Master's thesis in Economics

The association between integrated thinking and corporate reporting quality

Moderating effects of board of directors' and audit committee characteristics

Abstract

This study examines the relationship between integrated thinking and corporate reporting quality. Specifically, by means of agency and stakeholder theory, it is examined whether integrated thinking implementation fulfills the need for information asymmetry reduction and increased stakeholder focus. Moreover, this study looks into whether integrated thinking might increase the voluntary disclosure of higher quality information. Corporate reporting quality is measured by means of financial and non-financial reporting quality proxies. This study explores potential moderating effects of characteristics of the board of directors, such as its size, independence and gender diversity, and the audit committee, such as its expertise and independence. Using a sample of 100 European organizations for the period of 2009-2019, the results indicate that integrated thinking has a positive effect on financial reporting quality, but not on corporate and non-financial reporting quality. Additionally, board size, board independence, board gender diversity, audit committee expertise and audit committee independence all are shown to have either short or long term positive moderating effects on the association between integrated thinking and reporting quality. The findings are useful for stakeholders, regulators and standard setters, as an increased focus on these internal assurance mechanisms could lead to enhanced integrated thinking and reporting quality.

Keywords: Integrated thinking, integrated reporting, corporate reporting quality, corporate governance mechanisms, board of directors, audit committee, moderating effect

Name	Jesse Lemajnski
Student number	4612590
Supervisor	Dr. D. Reimsbach
Specialization	Accounting and Control
Date	25th of June 2021

Radboud Universiteit

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1. Introduction

The communicative burden placed on organizations with regard to their corporate disclosure has increased rigorously in the past decades (Beretta & Bozzolan, 2008; Healy & Palepu, 2001). Fueled by the accumulation of recent scandals, crises and climate change, there is a longing desire for an increase in the quality of corporate reporting. Past events, like those of Enron and Worldcom's misleading financial disclosure and Volkswagen's emission scandal, have changed stakeholders' confidence in the way organizations carry out their disclosure. Confidence should be restored by aiming for full transparency, responsibility and accountability (Borgia, 2005). Organizations have been put under more pressure by shareholders, stakeholders and society in general, to become 'good corporate citizens' (Epstein & Buhovac, 2014). They are expected to complement their financially oriented goals by conforming to sustainability related quality concerns regarding environmental, social and governmental (ESG) issues and thus become more focused on their long term impacts (Berger, Cunningham, & Drumwright, 2004).

To address the demand for increased transparency, responsibility and accountability, issuing non-financial reports in combination with financial reports is seen as the main strategy (Rupley, Brown, & Marshall, 2017). Stand-alone reports have been criticized for their inability to provide a complete and thorough understanding of the organization (Bachoo, Tan, & Wilson, 2013). As a result, integrated reporting adoption is gaining momentum as a holistic form of corporate reporting that combines annual reports, sustainability reports and corporate governance reports (Rivera-Arrubla & Zorio-Grima, 2016). There are few cases in which the reporting of non-financial information is mandated, but integrated reporting is predominantly of voluntary nature. By adopting integrated reporting, organizations adhere to stakeholder pressure, while simultaneously enhancing their ability to create "value over the short, medium and long term" (IIRC, 2011, p. 7). This value creation process arises from addressing issues that were not discussed by mere financial reporting (Lai, Melloni, & Stacchezzini, 2018).

However, integrated reporting adoption requires a different organizational mentality, as mainstream corporate reporting is perceived to have severe shortcomings (Feng, Cummings, & Tweedie, 2017). Individual reports lead to unnecessary complexity, disparity among reporting frameworks causes lack of unambiguity and corporate reporting in general struggles with the absence of timeliness and relevance (Adams, 2015; Eccles & Saltzman, 2011; Krzus, 2011; Rowbottom & Locke, 2016). According to the International Integrated Reporting Council (IIRC), current corporate reporting especially fails to capture "critical interdependencies between strategy, governance, operations and financial and non-financial performance" (IIRC, 2011, p. 2). The integrated reporting framework enables organizations to tackle these interdependencies by

connecting financial, social, intellectual, manufactured, human and natural capital to their strategy, which allows organizations to create value, and thus quality, over time (Feng, Cummings, & Tweedie, 2017). This particular link between capital and strategy essentially illustrates the concept of integrated thinking, on which the integrated reporting process is founded. Integrated thinking can be defined as "the active consideration by an organization of the relationships between its various operating and functional units and the capitals that the organization uses or affects" (IIRC, 2021, p. 3). By taking into consideration the interest of heterogeneous stakeholders with an integrated approach, organizations could be better fit to provide quality (Busco, Granà, & Quattrone, 2017).

Previous studies have shown that organizations are willing to demonstrate that sustainability related concerns are inherent in their policy and business operations and thus provide high quality to their stakeholders (Epstein & Buhovac, 2014; Eweje, 2011). However, the reasoning for this willingness to voluntarily report on these aspects can differ. Organizations are expected to act accountably and responsibly towards their stakeholders (Mulgan, 1997). The notion of stakeholder pressure is closely linked to the legitimacy theory, which suggests that organizations use non-financial disclosure as a strategy to influence public perception (Dhaliwal, Li, Tsang, & Yang, 2011). These organizations are forced to satisfy societal expectations, the so-called 'social contract', if they want to continue their operations (Deegan, 2002). Providing higher quality disclosure is therefore in their best interest. Moreover, signaling theory explains why organizations that provide greater value attempt to reveal their true nature and strategy towards sustainability by disclosing more non-financial information, ultimately aiming to increase their market value (Dhaliwal, Li, Tsang, & Yang, 2011). Whereas integrated thinking might lead to organizations providing greater value and thus higher quality to their stakeholders, these theories suggest that these higher quality organizations are in turn more likely to voluntarily provide higher quality disclosure.

Interestingly, what these different theories show is that a distinction should be made between the quantity and the quality of corporate reporting. Rather than making sure that the disclosed information is concise and material, organizations tend to resort to 'over reporting' (Montecalvo, Farneti, & De Villiers, 2018). Even though an increased amount of disclosed information would seem desirable to reduce information asymmetry (Leuz & Verrecchia, 2000), its impact could actually be quite damaging for corporate reporting quality. By shifting focus on quality, rather than quantity, corporate disclosure has the potential to reduce information asymmetry in accordance with agency theory, by decreasing the amount of private information, ultimately leveling the playing field for investors (Brown & Hillegeist, 2007). This particular shift in focus is visible in the corporate reporting literature and requires more attention (Eccles & Serafeim, 2015; Klai & Omri, 2011). More specific, drivers of corporate reporting quality need to be further explored (Manning, Braam, & Reimsbach, 2019; Pistoni, Songini, & Bavagnoli, 2018; Vitolla, Raimo, & Rubino, 2019).

Some potential drivers of corporate reporting quality can be found in varying corporate governance mechanisms. Effective corporate governance mechanisms are likely to have a positive moderating effect on the relationship between integrated thinking and corporate reporting quality (Hamad, Draz, & Lai, 2020). It is argued that "it takes leadership – a certain kind of leadership – to transform a business into a sustainable business" (Eweje, 2011). The adoption of integrated thinking requires a vision, commitment, and leadership for it to have positive effects on corporate reporting quality (Eweje, 2011). An organization's stakeholders and its management have to deal with a separation of ownership and control. According to Cohen et al. (2011), the board of directors and its audit committee are some of the most crucial corporate governance mechanisms to resolve this issue. In line with agency theory, the aforementioned corporate governance mechanisms may reduce information asymmetry and thus aid in the goals of integrated thinking (Odoemelam & Ofoegbu, 2018). Therefore, this study examines the moderating effects of corporate governance mechanisms such as board monitoring and audit committee effectiveness, to examine whether these mechanisms have a moderating effect on the relationship between integrated thinking and reporting quality. To operationalize these moderating effects, this study builds on previous studies that have found effects on integrated reporting and its quality. These effects are elicited by characteristics such as the board of director's size, independence and diversity (Frias-Aceituno, Rodriguez-Ariza, & Garcia-Sanchez, 2013; Hurghiş, 2017; Velte & Stawinoga, 2017) and the audit committee's independence and expertise (Haji & Anifowose, 2016), as all are able to influence and put pressure on the integrated thinking decision-making process (Gunarathne & Senaratne, 2017).

This study examines the relationship between integrated thinking and the quality of corporate reporting. Moreover, it explores whether there are moderating effects that influence said relationship. Pistoni et al. (2018) argue that the drivers of corporate reporting quality can be both internal firm specific characteristics and external environmental characteristics. Therefore, this study aims to find how and under what circumstances integrated thinking might affect corporate reporting quality. This leads to the following research question:

How and under what circumstances does integrated thinking elicit corporate reporting quality?

This study aims to contribute to prior research in several ways. First, it fulfills the request of several studies (Manning, Braam, & Reimsbach, 2019; Pistoni, Songini, & Bavagnoli, 2018; Vitolla, Raimo, & Rubino, 2019) to look into the drivers of corporate reporting quality more thoroughly. Since integrated thinking is a relatively new concept, the literature surrounding it is rather scarce. Moreover, the quantity of corporate reporting in relation to its determinants has been examined

before (Odoemelam & Ofoegbu, 2018). Therefore, by shifting the focus to the quality of corporate reporting, this study aims to contribute to this current knowledge gap. Second, this study examines the relationship between integrated thinking and corporate reporting quality by examining the conditions under which the effect might be strengthened or weakened. More specific, the role of certain board of directors' and audit committee characteristics as a moderator is explored. This study is one of the first to examine moderating effects with respect to the relationship between integrated thinking and corporate reporting quality. Therefore, it might have severe implications for regulators and standard setters, as governance regulations might prove to be the key to enhance integrated thinking and corporate reporting quality.

The remainder of this study is structured as follows. Chapter 2 will present the theoretical background relevant to integrated thinking, corporate reporting quality and the possible moderating effects of board of directors' and audit committee characteristics, followed by the development of hypotheses. Next, chapter 3 will provide the research design including the sample, variables and model. Chapter 4 contains the data analysis and the results. The last section, chapter 5, includes the discussion of possible implications, conclusion, limitations and suggestions for future research.

2. Theoretical background and hypotheses development

2.1 Non-financial information disclosure

Non-financial information disclosure, such as information regarding economic, social and governance (ESG) factors and corporate social responsibility (CSR), is highly demanded by stakeholders nowadays. Stakeholders aim to get a full understanding of the organization, the view provided should be fair and the valuation of the less tangible assets is crucial for the value-creation process of the organization (Arvidsson, 2011). Non-financial information disclosure is still mostly of voluntary nature, whereas the disclosure of financial information is mandated for public organizations. The rationale behind voluntary non-financial information disclosure practices can be derived from a wide array of theories, as this practice is too complex to be explained by a single theory (Arvidsson, 2011; Buhr, 2007; Fernando & Lawrence, 2014).

Agency theory is defined by the agency relationship, in which it differentiates between the engaging party, the principal, and the party with decision-making authority, the agent (Shehata, 2014). Linking this to voluntary disclosure practices, it is the shareholders, as the principals, that demand a certain degree of information provision from the management of the organization, the agent. Their reasoning being, that agents are assumed to be acting in their own interest, following the idea of opportunistic behavior (Zogning, 2017). Opportunistic behavior is defined as the manipulation of information accessible to managers and arises from the difference in accessible information between the two parties, called information asymmetry (Stiglitz, 1985). This clear conflict of interest is partly resolved by voluntary disclosure of non-financial information, as it both closes the information gap between principals and agents and convinces stakeholders that management is acting accordingly (Shehata, 2014; Watson, Shrives, & Marston, 2002). Moreover, more disclosure could be beneficial for the firm itself, as it was found to enhance the performance and effectiveness of corporate governance mechanisms (Siagian, Siregar, & Rahadian, 2013).

In the extant literature, voluntary disclosure theory is used to describe the willingness of organizations to show that non-financial concerns are inherent in their policy and business operations, and is often related to signaling theory and legitimacy theory (Epstein & Buhovac, 2014; Eweje, 2011). Disclosure is seen as a tool of communication to stakeholders (Guidry & Patten, 2012). However, besides using this tool as a way to reduce information asymmetries between agents and principals, disclosure can also be used in ways in which organizations partake in impression management in response to social and political pressures (Darrell & Schwartz, 1997; Patten, 1991). The latter phenomenon stems from the superior information managers have compared to their stakeholders and is aided by the limitations of accounting regulation and auditing (Guidry & Patten, 2012). Healy and Palepu (2001) describe that contracting, political, and corporate reasons incentivize

managers to partake in impression management.

Signaling theory posits that organizations that provide great value and high quality to their stakeholders tend to signal this to the market (Clarkson, Li, Richardson, & Vasvari, 2008; Healy & Palepu, 2001). Generally speaking, users of information have to deal with information asymmetry in an attempt to distinguish superior and inferior performers (Spence, 1973). The (voluntary) disclosure of information hence closes this information gap by providing credible signals that are both observable and too costly to imitate by inferior performers (Certo, 2003). One of the main motives for superior performing organizations to disclose ESG and CSR related information is to distinguish themselves to attract investors and enhance reputation (Gugerty, 2009). Moreover, by revealing their true nature and strategy towards sustainability by increasing the quantity of non-financial information disclosure, organizations are able to increase their market value due to reduced cost of capital and improved financing (Dhaliwal, Li, Tsang, & Yang, 2011).

Legitimacy theory delineates the actions organizations take to conform to societal expectations (Cohen, Krishnamoorthy, & Wright, 2004; Deegan, 2002). By adhering to these norms, a good state of legitimacy can be maintained, which is crucial for an organization's continued survival (An, Davey, & Eggleton, 2011). The expectations of society are ever changing and unforeseen circumstances can lead to severe organizational threats and risks (Fernando & Lawrence, 2014). Therefore, opposed to signaling theory, legitimacy theory mostly pertains to organizations with inferior non-financial performance. Whereas superior performers attempt to signal their true performance, these inferior performers only selectively disclose favorable information to deceive public perception (Dhaliwal, Li, Tsang, & Yang, 2011). Due to the omission of unfavorable news, stakeholders and the general public will overestimate an organization's capabilities, ultimately legitimizing its actions (Freedman & Patten, 2004; Lindblom, 1994). However, to avoid a bad image, providing higher quality disclosure is still in their best interest.

Stakeholder theory defines an organization's ability to create value and its effectiveness in relation to its stakeholders (Fernando & Lawrence, 2014; Parmar, Freeman, Harrison, Wicks, Purnell, & De Colle, 2010). These stakeholders can range from shareholders to customers and can be defined as "any group or individual who can affect or is affected by the achievement of the firm's objectives" (Freeman, 2010, p. 49). This theory builds on the idea of accountability and the broader concept of responsibility (Mulgan, 1997). This concept posits that the organization should not merely focus on living up to the expectations of its shareholders, but also to the expectations of its stakeholders in general. This means that organizations are expected to go beyond providing financially oriented insights that mostly pertain to shareholders and investors. Organizations could do this by reporting information on its accountability and responsibility regarding its non-financial activities and externalities (Guthrie, Petty, & Ricceri, 2006; Smith, 2008). Some key assumptions within stakeholder

theory deal with the effectiveness of achieving organizational goals, the balancing of conflicting interests of different stakeholders and the organization's adherence to financial, social and environmental responsibilities to its stakeholders (Fernando & Lawrence, 2014). Thus, an organization's management is incentivized to voluntarily disclose information beyond what the market requires to positively influence its stakeholders (Mahoney, 2012; Michelon, 2011).

