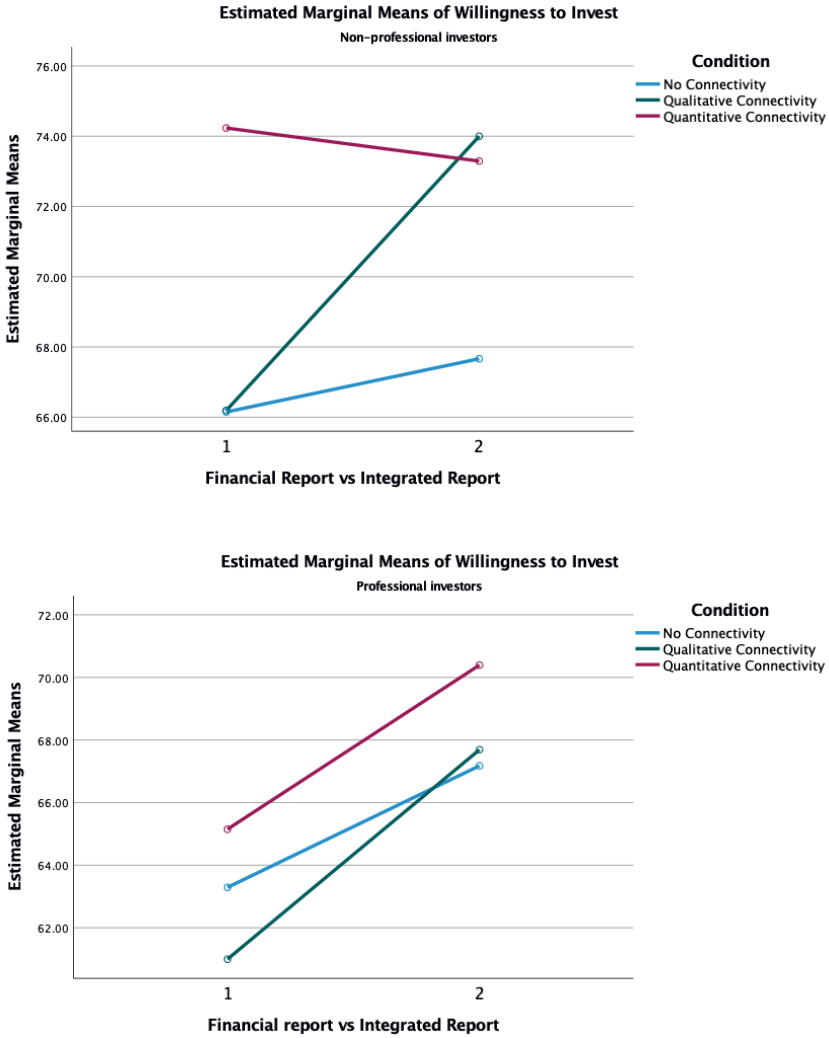
For *non-professional investors* there is a statistically significant main effect of financial vs integrated reporting, F(1, 100)= 4.555; p= .035. This effect

tells us that if we ignore the experimental condition, willingness to invest based on only the financial information (financial report) were rated significantly different from the willingness to invest based on both the financial and non-financial information (integrated report). The output shows that there is also a statistically significant interaction between the experimental conditions and the willingness to invest based on only the financial information (financial report) vs financial and non-financial information (integrated report), $F(2, 100)=4.062$; $p=.020$. This effect tells us that there is a different effect on willingness to invest based on financial vs integrated reporting in the three conditions. The pairwise comparison output is significant (mean difference= 7.806; $p< .001$) in the qualitative connectivity condition. So, in this condition non-professional investors' willingness to invest was higher when they received both the financial and non-financial information in a qualitative form. Refer to figure 3 for the profile plot.

For *professional investors* willingness to invest there is also a statistically significant main effect of financial vs integrated reporting, $F(1, 93)= 19.597$; $p< .001$. Within conditions the willingness to invest based on only the financial information (financial report) were rated significantly different from the willingness to invest based on both the financial and non-financial information (integrated report) by *professional investors* in all three experimental conditions. In the no connectivity condition, the mean difference= 3.882; $p=.055$. In the qualitative connectivity condition mean difference=6.690; $p=.003$). Also, in the quantitative connectivity condition the pairwise comparison output is significant (mean difference= 5.242; $p= .011$). In all three conditions professional investors willingness to invest was higher when they received both the financial and non-financial information.

The interaction effect between conditions was not statistically significant for professional investors F(2, 93)=0.456; p=.635. Refer to figure 3 for the profile plot.

Figure 3 – Profile plots 'willingness to invest' by non-professional and professional investors



4.4.3. The association between investors' firm valuation decisions and integrated reporting compared to only annual financial reporting

Next, to gain further understanding of the outcome of the mixed Anova, we performed a paired-samples t-test to compare changes in the assessment of current performance, prospects of future performance and willingness to invest before and after manipulation (delta) per investor type (professional and non-professional) within the experimental conditions. The test results are shown in Table 3.

The results in Table 3 show that the assessment of future prospects (mean= 3.844; $p< 0.05$) and willingness to invest (mean= 5.198; $p< 0.05$) by *professional investors* is statistically significant more positive when they receive an integrated report, compared to when they only receive an annual financial report. For *non-professional investors* we have similar results as the professional investors group with respect to future performance (mean= 5.893; $p< 0.05$) and willingness to invest (mean= 2.903; $p< 0.05$). But for non-professional investors the results also indicate that the assessment of current performance (mean= 2.311; $p< 0.05$) is statistically significant more positive when they receive an integrated report, compared to when they only receive a financial report. This suggests that the non-financial information that investors receive through the integrated report has a positive effect, irrespective of the level of connectivity of financial and non-financial information in the report.

Therefore, hypothesis 1b is accepted for the non-professional investor group and hypothesis 1a is partly accepted for the professional investor group. For *professional investors* we see that current performance is not statistically

significant more positive when they receive an integrated report compared to when they only receive an annual financial report. This can be explained by the theory that experienced professional investors prefer more traditional, fundamental analysis when analyzing financial statements (Cohen, 2012, p. 11). Fundamental tools are based on the firm's financial information to predict performance. Moreover, prior literature on decision-making behaviour shows that older people are taking less risks, have greater commitment to the status quo and may have less mental and physical stamina or are less able to grasp new ideas and learn new behaviours (Taylor, 1975; Serfling, 2014, p. 253).

Table 3 – Assessment annual financial report versus integrated report

	Professional investors			Non-Professional investors			Total population		
	Mean	Std. error	Sig. (2-tailed)	Mean	Std. error	Sig. (2-tailed)	Mean	Std. error	Sig. (2-tailed)
Current performance									
1) No connectivity	(1.765)	1.610	0.281	(0.697)	2.408	0.774	(1.239)	1.430	0.390
2) Qualitative connectivity	(0.621)	2.203	0.780	4.667	1.596	0.006**	2.308	1.351	0.093*
3) Quantified connectivity	(0.091)	1.359	0.947	2.735	1.182	0.027**	1.343	0.909	0.144
Total	(0.844)	0.985	0.394	2.311	1.042	0.029**	0.789	0.726	0.278
Future prospects									
1) No connectivity	4.882	1.887	0.014**	2.727	2.168	0.218	3.821	1.430	0.009**
2) Qualitative connectivity	4.276	2.195	0.062*	7.222	1.894	0.001**	5.908	1.436	0.000**
3) Quantified connectivity	2.394	1.805	0.194	7.559	3.943	0.064*	5.015	2.196	0.026**
Total	3.844	1.121	<0.001**	5.893	1.615	<0.001**	4.905	0.996	<0.001**
Willingness to invest									
1) No connectivity	3.882	2.026	0.064*	1.515	1.799	0.406	2.716	1.355	0.049**
2) Qualitative connectivity	6.690	2.288	0.007**	7.806	2.447	0.003**	7.308	1.685	0.000**
3) Quantified connectivity	5.242	1.883	0.009**	0.941	2.436	0.702	2.104	1.580	0.188
Total	5.198	1.181	<0.001**	2.903	1.347	0.000**	4.010	0.902	<0.001**

* Significant at $p < 0.1$

** Significant at $p < 0.05$

Furthermore, the results in Table 3 show that the assessment of current performance by *professional investors* is not statistically significant more positive, and even statistically insignificant less positive when they receive an integrated report, compared to when they only receive a financial report. This suggests that the non-financial information that they receive through the integrated report is neutral compared to the previously available financial information. This finding is supported by a study by Slack & Tsalavoutas (2018) who performed interviews with 22 mainstream senior mainstream equity market investors and found limited evidence as to the use of integrated reporting at a mainstream equity market level. The majority of the interviewees questioned the need for integrated reporting over that of the annual report and they did not perceive integrated reporting as specifically relevant to their needs as investors. The interviewees raised a number of cultural issues (i.e. short-termism) pervading the equity market that impair its demand and use by them (Slack & Tsalavoutas, 2018, p. 195). The result is also in line with the literature (Kida et al., 2010; Dhaliwal et al., 2011; Rzeszutek, 2016) which suggests that professional investors are to a lesser extent influenced by a firm's choices concerning the information that it provides and the format in which this is presented, since the firm predefines its information needs and organizes them in their own templates.

