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Materiality analysis in sustainability and integrated reports

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Abstract
Purpose – The paper aims to assess the disclosure on materiality analysis in sustainability and integrated reports through the lenses of legitimacy and stakeholder theory. Three research questions are addressed, (1) to what extent do companies report on their materiality analysis, (2) what are the methods used for the analysis of the stakeholders and their topics/aspects and (3) is there a higher disclosure of information of materiality assessment because of G4.

Design/methodology/approach – The paper uses an archival research approach and deploys content analysis. Thus, a binary disclosure index was developed that indicates whether materiality related information are mentioned and explained in detail. The sample contains 132 reports from 33 companies of the German 110 HDAX stock market index between 2014 and 2017.

Findings – The paper reveals that materiality analysis is a growing phenomenon. Nevertheless, companies disclose only a small amount of related information and fail to explain the methods for the stakeholder and topics/aspects identification. Thus, the underlying processes to define the report content remains unclear. Through the lenses of legitimacy theory, the study indicates that materiality analysis can strategically be misused to define report content without considering the interests of legitimized stakeholder groups and thus, does not improve the reports to those groups.

Practical implications – Managers are urged to regard the importance of reporting about ongoing materiality assessments as otherwise, concerns about the overall reliability of the information presented may arise.

Social implications – Poor reporting about materiality assessments might lead to potential conflicts with stakeholders that do see their important topics not sufficiently reflected in the sustainability or integrated report.

Originality/value – This study contributes to the literature regarding materiality in sustainability and integrated reporting and uses the assumptions of disclosure theories to evaluate the disclosure of a specific disclosure item.

Keywords: Sustainability Reporting, Integrated Reporting, Materiality Analysis, Stakeholder Theory, Legitimacy Theory

Paper type: Research paper

1. Introduction

Companies are facing an increasing demand for business model related information driven by manifold interest groups – usually referred to as stakeholders. As a response, the average number of different types of corporate reports per company has significantly increased during the last decade (Bellantuono et al., 2016). Some reports address a broad audience, whereas others focus mainly on a specific stakeholder group. Therefore, each report sheds light on the business model of a company from a different perspective. Simply spoken, the – mostly mandatory – General Purpose IFRS Financial Statements mainly address investors and provide only a financial perspective, whereas, the – in most cases voluntarily prepared – Sustainability Report [1] might focus on a broad audience – different from purely financial investors – and gives very detailed insights into a business model's impacts or outcomes from three usually isolated perspectives (economic, social, ecological). In recent times, attempts were made to bring together all the perspectives of those different corporate reports, thus, building up a holistic picture of the organization. The most popular initiative in this field is the International Integrated Reporting Council (IIRC) that released the International Integrated Reporting Framework (IIRC, 2013) in 2013 and stipulates companies to produce Integrated Reports. Summarizing, sustainability and integrated reports are characterised by the following: Both are prepared on a voluntary basis [2] and address a broader audience as purely financially orientated investors. Despite a growing body of published sustainability and integrated reports, they are often criticized for a lack in quality and credibility for example, even if a report is assured, due to limited and voluntary assurance possibilities (Dando and Swift, 2003; Coombs and Holladay, 2013; Lock and Seele, 2016), less developed regulations (Comyns et al., 2013) and standardizations (Hodge et al., 2009; Braam and Peeters, 2017), the vulnerability for manipulation through its narrative character (Basu and Palazzo, 2008; Melloni et al., 2017) or a discretionary leeway for the management in the choice of the reported content (Milne and Gray, 2013).

To restrict discretionary leeway and to ensure the report addresses topics and aspects of relevance to the relevant stakeholders, the materiality determination process enables companies to define the report content in a structured way (Hsu et al., 2013; Junior et al., 2014; Calabrese et al., 2016). Thus, internationally accepted standard setters like the Global Reporting Initiative (GRI) or the IIRC defined stakeholder inclusiveness and materiality as two of the reporting principles and require companies to enhance their reports through information regarding their materiality determination process, which possibly can enhance the quality of the disclosure (GRI, 2015a; IIRC, 2013). Thus, according to GRI G4, the report is to include stakeholders that are either significantly affected by the organization or themselves affect the successful implementation of the organization's objectives and to address the relevant topics (GRI, 2015a). Thereby, GRI G4 presents a materiality matrix that can be used for identifying the relevant topics of the relevant stakeholders. As there is no commonly understood definition of materiality and it has both quantitative and qualitative aspects, even research frequently draws on definitions provided by regulatory bodies (Eccles et al., 2012). Because of its emerging relevance, academic researchers started to focus their work on the concept of materiality in the context of voluntary sustainability and integrated reporting. For example, it is argued, that the identification of relevant topics for sustainability and integrated reports has direct implications for the value relevance of such reports (Eccles et al., 2013). Unerman and Zappettini (2014) further highlight that the materiality determination process reflects management decision processes to publish specific information. In this sense, they argue that companies can (mis-)use the materiality concept in order to exclude negative information. Lastly, companies can enhance the transparency to relevant stakeholders through reporting on their materiality analysis (Junior et al., 2014). In order to evaluate whether the disclosure on materiality can improve reporting and contributes to closing the discretionary leeway, research started to examine this information in sustainability and integrated reports and identified factors that influence the disclosure on materiality (for example the scope and diversity of the board or the sector of the company). What is still missing in empirical studies is the theoretical perspective that helps to explain the motives of the voluntary disclosure of materiality related information, which lastly can help to enhance the credibility of those reports.

Still, like the sustainability and integrated reports, reporting about materiality assessments remains a voluntary issue to date. While challenging the question why for-profit companies invest resources in voluntary reporting, scholars give, at least, two disparate answers. From a legitimacy theory perspective, companies use voluntary reporting as a tool for justifying their activities towards the public with respect to their license to operate (Deegan, 2014). Taking the stance of managerial stakeholder theory, this view is questioned by highlighting that reports might not necessarily be tailored to all, but to selected individual interest groups. Accordingly, they are a means to give account to the company's stakeholders "sometimes based on the extent of the stakeholders' power" (Fernando and Lawrence, 2014). Therefore, a rich body of literature on legitimacy and stakeholder theory is useful to derive expectations regarding the disclosure on materiality analysis.