2.2 Integrated thinking and corporate reporting quality

In contrast to stand-alone reporting, integrated reporting aims to provide organizations with a holistic approach to corporate reporting that combines annual reports, sustainability reports and corporate governance reports that were previously being issued separately (Rivera-Arrubla & Zorio-Grima, 2016; Rodriguez & LeMaster, 2007). This system of reporting is guided by extensive frameworks and standards that address measurement and disclosure related issues with regard to the aforementioned capitals, regulations and assurance (IIRC, 2021, p3). Not only does integrated reporting allow information to be linked to financial statements with more ease, it also adheres to the call for increased transparency, responsibility and accountability which is in accordance with stakeholder theory (Lee, 2008; Rupley, Brown, & Marshall, 2017). Whereas the IIRC argues that stakeholders are offered a comprehensive overview of relevant financial and non-financial information that focuses on "value over the short, medium and long term" (IIRC, 2011, p. 7), some argue that pivotal problem areas underlying the integrated reporting framework need to be addressed before it can "stand the test of time" (Oll & Rommerskirchen, 2018).

Integrated reporting and integrated thinking are two concepts that should go hand in hand if the goal is to positively influence corporate reporting quality, mostly because integrated reporting requires a solid foundation on which it should be built (Feng, Cummings, & Tweedie, 2017; Lodhia, 2015). Integrated reporting on its own would lack the underlying organizational mindset inherent within integrated thinking, which can together be defined as the 'process' (Mertins, Kohl, & Orth, 2012). This 'process', the "active consideration by an organization of the relationships between its various operating and functional units and the capitals that the organization uses or affects" (IIRC, 2021, p. 3), could enable a multiplicity of benefits, including increased effectiveness of capital and resource allocation and it could thus improve the organization's business strategy (Feng, Cummings, & Tweedie, 2017). According to Dumai and Dai (2017), a shift from 'silo thinking' to 'integrated thinking' is visible within organizations that adopt integrated reporting, evoked by the re-thinking of strategy, business model and corporate governance. This essentially means that organizational processes are considered as integrated, rather than separated. In line with agency theory, this has the potential to decrease information asymmetries and enhance the quality of disclosure. However,

a certain level of engagement is required to drive organizational change, as involvement of actors within the organization is fundamental for the institutionalization of the new reporting practice and the enhancement of its quality (Guthrie, Manes-Rossi, & Orelli, 2017).

This shift to a state where integrated thinking is embedded into daily organizational affairs is said to enhance the connectivity between information flows and management reporting, analysis and decision-making (IIRC, 2021). This is closely linked to one of integrated thinking's main aims: better overall internal and external communication. To put it another way, integrated thinking elicits the conveyance of information of how value is created over time (Venter, Stiglingh, & Smit, 2017). It is of great importance for organizations to try to balance their short and long term value creation goals (Churet & Eccles, 2014). Finding this balance depends on the organization's ability to deal with unforeseen risks and other economic, social and governance related issues. By managing every potential source of value, integrated thinking and integrated reporting could provide a long term outlook that facilitates corporate reports of high quality (De Villiers, Venter, & Hsiao, 2017). This is mainly due to the fact that these long term outlooks are relevant for stakeholders (Serafeim, 2015).

In summary, integrated thinking ultimately aims to enhance the quality of disclosed information for stakeholders to ensure efficient capital allocation and to support integrated internal thinking to emphasize the value creation, preservation and destruction processes of the firm (Barth, Cahan, Chen, & Venter, 2017). The adoption of integrated thinking and integrated reporting has been found to positively affect corporate reporting quality, as it provides a clear overview of the firm's strategy (Pavlopoulos, Magnis, & Latridis, 2019). Moreover, integrated thinking may allow organizations to provide value with more ease. Subsequently, in line with signaling theory, these organizations may signal their increase in value provision by providing corporate disclosure of higher quality. Additionally, the improved transparency and clarity that comes with integrated reporting makes it more desirable for stakeholders than stand-alone reporting (Eccles & Krzus, 2014). Integrated thinking takes the stakeholder's legitimate needs and interest into account (IIRC, 2021). Lastly, it is in the organizations best interest to provide high quality information if its goal is to legitimize its way of doing business. Therefore, it is expected that integrated thinking will have a positive effect on the quality of corporate reporting. This leads to the following hypothesis:

H1a: There is a positive association between integrated thinking and corporate reporting quality

2.2.1 Financial reporting quality

Corporate reporting quality can be split up into financial reporting quality and non-financial reporting quality. Prior academic literature lacks a generally accepted definition of financial reporting quality (Cohen, Krishnamoorthy, & Wright, 2004; Gaynor, Kelton, Mercer, & Yohn, 2016). However, in

accordance with the IASB (2021), financial insights should include information on the organization's practices and should be of use to investors, lenders and creditors for decision-making and resource allocation purposes (Gaynor, Kelton, Mercer, & Yohn, 2016). The usefulness of information depends on several qualitative characteristics. It should be provided in a timely manner (IASB, 2021) and should be fully, fairly and faithfully represented (Jonas & Blanchet, 2000). It should also be reliable, which entails that it should be verifiable, neutral, complete and free from error (IASB, 2021). Gassen and Schwedler (2010) found that there is a trade-off between relevance and reliability, as relevant outcomes are often less reliable and reliable values are less relevant. Lastly, clear and concise presentation of information enhances its understandability and usefulness (IASB, 2021).

Financial reporting quality can be exemplified by earnings management, as it has been found to be inversely related with the existence of earnings management within organizations (Dechow & Schrand, 2004). According to Healy and Wahlen (1999), "earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers" (Healy & Wahlen, 1999, p. 368). Thus, management's incentives have a big influence on financial reporting quality (Gaynor, Kelton, Mercer, & Yohn, 2016). Moreover, earnings management is oftentimes linked to a poor set of standards and will lead to low quality financial reports (Lo, 2008). Earnings management practices decrease the faithful representation of the financial statements and therefore decrease financial reporting quality (DeFond & Zhang, 2014; Jonas & Blanchet, 2000). Opportunistic behavior in the form of earnings management can be diminished by means of efficient corporate governance mechanisms. For example, audit committees serve as internal organizational mechanisms and function as financial reporting overseer and stakeholder protector (McDaniel, Martin, & Maines, 2002). Furthermore, the opportunistic behavior of managers can be counteracted by integrated thinking, as stakeholders' needs are embedded within the decision-making processes (IIRC, 2011; Jonas & Blanchet, 2000). Therefore, integrated thinking and earnings management are expected to be negatively associated. In addition, earnings management is expected to be negatively related to financial reporting quality. These expectations can be expressed in the following hypothesis:

H1b: There is a positive association between integrated thinking and financial reporting quality

2.2.2 Non-financial reporting quality

The number of organizations that have adopted non-financial reporting has been steadily increasing in recent years (Diouf & Boiral, 2017). Acting in a sustainable way encompasses the linkage of environmental and social issues to economic objectives (GRI, 2020). This approach is oftentimes

referred to as the triple bottom line of sustainability (Quick, 2008). Much like financial information, non-financial information should adhere to similar requirements as it should be full and transparent (Bachoo, Tan, & Wilson, 2013; Jonas & Blanchet, 2000). In accordance with signaling theory, organizations are expected to credibly convey high quality non-financial information to their stakeholders to decrease the knowledge gap between the two parties. However, based on legitimacy theory, organizations are expected to disclose non-financial information in an attempt to legitimize their behavior. Disclosing high quality information would be in their best interest.

Whenever integrated thinking is apparent within an organization, decision-making is based upon the aforementioned sustainability related economic, environmental and social dimensions. Venter et al. (2017) argue that this coincides with a clear organizational structure in which managers are coerced to think in an integrated manner. Moreover, Lodhia (2015) states that this organized way of working ultimately leads to a responsible and proactive way to resolve issues like information asymmetries, which is in line with both agency and stakeholder theory. The concise way of working inherent in integrated thinking could therefore also be able to contribute to higher quality (non-financial) reports on these issues (Venter, Stiglingh, & Smit, 2017). In line with these arguments, the following hypothesis is formulated:

H1c: There is a positive association between integrated thinking and non-financial reporting quality

2.3 Corporate governance mechanisms

The interconnectedness between integrated thinking and corporate reporting quality is subject to organizational structures, policies and controls as these have the ability to steer the organization's processes towards its objectives (Hamad, Draz, & Lai, 2020). As Eweje (2011) argued, it is impossible to get a comprehensive view on corporate objectives without having a complete understanding of how corporate management satisfies the demands of its stakeholders. This is conisistent with stakeholder theory, which posits that managers have fiduciary obligations to its stakeholders (Freeman, 1994). To positively affect corporate reporting quality, the adoption of integrated thinking requires management to show leadership with vision and commitment (Eweje, 2011). As investors seek to assess the organization's performance and credibility, more is demanded from organization in terms of the quality, quantity and integratedness of their reporting practices (Clarkson, Li, Richardson, & Vasvari, 2008; Sawani, Zain, & Darus, 2010).

Corporate governance mechanisms are organizational structures that can aid in embedding integrated thinking within organizations (Guthrie, Manes-Rossi, & Orelli, 2017). According to Guthrie et al. (2017), embedding integrated thinking within organizations could benefit from explicit

coercion, which concerns the facilitating process that empowers agents within the organization to act towards the goals of integrated thinking. Aras and Crowther (2008) noted that organizations with a more complete understanding of both corporate governance and non-financial issues will provide more complete and higher quality reports. Previous research that examined the effect of corporate governance on corporate reporting quality state that poorly governed firms have a higher likelihood to be associated with financial statement fraud, and thus with lower quality corporate reporting (Beasley, 1996; Dechow, Sloan, & Sweeney, 1995). Effective corporate governance mechanisms were found to be complementary in its benefits towards the quality of corporate financial and non-financial disclosure (Michelon & Parbonetti, 2012).

More specific, with agency theory in mind, the board of directors is seen as the main corporate governance mechanism that can bring about organizational change and it has the ability to institutionalize integrated thinking within the organization (Guthrie, Manes-Rossi, & Orelli, 2017; Nanka-Bruce, 2011). Additionally, Haji and Anifowose (2016) state that the audit committee, as one of the board's subcommittees and the organization's internal assurance mechanism, "functions to ensure the integrity of non-financial disclosures in the integrated reports" (Haji & Anifowose, 2016, p. 916). The audit committee thus strongly influences whether the organization discloses quality information, be it to signal or to legitimize their actions. Moreover, an organization's stakeholders and its management have to deal with a separation of ownership and control. According to Cohen et al. (2011), the board of directors and its audit committee are some of the most crucial corporate governance mechanisms to resolve this issue. Therefore this thesis examines and differentiates between board monitoring and audit committee effectiveness to examine their potential moderating effects on the association between integrated thinking and corporate reporting quality.

2.3.1 Board of directors

As posed by Gillan (2006), the board of directors, the organization's internal governing body, is often seen as the lynchpin of corporate governance. It both has an obligation to its shareholders and is responsible for the organization's decision-making and monitoring (Gillan, 2006). Also, the board of directors aims to implement policies for stakeholder engagement and tries to attain holistic transparency (Frias-Aceituno, Rodriguez-Ariza, & Garcia-Sanchez, 2013). With respect to agency theory, better monitoring enables the closing of the information gap between principal and agent in which the interest alignment of both parties is central (Jensen & Meckling, 1976). Previous studies show that the performance of the board can reduce information asymmetries, protecting shareholder's interests in consequence (Michelon & Parbonetti, 2012). Moreover, because of its responsibility for a clear vision and mission in which sustainability related values are anchored, the

board has the ability to force management's adoption of, and compliance with, non-financial reporting guidelines (Amran, Lee, & Devi, 2014). Managing board effectiveness therefore has the potential to moderate the relationship between integrated thinking and corporate reporting quality (Vitolla, Raimo, & Rubino, 2020). Corporate governance mechanisms, like the board, are the prime instruments to drive change. For example, by providing greater responsibility and transparency, more effective boards could enhance the positive effects of integrated thinking on corporate reporting quality. Put differently, how effective the board is, has the ability to determine and alter the relationship between integrated thinking and reporting quality.

In the extant literature, the effectiveness of the board in attaining the aforementioned goals is mostly determined by its characteristics such as its size, independence and diversity (Beasley, 1996; Frias-Aceituno, Rodriguez-Ariza, & Garcia-Sanchez, 2013; Kang, Cheng, & Gray, 2007). First, the increased agency problems that arise in larger boards cause the monitoring effectiveness of the board to be less optimal and larger board have also been linked to a lower willingness to disclose information regarding corporate actions (De Andres, Azofra, & Lopez, 2005). Controversially, previous research has shown that the presence of a considerable number of directors is associated with a greater assurance of accurate corporate disclosure (Frias-Aceituno, Rodriguez-Ariza, & Garcia-Sanchez, 2013). Moreover, Hurghiş (2017) found a direct link between boards of greater size and the issued integrated report being in accordance with the IIRC framework. In agreement with the latter, it is believed that the relationship between the integration and the quality of corporate information is positively moderated by boards of larger size.

Next, the board's effectiveness significantly increases in case of a greater number of independent board members. Board independence is characterized by board members that have no direct involvement with regular business operations (Liao, Luo, & Tang, 2015) and are not officially associated with the organization in the form of material financial interests (Harjoto & Jo, 2011). These non-executive directors are known to be striving for proper conduct, ultimately aiming to attain organizational objectives (Frias-Aceituno, Rodriguez-Ariza, & Garcia-Sanchez, 2013). Greater independence comes with greater objectivity and non-executive directors have no fear for reputational losses (Fama & Jensen, 1983). Dependent directors were also found to be associated with a more short-term orientation, whereas independent directors would take a broader perspective with regard to financial organizational goals (Johnson & Greening, 1999). This is in accordance with the findings of Lim et al. (2007), as they state that independent boards generally disclose more forward looking information. With that in mind, a positive moderating effect of the independence of the board on the relationship between integrated thinking and corporate reporting quality is expected.

Last, the board's diversity can be described as the disparity of characteristics inherent within

board members (Frias-Aceituno, Rodriguez-Ariza, & Garcia-Sanchez, 2013). Robinson and Dechant (1997) declare that greater diversity promotes enhanced problem-solving and increased leadership effectiveness. Not only is this caused by the fact that different ideas lead to the inclusion of more perspectives, but also because of the consideration of different ethics, traditions and cultures. Several studies have shown that both the quality and the quantity of non-financial disclosure are positively affected by increased board diversity (Andrew, Gul, Guthrie, & Teoh, 1989; Guthrie & Parker, 1990; Michelon & Parbonetti, 2012). This holds for gender diversity as well, as an increase in female board members is linked to an increased consideration of non-financial issues due to specific values inherent in women (Diamantopoulos, Schelgelmilch, Sinkovics, & Bohlen, 2003). For example, women are considered to be less self-centered, which increases board monitoring effectiveness (Liao, Luo, & Tang, 2015). The larger extent of ethical perceptions therefore causes gender diverse boards to outperform boards that are less diverse (Carter, Simkins, & Simpson, 2003; Erhardt, Werbel, & Shrader, 2003). Also, according to Velte and Stawinoga (2017), greater board diversity is strongly correlated with stakeholders' perceptions about the communication processes of the organization. Consequently, it is expected that the diversity of the board of directors positively moderates the relationship between integrated thinking and corporate reporting quality.