Even though their assessment of current performance declines statistically insignificant (mean= (0.844); p= 0.394), *professional investors'* expectations of the firm's future performance increase statistically significant. This increase is specifically found in the cases of no connectivity (mean= 4.882; $p< 0.05$) and qualitative connectivity (mean= 4.276; $p< 0.1$). This is in line with the notion that integrated reporting supports integrated

thinking, decision making and actions that focus on future value creation for the firm (Barth et al., 2017). Therefore, professional investors may expect higher future performances of those firms that not only focus on current financial performance, but also measures their current performance in terms of relevant non-financial aspects that affect future financial performance.

The increase in professional investors' future expectations of the firms' performance is, however, not significant in the case of *quantified connectivity*. This could be due to perceived proprietary costs outweighing the expected benefits described above. In the post-questionnaire professional investors noted that they believe that competitors have the highest understanding of the business model under the condition of quantified connectivity (mean= 60.21). This finding is in line with prior research (Verrecchia, 1983; García-Sánchez & Martinez-Ferrero, 2017; Fuhrmann et al., 2019), according to which proprietary costs may not be outweighed by the benefits of reducing information asymmetry.

In all the experimental conditions, the willingness to invest is statistically significant higher when professional investors receive an integrated report than when they only receive financial information. This is even the case in the quantified connectivity scenario (mean= 5.242; $p< 0.05$) in which their expectations about future performance are not statistically significant higher. This may be due to investors' evaluation of management competence and of the trust they have in the information provided by management, which could influence investors' perceived risk expectations.

In the experiment we asked professional investors to evaluate management reliability and trustworthiness. The output shows that management reliability is evaluated highest (mean= 72.61) under the qualitative connectivity condition and trustworthiness is evaluated highest

under the quantified connectivity condition (mean= 72.48). According to professional investors, the perceived reliability of the reported information is considered highest under the quantified connectivity condition (mean= 72.61). This can be explained by prior literature (Yalch & Elmore Yalch, 1984; Allen & Preiss, 1997; Kadous et al., 2005; Berk & DeMarzo, 2013; Ju & Seong Park, 2013) which shows that investment strategy and decision making are based on investment formulas with numerical input variables. Quantified, statistical information is perceived to be more credible than non-quantified narrative statements, as numbers reduce one's perception of uncertainty.

In the case of no connectivity, the assessment made by *non-professional investors* of current performance is not statistically significantly affected by the additional information in the integrated report, compared to when they only had financial information. Also, their assessment of future prospects and willingness to invest does not change in the case of no connectivity. As stated in prior literature (Sims, 2006; Veldkamp, 2006; Lee & Yeo, 2016), the way in which information is presented is more important for non-professional investors. Furthermore, the results suggest that when the non-financial and financial information is not clearly connected, non-professional investors have an insufficient ability to understand the future financial implications of a firm's current non-financial performance. However, when the non-financial information is connected in an integrated report using qualitative connectivity, non-professional investors' assessment of current performance (mean= 4.667; $p< 0.05$), future prospects (mean= 7.222; $p< 0.05$) and willingness to invest (mean= 2.447; $p< 0.05$) increases statistically significant. In the case of quantified connectivity, non-professional investors' assessment of current performance (mean= 2.735; p<

0.05) and future prospects (mean= 7.559; p< 0.1) increase statistically significant. Their willingness to invest, however, does not increase under the quantified connectivity condition. We only detect significant results in the willingness to invest for non-professional investors under the qualitative connectivity condition.

According to non-professional investors, information presented in a quantified connectivity form is considered to be more helpful to competitors. This could explain why the willingness of non-professional investors to invest does not increase under the quantified connectivity condition. Under the quantified connectivity condition (M=56.38), non-professional investors regard the non-financial information as a threat to the firm. The delta in the mean score under quantified connectivity compared to the qualitative connectivity condition is 4.88, and compared to the no connectivity condition it is 3.53. The post-questionnaire shows that non-professional investors also consider the non-financial information to be most sensitive under the quantified connectivity condition (mean= 57.26).

Furthermore, our results suggest that non-professional investors have a statistically significant higher preference for CSR than professional investors[9]. More specifically, according to ELM central processing theory, this may indicate that non-professional investors care more about non-financial information and compared to professional investors, will therefore pay more attention to the non-financial information.

Also, because of lower information processing costs in an integrated report, non-professional investors can process the CSR information under the

[9] An independent samples t-test was conducted to compare investor preference for CSR per investor type (professional vs. non-professional investors). There was a significant difference in the CSR-preference scores between professional investors (mean= 50.16, SD= 18.41) and non-professional investors (mean= 56.91, SD= 18.89); t (197) = 2.551, p = 0.011.

qualitative and quantified connectivity condition (Lee & Yeo, 2016). This can explain the significant increase in the non-professional investors' valuation under the qualitative and quantified connectivity condition and the insignificant decline in the professional investors' valuation of current performance. Professional investors are older than non-professional investors and according to literature they have greater commitment to the status quo and may have less mental and physical stamina or are less able to grasp new ideas and learn new behaviours (Taylor, 1975; Serfling, 2014, p. 253) therefore they might not incorporate the non-financial information in their assessment of current performance.

Overall, the results show that null hypothesis 2 is accepted for the *non-professional investor* group. No connectivity of non-financials and financials in a firm's integrated report compared to a financial report is not associated with non-professional investors' assessment of a firm's performance and prospects, and their willingness to invest. We explain this finding in terms of information acquisition and information integration (information processing theory). Information that is freely available to uninformed investors cannot be fully utilized, due to the limited information processing capacity of investors (Sims, 2006). The reason is that non-professional investors have less experience and therefore deem information acquisition and information integration costs to be higher then for professional investors.

For *professional investors*, the null hypothesis 2 is only accepted in respect of current performance. Also in the case of no connectivity, provision of non-financial and financial information in a firm's integrated report compared to a financial annual report only, is positively associated with professional investors' assessment of a firm's prospects and their willingness to invest. This may be due to professional investors' evaluation of

management competence and how much they trust the information provided by management, which could influence their perceived risk expectations.

Hypothesis 3 is accepted for the *non-professional investor group*. Qualitative connectivity of non-financials and financials in a firm's integrated report compared to a financial report is positively associated with non-professional investors' assessment of a firm's performance and prospects, and their willingness to invest. For the *professional investor group*, qualitative connectivity does not affect their assessment of current performance, but the hypothesis is accepted in respect of the firm's prospects and their willingness to invest which they assess statistically significant more positive.

Null hypothesis 4 is rejected for *non-professional investors* in respect of their assessment of a firm's performance and prospects which are positively affected by the provision of non-financial information that is quantitatively linked to the financial information. Their willingness to invest is however not statistically significantly affected by quantified connectivity of financial and non-financial information. For *professional investors*, null hypothesis 4 is accepted in respect of their assessment of firm performance and prospects which is not affected by the provision of non-financial information with quantified connectivity. Quantified connectivity of non-financials and financials in a firm's integrated report compared to a financial report is however associated with professional investors' willingness to invest. This can be explained by the finding that professional investors perceive reliability of the reported information highest under the quantified connectivity condition. This might lead to a higher willingess to invest.

4.5. Summary and conclusion

Prior literature in the field of integrated reporting shows that this format of reporting adds value to investors' investment analyses, especially for investors with a long investment horizon. However, prior academic research has provided relatively few insights into the effect of the degree of connectivity of financial and non-financial information in the integrated report on investors' judgment and decision-making behaviour. According to our knowledge, there are no prior studies that investigated and explained whether the linkage of financial and non-financial information in an integrated report affects investors' firm valuation decisions. Also, to our knowledge, there are no prior studies that investigated whether experienced and less experienced investors are affected differently by integrated reporting decisions and the provision of information about the connectivity of financial and non-financial information.

Understanding this is important because the results have implications for firms that examine the benefits and costs of developing, validating and quantifying connectivity within the organization and the external reporting of their financial and non-financial information. Organizations that get their reporting right can enhance the reputation of firms and their debt and capital-raising opportunities. However, since this is a costly process (Verrecchia, 1983), a firm's management needs to acknowledge the benefits of voluntary reporting in an integrated way. Prior studies already found that voluntary disclosure can reduce information asymmetry (Fuhrmann et al., 2019) and adverse selection costs (Healy & Palepu, 2001), increase investor awareness leading to a larger investor base (Merton, 1987), and reduce estimation risk (e.g. investors can make higher quality estimates of a firm's underlying cash flows) (Lang & Maffett , 2011). We extend these studies by focusing on the

effect of the degree of connectivity in an integrated report on investors' estimates of fundamental value and future cash flows of a firm, and by distinguishing between experienced professional and less experienced non-professional investors.