Therefore, guiding companies to report on the topics relevant to the key stakeholders only, can be seen as an instrument within the (managerial) stakeholder theory branch. Thus, one would expect companies to provide detailed explanations about their materiality analysis if these seek for stakeholder management. On the other hand, if companies use sustainability and integrated reports to strive for legitimation, one would expect the topics reported to be driven by the companies' choice addressing the broad public thereby neglecting specific stakeholders to some extent. Hence, explanations about the materiality processes in sustainability and integrated reports are expected to be limited from a legitimacy theory perspective.

Thus, to make a theoretical contribution on materiality assessment in sustainability and integrated reporting, the paper answers the following research questions (RQs): to what extent do companies report on their materiality analysis (RQ1); what are the methods used for the analysis of stakeholders and topics/aspects (RQ2); and whether there is a higher disclosure of information of materiality assessment because of G4 (RQ3). These questions will be evaluated through the lenses of legitimacy and (managerial) stakeholder theory. Thereby, this study uses an archival research approach and content analysis to evaluate (printed and online) sustainability and integrated reports of 33 listed German companies in the 110 HDAX stock market index in the years 2014 to 2017 and additionally calculates a disclosure index. As a main contribution, this paper draws on legitimacy theory, whereby it is proposed, when management disclose fuzzy information on their materiality determination process, it could be part of a legitimacy strategy. Thus, if management tries to enhance the credibility of its reporting, it should make the underlying materiality analysis more comprehensible for stakeholder groups.

The paper is structured as follows. After revisiting the related literature on Corporate Social Responsibility (CSR) reporting in general and stakeholder and legitimacy theory, the concept of materiality is introduced (Chapter 2). A short comparison of the assumptions towards reporting about the materiality analysis leads to the RQs in Section 3.1 and methods in Section 3.2. The results and discussion are presented in Chapter 4 followed by a conclusion in Chapter 5.

2. Related literature

2.1 Sustainability and CSR reporting

In recent discussions sustainability, sustainable development, corporate sustainability and CSR are contested phrases, at times with no distinct definitions. Sustainability particularly became prominent through the Brundtland-Report in 1987 which describes sustainable development as a process to reach the state of sustainability in a society as a whole (WCED, 1987). Hence, corporate sustainability and CSR are frequently synonymously used phrases that describe the contribution of a company to this development. Usually, this concept is linked to Elkington's triple bottom line approach, which states that sustainable development has an ecological, social and economic component (Wheeler and Elkington, 2001). To evaluate whether a company's contribution to the sustainable development is positive or negative it must be measured to express its CSR performance. The communication of these activities and the performance is lastly the task of the subsequent CSR report, whereby only an extract of all CSR activities and the CSR performance will be disclosed (Brown and Dillard, 2006). Thus, in this article, sustainability and integrated reports are defined as tools of stakeholder communication, with the purpose to show how companies deal with their economic, environmental and social impacts. These reporting tools usually contain financial and non-financial information (IIRC, 2013; Bellantuono et al., 2016).

Besides the academic debate, the GRI states that sustainability reporting is a means for "understanding and managing the effects of sustainability developments on the organizations activities and strategy" (GRI, 2015a). For the purpose of this paper, the investigation of the disclosure of information on materiality processes in sustainability and integrated reports, the GRI G4 standards were used to develop the measurement instrument. This set of standards contains categories of general disclosures with reporting requirements regarding the identification of key stakeholders and material topics resp. reporting boundaries (GRI, 2015a). The principle of materiality is also applicable to integrated reports. Because of the integration of financial and non-financial (e.g. natural, social and relationship capitals) information, integrated reports also have to deal with a wider range of topics. The IIRC's Integrated Reporting-Framework describes a materiality determination process, which includes on the one hand the identification of relevant matters and critical stakeholders to determine the report content but on the other hand a general investor orientation in its purpose to obtain or maintain a company's license to operate (IIRC, 2013).

Although through the concept of materiality, standard setters try to give the voluntarily prepared sustainability and integrated reports a more binding content, still also reporting on materiality and thus the materiality analysis remain a voluntary matter. Thus, also here discretionary leeway exists – which ultimately can lead to a situation where the reporting will not be enhanced through a materiality analysis. Because a materiality analysis reflects management decisions (Unerman and Zappettini, 2014), it is interesting to study the reporting on this specific topic in order to assess whether inferences can be drawn on the decisions of the management and whether this can lead to a surplus for the addressee. In the following, we therefore draw on literature on voluntary reporting in order to shed light on how these theories might explain the actual reporting of companies on their materiality analysis.

2.2 Theoretical explanations of voluntary reporting

Systematizations of theories underlying CSR reporting are manifold (Ali et al., 2017). Belal and Momin (2009) classified studies in the extent and level of CSR disclosure, managerial and other stakeholder perceptions. Ali et al. (2017) systemized the existing literature by means of different determinants of CSR disclosure and Clarkson et al. (2008) categorized the literature in studies that assess the connection between CSR/financial performance and CSR disclosure and motivations for the disclosure of CSR information. The most pertinent for this research project is the classification of Gray et al. (1995), who described CSR reporting practices under the lense of different theories in their study and categorized the extant literature into the subject areas of disclosure and the volume of disclosure.

Despite a rich body of research in the field of CSR reporting, a comprehensive theoretical framework for the explanation of why companies offer voluntary CSR reporting disclosure is still missing. (Verbeeten et al., 2016; Cormier et al., 2005). Theories to explain this phenomenon can be categorized in economic based and social or political based theories (Cormier et al., 2005; Gray et al., 1995; Solomon and Lewis, 2002). Theories in the first category (e.g. decision usefulness, agency theory, voluntary disclosure theory or signalling theory) focus on financial stakeholders and the market outcomes of CSR disclosure (Fernando and Lawrence, 2014; Gray et al., 2010). These theories suppose that companies use voluntary CSR disclosure to delineate themselves from other companies. Opposing to this view, social or political based theories (e.g. stakeholder theory, legitimacy theory or institutional theory) recognize that a company works in a broader societal context, its survival is depending on various stakeholder groups and it has to react to social pressure (Cormier et al., 2005). Consequently, CSR reports are used as vehicles to manage different relationships and to shape the public picture of a single company (Hahn and Lülfs, 2014).