In line with agency theory, stakeholder theory and the work of Michelon and Parbonetti (2012), the board of directors and its characteristics is expected to be fundamental to an organization's quality of disclosure. Moreover, more effective boards have the ability to indirectly increase disclosure quality by enhancing integrated thinking. Thus, board monitoring effectiveness is expected to positively moderate the relationship between integrated thinking and financial, non-financial and corporate reporting quality. Hence, the following hypotheses have been formulated:

H2a: There is a positive moderating effect of board monitoring effectiveness on the association between integrated thinking and corporate reporting quality

H2b: There is a positive moderating effect of board monitoring effectiveness on the association between integrated thinking and financial reporting quality

H2c: There is a positive moderating effect of board monitoring effectiveness on the association between integrated thinking and non-financial reporting quality

2.3.2 Audit committee

One of the board's responsibility committees to which it can delegate authority is the audit committee, which is responsible for overseeing the organization's reporting processes as 'the ultimate monitor' (Klein, 2002). Auditors have criticized audit committees for being ineffective as a corporate governance mechanism (Cohen, Krishnamoorthy, & Wright, 2004). Nevertheless, the audit committee ensures the reliability of the organization's reporting processes by selecting and meeting with the external auditor (Abdullah & Nasir, 2004). Moreover, it meets separately with senior financial management, all whilst remaining critical towards whether all parties are still acting in the organization's best interests (DeZoort, Hermanson, Archambeault, & Reed, 2002). Next to that, the audit committee contributes to internal control improvements by aiming for better accountability and risk management (Bananuka, Nkundabanyanga, Nalukenge, & Kaawaase, 2018). To get a clear understanding of what the effectiveness of the audit committee implies, the definition by DeZoort et al. (2002) is used, which states: "an effective audit committee has qualified members with the authority and resources to protect stakeholder interests by ensuring reliable financial reporting, internal controls, and risk management through Its diligent oversight efforts" (DeZoort, Hermanson, Archambeault, & Reed, 2002). This definition highlights the most relevant characteristics for its moderating effect on the relationship between integrated thinking and corporate reporting quality, by simultaneously increasing its scope from shareholders to stakeholders (Haji & Anifowose, 2016). In compliance with stakeholder theory, the audit committee's duties towards stakeholders should aid in decreasing the overload of information, thus enhancing its quality (Velte, 2018).

In the extant literature, characteristics such as independence and expertise are used to determine the effectiveness of the audit committee in attaining the aforementioned goals (Chariri & Januarti, 2017; Raimo, Vitolla, Marrone, & Rubino, 2021; Velte, 2018). First, the independence of the board, depicted by number of independent audit committee members, can have significant effects on the committee's effectiveness. Much like board independence, audit committee independence is characterized by members that are not involved in the organization's day-to-day operations and that have no material financial interests (Madi, Ishak, & Manaf, 2014). They are less sensitive and vulnerable to management pressure, reducing the risk of opportunistic behavior (Allegrini & Greco, 2013). In accordance with agency theory, information asymmetries are remedied as independent directors in the audit committee are better able to impose transparent and high quality disclosure (Li, Mangena, & Pike, 2012). Audit committee independence has been found to lead to increased and better voluntary disclosure (Akhtaruddin & Haron, 2010; Patelli & Prencipe, 2007). Therefore, in accordance with the latter and with Madi et al. (2014), it is believed that the relationship between integrated thinking and the quality of corporate information is positively moderated by the independence of the audit committee.

Next, previous research has found that audit committees with financial expertise can be linked to a higher effectiveness in accomplishing its oversight duties (Tanyi & Smith, 2015). Financial expertise can be defined as the inclusion of financial experts in the audit committee (Haji & Anifowose, 2016). Examples of financial experts are those educated or experienced in accounting, auditing or finance. Haji and Anifowose (2016) argue that some of the main benefits of audit committee expertise are that it "mitigates conflicts between management and external auditors; curbs well internal control weaknesses; results in positive capital market reactions; and enhances financial and non-financial disclosures" (Haji & Anifowose, 2016, p. 924). Moreover, less earnings management and fewer accounting restatements are other positive effects associated with audit committee financial expertise (Tanyi & Smith, 2015). Audit committees with financial expertise cause managers of the firm to think in an integrated manner (Venter, Stiglingh, & Smit, 2017). The larger part of previous literature has found financial expertise to be linked to higher quality financial reporting (Haji & Anifowose, 2016). It is therefore assumed that the association between integrated thinking and corporate reporting quality benefits from the inclusion of financial experts in the audit committee.

In line with agency theory and stakeholder theory, as well as the work of Madi et al. (2014) and Haji and Anifowose (2016), the audit committee and its characteristics, as part of the board of directors, is expected to have a positive moderating effect on the association between integrated thinking and financial, non-financial and corporate reporting quality. Therefore, the following hypotheses have been formulated:

H3a: There is a positive moderating effect of audit committee effectiveness on the association between integrated thinking and corporate reporting quality

H3b: There is a positive moderating effect of audit committee effectiveness on the association between integrated thinking and financial reporting quality

H3c: There is a positive moderating effect of audit committee effectiveness on the association between integrated thinking and non-financial reporting quality

3. Research design

3.1 Sample

Within this study, a panel data analysis with a sample consisting of 100 European listed organizations was conducted. A sample set of 1000 firm-year observations was collected for the period of 2009 to 2019. Due to limited access to the measure for non-financial reporting quality, these 100 organizations have been selected based on full data availability. Table 1 and table 2 show the country and industry distributions of these organizations respectively. No yearly distinction has been made, as the organizations remained similar over the years. The relevant financial and non-financial data has been obtained from the Refinitiv Eikon database, which builds on the ASSET4 database of Thomson Reuters. For the sake of consistency, the denotation of the Euro is used. Some amounts denoted in other currencies than the Euro were therefore converted.

Some of the key limitations of research within the realm of corporate reporting quality were noisy measures of sustainability reporting (Bachoo, Tan, & Wilson, 2013). The Environmental, Social and Corporate Governance (ESG) data from the Refinitiv Eikon database is a well acknowledged source as "ESG Scores from Refinitiv Eikon are designed to transparently and objectively measure a company's relative ESG performance, commitment and effectiveness across 10 main themes (emissions, environmental product innovation, human rights, shareholders, etc.) based on publicly-reported data" (Refinitiv, 2021). Moreover, it provides ESG related indicators in a much needed systematic and comprehensive way (De Villiers, Rinaldi, & Unerman, 2014; Simnett & Huggins, 2015). In addition, the ESG transparency disclosure score was obtained from Bloomberg Data Services.

Table 1. Organizations across country distribution (based on ISO codes)

Country	Number of firms
Austria	1 (1%)
Belgium	2 (2%)
Denmark	5 (5%)
Finland	6 (6%)
France	16 (16%)
Germany	24 (24%)
Greece	1 (1%)
Italy	4 (4%)
Netherlands	4 (4%)
Norway	1 (1%)
Spain	2 (2%)
Sweden	9 (9%)
Switzerland	8 (8%)
United Kingdom	17 (17%)
Total	**100 (100%)**

Table 2. Organizations across industry distribution (based on SIC codes)

Industry	Number of firms
Construction	1 (1%)
Manufacturing	78 (78%)
Mining	4 (4%)
Retail trade	1 (1%)
Services	7 (7%)
Transportation, communication, electric, gas and sanitary services	8 (8%)
Wholesale trade	1 (1%)
Total	**100 (100%)**

3.2 Measurement of variables

3.2.1 Dependent variable

This study uses corporate reporting quality as its dependent variable. To measure this variable, it has been divided into two separate proxies, being financial reporting quality and non-financial reporting quality.

3.2.1.1 Financial reporting quality

Previous studies used a wide variety of measures to capture financial reporting quality, like the examination of information completeness (Botosan, 1997), information usefulness (Müller, Riedl, & Sellhorn, 2015) and the likelihood of earnings manipulations (Dechow, Myers, & Shakespeare, 2010). The latter coincides with the idea of Jonas and Blanchet (2000), who argue that high quality financial reports should not mislead its users. Instead, they propose that financial reports should provide sufficient and competent information (Jonas & Blanchet, 2000). These goals are not met when an organization partakes in earnings manipulation or earnings management. Several studies have shown that organizations predominantly use two types of earnings management strategies as substitutes: 'accrual-based earnings management' and 'real earnings management' (Badertscher, 2011; Braam, Nandy, Weitzel, & Lodh, 2015; Cohen, Dey, & Lys, 2008). Accrual-based earnings management can be defined as the alteration of accounting procedures and estimates to bias certain transactions in the organization's financial statements (Zang, 2012). This way, actual economic performance can be concealed, while still remaining within the borders of the generally accepted accounting principles (Dechow & Skinner, 2000). Unlike accrual-based earnings management, which changes the accounting methods, real earnings management is achieved when reported earnings are altered by changing the timing or structuring of a business transaction (Roychowdhury, 2006; Zang, 2012). This study uses accrual-based earnings management and real earnings management as proxies for financial reporting quality.

Accrual-based earnings management

To capture the degree of earnings management within an organization, previous earnings management studies have used discretionary accruals (e.g. Dechow & Dichev, 2002; Cohen & Zarowin, 2010; Zang, 2012). To separate discretionary accruals from non-discretionary accruals, the Jones Model can be used (Bernard & Skinner, 1996). This model has later been modified to adjust for growth in credit sales by Dechow et al. (1995). The Modified Jones Model serves to reduce failures in earnings management detection and has been found to be the most powerful model in detecting earnings management (Dechow, Sloan, & Sweeney, 1995; Jackson, 2018). First, the total accruals should be determined (Braam, Nandy, Weitzel, & Lodh, 2015):

$$TA_{it} = NI_{it} - COA_{it} \quad (1)$$

where: TA_{it} = total accruals in year *t* of firm *i*; NI_{it} = net income in year *t* of firm *i* and COA_{it} = cash flows from operating activities in year *t* of firm *i*. Following that, the Modified Jones Model (Dechow, Sloan, & Sweeney, 1995) can be used to isolate the discretionary part:

$$\frac{TA_{it}}{A_{it-1}} = a_1\left(\frac{1}{A_{it-1}}\right) + a_2\left(\frac{\Delta SALES_{it} - \Delta AR_{it}}{A_{it-1}}\right) + a_3\left(\frac{PPE_{it}}{A_{it-1}}\right) + \varepsilon_t \quad (2)$$

where: A_{it-1} = total assets in year *t* of firm *i*; $\Delta SALES_{it}$ = change in net sales in year *t* of firm *i*; ΔAR_{it} = change in accounts receivables in year *t* of firm *i*; PPE_{it} = (gross) property, plant and equipment in year *t* of firm *i*. This equation can be separated in a non-discretionary part $a_{1t}\left(\frac{1}{A_{it-1}}\right) + a_{2t}\left(\frac{\Delta(SALES-AR)_{it}}{A_{it-1}}\right) + a_{1t}\left(\frac{PPE_{it}}{A_{it-1}}\right)$ and a discretionary part ε_t. This residual denotes the discretionary accruals of which the absolute value is used to determine the degree of accrual-based earnings management in an organization, now referred to as the proxy ABEM. The degree of ABEM is inversely related with financial reporting quality.

Real earnings management

A different way of capturing the degree of earnings management within an organization is by altering reported earnings. Roychowdhury (2006) differentiates between discretionary expenditure reduction, overproduction and sales manipulation. Accordingly, three proxies can be used to capture these real earnings management dimensions: abnormal levels of discretionary expenses, abnormal levels of production costs and abnormal cash flows from operations (Braam, Nandy, Weitzel, & Lodh,

2015). Several other earnings management studies have built on Roychowdhury (2006) to derive corresponding formulas for the three proxies (e.g. Cohen & Zarowin, 2010; Li V., 2019; Zang, 2012). First, the abnormal levels of discretionary expenses can be estimated using the following equation:

$$\frac{DISX_{it}}{A_{it-1}} = \beta_0 + \beta_1\left(\frac{1}{A_{it-1}}\right) + \beta_2\left(\frac{SALES_{it-1}}{A_{it-1}}\right) + \varepsilon_{it} \quad (3)$$

where: $DISX_{it}$ = discretionary expenses in year *t* of firm *i*, sum of SG&A (selling, general and administrative expenses) and R&D (research and development) expenses. The estimated residual ε_{it} resulted in the abnormal CFO (*REM_CFO*). Second, the abnormal levels of production costs can be estimated using the following equation:

$$\frac{PROD_{it}}{A_{it-1}} = \beta_0 + \beta_1\left(\frac{1}{A_{it-1}}\right) + \beta_2\left(\frac{SALES_{it}}{A_{it-1}}\right) + \beta_3\left(\frac{\Delta SALES_{it}}{A_{it-1}}\right) + \beta_4\left(\frac{\Delta SALES_{it-1}}{A_{it-1}}\right) + \varepsilon_{it} \quad (4)$$

where: $PROD_{it}$ = production costs in year *t* of firm *i*, sum of COGS (cost of goods sold) and the change in inventory. The estimated residual ε_{it} resulted in the abnormal CFO (*REM_PROD*). Third, the abnormal cash flows from operations can be estimated using the following equation:

$$\frac{CFO_{it}}{A_{it-1}} = \beta_0 + \beta_1\left(\frac{1}{A_{it-1}}\right) + \beta_2\left(\frac{SALES_{it}}{A_{it-1}}\right) + \beta_3\left(\frac{\Delta SALES_{it}}{A_{it-1}}\right) + \varepsilon_{it} \quad (5)$$

where: CFO_{it} = cash flow from operations in year *t* of firm *i*. The estimated residual ε_{it} resulted in the abnormal CFO (*REM_DISX*). Similar to the approach of Braam et al. (2015), the variables *REM_CFO* and *REM_DISX* have been multiplied by -1 for interpretation purposes, as higher residuals will then represent higher levels of real activities manipulation. Together, the three proxies can be combined into the overarching proxy REM. This proxy for real earnings management is inversely related to financial reporting quality.

3.2.1.2 Non-financial reporting quality

Compared to financial reporting quality, non-financial reporting quality has been relatively underexplored. However, as high quality reports should provide stakeholders with sufficient information to assess the organization's performance, the reports should reflect both positive and negative aspects of the organization's performance (Krivačić, 2017). Therefore, a score based system, like a proxy that enables the quantification of the level of disclosure, can be used to measure non-

financial disclosure quality (Bachoo, Tan, & Wilson, 2013). A well-acknowledged proxy for the measurement of non-financial reporting quality is the trusted and reliable Environmental, Social and Governance disclosure score (ESG score) from Bloomberg Data Services, which is based on 400 quantitative and qualitative measures to rate an organization's ESG related policies and practices (Bloomberg, 2020). However, it should be noted that this ESG score measures transparency and accountability, rather than performance (Tamimi & Sebastianelli, 2017). Bloomberg combines the separate scores for environmental, social and governance dimensions into one composite measure consisting of the most material and best reported metrics (Bloomberg, 2020). The ESG score includes metrics like greenhouse gas emissions, anti-bribery ethics and the percentage of women on the board of directors (Tamimi & Sebastianelli, 2017). Organizations are given a score ranging from 0, meaning no disclosure or low-quality disclosure, to 100, meaning full disclosure or high-quality disclosure (Bloomberg, 2020). This study therefore uses the Bloomberg ESG score, denoted as *BBESG*, to measure the quality of non-financial reporting.

3.2.1.3 Corporate reporting quality

For the determination of the dependent variable corporate reporting quality, financial reporting quality and non-financial reporting quality needed to be combined. The variables ABEM and REM were equally weighted in the determination of financial reporting quality, *FRQ*. The ESG transparency score from Bloomberg Data Services was used to determine non-financial reporting quality, *NFRQ*. To combine *FRQ* and *NFRQ*, dummy variables were created for the assessment of the overall corporate reporting quality. The dummy variable *FRQ* therefore denotes the organization's financial reporting quality and the dummy variable *NFRQ* captures the organization's non-financial reporting quality. These dummy variables allow the sample to be split in two commensurable groups as it uses the median as a distinctive separator. A dummy variable received a value of 1 in case of the reporting quality of firm *i* in year *t* being above the industry median and 0 otherwise. Subsequently, the dummy variable for corporate reporting quality, CRQ was created. This dummy variable received a score of 1 in case of the organization scoring a value of 1 on both the *FRQ* and the *NFRQ* and 0 in case of the organization scoring a 0 on either, or both, of the dummies. This conservative approach has been chosen over a more detailed approach including multiple dummies to measure corporate reporting quality on different levels, like has been done in the work of Wang et al. (2018). A single dummy would be most suitable as an indicator of corporate reporting quality as it includes organizations that score above median on both financial and non-financial reporting quality.