The results of our study are also relevant in the context of standard setting with the European sustainability reporting standards and the ISSB exposure drafts. Connectivity has been identified as a relevant objective by EFRAG (2021). Furthermore, our results are relevant in the context of the IASB revised Management Commentary exposure draft (2021). The IASB has developed proposals for a comprehensive framework that would enable firms to bring together in management commentary the information investors and creditors need for assessing a firm's long-term prospects. One of the key points addressed in the IASB Management Commentary exposure draft is the alignment between financial and non-financial information disclosed by an entity.

Our paper provides meaningful results on the content of integrated reports and investors' assessment of a firm's performance and prospects, and their investment decisions. We provide evidence that both professional and non-professional investors' assessment of future prospects and their willingness to invest is positively associated with an integrated report compared to an annual financial report only, even if professional investors' assessment of current performance is not positively influenced by non-financial information.

Professional investors' assessment of current performance is not affected by non-financial information, being a result of their use of predefined information and own templates that make them less sensitive to reporting choices in their assessment of current performance. Professional investors'

assessment of future prospects and their willingness to invest is, however, statistically significant more positive when an integrated report is provided. This is the case even if their assessment of current performance is not positively influenced and if no information about connectivity is provided. This could be due to the investors' evaluation of management competence and how much they trust the information provided by management, thus affecting their perceived risk which, subsequently, is affected by the integrated reporting as such and which is not dependent on how information is presented and explained.

For non-professional investors the addition of non-financial information positively influences their assessment of current performance, as well as their future prospects and willingness to invest, but only if the firm provides information that helps the investors to connect non-financial and (future) financial information. The positive impact of integrated reporting is strongest when qualitative connectivity is provided to explain the link between non-financial information and the (future) financial impact thereof.

The impact of quantified connectivity on future performance and willingness to invest is mixed in both groups of investors, possibly being driven by perceived proprietary costs. The increase in non-professional investors' future expectations of the firms' performance is significant in the case of quantified connectivity. For professional investors the increase is not statistically significant. For willingness to invest we see the opposite. The increase in professional investors' willingness to invest is significant in the case of quantified connectivity. For non-professional investors the increase in willingness to invest is not statistically significant.

The differences that we find in this study between non-professional and professional investors can be explained by the theory that professional

investors are more critical of the quality of non-financial information than non-professional investors. Furthermore, professional investors' decisions could also be driven by an implicit (automatic) process since they prefer more traditional analysis based on firm financial information (Cohen, 2012; Rzeszutek, 2016). Experienced professional investors make more extensive use of well-known and sophisticated fundamental investment tools based on financial information (Cohen, 2012). Moreover, prior literature shows that older managers are taking less risks, have greater commitment to the status quo and may have less mental and physical stamina or are less able to grasp new ideas and learn new behaviours. Furthermore, older managers tend to seek more information, to evaluate information in-depth, and take longer to make decisions (Taylor, 1975; Serfling, 2014, p. 253). Therefore, the level of connectivity of non-financial and financial information in the integrated report has a minor impact on experienced professional investors' firm valuation decisions. In addition, our data shows that non-professional investors have a statistically significant higher preference for CSR than professional investors. More specifically, according to ELM central processing theory, this may indicate that non-professional investors care more about non-financial information and, therefore, that they will pay more attention to non-financial information and will evaluate current performance more favourable when they receive non-financial information.

Furthermore, due to the characteristics of integrated reporting as a new field of research and the lack of a broadly accepted definition of integrated reporting, the type of connectivity in integrated reports is vague. As described, in this study we used an experimental setting and created the levels of connectivity as used in the experiment based on the description of the different types of connectivity in the IIRC framework (2013) (see

appendix B). Future research could help to build a clear definition of different types of connectivity and can for example investigate how companies report and incorporate connectivity in their integrated reporting under the new European regulations and standards and what the influence is on investors' firm valuation decisions.

To make a conclusion, this paper contributes to existing integrated reporting literature by exploring how integrated reporting is associated with the firm valuation decisions of professional and non-professional investors. Thus, we expand the integrated reporting literature with insights into the drivers of the content of integrated reports (different forms of connectivity) and insights into how these forms of connectivity in the integrated report aligns with market reflections of value, as called for by prior studies (Villiers and Underman, 2014; Melloni et al., 2017; Rivera-Arrubla et al., 2017; Pistoni et al., 2018).

Appendices

Appendix A – Overview of the provided information

Experimental scenario and group	Description of the report content
Scenario 1 – Integrated report, no connectivity	**(1)** Background information Alpha **(2)** Financial information Alpha • Fundamental profit & loss statement information • Fundamental balance sheet information • Fundamental ratios **(3)** Non-Financial information Alpha • Information on three non-financial key performance indicators – No connectivity
Scenario 2 – Integrated report, qualitative connectivity	**(1)** Background information Alpha • Same as above **(2)** Financial information Alpha • Same as above **(3)** Non-Financial information Alpha • Information on three non-financial key performance indicators - Qualitative connectivity
Scenario 3 – Integrated report, quantified connectivity	**(1)** Background information Alpha • Same as above **(2)** Financial information Alpha • Same as above **(3)** Non-Financial information Alpha • Information on three non-financial key performance indicators - Quantified connectivity

Appendix B – Examples of financial, non-financial information and connectivity as presented in the experiment

i. Financial information

The following financial information of the company 'Alpha' was presented to the participants in the experiment:

Alpha				
	As at year end (31/12)			
	2015		2014	
Continuing operations	in EUR mln		in EUR mln	
Total revenues	€	14.155	€	13.279
Operating profit	€	1.921	€	1.557
Income before income tax	€	2.787	€	2.427
Net Income	€	2.293	€	2.051
Balance Sheet				
Total assets	€	8.334	€	8.075
Total liabilities	€	1.500	€	1.375
Total equity	€	6.834	€	6.700
Cash flow				
Net cash flows from operating activities	€	2.139	€	2.049
Net cash flows from investing activities	€	1.025	€	936
Net cash flows from financing activities	€	1.292	€	1.114
Ratios				
Return on assets		28%		25%
Return on equity		34%		31%
Return on sales		20%		16%
Debt/Equity ratio		22%		21%
Net debt / EBITDA		54%		57%
Market price per common share at year end	€	2,97	€	2,37

ii. Non-financial information

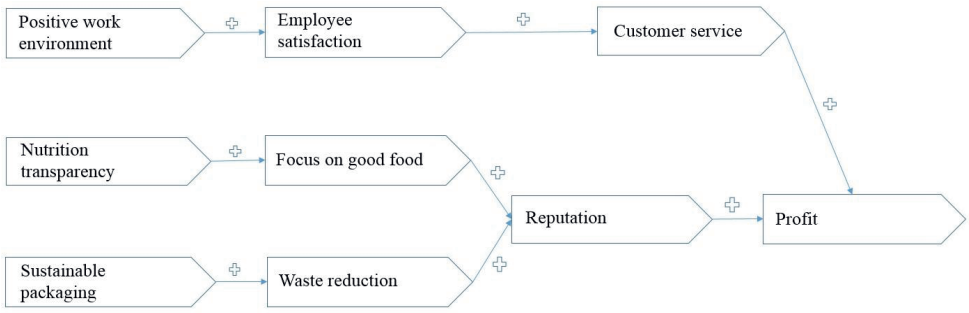
The following non-financial information of the company 'Alpha' was presented to the participants in the experiment:

KPI	**Work environment**		**Nutritional transparency**		**Sustainable packaging**	
Description	Alpha has its own training and development institute and provides training to the employees.		Alpha is committed to help their customers to make better informed nutritional choices.		Alpha focuses on using as much as possible packages that are made of recyclable paper or cardboard.	
Measure	Percentage of employees participating in an educational program of Alpha.		Percentage of Alpha shops where nutritional information is mentioned on the menu.		Percentage of products with a sustainable package.	
Year	**2014**	**2015**	**2014**	**2015**	**2014**	**2015**
Percentage	45%	66%	58%	79%	56%	82%

iii. Example of qualitative connectivity in the experiment:

The management team of Alpha also discloses to outsiders how the non-financial measures are linked to financial measures. The visual representation about the relationship between non-financial measures and financial measures that you can find below is disclosed together with the financial and non-financial information you have seen on previous screens.

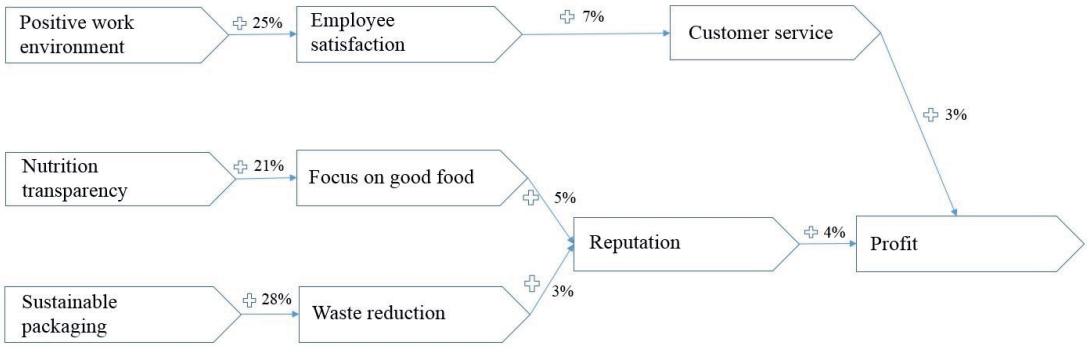
The visual representation represents the expectation of the management team of Alpha on how the non-financial measures are linked to the financial measures. The visual representation as a whole and the individual links are not statistically tested and validated. For instance, the '+' on the link between 'Positive work environment' and 'Employee satisfaction' indicates that an increase in the number of employees that participates in educational programs of Alpha is expected to lead to an increase in employee satisfaction.



iv. Example of quantitative connectivity in the experiment:

The management team of Alpha also discloses to outsiders how the non-financial measures are linked to financial measures. The visual representation about the relationship between non-financial measures and financial measures that you can find below is disclosed together with the financial and non-financial information you have seen on previous screens.