In order to find explanations for how companies report on their materiality analysis , i.e. how they identify stakeholders and the accompanying relevant topics, this article draws upon stakeholder theory and legitimacy theory. Both theories are built on assumptions of political economy and represent two overlapping perspectives that are useful to offer insights in the phenomenon on different levels of resolution (Gray et al., 1995). Further, they were chosen because a materiality analysis in sustainability and integrated reporting usually encourages a company to engage and communicate with different parties and stakeholder groups, which reflects the assumptions, that a company is part of a societal system and its survival depends on interactions with the society (Cormier et al., 2005). Thereby, the following section shortly introduces the main concepts, whereas a comparison and our expectations regarding materiality analysis are presented in Section 3.1.

2.2.1 Stakeholder theory

Stakeholder theory advocates that organizations should regard the interests of their stakeholders, who are "any group or individual who can affect or are affected by the achievement of the organisation's objectives" (Freeman 1984, p. 46), in their organizational decisions and target setting. Stakeholder theory can be used in order to investigate the extent of and how stakeholders are managed (Kaur and Lodhia, 2014).

Two main variants of stakeholder theory have evolved: a normative and a managerial branch (Donaldson and Preston, 1995; Jamali et al., 2008). Within the normative branch, companies pursue their duty to account for their actions to all stakeholders that have a right to be informed about the implications of the companies' operations. Thus, there is an ethical standpoint (Deegan, 2013). The second branch, the managerial stakeholder theory, takes an instrumental stance and argues that companies purposefully use voluntary reporting in order to control stakeholders, which are critical for the companies' subsistence and the provision of resources (Mitchell et al., 1997). As such, in the view of stakeholder theory, voluntary reporting is used to manage key stakeholders of the company (Fernando and Lawrence, 2014). Particularly the managerial stakeholder theory has received attention in research on sustainability reporting and is therefore drawn upon in the remaining of the paper. In the branch of the managerial stakeholder theory studies are conducted to unveil the motives to disclose sustainability reports.

For example, Belal and Owen (2007) or Islam and Deegan (2008) explored how powerful stakeholder groups exercise pressure on companies with regard to their social and environmental performance and thus affect the reporting practices of those companies. In both studies the reports directly reflect the interests of powerful stakeholder groups. Belal and Owen (2007) asked for the perceived need of CSR disclosure and the role of key stakeholders in the reporting process. First findings are that the general perception of most managers was positive regarding the disclosure of CSR information and that key stakeholders are those, depending on company specific circumstances, that possess economic power (e.g. shareholders or international buyers). Social or environmental groups or the wider society were merely mentioned. Thus, the main motivation for the provision of CSR information seems to be improving the corporate image and managing the interests of powerful stakeholder groups (Belal and Owen, 2007). Islam and Deegan (2008) identified changing sources of pressure from powerful stakeholder groups between 1987 and 2005 in the Bangladesh clothing industry (western buying companies) and compared it to the disclosure of the companies. A more extensive reporting of those topics under pressure and a variation over time was found, depending on the interests of powerful stakeholder groups. These adoptions seem to be driven by economic motivations. Thus, the changes in disclosure are an expression of strategic resource management (Islam and Deegan, 2008).

In a developed-country setting, Thorne et al. (2014) studied the decision and motivations to provide or not to provide CSR reports. Larger companies were more likely to provide CSR reports. Thorne et al. (2014) argue with a stakeholder theory perspective, that larger companies are more visible and have to react to a greater level of scrutiny by stakeholder groups. Both, reporters and non-reporters reveal that (missing) pressure from specific groups is an important factor for the actual (non-)disclosure of CSR reports. Further, a main motivation for the reporting companies is to benefit through stakeholders and to show their social and environmental performance. The results indicate that companies react with their sustainability reporting to external scrutiny by stakeholder groups (Thorne et al., 2014). Similarly, Deegan and Blomquist (2006) identified pressure from powerful stakeholder groups as a factor in changing CSR strategies and reporting. Hence, the WWF as a large scale NGO with great success in lobbying was identified as powerful stakeholder. The change in CSR reporting was perceived as a demonstration of environmental awareness and necessarily to receive the support of this key stakeholder to survive (Deegan and Blomquist, 2006).

Under the stance of the (managerial) stakeholder theory, these studies agree that identified powerful stakeholders are able to put pressure on companies, which consequently affects the corporate (sustainability) reporting to contain mostly information of relevance for those groups.

2.2.2 Legitimacy theory

Despite stakeholder theory, sustainability reporting is also often described by legitimacy theory, which seeks to explain disclosures of institutions or companies in its social and ecological environment (Hooghiemstra, 2000; Tilling, 2004). The perspective adopted in this paper reflects one aspect of legitimacy theory in which an organization seeks to obtain or maintain its legitimation via a social contract [3] which is in theory, the permission of a company to act. Through this contract, the entity receives resources from and its operations will be evaluated by the surrounding society. The benchmark are the norms and values given by society (i.e. the general public), which is affected by the company's actions (Dowling and Pfeffer, 1975; Suchman, 1995). A company's aim is to show a fit between the social, ecological and economic influences of its operations and the set of norms and values of society through CSR reporting. If an entity fails to reach this minimum level of acceptance, the consequence will be the loss of its legitimation and a withdrawal of provided resources. Following this argumentation, the entity must maintain its legitimation to safe its future operations and earnings. Because of the fact that the set of societal norms and values might be subject of changes over time, this minimum level of acceptance can alter and thus an adjustment of the entity's behaviour is required to ensure the fit between the social expectations and the perception of its operations (Neu et al., 1998; Melloni et al., 2017). Hence, in contrast to stakeholder theory, legitimacy theory expects voluntary reporting to address the broad public in contrast to some selected groups only.

Clarkson et al. (2008) assessed the level of discretionary environmental disclosure with a disclosure index based on GRI guidelines published in 2002, which contains both, hard (numbers) and soft (narrative in nature; more easy to mimic; e.g. letter to stakeholders) disclosure items. They found an absolute higher level of hard and soft disclosure items for companies without threatened legitimacy and on the opposite, a higher ratio of soft to total disclosure for companies with threatened environmental legitimacy. This result indicates that companies are likely to provide soft information to show commitment to the environment, which is a pattern that fits to the predictions of legitimacy theory (Clarkson et al., 2008).

Hahn and Lülfs (2014) assessed the reporting behaviour of companies regarding negative aspects in voluntary sustainability reporting. They found in a sample (19 Dow

Jones listed and 21 DAX listed companies) six different legitimization strategies (symbolic and substantial) for the communication of negative aspects whereby most of the identified strategies (e.g. marginalizations or abstractions) are manipulations of the presentation of information to reach the change in perceptions of the reader (Hahn and Lülfs, 2014).