3.2.2 Independent variable

This study uses integrated thinking as its independent variable, denoted as *IT*. In line with previous literature, an appropriate proxy is used to determine how well the organization implements CSR related activities in their organizational thinking (De Villiers, Venter, & Hsiao, 2017; Venter, Stiglingh, & Smit, 2017). The Corporate Social Responsibility strategy score, taken from the ASSET4 Thomson Reuters Eikon database, is used as a proxy to determine the degree of integrated thinking. The CSR strategy score can be used to reflect 'a company's practices to communicate that it integrates the economic (financial), social and environmental dimensions into its day-to-day decision-making processes', according to the ASSET4 database. It summarizes various vision and strategy aspects that have to do with an organization's integration strategy on the basis of twelve separate scores, like policy, implementation and transparency. This definition is closely linked to the definition of the IIRC (2021). This measure is an index score ranging from 0 to 100. The CSR strategy score has previously been used as a measure for integrated reporting quality (Serafeim, 2015), but has later been used as a measure of integrated thinking as it is better suited as a measure of integratedness rather than quality (Busco, Malafronte, Pereira, & Staritam, 2019; De Villiers, Venter, & Hsiao, 2017; Venter, Stiglingh, & Smit, 2017).

3.2.3 Moderating variables

To measure board monitoring and audit committee effectiveness, both variables have been split up into separate variables and are defined in accordance with the Refinitiv Eikon database (Refinitiv, 2021). Whereas Manning et al. (2019) created a composite measure to capture the effectiveness of board monitoring, the variables board size, board independence and board gender diversity have been employed separately to examine board monitoring effectiveness, in line with other studies (Li & Wahid, 2018; Vitolla, Raimo, & Rubino, 2019). This way it is possible to determine whether and, if applicable, how strong the separate variables might moderate the relationship between integrated thinking and reporting quality. The variable *BSIZE* is used to represent an organization's board size, which corresponds to the total number of members on the board at the end of the fiscal year. Board independence, denoted as *BIND*, is measured by the percentage of non-executive board members. Non-executive board members are deemed as independent, as they are not involved in any financial relationship with the firm (De Villiers, Naiker, & Van Staden, 2011). The diversity of the board of directors is represented by the numeric variable board gender diversity (*BDIV*), for which the percentage of female board members is used. The variables audit committee independence and audit committee expertise have been employed to examine audit committee effectiveness. Audit committee independence, denoted as *ACIND*, is measured as the proportion of non-executive board

members to the total of audit committee members, similar to board independence. The dummy variable *ACEXP* is used to represent audit committee expertise. This variable states whether the organization has an audit committee consisting of at least three members and at least one financial expert, receiving a value of 1, or 0 otherwise. The measurement of these variables is in line with prior research (e.g. De Andres, Azofra, & Lopez, 2005; De Villiers, Naiker, & Van Staden, 2011; Frias-Aceituno, Rodriguez-Ariza, & Garcia-Sanchez, 2013; Raimo, Vitolla, Marrone, & Rubino, 2021).

3.2.4 Control variables

This study includes several control variables within the model to control for their possible effects on the dependent, independent and moderating variables. These control variables consist of firm characteristics that have been shown to affect the aforementioned variables. Consistent with Braam et al. (2015), the size of an organization (*CSIZE*) is used as it is oftentimes closely linked to its quantity and quality of disclosure. Next to that, larger firms have a higher likelihood to identify and manage non-financial issues (De Villiers, Naiker, & Van Staden, 2011). The organization's size is measured by taking the natural log of total assets of the organization. Next, the organization's financial leverage (*FINLEV*) can be associated with managers being more likely to initiate accounting procedure and earnings manipulation (DeFond & Jiambalvo, 1994). Additionally, debt levels have been linked to firm performance (De Villiers, Naiker, & Van Staden, 2011). The financial leverage can be calculated by means of the debt-to-equity ratio. Discretionary accruals were found to be positively related to growth opportunities (Braam, Nandy, Weitzel, & Lodh, 2015). Hence, the market-to-book value ratio (*MTBV*) is used to analyze the organization's growth opportunities. Organizations with higher *MTBV* ratios are related to greater investment opportunities and better overall performance (De Villiers, Naiker, & Van Staden, 2011). The return on assets (ROA) of an organization is included to account for financial performance (*FPERF*). The model also includes the ESG score from the Eikon Refinitiv database, which scores an organization's non-financial performance (*NFPERF*) on the basis of environmental, social and corporate governance pillars (Refinitiv, 2021). Both financial and non-financial performance were found to have positive effects on corporate reporting quality (Hummel & Schlick, 2016). This study also controls for the assurance of non-financial information by means of the corporate social responsibility assurance control variable (*ASSUR*). According to Ballou et al. (2018) assurance providers have the ability to identify and prevent inaccuracies in reports, thus enhancing their quality. Also, this study controls for possible industry and year effects by adding dummy variables for each of them, consistent with prior literature (Cho & Patten, 2007; De Villiers, Naiker, & Van Staden, 2011). Table 3 summarizes all implemented variables and their definitions.

Table 3. Variable definitions

Variable	Definition	Data source
Independent variable		
IT	Integrated thinking	CSR strategy score ("TRESGCGVSS")
Dependent variables		
ABEM	Accrual-based earnings management	Predicted with the Modified Jones model (1995)
REM	Real earnings management	Predicted with the models for REM_CFO, REM_PROD and REM_DISX
FRQ	Financial reporting quality	Based on the combination of the standardized scores of ABEM and REM
NFRQ	Non-financial reporting quality	Based on the Bloomberg Data Services ESG score, BBESG
CRQ	Corporate reporting quality	Dummy variable based on the combination of FRQ and NFRQ
Moderating variables		
BSIZE	Board size	Total number of board members of the company ("CGBSDP060")
BIND	Board independence	Percentage of non-executive board members of the company ("CGBSO06V")
BDIV	Board gender diversity	Percentage of women on the board of the company ("CGBSO03V")
ACIND	Audit committee independence	Percentage of non-executive board members on the audit committee ("CGBFDP019")
ACEXP	Audit committee expertise	Existence of audit committee with at least three members and one financial expert ("CGBFO03V")
Control variables		
CSIZE	Company size	Natural logarithm of total assets of the company ("WC02999")
FINLEV	Financial leverage	The amount of debt the company uses to finance its assets ("WC08231")
MTBV	Market-to-book-value ratio	Market value of the company divided by its book value ("MTBV")
FPERF	Financial performance	Measured by the return on assets of the company ("WC08326")
NFPERF	Non-financial performance	Refinitiv's ESG score based on environmental, social and governance pillars ("TRESGCS")
ASSUR	External assurance	Is the organization externally audited? ("CGVSDP030")
INDUS	Industry classification	Industry dummies (SIC codes)
YEAR	Year	Time dummies

3.3 Regression model specification

Panel data regressions were run to test this study's hypotheses. These regression analyses have been performed in Stata. In order to check for moderating effects, interaction terms have been added for the variables of board monitoring effectiveness and audit committee effectiveness. These interaction terms have been centered for interpretation purposes. These interactions can now be interpreted as effects that are averaged around the mean and it avoids the problem of multicollinearity. The following three regression models were formulated. These models belong to financial reporting quality, non-financial reporting quality and corporate reporting quality respectively. Additionally, to control for causality and to distinguish between short and long term effects, a similar model including lag effects is used. These lag effects might exist due to some variables needing more time to develop their respective effects.

$$FRQ_{it}/\ NFRQ_{it}/\ CRQ_{it} = \beta_0 + \beta_1 IT_{it} + \beta_2 BSIZE_{it} + \beta_3 BIND_{it} + \beta_4 BDIV_{it} + \beta_5 ACIND_{it} + \beta_6 ACEXP_{it} + \beta_7 (IT * BSIZE)_{it} + \beta_8 (IT * BIND)_{it} + \beta_9 (IT * BDIV)_{it} + \beta_{10} (IT * ACIND)_{it} + \beta_{11} (IT * ACEXP)_{it} + \beta_{12} CSIZE_{it} + \beta_{13} FINLEV_{it} + \beta_{14} MTBV_{\ it} + \beta_{15} FPERF_{it} + \beta_{16} NFPERF_{it} + \beta_{17} ASSUR_{it} + \beta_{18} INDUSTRY_{it} + \beta_{19} YEAR_{it} + \varepsilon_{it} \quad (6)$$

4. Data analysis and results

4.1 Descriptive statistics

Table 4 contains the descriptive statistics for the dependent, independent, moderating and control variables that are included in this study. The financial, non-financial and corporate reporting quality scores are displayed as dummy variables and include 1200 observations due to some variables using two year lags within their respective models. Overall, less than half of the observed organizations scored above average on both financial and non-financial reporting quality, as the mean of *CRQ* is 0.37. The *IT* variable is expressed as a percentage. The mean of the integrated thinking percentage is 64.06 and ranged from 1.04 and 99.11, which means that some organizations were found to implement next to no integrated thinking, whereas other organization almost achieved the full score for integrated thinking.

The board of director's size ranged from 2 to 23 and averaged out on a size of 12 board members. The *BIND* variable is expressed as a percentage. The observed organizations scored relatively high on board independence as its mean is 87.7%. The percentage of women on the board was found to average out at 21.96%, which means that the gender diversity of the board of directors is relatively low. Much like board independence, audit committee independence scored relatively high with an average percentage of 95.85. The *ACEXP* variable is a dummy variable in which organizations either had an audit committee consisting of at least three members and one financial expert, or not. Most organizations were found to have audit committee expertise, as its mean is 0.79.

Table 4. Descriptive statistical analysis

Variable	*Observations*	*Mean*	*Standard deviation*	*Minimum*	*Maximum*
CRQ	1,200	0.37	0.48	0	1
NFRQ	1,200	0.57	0.50	0	1
FRQ	1,200	0.59	0.49	0	1
IT	1,000	64.06	26.87	1.04	99.11
BSIZE	1,000	12.39	4.11	2	23
BIND	1,000	87.70	13.96	0	100
BDIV	1,000	21.96	12.01	0	57.14
ACIND	1,000	95.85	11.73	0	100
ACEXP	1,000	0.79	0.41	0	1
CSIZE	1,100	16.46	1.72	11.76	20.70
FPERF	1,000	6.05	6.11	-9.22	32.29
NFPERF	1,000	66.45	16.88	18.86	94.68
FINLEV	1,000	82.40	73.71	0.15	383.84
MTBV	1,000	2.78	2.23	0.34	14.45
ASSUR	1,000	0.83	0.37	0	1

Note: See Table 3 for variable definitions.

The control variable *CSIZE* is expressed as the natural logarithm of the organization's total assets. Company size ranged from 11.76 to 20.70. The organization's financial performance has a mean of 6.05, whereas the organization's non-financial performance has a mean of 66.45. The return on assets is used as a proxy for the variable *FPERF* and the variable *NFPERF* is based on the ESG score from Refinitiv (2021). The ratio of debt that the observed organizations used to finance their assets ranged from 0.15 to 383.84. Lastly, the mean of the market-to-book ratio averaged out on 2.78.

Table 5 sets out the correlations for the variables included in this study. The independent variable *IT* is significantly and positively correlated with corporate reporting quality, which might be an indication of multicollinearity. The variables used to express board monitoring effectiveness are also significantly and positively correlated with both corporate reporting quality and integrated thinking. These findings are in line with previous literature as integrated thinking is often considered to be a governance initiative (Amran, Lee, & Devi, 2014; Venter, Stiglingh, & Smit, 2017). To test whether these strong correlations suggest multicollinearity, some statistical assumption tests are performed in the subsequent part.

Table 5. Pearson correlations

		1	*2*	*3*	*4*	*5*	*6*	*7*
1	***CRQ***	1.000						
2	***NFRQ***	0.653*	1.000					
3	***FRQ***	0.640*	0.122*	1.000				
4	***IT***	0.236*	0.359*	-0.043	1.000			
5	***BSIZE***	0.125*	0.119*	0.011	0.262*	1.000		
6	***BIND***	0.102*	0.154*	-0.027	0.079*	0.332*	1.000	
7	***BDIV***	0.074*	0.208*	-0.106*	0.138*	-0.056	0.055	1.000
8	***ACIND***	-0.017	0.024	-0.032	0.099*	0.172*	0.170*	-0.088*
9	***ACEXP***	0.057	0.043	0.012	0.245*	-0.042	-0.150*	0.040
10	***CSIZE***	0.179*	0.302*	-0.005	0.539*	0.413*	0.240*	0.217*
11	***FPERF***	-0.167*	0.010	-0.336*	0.019	-0.194*	-0.129*	0.030
12	***NFPERF***	0.321*	0.495*	-0.039	0.664*	0.263*	0.266*	0.291*
13	***FINLEV***	0.183*	0.093*	0.241*	-0.006	0.210*	0.040	-0.017
14	***MTBV***	-0.144*	-0.038	-0.190*	-0.057	-0.201*	-0.189*	0.119*
15	***ASSUR***	0.160*	0.288*	-0.075*	0.495*	0.152*	0.116*	0.218*

		8	*9*	*10*	*11*	*12*	*13*	*14*	*15*
8	***ACIND***	1.000							
9	***ACEXP***	0.058	1.000						
10	***CSIZE***	0.034	0.141*	1.000					
11	***FPERF***	-0.161*	0.047	-0.073*	1.000				
12	***NFPERF***	0.120*	0.141*	0.645*	-0.050	1.000			
13	***FINLEV***	0.086*	-0.032	0.074*	-0.372*	0.106*	1.000		
14	***MTBV***	-0.192*	-0.024	-0.174*	0.505*	-0.055	0.079*	1.000	
15	***ASSUR***	0.016	0.171*	0.333*	-0.079*	0.392*	0.016	-0.042	1.000

* indicates statistical significance at the 5% level. Note: See Table 3 for variable definitions.

4.2 Statistical assumption tests

In order to check whether the model used in the panel data regression analysis is not biased and leads to robust results, some additional tests are performed. These test results can be found under Appendix A. This is done before de panel data is analyzed, to adhere to the model assumptions of panel data. First of all, the Hausman test is conducted to determine whether the fixed effects model fits best with the panel data or if the random effects regression model should be used instead. This test examines whether the explanatory variables and the error term are correlated. From table A1 can be seen that the Hausman test provides a p-value of 0.0000 ($p < 0.01$). This means that the null hypothesis should be rejected, as it states that the error term is uncorrelated with the explanatory variables. Therefore, the fixed effects model is the appropriate model to use (Yaffee, 2003). The fixed effects model implicitly controls for the industry dummies.

Subsequently, the Breusch-Pagan/ Cook-Weisberg test is performed to check for heteroskedasticity. Heteroskedasticity is present whenever the variance of the error terms of a regression depends on the independent variables. According to the panel data regression assumptions, the variance of the observation should be approximately identical. Table A2 shows that the null hypothesis of homoscedasticity is rejected as the test provides a p-value of 0.0000 ($p < 0.01$). Therefore, the cluster option is used to correct for heteroskedasticity (and potential autocorrelation), as this clusters the results per organization (Williams, 2011).

Next, the panel data is tested for multicollinearity in two ways. First, a correlation matrix is used, followed by the variance inflation factor test. Multicollinearity essentially means that an independent variable is highly correlated with one or more other independent variable(s). This would lead to the problem of not being able to distinguish the effect of each individual independent variable. A value of 0.8 or higher would indicate a strong correlation and a value ranging from 0.5 to 0.8 would indicate a moderate correlation (Alin, 2010). As can be seen in table A3, no correlation coefficients exceed the 0.8 threshold, which suggests there is no multicollinearity. Additionally, the variance inflation factor (VIF) test has been performed to control for multicollinearity. Table A4 shows both the VIF and the tolerance (TOL) scores for the variables included in this study. The TOL score is calculated by dividing 1 by the score of the VIF test. The VIF score can be interpreted as follows: a score of 1 equals no correlation, whereas a score of 5 and higher indicates a high correlation (Daoud, 2017). As none of this study's variables exceed the VIF score of 5, it can be concluded that there is indeed no multicollinearity in the model, adhering to the assumption of panel data models.