The visual representation represents the outcome of a statistical analysis, which is done by the Finance & Control department of Alpha, on how the non-financial measures are linked to the financial measures. Thus, the visual representation as a whole and the individual links are statistically tested and validated. The numbers on the links indicate the effect of a 10% increase in the strategic construct on the left side of the link on the strategic construct on the right side of the link. For instance, the '+25%' between 'Positive work environment' and 'Employee satisfaction' indicates that an increase of 10% in the number of employees that participates in educational programs of Alpha leads to a 25% increase in employee satisfaction. The '+7%' between employee satisfaction and customer service indicates that an increase in 10% of the employee satisfaction leads to an increase of 7% in customer service.



CHAPTER

Summary and Conclusions

5. Summary and conclusions

5.1. Introduction

I started the PhD project in 2014, a time when there was not much academic evidence on the value relevance of integrated reporting. Also, a time when the International Integrated Reporting framework was recently introduced in the corporate reporting landscape. During the past years a lot has happened in the field of non-financial reporting, with a shift from voluntary frameworks and reporting to mandatory reporting and (upcoming) legislation and standards in this field.

5.2. Research aim, method, and research questions

This dissertation reports three separate studies that approach the central research theme (the use and usefulness of integrated reporting and non-financial information) from the perspective of the standard setter, the firm, and the investors to narrow down the broad scope of the research theme. The first study is performed by doing a literature review in combination with a survey. For the other two studies we use an experiment as the research method.

The following questions are central to this dissertation:

For the standard setter (paper 1):

1. *Are the information quality characteristics that are the basis for financial reporting standard setting also relevant for non-financial reporting according to investors?*
2. *Are there other quality characteristics in the academic literature that are relevant to non-financial information according to investors?*

From the firm perspective (paper 2):

1. *Do managers use impression management when they disclose material non-financial information in their integrated report?*

For the investors (paper 3):

2. *How are professional and non-professional investors' assessment of a firm's performance and prospects, and investment decisions influenced by the level of connectivity in the integrated report?*

The three studies, each form their own perspective on the value relevance of non-financial and integrated reporting in relation to judgement and decision-making behavior. This research is specifically aimed at the combination of academic research with practice. The research papers in my dissertation respond to several practical themes in the corporate reporting area.

5.3. Results Study 1: Characteristics of non-financial information quality – from the perspective of investors in the Netherlands

In this study, which is an explorative paper on non-financial reporting, we tried to gain a deeper understanding of whether the information quality characteristics in the International Accounting Standards Board (IASB) Conceptual Framework, that forms the basis for financial standard setting, are also relevant for non-financial reporting based on the Corporate Sustainability Reporting Directive (CSRD), and the International Sustainability Standards Board (ISSB) exposure drafts. It examines which other quality characteristics are applicable to narrative non-financial information by performing a literature review followed by a survey with institutional investors in the Netherlands.

Understanding the information quality characteristics that investors find most relevant for non-financial reporting is important for standard setting as well as for research about the quality of corporate reporting practice.

We performed a literature review and a survey with investors and conclude that most information quality characteristics that are applicable for financial reporting are also relevant for non-financial reporting. However, investors also identified other information quality characteristics that are important for non-financial reporting, next to the information quality characteristics that are identified for financial reporting.

Based on the literature review, we conclude that the information quality characteristics ‘relevance’, ‘verifiability’, ‘comparability across timeframes’, ‘timeliness of information’, and ‘understandability’ that are

mentioned in the IASB conceptual framework (2018) are also most relevant according to prior literature on information quality in other fields. This might suggest that these information quality characteristics can also be important according to investors in a setting of non-financial reporting.

'Comparability between firms' and 'faithful representation' are less often mentioned in prior literature than 'accuracy', 'completeness', and 'access to information'. The last three are not included in the IASB conceptual framework (2018) but might be important according to investors in a setting of non-financial reporting.

Some of the highlights from the survey are that the quality characteristic 'relevance' is considered most important according to investors. Next, 'faithful representation' and 'accuracy' are considered as important according to investors. So, investors are mostly looking for relevant and accurate non-financial information that give a faithful representation of the firms' non-financial performance for their investment decisions.

The 'format' in which the information is presented is considered as least important according to investors. This is an interesting finding in the light of greenwashing and impression management. Investors seem to pay less attention to the presentation format, while firms are sometimes blamed for using impression management strategies via the format in which information is presented (also see chapter 3 in this dissertation).

According to investors, the non-financial information quality characteristic 'relevance' is statistically significant more important than all other information quality characteristics, except for 'understandability' of non-financial information. So, relevance of information is also more often considered as important to investment decisions than faithful representation of the information. This might be explained by the division between main-

and sub-criteria in the IASB Conceptual framework (2018). The information quality characteristics are not considered equal. Investors do not seem to notice the difference and seem to find relevant non-financial information more important than faithful non-financial information.

Furthermore, we find that 'access to information' is considered significantly more important to investors' assessment of the firms' non-financial performance than to the assessment of financial performance. This might indicate that investors' struggle more with access to the right information for the non-financial performance assessments than for the assessment of financial performance. However, this information quality characteristic is not included in European Sustainability Reporting Standard (ESRS) 1 Exposure Draft - General principles (2022), and exposure drafts of the ISSB. It is briefly mentioned in the Draft European Sustainability Reporting Guidelines 2 – Characteristics of information quality working paper (2022), under sub 24 and 25, as being part of faithful representation.

Based on this result we recommend that the European sustainability reporting standard setter and the ISSB should re-evaluate the information quality characteristics for non-financial information. Our recommendation to EFRAG and the ISSB is to include 'access to non-financial information' as a separate information quality characteristic since this type of information is currently not as accessible as financial information.

We believe that the results of this study offer academics, investors, firms and regulators a clearer picture of investor needs regarding the information quality characteristics of non-financial information. The results can inform choices about which regulatory approach might be best applied to non-financial reporting. The findings of this study may provide insights for

firms in ways in which to integrate non-financial data with financial data based on information quality characteristics that are relevant to investors.

5.4. Results Study 2: Do firms that perform well report differently compared to those that perform badly? Impression management in integrated reporting

The goal of the second study is to investigate whether firms disclose reliable and complete information on their non-financial KPIs in a transparent manner in their integrated report, specifically when non-financial performance is weak. Additionally, the study investigates whether the disclosure of material non-financial KPIs is associated with firm financial performance.

The study examines whether managers tend to use impression management when they disclose non-financial information in the integrated report through an experiment with experienced professional controllers and part-time students in the Executive Master Finance and Control at universities in the Netherlands.

The main finding in this paper is that impression management is not applied by including or excluding non-financial KPIs in the integrated report, but it is applied by using more prominent presentation forms for positive non-financial performance and non-prominent presentation forms for negative non-financial performance.

The test output in the paper shows that participants statistically significant more often choose to report positive performing non-financial KPIs in a graph (prominent presentation form) than poor performing non-financial KPIs. Poor performing non financial KPIs are statistically significant more often reported in a qualitative form in the text (non-

prominent) than positive performing non-financial KPIs. This finding is in line with the *assertive impression management* strategy. firms use positive presentational patterns to make a positive outcome more obvious to the users of the integrated report (Yang & Liu, 2017, p. 676; Merkl-Davies & Brennan, 2007; Clatworthy & Jones, 2006).

When we run the tests based on the different levels of financial performance, the results indicate a decrease in the use of impression management through presentation format in the *good financial performance* condition compared to the group that did not know the financial performance. In this condition participants decided to present poor performing non-financial KPIs statistically significantly more often in a prominent presentation format compared to the group that did not know the financial performance. Since the financial performance is good, there is no incentive to use impression management through reporting non-financial performance.

Furthermore, we find that firms report positive performing non-financial KPIs significantly more often in a prominent manner compared to poor performing non-financial KPIs in the *weak financial performance* condition. So, firms use impression management through presentation format in their integrated report when financial performance is weak. However, they do not use statistically significant more impression management through presentation format in the weak financial performance condition than in the the good financial performance condition.