Likewise, Font et al. (2016) surveyed different internal and external stakeholders in the cruising sector on whether a set of identified sustainability related indicators (soft vs. hard; management vs. performance indicators) is material, the perceived influence of those groups on how companies deal with single indicators and the perceived motivation of companies to report a topic or aspect. The answers were compared with published reports of cruising companies. The results indicate firstly that most topics in sustainability reports are not material for single groups and further, in contrast to the reporting companies, stakeholders prefer soft instead of hard disclosure items. In total, the presentation of the actions undertaken and a complete picture of the company in sustainability reports seem to be more important than detailed outcomes. Most external stakeholders perceive to have only few opportunities to influence different indicators, whereby the perceived influence on soft and management indicators is higher than on hard and performance indicators. In combination, both results reveal a gap between stakeholder expectations and the coverage of reporting whereby the impact of stakeholder groups is perceived small. This, however, suggests that sustainability reporting is a reflection of legitimacy theory because even "more" influential stakeholders perceive the reports as non-transparent in their own direction, so reports are written for a broader audience instead to address powerful stakeholder (Font et al., 2016).

A more recent study of Melloni et al. (2017) found different impression management schemes and assessed the conciseness (length and readability), completeness (scope) and balance (tone) of integrated reports in 2013 to 2015. As support for the impression management hypothesis the results show that companies shift the focus between different types of information in terms of a different extent of financial and non-financial information and publish more unbalanced and less readable reports when legitimacy is threatened. Melloni et al. (2017) identified two impression management strategies. Firstly, a strategy with a stronger focus on positive and softer reporting, which is a manipulation of the direction of the report or secondly a reduction of the information scope and the readability, which is a manipulation of syntactical aspects of the report (Clarkson et al., 2008; Melloni et al., 2017). In the same notion, Waniak-Michalak et al. (2018) observe a lack of explanation of the reasons for changes made in CSR measures, which they link to attempts of retaining legitimacy.

Through the lens of legitimacy theory, the studies agree that companies manipulate the content of their communication tools when legitimacy is threatened. The manipulation takes place by a shift from one issue to another (change of information coverage), the direction of the information (unbalanced in a positive direction or soft disclosure) or syntactical features (readability) and is used to show commitment to societal norms. In the following, stakeholder and legitimacy theory will be linked to the concept of materiality analysis.

2.3 Materiality analysis

Within sustainability and integrated reporting, the materiality analysis is the process by which a company determines and prioritizes its relevant aspects and topics [4] to derive its materiality matrix (Bellantuono, 2016). All topics or aspects of this set should be part of the sustainability report, whereby an integrated report should contain the most relevant ones. Still, in both cases these topics are important due to their decision relevance for those groups, which can affect the long-term viability of the company (Hsu et al., 2013). The concept of materiality stems from the financial reporting literature and there is a body of definitions for the concept. For example, the IASB states the following: “Information is material if omitting it or misstating it could influence decisions that users make on the basis of financial information about a specific reporting entity. […] materiality is an entity-specific aspect of relevance based on the nature or magnitude, or both, of the items […]” (IASB, 2010). Also in sustainability and integrated reporting, the concept of materiality is known as a reporting threshold, whereby a wider range of stakeholders and topics is recognized. (Eccles et al., 2012; GRI, 2015b)[5]. Following this broad description, different standard setters developed different definitions. The most pertinent ones for this study are those of the GRI and the IIRC. The first one focuses on topics that reflect the significant economic, ecological and social impacts of a company or on those that substantively can influence the decisions and assessments of stakeholders (GRI, 2015a). The materiality definition of the IIRC also focuses on the decision relevance of information but it differs from the GRI definition in so far, that it requires information about matters that substantively affect the company’s ability to create value over the short, medium and long term. It further focuses in the first place on financial stakeholders and in the second place on a broader stakeholder field (IIRC, 2013).

Because of the wider scope of the materiality concept and a more complex determination process in this reporting area, beside definitions of “what is important to recognize in a report”, guidance by standard setters, for example the GRI, is provided to determine materiality (Brown et al., 2009; GRI, 2015a).

The outcome of the materiality analysis is the materiality matrix, which is a continuum that should reflect prioritized aspects and topics from a company´s and stakeholder perspective and the relative importance of such issues (Bellantuono, 2016; GRI, 2015a). An illustrative example is provided in Fig. 1.

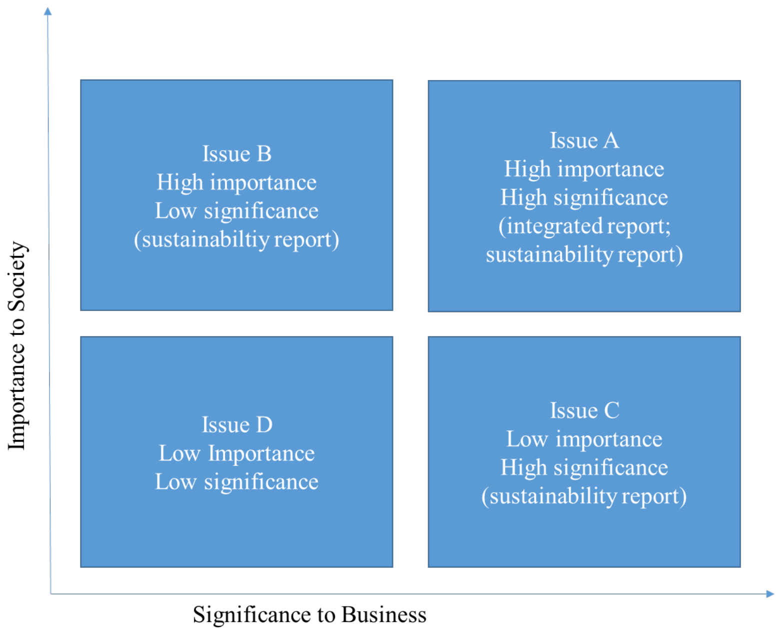

Figure 1: Illustration of a materiality matrix (Corporate Citizenship, 2013)

A materiality matrix is a typical tool to report on compliance and dissent of stakeholder and management views in sustainability and integrated reporting. The explanations of companies, about how the materiality matrix was set up, are of particular interest, as it can show, if the sustainability or integrated report is used to directly address the interest of stakeholders and whether their interests have been seriously sought for (i.e. from a stakeholder theory perspective). If otherwise, reporting about the materiality analysis is opaque, one might assume that the companies pursue other goals than addressing stakeholders with their sustainability or integrated reports (e.g. a legitimization strategy).