4.3 Hypothesis testing

After these statistical assumption tests, the conditional fixed effects logistic regression model including the cluster option is used. Six models are run to test the formulated hypotheses, regarding the effect of integrated thinking on corporate reporting quality and possible moderating effects of board monitoring and audit committee effectiveness. Models 1 to 6 either take financial, non-financial or corporate reporting quality as their dependent variable. Models 1, 3 and 5 contain the logistic regression results without interaction terms, whereas models 2, 4 and 6 incorporate interaction terms within their respective regressions to identify possible moderating effects. Table 6 shows the results of the logistic regressions after controlling for the effects of the control variables.

Recall that the first set of hypotheses focuses on how strongly corporate reporting quality, financial reporting quality and non-financial reporting quality are affected by the level of integrated thinking inherent in organizations. The results in model 1 indicate that *IT* has a positive and insignificant effect on corporate reporting quality (β = .016, p = .323). This means that an increase in integrated thinking within the observed organizations does not lead to an increase in corporate reporting quality. Therefore, the results provide no support for hypothesis 1a. These results are inconsistent with previous literature, as integrated thinking was found to have positive significant effects on corporate reporting quality (Venter, Stiglingh, & Smit, 2017). Next, the results in model 3 show a positive insignificant effect of *IT* on *FRQ* (β = .018, p = .210). As there is no significant effect of integrated thinking on financial reporting quality, there is no evidence for hypothesis 1b. Similarly, the results in model 5 show a positive and insignificant effect of *IT* on *NFRQ* (β = .011, p = .517). On this basis, hypothesis 1c should also be rejected.

The second set of hypotheses focuses on the expected positive moderating effects of board monitoring effectiveness on the association between integrated thinking and corporate, financial and non-financial reporting quality. Model 2, 4 and 6 test these moderating effects by means of interaction variables, respectively. Model 2, which has corporate reporting quality as its dependent variable, shows significant effects for *IT*BSIZE* at the 5% level (β = .007, p = .031) and insignificant effects for the two other variables for board monitoring effectiveness, being *IT*BIND* (β = -.000, p = .737) and *IT*BDIV* (β = .001, p = .162). These mixed results provide some support for hypothesis 2a. Similarly, models 6 shows the same mixed moderating effects on the relationship between integrated thinking and non-financial reporting quality, whereas model 4 shows no significant effects of these moderating variables on financial reporting quality. Thus, hypothesis 2b should be rejected, while hypothesis 2c finds some support. This means that of the variables for board monitoring effectiveness, only board size is found to have a moderating effect on the association between integrated thinking and corporate and non-financial reporting quality.

The third set of hypotheses captures the expectations of positive moderating effects of audit committee effectiveness on the association between integrated thinking and corporate, financial and non-financial reporting quality. These moderating effects are tested by the inclusion of interaction terms in models 2, 4 and 6. Model 4 shows a positive significant effect of *IT*ACEXP* on *FRQ* at the 5% level (β = .038, p = .036). Audit committee expertise therefore slightly positively moderates the effect of integrated thinking on financial reporting quality. The variable *IT*ACIND* in model 4 is insignificant (β = .001, p = .260). These mixed results provide some support for hypothesis 3b. Models 2 and 6 provide no evidence for hypotheses 3b and 3c, as no significant moderating effects have been found for the audit committee effectiveness variables on the association between integrated thinking and corporate and non-financial reporting quality respectively. Collectively, the results in table 6 provide support for hypotheses 2a, 2c and 3b.

Furthermore, some of the control variables show contradictory significant results. Financial performance is found to have negative significant effects on financial reporting quality at the 5% level (β = -.144, p = .038). Next to that, financial performance was found to have a positive significant effect on non-financial reporting quality at the 5% level (β = .129, p = .027). Non-financial performance is found to have similar significant effects on both corporate reporting quality and non-financial reporting quality at the 5% and 10% level (β = -.063, p = .017) and (β = .063, p = .063), respectively. Next, financial leverage (*FINLEV*) is found to have small positive significant effects on financial reporting quality at the 1% level (β = .015, p = .000). The control variable *MTBV*, which is a proxy for an organization's growth opportunities, shows negative significant effects on financial reporting quality at the 1% level (β = -.793, p = .009). Lastly, *ASSUR* is found to have negative significant effects on financial reporting quality at the 5% level (β = -1.630, p = .038).

Table 6. Logistic regression results

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT	0.016	0.017	0.018	0.018	0.011	0.014
	(0.016)	(0.012)	(0.014)	(0.015)	(0.017)	(0.014)
BSIZE	0.377***	0.384***	-0.108	-0.106	0.349***	0.369***
	(0.121)	(0.122)	(0.097)	(0.101)	(0.134)	(0.125)
BIND	0.017	0.013	0.003	0.000	0.010	0.032
	(0.023)	(0.023)	(0.010)	(0.012)	(0.018)	(0.024)
BDIV	0.003	0.010	0.006	0.001	0.065**	0.069**
	(0.025)	(0.028)	(0.022)	(0.021)	(0.030)	(0.031)
ACIND	-0.006	-0.003	-0.025	-0.015	0.028	0.020
	(0.032)	(0.027)	(0.016)	(0.024)	(0.026)	(0.028)
ACEXP	-0.208	-0.279	-0.301	-0.116	0.306	0.409
	(0.474)	(0.548)	(0.466)	(0.488)	(0.467)	(0.498)
ITxBSIZE		0.007**		0.003		0.010***
		(0.003)		(0.003)		(0.003)
ITxBIND		0.000		0.001		0.002
		(0.001)		(0.001)		(0.001)
ITxBDIV		0.001		0.000		0.001
		(0.001)		(0.001)		(0.001)
ITxACIND		0.001		0.001		0.001
		(0.001)		(0.001)		(0.001)
ITxACEXP		0.018		0.038**		0.017
		(0.018)		(0.018)		(0.023)
CSIZE	-0.002	0.384	0.630	0.358	0.218	0.215
	(0.940)	(0.948)	(0.817)	(0.838)	(0.995)	(0.997)
FPERF	0.009	0.016	-0.144**	-0.147**	0.129**	0.141**
	(0.044)	(0.042)	(0.069)	(0.070)	(0.058)	(0.056)
NFPERF	-0.002	0.003	-0.063**	-0.066**	0.063*	0.078**
	(0.031)	(0.030)	(0.026)	(0.027)	(0.034)	(0.032)
FINLEV	0.000	-0.001	0.015***	0.015***	-0.006	-0.008*
	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.004)
MTBV	-0.326	-0.264	-0.793***	-0.745**	-0.179	-0.141
	(0.214)	(0.204)	(0.303)	(0.294)	(0.190)	(0.196)
ASSUR	-0.449	0.075	-1.630**	-1.508*	0.337	0.574
	(1.032)	(0.987)	(0.787)	(0.810)	(0.984)	(0.998)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	439	439	426	426	482	482
Wald X^2	54.36	86.22	109.49	165.57	61.93	98.49

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.

Note: See Table 3 for variable definitions.

*** p<0.01, ** p<0.05, * p<0.1

4.4 Additional lag analysis

To distinguish between short and long term effects, the same conditional logistic regression model is used, which includes 1-year and 2-year lag effects for the independent and moderating variables. These results are shown in table 7 and 8 respectively. The results in both table 7 and 8 indicate that integrated thinking has lag effects on financial reporting quality, providing support for hypothesis 1b. However, the results do not indicate significant lag effects of integrated thinking on corporate and non-financial reporting quality. Regarding the moderating effects, both tables show significant moderating effects of board independence on the relationship between integrated thinking and corporate reporting quality, providing additional support for hypothesis 2a. Moreover, board independence has significant positive moderating 2-year lag effects on the relationship between integrated thinking and non-financial reporting quality, providing additional support for hypothesis 2c. Hypothesis 2a is also supported by the moderating 2-year lag effects of board gender diversity. Next, audit committee independence is found to have positive moderating 1-year lag effects under model 2 and 4 combined with 2-year lag effects under model 2, providing support for hypothesis 3a and additional support for 3b. Also, audit committee expertise is found to have moderating 1-year lag effects on the relationship between integrated thinking and financial reporting quality, providing further evidence for hypothesis 3b. Collectively, the results in tables 7 and 8 provide support for hypotheses 1b, 2a, 2c, 3a and 3b.

Table 7. Logistic regression results with 1-year lag effects of the independent/ moderating variables

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT_{t-1}	0.018	0.011	0.039**	0.044***	-0.008	-0.007
	(0.017)	(0.016)	(0.016)	(0.017)	(0.014)	(0.014)
$BSIZE_{t-1}$	0.388***	0.372***	0.032	0.005	0.168	0.178
	(0.136)	(0.130)	(0.120)	(0.127)	(0.148)	(0.149)
$BIND_{t-1}$	0.014	-0.051*	0.014	0.017	0.004	-0.022
	(0.018)	(0.029)	(0.012)	(0.019)	(0.052)	(0.046)
$BDIV_{t-1}$	0.032	0.038	0.027	0.028	0.076**	0.084**
	(0.030)	(0.035)	(0.023)	(0.025)	(0.037)	(0.033)
$ACIND_{t-1}$	-0.039	-0.009	-0.055*	-0.063**	0.051	0.068*
	(0.028)	(0.028)	(0.030)	(0.029)	(0.033)	(0.038)
$ACEXP_{t-1}$	0.723	0.648	0.373	0.233	0.028	-0.243
	(0.506)	(0.609)	(0.474)	(0.535)	(0.467)	(0.455)
$ITxBSIZE_{t-1}$		0.003		0.000		0.002
		(0.003)		(0.003)		(0.003)
$ITxBIND_{t-1}$		0.003***		0.000		0.001
		(0.001)		(0.001)		(0.001)
$ITxBDIV_{t-1}$		0.001		0.000		0.000
		(0.001)		(0.001)		(0.001)
$ITxACIND_{t-1}$		0.002*		0.001**		0.001
		(0.001)		(0.001)		(0.002)
$ITxACEXP_{t-1}$		0.020		0.045*		0.034
		(0.025)		(0.023)		(0.028)
CSIZE	1.326	1.875*	1.136	1.299	0.855	0.777
	(0.911)	(1.030)	(0.991)	(1.090)	(1.002)	(1.012)
FPERF	0.050*	0.062**	-0.067	-0.064	0.118**	0.120**
	(0.030)	(0.031)	(0.061)	(0.057)	(0.049)	(0.048)
NFPERF	0.025	0.034	-0.076**	-0.081**	0.104***	0.101***
	(0.030)	(0.031)	(0.032)	(0.032)	(0.028)	(0.027)
FINLEV	-0.002	-0.000	0.014***	0.015***	-0.010	-0.010*
	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)	(0.005)
MTBV	-0.224	-0.157	-0.822**	-0.793**	-0.003	-0.008
	(0.203)	(0.198)	(0.371)	(0.359)	(0.198)	(0.194)
ASSUR	-1.951*	-1.811*	-1.670	-1.966*	0.180	-0.021
	(1.052)	(1.068)	(1.119)	(1.080)	(1.086)	(1.066)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	350	350	361	361	388	388
Wald X^2	55.13	80.76	77.68	135.52	73.09	91.44

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.

Note: See Table 3 for variable definitions.

*** p<0.01, ** p<0.05, * p<0.1

Table 8. Logistic regression results with 2-year lag effects of the independent/ moderating variables

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT_{t-2}	0.014	0.014	0.038**	0.039**	0.010	0.008
	(0.016)	(0.014)	(0.016)	(0.016)	(0.014)	(0.015)
$BSIZE_{t-2}$	0.196	0.236*	0.129	0.125	0.146	0.120
	(0.125)	(0.129)	(0.142)	(0.172)	(0.099)	(0.106)
$BIND_{t-2}$	-0.009	-0.065***	-0.053	-0.086*	0.022	0.017
	(0.015)	(0.022)	(0.045)	(0.045)	(0.039)	(0.038)
$BDIV_{t-2}$	0.020	0.012	0.027	0.022	0.060*	0.056
	(0.023)	(0.025)	(0.026)	(0.031)	(0.033)	(0.037)
$ACIND_{t-2}$	0.048**	0.069***	0.010	0.041	0.059*	0.049*
	(0.024)	(0.026)	(0.020)	(0.026)	(0.034)	(0.029)
$ACEXP_{t-2}$	-0.354	-0.267	-0.232	-0.125	-0.891*	-1.058*
	(0.562)	(0.692)	(0.372)	(0.386)	(0.474)	(0.641)
$ITxBSIZE_{t-2}$		0.005		0.002		0.000
		(0.003)		(0.004)		(0.003)
$ITxBIND_{t-2}$		0.003***		0.001		0.002**
		(0.001)		(0.001)		(0.001)
$ITxBDIV_{t-2}$		0.001*		0.000		0.000
		(0.001)		(0.001)		(0.001)
$ITxACIND_{t-2}$		0.000		0.001*		0.001
		(0.001)		(0.001)		(0.001)
$ITxACEXP_{t-2}$		0.025		0.003		0.033
		(0.022)		(0.014)		(0.029)
CSIZE	0.871	1.091	1.503	1.625	1.000	0.820
	(0.995)	(1.107)	(1.057)	(1.097)	(1.276)	(1.256)
FPERF	0.010	0.022	-0.091	-0.096	0.127**	0.132**
	(0.034)	(0.040)	(0.071)	(0.073)	(0.056)	(0.062)
NFPERF	0.045	0.040	-0.124***	-0.137***	0.148***	0.142***
	(0.038)	(0.035)	(0.032)	(0.036)	(0.038)	(0.035)
FINLEV	-0.004	-0.003	0.008*	0.008	-0.012	-0.010
	(0.007)	(0.006)	(0.005)	(0.005)	(0.009)	(0.009)
MTBV	-0.204	-0.261	-0.737*	-0.834*	0.053	0.025
	(0.239)	(0.224)	(0.409)	(0.456)	(0.268)	(0.295)
ASSUR	-2.024**	-2.301**	0.456	0.784	-0.604	-0.476
	(1.004)	(1.167)	(1.065)	(1.292)	(1.293)	(1.373)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	300	300	297	297	320	320
Wald X^2	32.97	146.09	91.46	111.00	51.90	93.29

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.

Note: See Table 3 for variable definitions.

*** p<0.01, ** p<0.05, * p<0.1

4.5 Robustness analysis

As the results from the logistic regressions are somewhat contradictory to previous research and not in line with some of the formulated hypotheses, additional robustness analyses are performed to check whether these results are consistent. Referring back to tables 1 and 2, the data sample consists of a set of industries and countries. From table 2 can be seen that 78% of the organizations are in the manufacturing industry, which might bias the results. Similarly, table 1 shows that Germany (24%), Great Britain (17%) and France (16%) each take up a large portion of the observed organizations. Therefore, separate logistic regressions are run in which the manufacturing industry or one of the aforementioned countries is omitted. Again, the results differentiate between no lag, 1-year lag and 2-year lag effects. The results for the robustness analyses excluding the manufacturing industry and Germany, France or Great Britain are shown in appendix B.

The removal of the manufacturing industry from the sample causes the results to be slightly altered compared to the results from table 6 to 8. As can be seen from table B1, different conclusions can be made on whether the hypotheses should be accepted or rejected. Without the inclusion of the manufacturing company, evidence for hypotheses 1a and 1c is found as integrated thinking seemingly positively affects corporate and non-financial reporting quality. Moreover, a positive significant moderating effect for *BIND and ACIND* on the association between integrated thinking and corporate quality is found, whereas other variables that were shown to have significant moderating effects in the original regression analysis like *BSIZE* and *ACEXP* are shown to be insignificant. Similar inconsistencies can be found in the 1-year and 2-year lag analyses. Even though the omission of the manufacturing industry causes the results and their interpretation to be slightly different and inconsistent, it is important to note that leaving out the manufacturing industry severely reduces the sample size and should thus be interpreted with caution.