Our test results show that impression management is not exercised through the inclusion or exclusion of positive or negative performing non-financial KPIs. We find that positive non-financial KPIs are statistically significant more often included in the integrated report than poor performing non-financial KPIs in all three experimental conditions, but this was already

the case before participants knew the non-financial performance. Therefore, the evidence for impression management and underreporting or opportunistic reporting through the inclusion or exclusion of positive or poor performing non-financial KPIs is weak. This finding can be explained by prior literature that states that litigation risk can influence disclosure choices (Cazier et al., 2016). The risk of litigation and its associated costs can reduce managers' incentives to provide misleading disclosures (Cazier et al., 2016; Billings & Cedergren, 2015; Kothari et al., 2009). Therefore, managers might estimate the risk regarding the inclusion or exclusion of certain information as higher compared to impression management through presentation form.

Not much research on the use of impression management by firms in an integrated reporting setting has been conducted to date. In this paper, we present what is, to our knowledge, the first study that looks into the relationship between firms' financial performance and the use of impression management strategy in reporting material non-financial KPIs in an integrated reporting context. The results of the study are of importance for users of the integrated report, since it will provide more insight in whether firms are truly transparent in their integrated report.

5.5. Results Study 3: Non-financial and financial information in an integrated report: How connectivity affects professional and non-professional investors' assessment of a firm's performance, prospects, and their willingness to invest

By performing an experiment with professional investors and non-professional investors in the Netherlands, this study investigates the influence of connectivity levels in an integrated report on professional and non-

professional investors' assessment of a firm's performance and prospects of future performance, and their willingness to invest.

Understanding this is important because the results have implications for firms that examine the benefits and costs of developing, validating and quantifying connectivity within the firm and the external reporting of their financial and non-financial information. Firms that get their reporting right can enhance the reputation of the firm and its debt and capital-raising opportunities.

The main finding in this study is that non-financial information in an integrated report positively influences non-professional investors' assessments of current and future financial performance and their willingness to invest, but only when the report connects the non-financial information to the financial information. Professional investors' assessment of current performance is unaffected by non-financial information irrespective of the level of connectivity, which is explained by their use of predefined information and own templates. Professional investors' prospects of future performance and their willingness to invest are however significantly more positive when based on an integrated report.

For both professional and non-professional investors the strongest effect of integrated reporting appears when *qualitative connectivity* explains the link between non-financial information and its (future) financial impact. For non-professional investors we find this positive association with respect to their assessment of a firm's performance and prospects, and their willingness to invest. For the professional investor group, qualitative connectivity does not affect their assessment of current performance, but it does positively affect their assessment of the firm's prospects and their willingness to invest.

The impact of *quantified connectivity* on future performance and willingness to invest is mixed in both groups of investors, possibly being driven by perceived proprietary costs. The increase in non-professional investors' future expectations of the firms' performance is statistically significant in the case of quantified connectivity. For professional investors the increase is not statistically significant. For willingness to invest we see the opposite. The increase in professional investors' willingness to invest is statistically significant in the case of quantified connectivity. For non-professional investors the increase in willingness to invest is not statistically significant.

The differences that we find in this study between non-professional and professional investors can be explained by the theory that professional investors are more critical of the quality of non-financial information than non-professional investors.

Also, professional investors' decisions could also be driven by an implicit (automatic) process since they prefer more traditional analysis based on firm financial information (Cohen, 2012; Rzeszutek, 2016). Experienced professional investors make more extensive use of well-known and sophisticated fundamental investment tools based on financial information (Cohen, 2012). Therefore, the level of connectivity of non-financial and financial information in the integrated report has a minor impact on experienced professional investors' firm valuation decisions.

In addition, our data shows that non-professional investors have a statistically significant higher preference for corporate, social, responsibility (CSR) than professional investors. More specifically, according to Elaboration Likelihood Model (ELM) central processing theory, this may indicate that non-professional investors care more about non-financial

information and, therefore, that they will pay more attention to non-financial information and will evaluate current performance more favourable when they receive non-financial information.

The study provides meaningful results on the content of integrated reports and investors' assessment of a firm's performance and prospects, and their investment decisions. The results are also relevant in the context of EFRAG's standard setting activities in relation to the EU CSRD (2021) for which connectivity has been identified as a relevant objective. Furthermore, the results are relevant in the context of the IASB revised Management Commentary exposure draft (2021).

5.6. Conclusion

The three studies are an important contribution to science as they examine the use and usefulness of integrated reporting and non-financial information, including the information quality characteristic that are important for non-financial information, to standard setters, firms, and investors.

From a standard setter perspective the first paper (chapter 2) in the dissertation shows that most information quality characteristic that are applicable for financial reporting are also relevant for non-financial reporting. However, investors also identified other information quality characteristics that are important for non-financial reporting, next to the information quality characteristics that are identified for financial reporting.

An interesting finding is that the format in which the information is presented is not often mentioned in prior literature on information quality characteristics. Also, in the survey with investors the study shows that investors consider the format in which the information is presented as least

important to their investment decisions. This is interesting in the light of greenwashing and impression management. Investors seem to pay less attention to the presentation format, while firms are sometimes blamed for using impression management strategies (Melloni et al., 2016). Impression management is for example applied by using more prominent presentation forms for positive non-financial performance and non-prominent presentation forms for poor non-financial performance (Skinner, 1994; Clatworthy & Jones, 2006; Yang & Liu, 2017). This is also one of our findings in chapter 3 of this dissertation.

The results in chapter 3 show that impression management is not applied by including or excluding non-financial KPIs in the integrated report, but it is applied by using more prominent presentation forms for positive non-financial performance and non-prominent presentation forms for negative non-financial performance.

These are interesting findings, because the results in the first paper (chapter 2) show that the format in which non-financial information is presented is least important, according to investors. While the results in the second paper (chapter 3) show that firms apply impression management in their integrated report through presentation form. So, in practice investors often say that firms use integrated reporting for 'window dressing' or impression management purposes, but in their investment decisions they seem to ignore this and seem to be unaware of this gap.

Also, the CSRD introduces a new amendment to non-financial reporting of firms in an effort to fight greenwashing with new rules on firm disclosures, but presentation format is not included in the CSRD as one of the information quality characteristics.

In the third study in the dissertation (chapter 4) we investigate professional and non-professional investors' firm valuation decisions based on different levels of connectivity in integrated reporting. The results of the experiment show from an investor perspective that non-financial information in an integrated report is value relevant to investors' prospects of future performance and their willingness to invest in the firm. For both professional and non-professional investors the strongest effect of integrated reporting appears when qualitative connectivity explains the link between non-financial information and its (future) financial impact. This is an interesting finding, because it indicates that for investors it is sufficient when firms connect their non-financial and financial information in the integrated report by using words instead of quantifying their impact.

Prior literature that is included in chapter 2 of this dissertation does not mention connectivity of information as one of the information quality characteristics. However, connectivity is mentioned in Draft ESRS 1 General Requirements (2022), but not in the chapter that identifies the qualitative characteristics of information. This is remarkable since investors value connectivity of information in the integrated report (chapter 4) and connectivity is the information quality characteristic that is key to integrated reporting since it brings together the financial and non-financial information in the report. We believe that the results of the studies in this dissertation enable us to contribute to the literature and the results can be useful to the standard setter since it provides insight on characteristics that are not yet included in the Standards as qualitative information quality characteristic but might be important to include, like connectivity of information.

With respect to the studies' joint contribution to the integrated reporting literature, these are interesting findings when linked to each other,

since there seems to be a gap between investors needs and firm's (sub)conscious way of presenting the information in the integrated report.

Based on the three studies in this dissertation we conclude that investors think that firms use impression management in their integrated reporting and investors ask firms to present their non-financial information linked to the financial information in a quantified form, but our results (chapter 2) show that investors find the format in which the information is presented least important to their investment decisions. So, there seems to be a gap between investors believes and actions.

Our results in chapter 3 show that firms use impression management through presentation format. Firms emphasize good performance and downplay poor performance about material non-financial KPIs through presentation form in their integrated report. Since, investors do not seem to care about the presentation format they might not see this form of impression management used by firms in their integrated reports.

Furthermore, our results in chapter 4 show that for both professional and non-professional investors the strongest effect of integrated reporting appears when qualitative connectivity explains the link between non-financial information and its (future) financial impact. This is an interesting finding, because it indicates that for investors it is sufficient when firms connect their non-financial and financial information in the integrated report by using words instead of quantifying their impact.

5.7. Relevance for practice

The studies reported in this dissertation on the use and usefulness of integrated reporting and non-financial information reveals the complexity in

the non-financial reporting landscape. On the one hand the complexity for firms that are expected to issue an integrated report and on the other hand the complexity for investors in accessing non-financial information.

The results will have implications for firms examining the benefits and costs of developing and validating their integrated thinking process within the organization and their external reporting process. Furthermore, the study provides insights about the use of impression management to users of the integrated report. The results in this dissertation are also relevant to the European sustainability reporting standard setter and the International Sustainability Standards Board. The results provide recommendation to the standard setter to re-evaluate the information quality characteristics for non-financial information.