Materiality is the main guiding principle to, at least limit the problem of low credibility due to a discretionary leeway (Fasan and Mio, 2017; Lock and Seele, 2016). Therefore, different authors highlight the importance to assess this underdeveloped research area. Eccles et al. (2012) underlines, that materiality is of importance when CSR reports should unfold value relevance because it distinguishes between important and not important issues. Unerman and Zappettini (2014) highlight the materiality concept in social and environmental disclosure because companies may use it as a justification to exclude negative information. They concluded, that a prerequisite for the interpretation of not disclosed information is the materiality evaluation process because it reflects management decisions about what to include and explicitly exclude from the report. Higgins et al. (2014) argue that materiality has a substantial influence on the formulation and execution of a company´s strategy and risk management process and is therefore of importance in the creation of sustainability and integrated reports. Junior et al. (2014) conclude that reporting on fundamental aspects of sustainability reporting processes enhances transparency about organizational performance.

Because materiality remains an opaque concept (Edgeley, 2014; Whitehead, 2017), researchers focus on different perspectives to develop guidance for companies. Due to fuzzy standard setter definitions, Eccles et al. (2012) claims for a sector specific materiality in order to enhance the reporting of companies because of the specificity of different aspects and topics that have not the same relevance in every sector. Further authors developed quantitative and feedback based processes to reduce complexity in assessing materiality. These studies link the principle of stakeholder inclusiveness in order to assess materiality in an objectified manner and to cover all relevant aspects and topics to save completeness of CSR reports (Bellantuono et al., 2016; Calabrese et al., 2015, Calabrese et al., 2017; Cinelli et al, 2014; Hsu et al., 2013). Because stakeholder inclusiveness (engagement) and materiality are different but connected facets of one process, research also puts more focus on the first concept and its influence in identifying relevant topics. It was argued, that stakeholder engagement could be used strategically to manage legitimacy risks (Moratis and Brandt, 2017). Companies consult their stakeholders, report on these activities but rarely involve them in decision processes, which lowers the credibility of CSR reports (Manetti, 2011). The resulting argument, that disclosure on stakeholder engagement enhances report quality (Unerman and Zappettini, 2014; Junior et al., 2014) was also represented by Fasan and Mio (2017) or Gerwanski et al. (2019), who investigated the determinants of disclosure on materiality determination processes of integrated reporting adopters. To obtain more insights, they relied on content analysis to reveal associations between corporate, country or legal characteristics and materiality disclosure (Fasan and Mio, 2017; Gerwanski et al., 2019) but they do not explicitly conduct their assessments in the context of theories that should explain voluntary disclosure and did not recognize standalone sustainability reports in their assessments. Thus, this paper tries to provide a theoretical reasoning drawing on stakeholder and legitimacy theory of why there could be differences in reporting about materiality analysis in a broader context of voluntary disclosure.

3. Research questions and methods

3.1 Research questions

Reporting about a materiality analysis has been recently required by the GRI G4 or the IIRC framework, but remains voluntary. Thus, topics in sustainability and integrated reports are expected to be only reported if a materiality analysis has preceded. This would particularly be the case if the company pursues stakeholder management through its report. In contrast, by relying on legitimacy theory, research has shown that companies tend to select topics for their CSR reports that are of high relevance for the media (e.g. due to perceived community concerns or scandals and try to illustrate a company's behavior towards these topics with positive examples and information (Deegan et al., 2002)). Thereby, CSR reporting is used to change public opinion towards the company into a supportive view. Thus, within the legitimacy theory perspective, one might assume that the company selects reputation related topics by itself without considering the interests of stakeholders. Thus, we expect less extensive reporting about the materiality analysis within the lens of legitimacy theory. The theoretical underpinnings described in Section 2.3 and our expectations are shown in Table 1.

	Legitimacy theory	**(Managerial) Stakeholder theory**
Company seeks for	Social contract / Licence to operate	Accountability to the most powerful stakeholders
Addressees	Society in general	Most powerful stakeholders
Aim of reporting	Compliance to social values and norms	Managing critical stakeholders' competing interests
Expectations for reporting about materiality analysis	Address the materiality analysis to show conformity to societal expectations in general • Designate methods identification of stakeholders and topics and aspects • Stress topics instead of stakeholders • Do not provide detailed explanations about the underlying methods and processes	Address the materiality analysis to show conformity to expectations of most powerful stakeholders • Define materiality analysis • Designate methods for identification of stakeholders and topics and aspects • Explain the methods and processes

Table 1: Comparative view on legitimacy and stakeholder theory (adapted from Fernando and Lawrence, 2014, p. 168)

Drawing on Table 1, it is of relevance to investigate how companies describe their materiality analysis in order to find indications for whether companies rather follow a stakeholder management or legitimisation strategy with their sustainability or integrated reports. Relying upon stakeholder theory, an in-depth explanation about how the materiality analysis was conducted is expected. Thereby, this paper draws on a disclosure index in order to assess (RQ1): *To what extent do companies report on their materiality analysis?* Particularly the methods used for such identification processes are of importance, because they reflect whether the process to determine material aspects and topics was dominated by the management perspective of the company or is centered on the needs of powerful stakeholder. These perspectives are than comparable to the expectations derived out of the literature review. Thus RQ2 is: *What are the methods used for the analysis of stakeholders and their topics/aspects?*

As within GRI G4, a detailed explanation of the materiality assessment has been required by 2015, the new standard could drive an increase in reporting about this topic despite any legitimising or stakeholder management strategies of companies. In order to account for such important contextual factor, (RQ3) asks: *Is there a higher disclosure of information of materiality assessments because of G4?*

3.2 Research methods

This study examined the sustainability and integrated reports of listed German companies that are part of the HDAX stock market index. For the population of all sustainability and integrated report preparers, the HDAX was chosen as sample because of the public availability of several data (e.g. clustering of the companies by the German stock market by sectors and company size) and the comparability of the companies (e.g. similar disclosure setting). Further, this paper seeks to make first explorations regarding the implementation of materiality analyses in corporate practice in Germany. The HDAX includes 110 German companies of different sectors and contains three sub-indices, the DAX (the 30 largest companies), the MDAX (the following 50 companies) and the TecDAX (the 30 largest companies of the technology sector).