Next, when removing the organizations located in Germany, it causes the results to be more in line with the original analysis. Similar effects, such as the moderating effects of *BSIZE* on the relationship between integrated thinking and corporate reporting quality and the moderating effects of *ACEXP* on the relationship between integrated thinking and financial reporting quality are found. Moreover, comparing the 1-year and 2-year lag analyses of the results in which Germany is omitted to the original results, similar long term (moderating) effects are found, again providing support for hypotheses 1b, 2a and 3b. Identically, the results for the logistic regressions in which Great Britain or France is omitted show consistent results. These results might indicate that the sample size became too small after the omission of the manufacturing industry, but that the original results are found to be robust according to the robustness analyses that leave out some of the largest countries.

5. Discussion and conclusion

5.1 Discussion

The results confirm that there is some evidence for the expected positive association between integrated thinking and financial reporting quality in the long run. This indicates that the supposed benefits of integrated thinking, such as the easier linkage of financial statements, the more comprehensive overview of financial information and the reduction of information asymmetries, prove to be beneficial for the quality of financial reporting, which is in line with both stakeholder and agency theory (Lee, 2008; Rupley, Brown, & Marshall, 2017). However, contradictory to what was expected, there is no evidence for the expected positive relationship between integrated thinking and corporate or non-financial reporting quality, both short and long term. The supposed benefits of integrated thinking, such as the elicited conveyance of information of how value is created over time or the improved transparency and clarity that is said to come with integrated thinking, seem to have no significant effects on the voluntary disclosure of higher quality non-financial information, finding no support for both signaling and legitimacy theory (Barth, Cahan, Chen, & Venter, 2017; Eccles & Krzus, 2014).

In addition, the results confirm that certain characteristics of the board of directors and the audit committee have moderating effects on the association between integrated thinking and reporting quality. In the short run, the board's size was found to positively moderate the relationship between integrated thinking and both corporate and non-financial reporting quality. This is in line with the findings of Frias-Aceituno et al. (2013) and Hurgiş (2017), who argue that larger boards are associated with greater conformance to guidelines and greater assurance of accurate corporate disclosure. In addition, board independence was found to positively moderate the relationship between integrated thinking and both corporate and non-financial reporting quality in the long run. This is in line with the works of Johnson and Greening (1999) and Lim et al. (2007), in which independent directors are deemed to strive for proper conduct and are associated with the disclosure of broader and more forward looking information. This could also indicate that the board of directors' size and independence might (indirectly) affect whether organizations attempt to signal or legitimize their corporate behavior by providing higher quality non-financial information. Board gender diversity was found to have significant long term moderating effects. This is in line with previous research that found gender diverse boards to be more stakeholder-oriented (Velte & Stawinoga, 2017).

Audit committee expertise was found to have both short and long term positive moderating effects on the relationship between integrated thinking and financial reporting quality. This is in line with previous literature, which claimed that the inclusion of financial experts, such as accountants

and auditors, causes firms to think in a more integrated manner, have less internal control weaknesses and enhance financial disclosure (Haji & Anifowose, 2016). Moreover, according to DeZoort et al. (2002), qualified audit committee members protect stakeholder interests by ensuring reliable financial reporting, thus decreasing information asymmetries, which is in line with both agency and stakeholder theory. However, no moderating effects were found for audit committee expertise on the relationship between integrated thinking and both corporate and non-financial reporting quality. This might indicate that financial experts are mainly focused on financial aspects, whereas non-financial aspects tend to get neglected. Next, audit committee independence was found to have significant positive moderating effects on the relationship between integrated thinking and both corporate and financial reporting quality. Similar to independent board members and in line with agency theory, independent audit committee members tend to reduce the risk of opportunistic behavior and contribute to more transparent disclosure (Allegrini & Greco, 2013). However, no evidence is found for moderating effects of audit committee independence on the relationship between integrated thinking and non-financial reporting quality. This is contradictory to previous literature, which found audit committee independence to be associated with increased and better voluntary disclosure (Akhtaruddin & Haron, 2010; Patelli & Prencipe, 2007).

5.2 Conclusion

Organizations are expected to reduce information asymmetries and to provide higher quality information to their stakeholders. Therefore, by making use of agency and stakeholder theory, this study examined the relationship between integrated thinking and corporate reporting quality in a European setting. Additionally, with signaling and legitimacy theory in mind, it examined whether organizations, that implement integrated thinking to a higher degree, voluntarily provided higher quality corporate disclosure. This study aimed to examine how and under what circumstances integrated thinking elicits corporate reporting quality. Thus, it explored whether this relationship between integrated thinking and corporate reporting quality is moderated by characteristics of the board of directors and the audit committee, such as size, independence, diversity and expertise. In order to do so, corporate reporting quality was represented by a combination of financial reporting quality, for which two earnings management proxies were used, and non-financial reporting quality, for which the Bloomberg transparency score was used. Three hypotheses were formulated based on previous literature, each divided in three subcomponents. To test these hypotheses, a conditional fixed effects logistic regression model including the cluster option was used. Additional lag analyses were performed to differentiate between short and long term effects.

The first set of hypotheses expected a positive association between integrated thinking and

corporate (H1a), financial (H1b) and non-financial reporting quality (H1c). The results provided evidence for H1b in the long term, but did not support H1a and H1c. This means that a business strategy that includes both financial and non-financial aspects merely enhances financial reporting quality, but not non-financial reporting quality. This could indicate that the underlying integrated reporting framework indeed needs to be addressed before it can "stand the test of time" (Oll & Rommerskirchen, 2018).

The second set of hypotheses expected a positive moderating effect of characteristics of the board on the association between integrated thinking and corporate (H2a), financial (H2b) and non-financial reporting quality (H2c). The results provide some evidence for H2a and H2c, both short and long term. The board's size positively moderates the relationship between integrated thinking and both corporate and non-financial reporting quality short term, whereas the board's independence positively moderates the relationship between integrated thinking and both corporate and non-financial reporting quality long term. Also, support was found for moderating effects of the board's gender diversity on the relationship between integrated thinking and corporate reporting quality. This could indicate that the integratedness of the organization's strategy and the quality of disclosure could benefit from larger, more independent and more diverse boards.

The third set of hypotheses expected a positive moderating effect of characteristics of the audit committee on the association between integrated thinking and corporate (H3a), financial (H3b) and non-financial reporting quality (H3c). The results do not support H3c, but do provide evidence for H3a and H3b. Audit committee expertise was found to have positive moderating effects on the association between integrated thinking and financial reporting quality short term and long term, whereas audit committee independence was found to positively moderate the association between integrated thinking and both corporate and financial reporting quality long term. This could indicate that, contrary to the criticism of Cohen et al. (2004), audit committee effectiveness, in the sense of more expertise and independence, could contribute to more integratedness and higher quality disclosure. Thus, referring back to the initial aim of this study to explore how and under what circumstances integrated thinking elicits corporate quality, this relationship could benefit from alterations in the board's size/ independence/ gender diversity and the audit committee's expertise/ independence.

This study contributes to existing literature by looking into the drivers of corporate reporting quality, by providing more insights into the realm of integrated thinking and by examining potential moderating effects on the relationship between integrated thinking and corporate reporting quality. This study informs regulators and standard setters with evidence that the current integrated thinking and reporting framework is useful in enhancing financial reporting quality, but not yet able to increase non-financial reporting quality, which is contradictory to the framework's aim. Moreover,

this study supports the potential significance of the board of directors and the audit committee as internal assurance mechanisms that can contribute to integrated reporting practices and corporate disclosure. As Haji and Anifowose (2016) pose that external assurance mechanisms might be too costly and challenging for some organizations, an increased focus on these internal mechanisms might prove to be a cost-effective alternative.

5.3 Limitations and future research

The results and conclusions from this study should be interpreted with caution in the light of some limitations. First, as the disclosure of non-financial information is still mainly of voluntary nature, the provided non-financial information might be subject to selection bias. Next, the Bloomberg transparency score also has its limitations, even though it is a well-acknowledged measure for non-financial information quality that increases comparability, reliability and verifiability. Due to the limited data availability of the non-financial reporting quality measure from the Bloomberg Data Services database, the sample size became skewed towards the manufacturing industry, leading to potentially biased results. Moreover, to determine whether organizations use their disclosure either as a signaling or legitimation tactic, future studies could differentiate between organizations with superior and inferior performance. Also, to see how integrated thinking (and reporting) develops over the coming years and how it might affect reporting quality, future studies should conduct similar research.

This study's use of variables and methods should be discussed. Whereas some studies measured board monitoring and audit committee effectiveness by means of composite measures (e.g. Manning et al., 2019), this study attempted to look into the separate drivers of board monitoring and audit committee effectiveness individually. As this study examined only three measures for board monitoring effectiveness and two measures for audit committee effectiveness, future studies could look into further measures to get a fuller understanding of what aspects of the board and audit committee might affect integrated thinking and/ or increase reporting quality. Examples of such measures could be the presence of different ownership structures, director tenure, CEO presence and influence, audit committee activity and audit committee diligence.

Moreover, different proxies for financial and non-financial reporting quality could be used to determine whether the proxies used in this study are robust and consistent. Future studies could, for example, make use of scores to measure analyst-perceived financial reporting quality (Felo, Krishnamurthy, & Solieri, 2003) or could create self-made proxies to assess non-financial reporting quality criteria (Hoffmann, Dietsche, & Hobelsberger, 2018). The method used to determine the dummy variable for corporate reporting quality, consistent with Braam et al. (2015), which uses the

industry median for financial and non-financial reporting quality, could also be altered by using different demarcations or standardization. The method used in this study loses some of its predictive power by dividing the separate proxies in dummies. Future research could also look into a more comprehensive measure for overall corporate reporting quality.

Also, the effects that were examined in this study might be more nuanced, as the effects of the characteristics of board monitoring and audit committee effectiveness on corporate reporting quality might depend on, for example, the culture of the countries being studied (He, Labelle, Piot, & Thornton, 2009). Future studies could therefore distinguish between different cultures. Additionally, future studies could discriminate between different orientations, for instance between stakeholder and shareholder-oriented countries. These different orientations were found to determine differences in the level of voluntary disclosure (Meek, Roberts, & Gray, 1995). Lastly, it could be interesting to look into whether the effect of integrated thinking on reporting quality differs between countries with mandatory and voluntary disclosure.

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Appendices

Appendix A: Statistical assumption tests

Table A1. Hausman test

Panel: dependent variable CRQ	
	Coef.
Chi-squared test value	104.96
P-value	0.0000

Table A2. Breusch-Pagan/ Cook-Weisberg test

Panel: dependent variable CRQ	
	Coef.
Chi-squared test value	115.27
P-value	0.0000

Table A3. Multicollinearity test

		1	*2*	*3*	*4*	*5*	*6*	*7*
1	***IT***	1.000						
2	***BSIZE***	0.262	1.000					
3	***BIND***	0.041	0.242	1.000				
4	***BDIV***	0.122	-0.046	0.094	1.000			
5	***ACIND***	0.160	0.203	0.198	-0.114	1.000		
6	***ACEXP***	0.230	-0.007	-0.127	0.029	0.100	1.000	
7	***CSIZE***	0.475	0.424	0.209	0.184	0.076	0.121	1.000
8	***FPERF***	-0.043	-0.186	-0.093	0.013	-0.171	0.009	-0.104
9	***NFPERF***	0.548	0.288	0.278	0.307	0.180	0.105	0.626
10	***FINLEV***	0.038	0.285	0.037	-0.022	0.076	-0.011	0.138
11	***MTBV***	-0.028	-0.146	-0.124	0.128	-0.222	-0.007	-0.103
12	***ASSUR***	0.495	0.152	0.116	0.218	0.016	0.171	0.333

		8	*9*	*10*	*11*	*12*
8	***FPERF***	1.000				
9	***NFPERF***	-0.088	1.000			
10	***FINLEV***	-0.387	0.132	1.000		
11	***MTBV***	0.577	-0.050	-0.017	1.000	
12	***ASSUR***	-0.079	0.392	0.016	-0.042	1.000

Note: See Table 3 for variable definitions.

Table A4. Variance inflation factor test

Variable	VIF	TOL
IT	2.00	0.500002
BSIZE	1.46	0.685053
IT*BSIZE	1.33	0.752371
BIND	1.25	0.798064
IT*BIND	1.17	0.854385
BDIV	1.22	0.817515
IT*BDIV	1.13	0.884378
ACIND	1.85	0.541733
IT*ACIND	1.84	0.544737
ACEXP	1.17	0.852704
IT*ACEXP	1.31	0.763056
CSIZE	1.99	0.503166
FPERF	2.02	0.495154
NFPERF	2.25	0.044986
FINLEV	1.41	0.709530
MTBV	1.81	0.551438
ASSUR	1.51	0.664062
Mean VIF	1.57	

Note: See Table 3 for variable definitions.

Appendix B: Additional robustness regression analyses

Table B1. Robustness analysis: logistic regression results (manufacturing industry omitted)

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT	0.151*	2.468*	0.068	0.126	0.064***	0.005
	(0.081)	(1.362)	(0.054)	(0.080)	(0.023)	(0.035)
BSIZE	0.898*	-0.860	0.152	0.348	0.114	-0.358
	(0.535)	(1.028)	(0.593)	(0.706)	(0.386)	(0.389)
BIND	0.019	0.009	0.054***	0.024	-0.060**	-0.067
	(0.021)	(0.351)	(0.020)	(0.068)	(0.028)	(0.187)
BDIV	0.019	0.158	-0.025	0.000	0.350***	0.359*
	(0.067)	(0.227)	(0.039)	(0.066)	(0.112)	(0.202)
ACIND	0.233**	14.011*	-0.047	0.013	0.376***	0.675**
	(0.111)	(7.507)	(0.058)	(0.079)	(0.087)	(0.295)
ACEXP	1.414	-0.477	1.733	1.407	0.047	-1.020
	(1.449)	(3.570)	(1.284)	(1.256)	(1.007)	(1.945)
ITxBSIZE		0.083		0.015		0.014
		(0.079)		(0.016)		(0.037)
ITxBIND		0.023***		0.005		0.001
		(0.009)		(0.008)		(0.013)
ITxBDIV		0.034		0.004		0.002
		(0.028)		(0.003)		(0.006)
ITxACIND		0.532*		0.004		0.018
		(0.282)		(0.003)		(0.014)
ITxACEXP		1.272		0.137		0.055
		(1.031)		(0.157)		(0.191)
CSIZE	9.349**	9.724***	8.443***	9.900	24.453***	21.534***
	(4.129)	(3.495)	(3.155)	(6.173)	(4.263)	(5.053)
FPERF	-0.145*	-0.496	-0.745***	-0.662***	0.234*	0.269**
	(0.081)	(0.437)	(0.158)	(0.165)	(0.121)	(0.113)
NFPERF	-0.017	-0.045	-0.026	-0.133	0.019	-0.018
	(0.084)	(0.086)	(0.055)	(0.086)	(0.105)	(0.230)
FINLEV	0.009	0.063*	0.050**	0.050*	0.018***	0.019**
	(0.007)	(0.033)	(0.022)	(0.030)	(0.005)	(0.009)
MTBV	0.412	1.876	-0.945*	-0.965	0.212	0.541
	(0.635)	(1.144)	(0.523)	(0.675)	(0.504)	(0.694)
ASSUR	13.060***	29.183	-7.431***	-7.508***	23.470***	32.991***
	(2.642)	(34.573)	(2.211)	(2.717)	(3.280)	(12.518)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	106	106	108	108	98	98

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.
Note: See Table 3 for variable definitions.
*** p<0.01, ** p<0.05, * p<0.1

Table B2. Robustness analysis: logistic regression results with 1-year lag effects of the independent/ moderating variables (manufacturing industry omitted)