CHAPTER

Nederlandstalige samenvatting en conclusie

6. Nederlandstalige samenvatting en conclusie

6.1. Intro

In 2014 ben ik begonnen met het promotietraject. In die tijd was er nog niet veel wetenschappelijk onderzoek naar de relevantie van geïntegreerde verslaggeving. Het International Integrated Reporting Framework was toen recent gepubliceerd. In de afgelopen jaren hebben er belangrijke ontwikkelingen plaatsgevonden in het landschap van niet-financiële verslaggeving; een overgang van vrijwillig rapporteren over niet-financiële informatie naar verplicht rapporteren in het bestuursverslag en de komende periode zal er nog meer veranderen met de komst van de Internationale duurzaamheidsverslaggeving Standaarden en wetgeving.

6.2. Doel van het onderzoek, onderzoeksmethode en onderzoeksvraag

Dit proefschrift bestaat uit drie afzonderlijk onderzoeken die het centrale onderzoeksthema (het gebruik en de bruikbaarheid van geïntegreerde verslaggeving en niet-financiële informatie) benaderen vanuit het perspectief van de regelgever, het bedrijf en investeerders.
Het eerste onderzoek wordt uitgevoerd door het doen van een literatuuronderzoek in combinatie met een vragenlijst. Voor de andere twee onderzoeken gebruiken we een experiment als onderzoeksmethode.

De volgende vragen staan centraal in het proefschrift:

Voor de regelgever (paper 1):

1) *Zijn de kwaliteitsindicatoren van informatie die de basis vormen voor financiële verslaggeving ook relevant voor niet-financiële verslaggeving volgens beleggers?*
2) *Zijn er andere kwaliteitsindicatoren in de wetenschappelijke literatuur die volgens beleggers relevant zijn voor niet-financiële informatie?*

Vanuit het bedrijf (paper 2):

3) *Maken managers gebruik van impressie management wanneer zij materiële niet-financiële informatie rapporteren in het geïntegreerde verslag van het bedrijf?*

Vanuit de investeerders (paper 3):

4) *Wat is het effect van connectiviteit in geïntegreerde verslaggeving op de beslissingen van professionele en niet-professionele investeerders ten aanzien van de bereidheid om te investeren in een bedrijf, de huidige performance van het bedrijf en het toekomstperspectief?*

De drie onderzoeken vormen elk een eigen perspectief op de waarde relevantie van niet-financiële en geïntegreerde verslaggeving in relatie tot besluitvorming. Dit onderzoek is specifiek gericht op het verbinden van wetenschappelijk onderzoek met de praktijk. De drie onderzoeken in dit proefschrift spelen in op verschillende praktische thema's die relevant zijn op het gebied van externe verslaggeving.

6.3. Resultaten onderzoek 1: Kwaliteitskenmerken van niet-financiële informatie – vanuit het perspectief van investeerders in Nederland

In dit verkennende onderzoek hebben wij getracht om inzicht te krijgen in de vraag of de kwaliteitskenmerken voor financiële informatie die genoemd zijn in het Conceptual Framework van de Internationale Accounting Standards Board (IASB), ook relevant zijn voor niet-financiële verslaggeving op basis van de Corporate Sustainability Reporting Directive (CSRD), en de International Sustainability Standards Board (ISSB) exposure drafts. Aan de hand van een literatuuronderzoek en vragenlijst aan institutionele investeerders in Nederland, wordt onderzocht welke andere kwaliteitsindicatoren van toepassing zijn voor niet-financiële informatie.

Het begrijpen van de kwaliteitskenmerken die investeerders het meest relevant vinden voor niet-financiële verslaglegging is belangrijk voor het vaststellen van normen en voor onderzoek naar de kwaliteit van externe verslaggeving.

Op basis van het literatuuronderzoek en de vragenlijst concluderen wij dat de meeste kwaliteitsindicatoren die van toepassing zijn op financiële verslaggeving, ook relevant zijn voor niet-financiële verslaggeving, maar dat investeerders daarnaast ook andere kwaliteitsindicatoren identificeren die zij belangrijk vinden voor niet-financiële informatie.

Op basis van het literatuuronderzoek concluderen we dat de informatiekwaliteitskenmerken 'relevantie', 'verifieerbaarheid', 'vergelijkbaarheid over jaren', 'tijdigheid van informatie' en 'begrijpelijkheid' die worden genoemd in het IASB conceptueel raamwerk (2018) ook het meest relevant zijn volgens eerdere literatuur over informatiekwaliteit op

andere gebieden. Dit zou erop kunnen wijzen dat deze informatiekwaliteitskenmerken volgens investeerders ook van belang kunnen zijn in een setting van niet-financiële verslaggeving.

'Vergelijkbaarheid tussen bedrijven' en een 'getrouwe weergave' worden in eerdere literatuur minder vaak genoemd dan 'nauwkeurigheid', 'volledigheid' en 'toegang tot informatie'. De laatste drie zijn niet opgenomen in het IASB conceptueel raamwerk (2018) maar kunnen volgens investeerders belangrijk zijn in een setting van niet-financiële verslaggeving.

Enkele highlights uit het onderzoek zijn dat kwaliteitskenmerk 'relevantie' volgens investeerders het belangrijkst wordt geacht. Vervolgens worden volgens investeerders 'getrouwe weergave' en 'nauwkeurigheid' als belangrijk beschouwd. Investeerders zijn dus meestal op zoek naar relevante en nauwkeurige niet-financiële informatie die een getrouwe weergave geeft van de niet-financiële prestaties van het bedrijf voor hun investeringsbeslissingen.

De vorm waarin de informatie wordt gepresenteerd, wordt door investeerders als het minst belangrijk beschouwd. Dit is een interessante bevinding in het licht van greenwashing en impressiemanagement. Investeerders lijken minder aandacht te besteden aan de presentatievorm, terwijl bedrijven soms de schuld krijgen van het gebruik van impressiemanagementstrategieën (zie hoofdstuk 3 in dit proefschrift).

Volgens investeerders is het kwaliteitskenmerk 'relevantie' statistisch significant belangrijker dan alle andere kwaliteitskenmerken van niet-financiële informatie, behalve de 'begrijpelijkheid' van niet-financiële informatie. Relevantie van informatie wordt dus ook vaker als belangrijker beschouwd voor investeringsbeslissingen dan een getrouwe weergave van

de informatie. Dit kan worden verklaard door de scheiding tussen hoofd- en sub-criteria in het IASB Conceptueel Raamwerk (2018). De informatiekwaliteitskenmerken worden niet als gelijk beschouwd. Investeerders merken het verschil niet op en lijken relevante niet-financiële informatie belangrijker te vinden dan getrouwe niet-financiële informatie.

Bovendien vinden we dat 'toegang tot informatie' aanzienlijk belangrijker wordt geacht voor de beoordeling door investeerders van de niet-financiële prestaties van het bedrijf dan voor de beoordeling van de financiële prestaties. Dit zou erop kunnen wijzen dat investeerders meer moeite hebben met toegang tot de juiste informatie voor de niet-financiële prestatiebeoordelingen dan voor de beoordeling van financiële prestaties. Dit kwaliteitskenmerk van informatie is echter niet opgenomen in de European Sustainability Reporting Standard (ESRS) 1 Exposure Draft - General Principles (2022), en exposure drafts van de ISSB. Het wordt kort genoemd in de Draft European Sustainability Reporting Guidelines 2 - Characteristics of information quality working paper (2022), onder sub 24 en 25, als onderdeel van een getrouwe weergave.

Op basis van de resultaten moedigen wij de Europese regelgever EFRAG en de ISSB aan om de kwaliteitskenmerken van niet-financiële informatie zoals die nu zijn overgenomen vanuit het IASB Conceptueel Raamwerk (2018) te heroverwegen.

De resultaten van dit onderzoek geven aan wetenschappers, investeerders, bedrijven en regelgevers inzicht in de behoeften van investeerders ten aanzien van de kwaliteitskenmerken van niet-financiële informatie. De resultaten kunnen helpen bij de vormgeving van Standaarden voor niet-financiële verslaggeving. De bevindingen van dit onderzoek kunnen bedrijven inzicht verschaffen in de wijze waarop niet-financiële

gegevens geïntegreerd kunnen worden met financiële informatie in het jaarverslag op basis van informatiekwaliteitskenmerken die relevant zijn voor investeerders.

6.4. Resultaten onderzoek 2: Rapporteren bedrijven die goed presteren anders dan bedrijven die slecht presteren? Impressiemanagement in geïntegreerde verslaggeving

Het doel van de tweede studie is om te onderzoeken of bedrijven betrouwbare en volledige informatie over hun niet-financiële KPI's op een transparante manier bekendmaken in hun geïntegreerde verslag, met name wanneer de niet-financiële prestaties zwak zijn. Daarnaast onderzoekt de studie of de openbaarmaking van materiële niet-financiële KPI's verband houdt met financiële prestaties van het bedrijf.

In het onderzoek is onderzocht of managers de neiging hebben om impressiemanagement te gebruiken wanneer ze niet-financiële informatie in het geïntegreerde rapport rapporteren door middel van een experiment met ervaren professionele controllers en deeltijdstudenten in de Executive Master Finance and Control aan universiteiten in Nederland.