The selection criteria of the sample collection were twofold. Firstly, the composition of the HDAX index was taken over a four-year interval (2014 to 2017) to check whether the companies published sustainability or integrated reports in every year. For the data collection, routinely offered composition publications of the German stock market in December of the specific years were used [6]. Secondly, it was assessed whether a company conducts a materiality analysis and reports information about it. For this reason, all reports were scanned by using specific keywords [7]. After this collection process, a total of 33 out of 110 companies, i.e. 132 sustainability and integrated reports remained for the four-year interval. The distribution of the sample is summarized in Table 2.

Index	Total	Part of the sample
DAX	30	22
MDAX	50	10
TecDAX	30	1
Sum	110	33

Table 2: Distribution of the sample

For the data collection process, a mix of content analytical approaches was used. Overall, the data collection in the sustainability and integrated reports is based on a qualitative approach, which is extended by quantitative steps of analysis in order to address RQs 1 and 3. The following steps have been taken, which are explained in more detail in the paragraphs below:

Step 1: Qualitative data collection by extracting information from the sustainability and integrated reports about materiality analyses reporting (basis for RQs 1, 2 and 3)
Step 2: Clustering of methods used (primarily needed for RQ2)
Step 3: Development of a disclosure index (for RQs 1 and 3) and
Step 4: Statistical test (for RQ3)

For step 1, the 132 reports were qualitatively analysed by scanning for related information regarding the (a) definition of the materiality analysis [8], (b) the aspects/topics reported and (c) the methods used to identify (c1) stakeholders and (c2) aspects/topics. The content analysis focussed on the meaning of words and has been conducted analogously, i.e. without a specific software. However, all results for each report were marked and digitally stored together to count the results. To ensure collecting all necessary information and to cope with subjectivity, a six-eye-principle was engaged. Thereby for (a) and (b) a deductive approach was used by applying keywords (and their German equivalents) which were formulated in respect to theory and the material and were revised with the process of analysis [9].

In step 2, to obtain an overview of the methods used in the materiality processes (RQ2) for identifying the stakeholders (c1) and the aspects/topics (c2), paraphrases were extracted from the data material with an inductive approach and the identified methods were clustered into different groups. Thus, the inductive approach of step 2 was completed by taking the paraphrases about the methods by generalizing and reducing them in a stepwise approach into groups of methods.

In step 3, for the further evaluation of the sustainability and integrated reports and to address RQs 1 and 3, a scoring index was built (the composition of the disclosure index is depicted in the first three columns of Table 3). This index contains nine different categories which can be either "1" (the information is available) or "0" (the information is not available) (see e.g. Raffournier, 2006; Michelon et al., 2014; Plumlee et al., 2015). This type of content analysis in a binary scheme of a disclosure index is often used in social science and shows whether an item is present or absent (Beattie et al., 2004). A binary scheme without any weightings of the items is used, because of the nature of the information under investigation. First, the aim of this paper is to address whether companies report on their materiality processes, not to assess the quality of such information. Thus, a binary scheme can reduce complexity during the data gathering process. Second, weightings of the index items are useful in cases when some information is of more importance than other (Marston and Shrives, 1991), which is not the case for the research objectives. The information about stakeholders and relevant topics are from the perspective of (at least) stakeholder theory both necessary conditions to create a meaningful tool for the stakeholder communication and to define the reporting boundary. Further, information on materiality is no sector specific information. Therefore, the index follows a broad-based guidance (GRI G4) for general standard disclosure.

At first, it was verified whether a company defines the term "materiality analysis", which had to contain the identification of the "most relevant topics" for the most relevant "internal" and "external" stakeholders. Following stakeholder theory, sustainability and integrated reports are tools of stakeholder communication for the relevant topics. In this sense, the identification of different stakeholder groups is a necessary condition to identify their most relevant topics. For this purpose, the further categories should show whether a company "designated" (i.e. simply mentioned) and "explained" (i.e. gives more details) about how it identified its most relevant stakeholder groups and the methods used for this purpose. Because of this distinction, four categories were derived: two groups ("stakeholders" and "identification methods") differentiated by two characteristics ("designated" and "explained"). In the same manner, four more categories were constructed regarding the identified relevant topics and aspects. These categories should reflect whether an organization "designated" and "explained" its material "topics" and the "identification methods". In sum, each company and report in the categories "definition", "stakeholders" and material "topics" could reach a disclosure score of nine points.

Lastly in step 4, through the quantification of the disclosure index, further statistical comparisons between the reporting years were possible to address RQ3. Because of the metric scale-level of the gathered data and the directed proposition, a one-tailed t-test for paired samples was conducted to assess whether a possible influence of G4 on reporting about materiality processes is observable.

4. Results & discussion

4.1 Results

4.1.1 Methods in use

The presentation of the results is structured as follows. To answer RQ1, an overview of the aggregated counts per category of the disclosure index will be provided, followed by a more detailed analysis of the methods used for the identification of relevant stakeholders and topics in order to address RQ2. After this, the results of the statistical comparisons of the disclosure indices between the years are presented to assess RQ3. The different levels of the disclosure index in the four years are shown in Table 3.

Disclosure of			**Number of companies (n=33)**			
			2014	**2015**	**2016**	**2017**
	Definition		25	27	21	27
Stake-holders		designated	30	30	31	32
		explained	4	5	6	7
	Methods	designated	3	6	9	12
		explained	0	1	1	1
Topics/ Aspects		designated	32	32	33	33
		explained	30	32	31	33
	Methods	designated	31	31	31	32
		explained	3	6	7	10