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT_{t-1}	0.078	0.192	0.242***	-0.106***	-0.101	-0.085**
	(0.062)	(0.138)	(0.085)	(0.038)	(0.071)	(0.034)
$BSIZE_{t-1}$	1.230**	2.497*	3.079**	-0.634*	-0.067	0.652
	(0.517)	(1.435)	(1.390)	(0.332)	(0.493)	(0.417)
$BIND_{t-1}$	-0.005	0.027	0.193***	0.145	-0.063	-0.254
	(0.023)	(0.162)	(0.057)	(0.248)	(0.058)	(0.194)
$BDIV_{t-1}$	0.110*	0.471	-0.097**	0.245***	0.268	0.230
	(0.057)	(0.335)	(0.047)	(0.051)	(0.182)	(0.214)
$ACIND_{t-1}$	-0.035	-0.546	-0.851***	-1.532***	0.228	0.340
	(0.082)	(0.444)	(0.250)	(0.204)	(0.153)	(0.298)
$ACEXP_{t-1}$	1.805	-1.924	9.666***	-0.974	-0.365	0.737
	(1.142)	(3.219)	(3.546)	(1.945)	(1.221)	(1.079)
$ITxBSIZE_{t-1}$		0.078		0.071***		0.006
		(0.055)		(0.018)		(0.014)
$ITxBIND_{t-1}$		0.002		0.002		0.012
		(0.011)		(0.009)		(0.009)
$ITxBDIV_{t-1}$		0.018*		0.013***		0.004
		(0.011)		(0.004)		(0.006)
$ITxACIND_{t-1}$		0.011		0.010*		0.005
		(0.012)		(0.005)		(0.012)
$ITxACEXP_{t-1}$		0.540		0.295		0.069
		(0.397)		(0.210)		(0.074)
CSIZE	13.576***	28.071	1.650	9.328	9.349	10.373*
	(5.221)	(18.244)	(4.934)	(9.548)	(10.220)	(5.657)
FPERF	-0.102	-0.314	-0.929**	-0.759**	0.084	0.027
	(0.099)	(0.231)	(0.441)	(0.381)	(0.075)	(0.073)
NFPERF	0.023	0.022	0.159	-0.286	0.288*	0.249
	(0.071)	(0.128)	(0.224)	(0.179)	(0.149)	(0.178)
FINLEV	0.007	0.005	0.094*	0.040**	-0.007	-0.003
	(0.007)	(0.007)	(0.054)	(0.017)	(0.008)	(0.011)
MTBV	0.494	-0.579	-4.632**	-3.260**	1.168**	1.308
	(0.554)	(1.502)	(2.242)	(1.610)	(0.579)	(0.989)
ASSUR	14.246***	14.686***	-29.849***	-24.750***	21.485***	17.383***
	(2.477)	(1.974)	(2.960)	(1.699)	(5.975)	(2.608)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	95	95	91	91	86	86

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.
Note: See Table 3 for variable definitions.
*** p<0.01, ** p<0.05, * p<0.1

Table B3. Robustness analysis: logistic regression results with 2-year lag effects of the independent/ moderating variables (manufacturing industry omitted)

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT_{t-2}	0.074**	0.813***	0.050	0.172	-0.042	0.160
	(0.030)	(0.267)	(0.034)	(0.126)	(0.062)	(0.099)
$BSIZE_{t-2}$	0.362	0.711	0.115	0.556	0.586	2.853***
	(0.386)	(0.681)	(0.722)	(0.450)	(0.380)	(0.999)
$BIND_{t-2}$	0.223	1.591**	-0.020	-0.448**	0.511	0.483
	(0.154)	(0.691)	(0.033)	(0.219)	(0.557)	(0.701)
$BDIV_{t-2}$	0.120	0.678**	0.067	0.493	0.202	0.386**
	(0.089)	(0.312)	(0.092)	(0.307)	(0.125)	(0.189)
$ACIND_{t-2}$	0.044	5.856**	-0.664***	0.288	-0.000	1.447
	(0.115)	(2.452)	(0.098)	(0.599)	(0.207)	(0.917)
$ACEXP_{t-2}$	-1.559	-3.760	-0.390	-2.639	-2.929	-2.034**
	(1.119)	(2.540)	(0.771)	(2.157)	(2.135)	(0.911)
$ITxBSIZE_{t-2}$		0.085***		0.097*		0.044***
		(0.028)		(0.057)		(0.017)
$ITxBIND_{t-2}$		0.052**		0.029**		0.036**
		(0.023)		(0.013)		(0.014)
$ITxBDIV_{t-2}$		0.015		0.025**		0.009
		(0.012)		(0.011)		(0.006)
$ITxACIND_{t-2}$		0.225**		0.008		0.049
		(0.100)		(0.010)		(0.044)
$ITxACEXP_{t-2}$		0.051		0.021		0.024
		(0.156)		(0.119)		(0.261)
CSIZE	5.694*	-14.823	8.030	-6.940*	-9.728	-15.638
	(3.329)	(10.145)	(5.960)	(3.836)	(11.154)	(11.627)
FPERF	-0.407**	-1.443**	-0.511***	-0.893***	-0.080	-0.364**
	(0.164)	(0.718)	(0.140)	(0.238)	(0.108)	(0.153)
NFPERF	0.160**	0.122	-0.107	0.357	0.431**	0.513***
	(0.079)	(0.109)	(0.224)	(0.386)	(0.187)	(0.195)
FINLEV	-0.001	0.008	0.040**	0.126	-0.013	0.005
	(0.014)	(0.014)	(0.019)	(0.103)	(0.025)	(0.014)
MTBV	-0.915	0.286	-2.544*	-12.061*	0.866	0.557
	(0.852)	(1.252)	(1.323)	(6.866)	(0.840)	(0.576)
ASSUR	15.780***	4.273	-18.014***	-5.544	22.276***	10.019***
	(1.861)	(6.601)	(3.858)	(11.173)	(4.402)	(3.525)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	80	80	72	72	72	72

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.
Note: See Table 3 for variable definitions.
*** p<0.01, ** p<0.05, * p<0.1

Table B4. Robustness analysis: logistic regression results (Germany omitted)

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT	0.015	0.016	0.018	0.022	0.012	0.022
	(0.018)	(0.013)	(0.015)	(0.014)	(0.020)	(0.018)
BSIZE	0.438***	0.439***	-0.192*	-0.200	0.527***	0.551***
	(0.137)	(0.130)	(0.113)	(0.122)	(0.143)	(0.121)
BIND	0.016	0.012	0.006	-0.009	0.005	0.035
	(0.025)	(0.026)	(0.017)	(0.022)	(0.018)	(0.036)
BDIV	0.004	0.010	0.013	0.008	0.048	0.051
	(0.026)	(0.031)	(0.023)	(0.022)	(0.034)	(0.035)
ACIND	-0.003	0.002	-0.020	-0.000	0.025	0.019
	(0.033)	(0.028)	(0.013)	(0.024)	(0.030)	(0.034)
ACEXP	-0.133	-0.209	-0.414	-0.124	0.537	0.637
	(0.486)	(0.597)	(0.528)	(0.543)	(0.672)	(0.726)
ITxBSIZE		0.007*		0.002		0.009
		(0.004)		(0.003)		(0.006)
ITxBIND		0.000		0.001		0.002
		(0.001)		(0.001)		(0.002)
ITxBDIV		0.001		0.000		0.000
		(0.001)		(0.001)		(0.001)
ITxACIND		0.001		0.001		0.001
		(0.001)		(0.001)		(0.001)
ITxACEXP		0.041**		0.042***		0.026
		(0.018)		(0.016)		(0.030)
CSIZE	0.144	0.385	0.228	0.083	0.561	0.561
	(1.065)	(1.051)	(0.832)	(0.859)	(1.218)	(1.344)
FPERF	0.007	0.011	-0.141*	-0.147*	0.159**	0.171***
	(0.048)	(0.047)	(0.073)	(0.076)	(0.068)	(0.063)
NFPERF	0.012	0.014	-0.055*	-0.055*	0.093***	0.105***
	(0.032)	(0.032)	(0.028)	(0.030)	(0.032)	(0.029)
FINLEV	0.001	0.000	0.016***	0.016**	-0.008	-0.012*
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)
MTBV	-0.371	-0.324	-0.571	-0.610	-0.205	-0.147
	(0.240)	(0.228)	(0.386)	(0.404)	(0.255)	(0.269)
ASSUR	-0.874	-0.186	-0.992	-0.900	-0.082	0.060
	(0.992)	(0.987)	(0.834)	(0.822)	(1.255)	(1.322)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	376	376	355	355	384	384

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.
Note: See Table 3 for variable definitions.
*** p<0.01, ** p<0.05, * p<0.1

Table B5. Robustness analysis: logistic regression results with 1-year lag effects of the independent/ moderating variables (Germany omitted)

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT_{t-1}	0.014	0.006	0.045**	0.062***	-0.013	-0.016
	(0.020)	(0.020)	(0.018)	(0.019)	(0.017)	(0.022)
$BSIZE_{t-1}$	0.375***	0.363***	-0.021	-0.116	0.213	0.266*
	(0.140)	(0.134)	(0.137)	(0.186)	(0.155)	(0.152)
$BIND_{t-1}$	0.015	-0.053	0.012	0.006	0.001	-0.028
	(0.019)	(0.038)	(0.014)	(0.020)	(0.061)	(0.055)
$BDIV_{t-1}$	0.033	0.045	0.019	0.021	0.094**	0.104**
	(0.035)	(0.041)	(0.021)	(0.023)	(0.048)	(0.041)
$ACIND_{t-1}$	-0.030	0.003	-0.040	-0.043	0.058*	0.085**
	(0.030)	(0.031)	(0.025)	(0.029)	(0.035)	(0.038)
$ACEXP_{t-1}$	1.303*	1.476*	0.326	0.073	0.621	0.440
	(0.714)	(0.765)	(0.524)	(0.593)	(0.715)	(0.702)
$ITxBSIZE_{t-1}$		0.002		0.009**		0.005
		(0.005)		(0.004)		(0.005)
$ITxBIND_{t-1}$		0.003**		0.000		0.001
		(0.001)		(0.001)		(0.001)
$ITxBDIV_{t-1}$		0.001		0.000		0.001
		(0.001)		(0.001)		(0.002)
$ITxACIND_{t-1}$		0.002		0.001*		0.002
		(0.001)		(0.001)		(0.002)
$ITxACEXP_{t-1}$		0.036		0.040*		0.021
		(0.024)		(0.021)		(0.042)
CSIZE	1.500	1.994*	0.920	1.104	1.039	0.932
	(1.052)	(1.153)	(1.021)	(1.142)	(1.323)	(1.327)
FPERF	0.042	0.054	-0.073	-0.071	0.119**	0.124**
	(0.031)	(0.034)	(0.065)	(0.062)	(0.052)	(0.053)
NFPERF	0.016	0.028	-0.063*	-0.069**	0.116***	0.120***
	(0.033)	(0.032)	(0.035)	(0.034)	(0.027)	(0.029)
FINLEV	-0.003	-0.001	0.012*	0.015*	-0.020**	-0.021***
	(0.007)	(0.007)	(0.007)	(0.009)	(0.008)	(0.008)
MTBV	-0.228	-0.166	-0.593	-0.597	0.207	0.217
	(0.238)	(0.219)	(0.443)	(0.439)	(0.257)	(0.252)
ASSUR	-1.955*	-1.905*	-1.303	-1.503	-0.676	-0.524
	(1.068)	(1.015)	(1.283)	(1.392)	(1.411)	(1.478)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	306	306	303	303	312	312

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.
Note: See Table 3 for variable definitions.
*** p<0.01, ** p<0.05, * p<0.1

Table B6. Robustness analysis: logistic regression results with 2-year lag effects of the independent/ moderating variables (Germany omitted)

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT_{t-2}	0.010	0.007	0.031*	0.054**	0.001	-0.006
	(0.019)	(0.018)	(0.018)	(0.024)	(0.022)	(0.020)
$BSIZE_{t-2}$	0.223*	0.292**	0.097	-0.037	0.235	0.290
	(0.135)	(0.143)	(0.146)	(0.223)	(0.151)	(0.182)
$BIND_{t-2}$	-0.037	-0.092**	-0.046	-0.067	0.009	0.007
	(0.034)	(0.039)	(0.044)	(0.044)	(0.039)	(0.051)
$BDIV_{t-2}$	0.021	0.003	0.028	0.016	0.076*	0.097*
	(0.028)	(0.029)	(0.025)	(0.029)	(0.046)	(0.054)
$ACIND_{t-2}$	0.076***	0.095***	0.009	0.049*	0.096***	0.088***
	(0.027)	(0.030)	(0.020)	(0.026)	(0.035)	(0.033)
$ACEXP_{t-2}$	-0.383	-0.195	-0.129	-0.236	-1.313***	-1.012
	(0.755)	(0.882)	(0.540)	(0.523)	(0.475)	(0.818)
$ITxBSIZE_{t-2}$		0.008		0.010		0.005
		(0.005)		(0.006)		(0.006)
$ITxBIND_{t-2}$		0.003***		0.001		0.001
		(0.001)		(0.001)		(0.001)
$ITxBDIV_{t-2}$		0.002**		0.000		0.001
		(0.001)		(0.001)		(0.002)
$ITxACIND_{t-2}$		0.000		0.001*		0.001
		(0.001)		(0.001)		(0.001)
$ITxACEXP_{t-2}$		0.032		0.009		0.112***
		(0.025)		(0.014)		(0.036)
CSIZE	1.468	1.603	1.575	1.306	0.793	1.168
	(1.159)	(1.220)	(1.312)	(1.338)	(1.769)	(1.812)
FPERF	0.000	0.014	-0.091	-0.101	0.167***	0.191***
	(0.036)	(0.046)	(0.067)	(0.073)	(0.061)	(0.073)
NFPERF	0.039	0.037	-0.130***	-0.143***	0.199***	0.220***
	(0.039)	(0.035)	(0.039)	(0.041)	(0.042)	(0.041)
FINLEV	-0.007	-0.008	0.005	0.007	-0.030***	-0.033***
	(0.011)	(0.010)	(0.007)	(0.008)	(0.011)	(0.012)
MTBV	-0.141	-0.188	-0.738	-0.681	0.427	0.435
	(0.331)	(0.295)	(0.486)	(0.488)	(0.341)	(0.400)
ASSUR	-2.255**	-2.663**	0.818	1.306	-2.287	-2.442
	(0.983)	(1.234)	(1.443)	(1.732)	(2.197)	(1.712)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	260	260	260	260	251	251

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.
Note: See Table 3 for variable definitions.
*** p<0.01, ** p<0.05, * p<0.1

Table B7. Robustness analysis: logistic regression results (France omitted)

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT	0.010	0.017	0.020	0.019	0.003	0.014
	(0.017)	(0.014)	(0.014)	(0.015)	(0.020)	(0.017)
BSIZE	0.281**	0.285**	-0.102	-0.088	0.310**	0.356**
	(0.119)	(0.123)	(0.100)	(0.105)	(0.156)	(0.161)
BIND	0.012	0.008	0.003	0.000	0.011	0.025
	(0.020)	(0.023)	(0.011)	(0.013)	(0.019)	(0.020)
BDIV	-0.016	-0.009	-0.005	-0.009	0.048	0.037
	(0.028)	(0.030)	(0.023)	(0.023)	(0.032)	(0.038)
ACIND	0.008	0.006	-0.030*	-0.021	0.039	0.033
	(0.032)	(0.030)	(0.017)	(0.024)	(0.030)	(0.030)
ACEXP	-0.012	-0.137	-0.306	-0.150	0.416	0.449
	(0.516)	(0.560)	(0.507)	(0.529)	(0.505)	(0.524)
ITxBSIZE		0.006*		0.004		0.009***
		(0.003)		(0.003)		(0.003)
ITxBIND		0.000		0.001		0.001
		(0.001)		(0.001)		(0.001)
ITxBDIV		0.001		0.001		0.002*
		(0.001)		(0.001)		(0.001)
ITxACIND		0.000		0.001		0.000
		(0.001)		(0.001)		(0.001)
ITxACEXP		0.003		0.036*		0.021
		(0.020)		(0.021)		(0.025)
CSIZE	-0.015	0.259	0.158	-0.102	-0.128	0.274
	(1.190)	(1.200)	(0.791)	(0.825)	(1.182)	(1.167)
FPERF	-0.017	-0.011	-0.154**	-0.155**	0.115*	0.141**
	(0.056)	(0.055)	(0.072)	(0.072)	(0.059)	(0.056)
NFPERF	0.000	0.003	-0.036	-0.039	0.061	0.081**
	(0.037)	(0.037)	(0.023)	(0.024)	(0.040)	(0.038)
FINLEV	-0.000	-0.001	0.013***	0.014***	-0.005	-0.006
	(0.005)	(0.006)	(0.004)	(0.005)	(0.005)	(0.005)
MTBV	-0.065	-0.004	-0.786**	-0.742**	0.024	0.078
	(0.272)	(0.255)	(0.317)	(0.309)	(0.288)	(0.301)
ASSUR	-0.590	-0.327	-1.710**	-1.585*	0.695	0.432
	(1.159)	(1.166)	(0.782)	(0.818)	(1.118)	(1.099)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	355	355	383	383	360	360