De belangrijkste bevinding in dit artikel is dat impressiemanagement niet wordt toegepast door niet-financiële KPI's in het geïntegreerde verslag toe te voegen of weg te laten, maar door prominentere presentatievormen te gebruiken voor positieve niet-financiële prestaties en niet-prominente presentatievormen voor negatieve niet-financiële prestaties.

Uit de test blijkt dat deelnemers statistisch significant vaker ervoor kiezen om positief presterende niet-financiële KPI's in een grafiek

(prominente presentatievorm) te rapporteren dan slecht presterende niet-financiële KPI's. Slecht presterende niet-financiële KPI's worden statistisch significant vaker gerapporteerd in kwalitatieve vorm in de tekst (niet-prominent) dan positief presterende niet-financiële KPI's. Deze bevinding is in lijn met de assertieve impressiemanagementstrategie. Bedrijven gebruiken positieve presentatievormen om een positief resultaat duidelijker te maken voor de gebruikers van het geïntegreerde rapport (Yang & Liu, 2017, p. 676; Merkl-Davies & Brennan, 2007; Clatworthy & Jones, 2006).

Als we de testen uitvoeren op basis van de verschillende niveaus van de financiële prestatie van het bedrijf, dan wijzen de resultaten op een afname van het gebruik van impressiemanagement door middel van presentatievorm in de goede financiële prestatieconditie ten opzichte van de groep die de financiële prestaties niet kende. In de conditie waarin er een goede financiële prestatie was, besloten deelnemers om slecht presterende niet-financiële KPI's statistisch significant vaker in een prominente presentatievorm te presenteren dan de groep die de financiële prestaties niet kende. Aangezien de financiële prestaties goed zijn, is er geen prikkel om gebruik te maken van impressiemanagement door niet-financiële prestaties te rapporteren.

Verder stellen we vast dat bedrijven significant vaker positief presterende niet-financiële KPI's op een prominente manier rapporteren dan slecht presterende niet-financiële KPI's in de zwakke financiële prestatieconditie. Bedrijven gebruiken dus impressiemanagement via presentatievorm in hun geïntegreerde rapport wanneer de financiële prestaties zwak zijn. Ze gebruiken echter niet statistisch significant meer impressiemanagement via presentatievorm in de zwakke financiële prestatieconditie dan in de goede financiële prestatieconditie.

Onze testresultaten laten zien dat impressiemanagement niet wordt uitgeoefend door het opnemen of uitsluiten van positief of negatief presterende niet-financiële KPI's. We vinden dat positieve niet-financiële KPI's statistisch significant vaker worden opgenomen in het geïntegreerde rapport dan slecht presterende niet-financiële KPI's in alle drie de experimentele omstandigheden, maar dit was al het geval voordat deelnemers de niet-financiële prestaties kenden. Daarom is het bewijs voor impressiemanagement en onderrapportage of opportunistische rapportage door het opnemen of uitsluiten van positieve of slecht presterende niet-financiële KPI's zwak. Deze bevinding kan worden verklaard door eerdere literatuur die stelt dat het risico op rechtszaken van invloed kan zijn op de keuzes over de toelichtingen die worden opgenomen in het jaarverslag (Cazier et al., 2016). Het risico op rechtszaken en de bijbehorende kosten kunnen de prikkels van managers om misleidende informatie te verstrekken verminderen (Cazier et al., 2016; Billings & Cedergren, 2015; Kothari et al., 2009). Daarom kunnen managers het risico met betrekking tot het opnemen of uitsluiten van bepaalde informatie als hoger inschatten in vergelijking met impressiemanagement via presentatievorm.

Tot op heden is er niet veel onderzoek gedaan naar het gebruik van impressiemanagement door bedrijven in een geïntegreerde rapportageomgeving. In dit artikel presenteren wij wat, voor zover wij weten, het eerste onderzoek naar de relatie tussen de financiële prestaties van bedrijven en het gebruik van een impressiemanagementstrategie bij het rapporteren van materiële niet-financiële KPI's in een geïntegreerde rapportagecontext. De resultaten van het onderzoek zijn van belang voor gebruikers van het geïntegreerd verslag, omdat het meer inzicht geeft in de vraag of bedrijven werkelijk transparant zijn in hun geïntegreerd verslag.

6.5. Resultaten onderzoek 3: Niet-financiële en financiële informatie in een geïntegreerd verslag: Hoe connectiviteit de beoordeling van professionele en niet-professionele investeerders van de prestaties, vooruitzichten en hun investeringsbereidheid in het bedrijf beïnvloed

Door middel van een experiment met professionele en niet-professionele investeerders in Nederland, wordt er onderzocht wat de invloed van connectiviteitsniveaus in een geïntegreerd rapport is op de beoordeling door professionele en niet-professionele investeerders over de prestaties en vooruitzichten van een bedrijf, en hun bereidheid om te investeren.

De resultaten van dit onderzoek kunnen relevant zijn voor bedrijven die de voordelen en kosten onderzoeken van geïntegreerd rapporteren en het ontwikkelen, valideren en kwantificeren van connectiviteit. Bedrijven die transparant rapporteren, kunnen de reputatie van het bedrijf en de mogelijkheden voor het aantrekken van kapitaal verbeteren.

De belangrijkste bevinding in dit onderzoek is dat niet-financiële informatie in een geïntegreerd verslag een positieve invloed heeft op de beoordeling van de huidige en toekomstige financiële prestaties door niet-professionele investeerders alsmede hun investeringsbereidheid, maar alleen wanneer het geïntegreerd verslag de niet-financiële informatie koppelt aan de financiële informatie. De beoordeling van de huidige prestaties door professionele investeerders wordt niet beïnvloed door niet-financiële informatie, ongeacht het connectiviteitsniveau, wat wordt verklaard door hun gebruik van vooraf gedefinieerde verwachtingen en analyses. De

vooruitzichten van professionele investeerders op toekomstige prestaties en hun bereidheid om te investeren zijn echter aanzienlijk positiever op basis van een geïntegreerd rapport. Het sterkste effect van geïntegreerde rapportage treedt op wanneer kwalitatieve connectiviteit het verband verklaart tussen niet-financiële informatie en de (toekomstige) financiële impact.

Voor zowel professionele als niet-professionele investeerders treedt het sterkste effect van geïntegreerde verslaggeving op wanneer *kwalitatieve connectiviteit* het verband verklaart tussen niet-financiële informatie en de (toekomstige) financiële impact ervan. Voor niet-professionele investeerders vinden we deze positieve associatie met betrekking tot hun beoordeling van de prestaties en vooruitzichten van een bedrijf, en hun bereidheid om te investeren. Voor de professionele investeerders heeft kwalitatieve connectiviteit geen invloed op hun beoordeling van de huidige prestaties, maar het heeft wel een positieve invloed op hun beoordeling van de vooruitzichten van het bedrijf en hun bereidheid om te investeren.

De impact van *gekwantificeerde connectiviteit* op toekomstige prestaties en investeringsbereidheid is gemengd voor beide groepen investeerders, en wordt mogelijk veroorzaakt door het risico op kosten voor het publiceren van concurrentie gevoelige informatie. De toename van de toekomstige verwachtingen van de prestaties van de bedrijven door niet-professionele investeerders is statistisch significant in het geval van gekwantificeerde connectiviteit. Voor professionele investeerders is de stijging statistisch niet significant. Bij investeringsbereidheid zien we het tegenovergestelde. De toename van de investeringsbereidheid van professionele investeerders is statistisch significant in het geval van

gekwantificeerde connectiviteit. Voor niet-professionele investeerders is de toename van de investeringsbereidheid statistisch niet significant.

De verschillen die we in dit onderzoek vinden tussen niet-professionele en professionele investeerders kunnen worden verklaard door de theorie dat professionele investeerders kritischer zijn op de kwaliteit van niet-financiële informatie dan niet-professionele investeerders.

De beslissingen van professionele investeerders kunnen ook worden gestuurd door een impliciet (automatisch) proces, aangezien ze de voorkeur geven aan een meer traditionele analyse op basis van financiële bedrijfsinformatie (Cohen, 2012; Rzeszutek, 2016) . Ervaren professionele investeerders maken uitgebreider gebruik van bekende en geavanceerde fundamentele methodes op basis van financiële informatie (Cohen, 2012). Daarom heeft het niveau van connectiviteit van niet-financiële en financiële informatie in het geïntegreerde rapport een kleine impact op de waarderingsbeslissingen van ervaren professionele investeerders.

Bovendien blijkt uit onze gegevens dat niet-professionele investeerders een statistisch significant hogere voorkeur hebben voor maatschappelijk verantwoord ondernemen (MVO) dan professionele investeerders. Meer specifiek, volgens de centrale verwerkingstheorie van het Elaboration Likelihood Model (ELM), kan dit erop wijzen dat niet-professionele investeerders meer geven om niet-financiële informatie en daarom meer aandacht zullen besteden aan niet-financiële informatie en de huidige prestaties gunstiger zullen evalueren wanneer zij niet-financiële informatie ontvangen.

Het onderzoek levert waardevolle resultaten op over de inhoud van geïntegreerde rapporten en de beoordeling door investeerders van de prestaties en vooruitzichten van een bedrijf, en hun investeringsbeslissingen.