Table 3: Absolute disclosure values

According to the disclosure index, companies commonly report on their materiality processes. With regard to RQ1, i.e. the extent of reporting about a materiality analysis, most enterprises designated their methods for their topics and aspects identification but only a few companies designate, how relevant stakeholder groups are identified. Still, in 2017 just 10 companies give detailed information about their topic identification process. Regarding the identification of relevant stakeholders, there is only one company that provides further information. Thus, it seems that the companies tend to use their CSR reporting rather for the transmission of sustainability related topics than to report on materiality, which is merely a means for the purpose to define report content. This finding could be interpreted as legitimation strategies of the companies studied and is also distinctive for the count of the definition of a materiality analysis in the four years. Not all companies give (explicitly or implicitly) a definition in the context of their sustainability reporting process and most interestingly, the number is shrinking from 2014 to 2016 and slightly increasing to 2017. This notion could be explained by the CSR directive in Germany that contains further obligations regarding CSR reporting but relies on a different materiality definition. The number of designated and explained topics over the four years is however relatively constant and nearly all companies report in detail on identified topics. Further, the number of designated stakeholders is more or less steady and nearly all companies mentioned different interest groups, but in most cases, detailed information is lacking about, why particular stakeholders are of relevance. Examples for a detailed depiction are SAP (a multinational operating software company), which gives information about the relationship to specific customers in different geographical areas (SAP, 2017), and E.ON (a holding company of electric utility service providers), that explains the meaning of different stakeholders to the company and the expectations of the identified groups to the company in concise terms (E.ON, 2017). Table 4 contains the methods used for both identification processes and thereby addresses RQ2. The stakeholder dimension indicates that companies tend to increase information about how they identify their key stakeholders from 2014 to 2017.

Methods	Stakeholder				Topics/ Aspects							
	2014	2015	2016	2017	2014		2015		2016		2017	
					inter-nal	exter-nal	inter-nal	exter-nal	inter-nal	exter-nal	inter-nal	exter-nal
Mapping	2	2	2	2	-	-	-	-	-	-	-	-
Due Process	-	1	-	-	-	-	-	-	-	-	-	-
CR- Topics	-	1	1	-	-	-	-	-	-	-	-	-
Institutions	2	4	5	9	6	23	14	21	13	33	15	28
Analysis	-	1	1	1	13	7	10	12	9	15	9	13
Events	-	-	-	-	10	20	17	21	14	12	9	30
Surveys & Discussions	-	-	1	1	29	30	19	30	24	24	29	29
Engaged SH	-	-	-	-	4	3	3	2	1	2	5	4
SUM	4	9	10	13	62	83	63	86	61	86	67	104

Table 4: Methods used to identify stakeholders and topics/aspects

Besides the increase of the absolute number, different categories of methods are used, i.e. various kinds of sources are used for the determination process. Here, most important are different internal and external institutions. These encompass internal bodies like boards of directors or departments within a company. As external "Institutions" different standard setters are mentioned, like the GRI or AccountAbility, rating or consulting agencies which provide guidance for the stakeholder identification process. Usually the order was first, to identify key stakeholder and second, to identify relevant topics. But one company proposed a reversed way for stakeholder identification. In this case a preselection of CSR related topics was used to evaluate, whether these topics are relevant for different stakeholder groups, so the agenda of the company determines whether a particular stakeholder group was relevant or not. In sum, during the stakeholder identification, several methods are observable but the overall number of reported and described activities are still low.

The topics/aspects dimension shows the relevant identification methods in five different categories and is divided in two sections: whether the information on the relevance regarding a specific topic comes from outside (external stakeholders) or inside (e.g. management, employees) of the company. First, the overall sum of all methods does not reveal significant changes from 2014 to 2016 in the methods used for the identification of relevant topics and aspects. The reporting year 2017 is characterized by an increased use of different internal and external methods. Second, an isolated look in the internal and external perspective in the single categories reveals a more detailed picture. The comparison of 2014 and 2015 is characterized by a change in the use of internal sources of information. During these two years, most categories of the external perspective are relatively constant. The comparison of 2015 and 2016 reveals a picture in the opposite direction: a change in the use of external information sources is observable whereby most categories in the internal perspective are relatively constant. The shift of the categories in the internal perspective from 2014 to 2015 is mostly attributable to the increased use of internal institutions and especially to the use of the boards or the assessment through internal departments. For example, the E.ON group mentioned the responsibility of a senior vice president for the process and the direct communication with the CEO during the materiality assessment in 2015. This specific role and hierarchical structure was not observable in the 2014 report (E.ON, 2014, 2015). Another example is the inventory of sustainability topics of internal departments that are part of the sustainability committee of the HUGO BOSS group in the 2015 report. The collection of internal topics as one task of the committee was not mentioned in the foregoing report (HUGO BOSS, 2014, 2015). Another method stronger used in 2015 compared to 2014 were workshops as internal events. Exemplary, the Bayer group 2014 report highlights, that a comprehensive materiality analysis contains document analysis, an external consulting group, interviews and surveys with stakeholders. In 2015 it was reported, that the results of the materiality process of the foregoing year were discussed in an internal workshop, which serves merely as confirmation of the results (Bayer, 2014, 2015). From 2015 to 2016 the external use of the category "Institutions" rose, while "Events" and "Surveys & Discussions" decreased. The shifts in these categories were caused by a more extensive use of external sustainability ratings and sector specific guidance of standard setters (e.g. GRI G4 sector disclosure or the identified topics of the Global e-Sustainability Initiative for telecommunication companies) and less interviews, surveys or forums for external stakeholders. Instead of exploring external stakeholders' views by interviews and surveys, the observed companies conducted these methodologies with internal interest groups. The last comparison regards to the years 2016 and 2017, which reveals a different picture in comparison to the foregoing years. Whereby in the first three years an increased use of management perspectives and standard setters was observed, between the last two years an increased direct contact to different stakeholder groups was observed. This is expressed in the higher rate of direct contact formats with external stakeholder groups, for example personal meetings, on annual general meetings, workshops with different stakeholder groups and broad surveys.

4.1.2 Comparison of the disclosure indices

To evaluate whether there is a development in the disclosure regarding information on materiality assessments, we compared the scores in the three different years to draw further insights into RQ3. Descriptive values of the selected sample are shown in Table 5.

	2014	**2015**	**2016**	**2017**
N	33	33	33	33
Min	3	0	3	2
Max	6	7	7	7
Mode	5	5	5	6
Mean	4.76	5.12	5.15	5.67
SD	0.969	1.317	1.176	1.080
GRI G4 / Standards adopters	14	32	33	33

Table 5: Results for the disclosure index

Some interesting findings are revealed here. First, the minimum value in 2015 is null. In this case, the company mentioned to conduct a materiality analysis but did not disclose substantial content. Neither, it was possible to identify whether the reporting content on specific topics was material, nor information on key stakeholders could be found, nor was any method for stakeholder or topic/aspect exploration designated or described. Second, no company reached the maximum score of nine. As measured by the absolute disclosure values in Table 3 the following can be stated: In most cases, neither the method of stakeholder identification (i.e. the "stakeholder-method" category) was explained nor the methods of how topics were identified (i.e. the "topics-methods" category), but a considerable increase potentially in the context of the adoption of the GRI G4 can be observed. This development could be attributed to the effective date of the G4 (31.12.2015; GRI, 2015a) (addressed are the reports regarding the fiscal year 2015). This could influence the statistical comparison of the disclosure scores through the years because G4 has stronger requirements on the materiality assessment than its forerunner G 3.1. A t-test for paired samples to address RQ3 was conducted.