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.
Note: See Table 3 for variable definitions.
*** p<0.01, ** p<0.05, * p<0.1

Table B8. Robustness analysis: logistic regression results with 1-year lag effects of the independent/ moderating variables (France omitted)

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT_{t-1}	0.007	-0.001	0.041**	0.044**	-0.025	-0.023
	(0.020)	(0.021)	(0.017)	(0.017)	(0.016)	(0.021)
$BSIZE_{t-1}$	0.378**	0.381**	0.069	0.072	0.226	0.233
	(0.151)	(0.156)	(0.126)	(0.134)	(0.151)	(0.143)
$BIND_{t-1}$	0.008	-0.051*	0.014	0.022	0.002	-0.046
	(0.016)	(0.030)	(0.012)	(0.023)	(0.054)	(0.072)
$BDIV_{t-1}$	0.029	0.051	0.017	0.019	0.087**	0.095*
	(0.033)	(0.039)	(0.023)	(0.024)	(0.040)	(0.049)
$ACIND_{t-1}$	-0.026	0.001	-0.059*	-0.066**	0.056	0.065*
	(0.028)	(0.029)	(0.031)	(0.030)	(0.035)	(0.034)
$ACEXP_{t-1}$	1.048**	1.389*	0.328	0.271	-0.304	-0.517
	(0.510)	(0.717)	(0.501)	(0.525)	(0.443)	(0.632)
$ITxBSIZE_{t-1}$		0.003		0.002		0.001
		(0.003)		(0.003)		(0.003)
$ITxBIND_{t-1}$		0.003**		0.000		0.002
		(0.001)		(0.001)		(0.002)
$ITxBDIV_{t-1}$		0.001		0.001		0.000
		(0.001)		(0.001)		(0.001)
$ITxACIND_{t-1}$		0.002		0.001		0.000
		(0.001)		(0.001)		(0.001)
$ITxACEXP_{t-1}$		0.018		0.028		0.020
		(0.034)		(0.026)		(0.035)
CSIZE	1.850	2.155	0.679	0.696	0.841	0.917
	(1.158)	(1.405)	(1.034)	(1.135)	(1.271)	(1.270)
FPERF	0.041	0.046	-0.076	-0.075	0.113**	0.123**
	(0.032)	(0.034)	(0.065)	(0.062)	(0.054)	(0.055)
NFPERF	0.037	0.025	-0.045	-0.047	0.110***	0.103***
	(0.041)	(0.042)	(0.032)	(0.034)	(0.034)	(0.032)
FINLEV	-0.002	0.000	0.013***	0.013***	-0.009	-0.007
	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
MTBV	0.174	0.127	-0.803**	-0.772**	0.217	0.152
	(0.216)	(0.237)	(0.384)	(0.371)	(0.299)	(0.301)
ASSUR	-2.189*	-1.907	-1.809*	-2.007*	0.547	0.219
	(1.282)	(1.457)	(1.095)	(1.030)	(1.087)	(1.096)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	283	283	322	322	286	286

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.
Note: See Table 3 for variable definitions.
*** p<0.01, ** p<0.05, * p<0.1

Table B9. Robustness analysis: logistic regression results with 2-year lag effects of the independent/ moderating variables (France omitted)

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT_{t-2}	0.002	0.001	0.042**	0.040**	-0.011	-0.015
	(0.019)	(0.020)	(0.018)	(0.018)	(0.021)	(0.023)
$BSIZE_{t-2}$	0.182	0.197	0.215	0.258	0.131	0.152
	(0.127)	(0.142)	(0.137)	(0.177)	(0.125)	(0.139)
$BIND_{t-2}$	-0.014	-0.072***	-0.063	-0.115**	0.034	0.013
	(0.016)	(0.025)	(0.050)	(0.055)	(0.047)	(0.049)
$BDIV_{t-2}$	0.016	0.018	0.007	0.005	0.089**	0.091*
	(0.023)	(0.026)	(0.026)	(0.030)	(0.036)	(0.049)
$ACIND_{t-2}$	0.050**	0.077**	0.007	0.050	0.059*	0.049
	(0.025)	(0.032)	(0.022)	(0.031)	(0.036)	(0.040)
$ACEXP_{t-2}$	0.047	0.493	-0.128	-0.033	-0.950	-1.250
	(0.706)	(1.104)	(0.387)	(0.414)	(0.641)	(0.763)
$ITxBSIZE_{t-2}$		0.004		0.000		0.002
		(0.003)		(0.004)		(0.004)
$ITxBIND_{t-2}$		0.003***		0.002		0.003**
		(0.001)		(0.001)		(0.001)
$ITxBDIV_{t-2}$		0.001		0.000		0.001
		(0.001)		(0.001)		(0.002)
$ITxACIND_{t-2}$		0.001		0.002**		0.000
		(0.002)		(0.001)		(0.001)
$ITxACEXP_{t-2}$		0.052		0.004		0.003
		(0.046)		(0.024)		(0.039)
CSIZE	1.281	1.576	1.073	1.163	0.928	0.643
	(1.256)	(1.428)	(1.065)	(1.078)	(1.570)	(1.563)
FPERF	0.003	0.017	-0.099	-0.109	0.134**	0.141**
	(0.044)	(0.053)	(0.075)	(0.080)	(0.059)	(0.062)
NFPERF	0.069	0.051	-0.090***	-0.098***	0.164***	0.160***
	(0.053)	(0.055)	(0.031)	(0.032)	(0.048)	(0.043)
FINLEV	-0.004	-0.002	0.006	0.006	-0.008	-0.006
	(0.007)	(0.006)	(0.005)	(0.005)	(0.008)	(0.008)
MTBV	0.161	0.180	-0.669	-0.835*	0.261	0.231
	(0.234)	(0.258)	(0.410)	(0.487)	(0.336)	(0.342)
ASSUR	-2.351**	-2.770**	0.224	0.636	-0.447	-0.395
	(1.159)	(1.226)	(1.156)	(1.575)	(1.353)	(1.396)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	239	239	262	262	227	227

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.
Note: See Table 3 for variable definitions.
*** p<0.01, ** p<0.05, * p<0.1

Table B10. Robustness analysis: logistic regression results (Great Britain omitted)

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT	0.014	0.017	0.025	0.032**	0.006	0.008
	(0.015)	(0.012)	(0.015)	(0.015)	(0.018)	(0.015)
BSIZE	0.418***	0.459***	-0.049	-0.010	0.316**	0.366***
	(0.129)	(0.132)	(0.109)	(0.119)	(0.135)	(0.135)
BIND	0.025	0.016	-0.004	0.002	0.022	0.041*
	(0.029)	(0.024)	(0.010)	(0.014)	(0.023)	(0.023)
BDIV	-0.000	0.009	0.009	0.004	0.062**	0.071**
	(0.027)	(0.030)	(0.024)	(0.022)	(0.031)	(0.035)
ACIND	-0.013	-0.008	-0.021	-0.012	0.036	0.030
	(0.032)	(0.024)	(0.015)	(0.026)	(0.026)	(0.027)
ACEXP	-0.160	-0.160	-0.282	-0.092	0.611	0.778
	(0.520)	(0.641)	(0.524)	(0.590)	(0.585)	(0.638)
ITxBSIZE		0.006**		0.006**		0.009***
		(0.003)		(0.003)		(0.003)
ITxBIND		0.000		0.000		0.002*
		(0.001)		(0.001)		(0.001)
ITxBDIV		0.001		0.001		0.001
		(0.001)		(0.001)		(0.001)
ITxACIND		0.001		0.002*		0.000
		(0.001)		(0.001)		(0.001)
ITxACEXP		0.012		0.032		0.015
		(0.019)		(0.021)		(0.027)
CSIZE	-1.207	-0.839	0.549	-0.019	-0.494	-0.538
	(1.022)	(0.998)	(1.119)	(1.138)	(1.026)	(0.948)
FPERF	0.010	0.023	-0.122	-0.124*	0.088*	0.106**
	(0.054)	(0.053)	(0.075)	(0.074)	(0.051)	(0.045)
NFPERF	-0.017	-0.010	-0.079**	-0.083**	0.029	0.048
	(0.037)	(0.036)	(0.033)	(0.036)	(0.037)	(0.037)
FINLEV	0.005	0.004	0.015***	0.018***	-0.001	-0.003
	(0.005)	(0.006)	(0.004)	(0.006)	(0.005)	(0.005)
MTBV	-0.502*	-0.416*	-0.866**	-0.757**	-0.290	-0.230
	(0.258)	(0.238)	(0.340)	(0.369)	(0.178)	(0.166)
ASSUR	-0.101	0.369	-1.961**	-2.138**	0.290	0.606
	(1.245)	(1.067)	(0.842)	(0.843)	(1.139)	(1.101)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	372	372	350	350	409	409

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.
Note: See Table 3 for variable definitions.
*** p<0.01, ** p<0.05, * p<0.1

Table B11. Robustness analysis: logistic regression results with 1-year lag effects of the independent/ moderating variables (Great Britain omitted)

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT_{t-1}	0.026	0.018	0.051***	0.065***	-0.009	-0.013
	(0.016)	(0.016)	(0.018)	(0.019)	(0.016)	(0.017)
$BSIZE_{t-1}$	0.386**	0.360**	-0.013	-0.025	0.252	0.245
	(0.161)	(0.155)	(0.166)	(0.199)	(0.193)	(0.192)
$BIND_{t-1}$	0.027	-0.015	0.011	0.039	-0.001	-0.029
	(0.017)	(0.036)	(0.012)	(0.026)	(0.044)	(0.052)
$BDIV_{t-1}$	0.021	0.025	0.028	0.032	0.059	0.067*
	(0.031)	(0.034)	(0.025)	(0.027)	(0.041)	(0.038)
$ACIND_{t-1}$	-0.058*	-0.037	-0.054*	-0.069**	0.065*	0.082**
	(0.031)	(0.031)	(0.033)	(0.033)	(0.034)	(0.041)
$ACEXP_{t-1}$	0.749	0.662	0.636	0.648	-0.048	-0.268
	(0.508)	(0.577)	(0.495)	(0.568)	(0.521)	(0.478)
$ITxBSIZE_{t-1}$		0.002		0.002		0.004
		(0.003)		(0.003)		(0.003)
$ITxBIND_{t-1}$		0.002		0.001		0.001
		(0.001)		(0.001)		(0.001)
$ITxBDIV_{t-1}$		0.001		0.001		0.000
		(0.001)		(0.001)		(0.001)
$ITxACIND_{t-1}$		0.002*		0.001*		0.001
		(0.001)		(0.001)		(0.002)
$ITxACEXP_{t-1}$		0.017		0.058**		0.034
		(0.024)		(0.029)		(0.030)
CSIZE	0.839	1.233	0.779	0.764	0.257	0.168
	(0.945)	(1.033)	(1.361)	(1.614)	(0.824)	(0.837)
FPERF	0.083*	0.098**	-0.042	-0.041	0.095**	0.092**
	(0.043)	(0.044)	(0.063)	(0.060)	(0.042)	(0.039)
NFPERF	0.021	0.031	-0.096**	-0.107**	0.078***	0.080***
	(0.033)	(0.035)	(0.041)	(0.043)	(0.028)	(0.027)
FINLEV	0.003	0.003	0.016***	0.018***	-0.005	-0.006
	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
MTBV	-0.363	-0.274	-0.881**	-0.736**	-0.116	-0.095
	(0.232)	(0.223)	(0.405)	(0.374)	(0.200)	(0.195)
ASSUR	-2.459**	-2.288**	-2.127*	-2.645**	-0.120	-0.193
	(1.076)	(1.095)	(1.217)	(1.222)	(1.260)	(1.211)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	299	299	304	304	323	323

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.
Note: See Table 3 for variable definitions.
*** p<0.01, ** p<0.05, * p<0.1

Table B12. Robustness analysis: logistic regression results with 2-year lag effects of the independent/ moderating variables (Great Britain omitted)

VARIABLES	(1) CRQ	(2) CRQ	(3) FRQ	(4) FRQ	(5) NFRQ	(6) NFRQ
IT_{t-2}	0.023	0.020	0.057***	0.059***	0.005	-0.004
	(0.015)	(0.015)	(0.017)	(0.017)	(0.015)	(0.018)
$BSIZE_{t-2}$	0.336**	0.361**	0.222	0.295	0.237**	0.153
	(0.143)	(0.154)	(0.172)	(0.207)	(0.112)	(0.125)
$BIND_{t-2}$	-0.005	-0.039	-0.036	-0.045	0.045	0.041
	(0.016)	(0.024)	(0.041)	(0.064)	(0.050)	(0.047)
$BDIV_{t-2}$	0.011	0.004	0.019	0.028	0.032	0.025
	(0.025)	(0.026)	(0.025)	(0.035)	(0.036)	(0.040)
$ACIND_{t-2}$	0.039	0.053*	0.010	0.042	0.053	0.044
	(0.027)	(0.032)	(0.017)	(0.028)	(0.041)	(0.032)
$ACEXP_{t-2}$	-0.457	-0.297	-0.342	-0.290	-0.840	-0.992
	(0.574)	(0.679)	(0.362)	(0.409)	(0.529)	(0.665)
$ITxBSIZE_{t-2}$		0.005		0.002		0.003
		(0.003)		(0.004)		(0.004)
$ITxBIND_{t-2}$		0.001*		0.001		0.002
		(0.001)		(0.002)		(0.002)
$ITxBDIV_{t-2}$		0.001		0.001		0.000
		(0.001)		(0.001)		(0.001)
$ITxACIND_{t-2}$		0.000		0.002**		0.000
		(0.001)		(0.001)		(0.001)
$ITxACEXP_{t-2}$		0.030		0.004		0.036
		(0.021)		(0.016)		(0.029)
CSIZE	0.219	0.156	0.068	0.211	0.301	-0.062
	(1.124)	(1.230)	(1.400)	(1.603)	(1.140)	(1.170)
FPERF	0.036	0.048	-0.069	-0.073	0.140**	0.142**
	(0.042)	(0.048)	(0.060)	(0.058)	(0.056)	(0.070)
NFPERF	0.019	0.021	-0.160***	-0.169***	0.132***	0.123***
	(0.039)	(0.038)	(0.041)	(0.046)	(0.044)	(0.041)
FINLEV	0.001	-0.000	0.011**	0.011*	-0.003	-0.002
	(0.006)	(0.005)	(0.005)	(0.007)	(0.006)	(0.008)
MTBV	-0.370	-0.367	-0.855*	-0.873*	-0.192	-0.225
	(0.237)	(0.228)	(0.456)	(0.479)	(0.246)	(0.285)
ASSUR	-1.637	-1.805	0.608	0.819	-0.543	-0.341
	(1.273)	(1.417)	(1.004)	(1.065)	(1.477)	(1.508)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	259	259	254	254	266	266

Model 2, 4 and 6 include interaction terms. Robust standard errors in parentheses.
Note: See Table 3 for variable definitions.
*** p<0.01, ** p<0.05, * p<0.1