De resultaten zijn ook relevant in de context van de ontwikkeling van Standaarden op niet-financiële verslaggeving door EFRAG in relatie tot de EU CSRD (2021), waarbij connectiviteit is geïdentificeerd als een relevante doelstelling. Bovendien zijn de resultaten relevant in de context van de door de IASB herziene conceptversie van de Management Commentary exposure draft (2021).

6.6. Conclusie

De drie onderzoeken vormen een belangrijke bijdrage aan de wetenschap omdat ze het gebruik en het nut van geïntegreerde verslaglegging en niet-financiële informatie, inclusief de kwaliteitskenmerken van niet-financiële informatie, voor normstellers, bedrijven en investeerders onderzoeken.

Vanuit een standard setter perspectief laat het eerste artikel (hoofdstuk 2) in het proefschrift zien dat de meeste kwaliteitskenmerken die van toepassing zijn voor financiële verslaggeving ook relevant zijn voor niet-financiële verslaggeving. Echter, investeerders hebben ook andere kwaliteitskenmerken geïdentificeerd die van belang zijn voor niet-financiële verslaggeving.

Een interessante bevinding is dat de vorm waarin de informatie wordt gepresenteerd niet vaak wordt genoemd in eerdere literatuur over kwaliteitskenmerken. Ook blijkt uit het onderzoek onder investeerders dat zij de vorm waarin de informatie wordt gepresenteerd het minst belangrijk vinden voor hun investeringsbeslissingen. Dit is interessant in het licht van greenwashing en impressiemanagement. Investeerders lijken minder aandacht te besteden aan de presentatievorm, terwijl bedrijven soms de schuld krijgen van het gebruik van impressiemanagementstrategieën

(Melloni et al., 2016). Impressiemanagement wordt bijvoorbeeld toegepast door prominentere presentatievormen te gebruiken voor positieve niet-financiële prestaties en niet-prominente presentatievormen voor slechte niet-financiële prestaties (Skinner, 1994; Clatworthy & Jones, 2006; Yang & Liu, 2017). Dit is ook een van onze bevindingen in hoofdstuk 3 van dit proefschrift.

De resultaten in hoofdstuk 3 laten zien dat impressiemanagement niet wordt toegepast door niet-financiële KPI's in het geïntegreerde rapport op te nemen of uit te sluiten, maar door prominentere presentatievormen te gebruiken voor positieve niet-financiële prestaties en niet-prominente presentatievormen voor negatieve niet-financiële prestaties.

Dit zijn interessante bevindingen, omdat uit de resultaten in het eerste paper (hoofdstuk 2) blijkt dat de vorm waarin niet-financiële informatie wordt gepresenteerd volgens investeerders het minst belangrijk is. Terwijl de resultaten in het tweede artikel (hoofdstuk 3) laten zien dat bedrijven impressiemanagement toepassen in hun geïntegreerde rapport via presentatievorm. In de praktijk zeggen investeerders dus vaak dat bedrijven geïntegreerde rapportage gebruiken voor 'window dressing' of impressiemanagementdoeleinden, maar in hun investeringsbeslissingen lijken ze dit te negeren en lijken ze zich niet bewust te zijn van deze kloof.

Ook introduceert de CSRD een nieuwe wijziging in de niet-financiële verslaglegging van bedrijven in een poging om greenwashing tegen te gaan met nieuwe regels voor informatieverschaffing over bedrijven, maar de presentatievorm is niet opgenomen in de CSRD als een van kwaliteitskenmerken van informatie.

In de derde studie in het proefschrift (hoofdstuk 4) hebben wij gekeken naar de waarderingsbeslissingen van professionele en niet-

professionele investeerders op basis van verschillende vormen van geïntegreerde rapportage. De resultaten van het experiment laten vanuit een perspectief van investeerders zien dat niet-financiële informatie in een geïntegreerd verslag waarde heeft die relevant is voor de verwachtingen van investeerders op toekomstige prestaties en hun bereidheid om in het bedrijf te investeren. Voor zowel professionele als niet-professionele investeerders treedt het sterkste effect van geïntegreerde rapportage op wanneer kwalitatieve connectiviteit het verband verklaart tussen niet-financiële informatie en de (toekomstige) financiële impact. Dit is een interessante bevinding, omdat het aangeeft dat het voor investeerders voldoende is als bedrijven hun niet-financiële en financiële informatie in het geïntegreerde verslag met woorden verbinden in plaats van hun impact te kwantificeren.

Eerdere literatuur die is opgenomen in hoofdstuk 2 van dit proefschrift noemt connectiviteit van informatie niet als een van de informatiekwaliteitskenmerken. Wel wordt connectiviteit genoemd in Draft ESRS 1 General Requirements (2022), maar niet in het hoofdstuk dat de kwalitatieve kenmerken van informatie identificeert. Dit is opmerkelijk omdat investeerders waarde hechten aan connectiviteit van informatie in het geïntegreerde verslag (hoofdstuk 4) en connectiviteit is het informatiekwaliteitskenmerk dat essentieel is voor geïntegreerde verslaggeving, aangezien het de financiële en niet-financiële informatie in het verslag samenbrengt. Wij zijn van mening dat de resultaten van de onderzoeken in dit proefschrift ons in staat stellen om bij te dragen aan de literatuur en dat de resultaten nuttig kunnen zijn voor de standaardsetter, aangezien het inzicht geeft in kenmerken die nog niet zijn opgenomen in de Standaarden als kwalitatief informatiekwaliteitskenmerk, maar belangrijk om op te nemen, zoals connectiviteit van informatie.

Met betrekking tot de gezamenlijke bijdrage van de onderzoeken aan de literatuur over geïntegreerde verslaggeving, zijn dit interessante bevindingen wanneer ze aan elkaar worden gekoppeld, aangezien er een kloof lijkt te bestaan tussen de behoeften van investeerders en de (on)bewuste manier waarop het bedrijf de informatie in het geïntegreerde rapport presenteert.

Op basis van de drie onderzoeken in dit proefschrift concluderen we dat investeerders denken dat bedrijven impressiemanagement gebruiken in hun geïntegreerde rapportage en dat investeerders aan bedrijven vragen hun niet-financiële informatie gekoppeld aan de financiële informatie in een gekwantificeerde vorm te presenteren, maar onze resultaten (hoofdstuk 2) laten zien dat investeerders de vorm waarin de informatie wordt gepresenteerd het minst belangrijk vinden voor hun investeringsbeslissingen. Er lijkt dus een kloof te bestaan tussen de overtuigingen en acties van investeerders.

Onze resultaten in hoofdstuk 3 laten zien dat bedrijven gebruik maken van impressiemanagement door middel van presentatievorm. Bedrijven benadrukken goede prestaties en zwakken slechte prestaties over materiële niet-financiële KPI's af door middel van de vorm waarin zij de informatie presenteren in hun geïntegreerd rapport. Aangezien investeerders niet geïnteresseerd lijken te zijn in de presentatievorm, zien ze deze vorm van impressiemanagement misschien niet in de geïntegreerde rapporten.

Verder laten onze resultaten in hoofdstuk 4 zien dat het sterkste effect van geïntegreerde rapportage, voor zowel professionele als niet-professionele investeerders, optreedt wanneer kwalitatieve connectiviteit het verband verklaart tussen niet-financiële informatie en de (toekomstige) financiële impact ervan. Dit is een interessante bevinding, omdat het

aangeeft dat het voor investeerders voldoende is als bedrijven hun niet-financiële en financiële informatie in het geïntegreerde rapport verbinden door woorden te gebruiken in plaats van hun impact te kwantificeren.

6.7. Relevantie voor de praktijk

De onderzoeken die in dit proefschrift worden gerapporteerd over het gebruik en nut van geïntegreerde rapportage en niet-financiële informatie onthullen de complexiteit in het landschap van niet-financiële rapportage. Enerzijds de complexiteit voor bedrijven die geacht worden een geïntegreerd verslag uit te brengen en anderzijds de complexiteit voor investeerders om toegang te krijgen tot niet-financiële informatie.

De resultaten zullen implicaties hebben voor bedrijven die de voordelen en kosten onderzoeken van het ontwikkelen en valideren van hun geïntegreerde denkproces binnen de organisatie en hun geïntegreerde rapportageproces. Verder geeft het onderzoek gebruikers van het geïntegreerde verslag inzicht in het gebruik van impressiemanagement. De resultaten in dit proefschrift zijn ook relevant voor de Europese normsteller voor duurzaamheidsverslaglegging en de International Sustainability Standards Board. De resultaten geven een aanbeveling aan de normsteller om de informatiekwaliteitskenmerken voor niet-financiële informatie te herevalueren.

CHAPTER

7

Literature

7. Literature

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About the author

Kavita Nandram MSc. RA is a Chartered Accountant in the Netherlands with a passion for non-financial and integrated reporting. She has a background in financial audit, sustainability assurance, non-financial and integrated reporting with over 10 years of experience at PwC Amsterdam and as a supervisory officer at the Dutch Authority for the Financial Markets (AFM).

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