The means, depicted in Table 5, give a first indication. On average, the reporting companies had reached a disclosure score of 4.76 in 2014, 5.12 in 2015, 5.15 in 2016 and 5.67 in 2017. This increase is underpinned by the statistical test, which shows a significant change of the t-value at the 5% probability level from 2014 to 2015 and 2016 to 2017, but no change between the years 2015 and 2016. The t-values are summarized in Table 6. Still, it needs to be stressed that there could be other explanatory factors for the increase in reporting on materiality analysis that were not in the scope of this study.

	t-value	Sig. (one tailed)
Pair 2014 - 2015	- 2.037	0.024
Pair 2015 - 2016	- 0.098	0.462
Pair 2016 - 2017	- 3.721	0.00038

Table 6: Results for t-tests of GRI G4 adoption

4.2 Discussion

This study seeks to contribute to a better understanding of reporting about materiality assessment in sustainability and integrated reporting. Thereby, we try to provide a theoretical reasoning drawing on stakeholder and legitimacy theory of why there could be differences in reporting about materiality analysis. Regarding RQ1, it was revealed that most companies report at least to some extent about their materiality analysis but do not provide detailed information in most cases, thereby leaving some indication that companies primarily rely on legitimisation strategies for their voluntary sustainability and integrated reporting. Following legitimacy theory, one might expect less detailed disclosure on the methods used to identify relevant stakeholders and topics and a stronger focus on topics than on unique stakeholder groups, because companies use the sustainability or integrated reports to show conformity to general expectations and norms and not to specific interests (Deegan, 2014). The results of this study show a strong focus on sustainability related aspects and topics, as nearly all companies report on their material topics in detail, but only in a small number of cases materiality related information in detail. Because of information on a materiality analysis are mostly narrative and missing explanations, the disclosure and the underlying processes seem to be hard to verify. These patterns of "hard to verify" information conform to existing literature on legitimacy strategies in corporate disclosure such as Clarkson et al. (2008) which found "soft" reporting schemes in environmental reporting to show merely commitment to the environment instead of comprehensible information. Statements related to the materiality analysis that were found show commitment to stakeholder engagement, but fail to clarify the underlying processes because of missing explanations. If as assumed by legitimacy theory, companies might tend to select topics strategically, i.e. by applying in "particular strategies, such as providing information to counter or offset the negative news which may be publicly available" (Deegan and Ranking, 1997, p. 567), the choice of topics is e.g. media-driven and a thorough analysis of how the topics were selected would reveal such legitimization strategy. If a stakeholder management objective was predominant, the disclosure of more detailed information about the materiality analysis and the used methods for the stakeholder/topic identification was expected, that goes beyond the presentation of merely stakeholder commitment (without any explanations). In this view, the voluntary reporting is used to manage the (specific) key stakeholder(s), which are crucial for the provision of resources (Fernando and Lawrence, 2014) and should reflect these dependencies as proposed for example by Thorne et al. (2014). Because of missing explanations of specific stakeholder groups and the identification of stakeholders as well as their topics and aspects in the reports, it remains in most cases unclear how companies are related to material stakeholder groups and why these are of importance.

Further results show that companies gave a definition (explicit or implicit) of a materiality analysis, which gave first insights about whether a company differentiated between internal and external stakeholders. Here, different definitions of a materiality analysis out of the integrated reporting and GRI framework do not play a significant role in this paper, because the three integrated reporting adopters also report in accordance to the GRI framework. Nevertheless, a decrease (2014-2016) in this category could be observed, for which several explanations are possible. For example, companies could have placed references to reports of foregoing years to reduce the report extent and thus did not provide details in the reports analysed. This could be a case if the underlying assumptions of the processes were not changed. This also explains the increase in 2017, because in this period, companies were mostly mandated by the German CSR-law to publish non-financial information on a legal basis with another materiality definition. Another explanation is that companies do not conduct the complete process of materiality assessment in every reporting year because such processes are potentially resource consuming and sustainability related topics and aspects are relatively constant over time. To summarize these findings, hard to verify processes are typical reporting patterns in the realm of the legitimacy theory. Because companies talk about their materiality processes but not in a comprehensible way, it could be interpreted as some "norm confoming" behaviour as part of a legitimacy strategy (Unerman and Zappettini, 2014).

These reasons are also possible explanations for the shift in the use of different identification methods (RQ2). Especially in the second reporting period was a shift to a more intense use of management or department opinions in the identification and validation process of topics and aspects, whereby other internal sources were constant and external sources of information were less used. In the third reporting period was a more intense use of external standard setter, advisory or rating boards in the identification or validation process salient. Again, the cycle and the resource consumption of a materiality analysis are possible explanations for these shifts, whereby in 2015, there was also an increase in the use of the GRI G4, which can explain the implementation by the management in 2015 and the examination in 2016. These findings also go in line with Fasan and Mio (2017) and Gerwanski et al. (2019). Both found an association between disclosure on materiality analysis and characteristics of the board, whereby the present study underpins these results because of the identified increased use between the years, which indicates the relevance of the board in the process. These findings gave a hint, that the materiality process could be management centered and not focused on important stakeholder groups. In sum, there is limited information on stakeholder groups and the identification processes at all which makes these assumptions hard to verify through the reports. Again, to summarize these results, it is observable that the role of the management and the external standard setters becomes more important in the identification of relevant topics and stakeholder groups in the relevant period. Thus, a specific stakeholder focus is at least in some cases rejected.

Also, most processes are not well explained, which underlines the perspective of legitimacy theory, because methods without direct stakeholder contact seem to become more prominent (Fasan and Mio, 2017; Gerwanski et al., 2019). This assertion holds under the consideration of the increased reporting requirements of the GRI G4 by investigating RQ3 on the effect of G4 on reporting on materiality analysis. Overall, the companies are required to report in detail about their materiality processes. The disclosure index shows ceteris paribus an increased reporting extent because of the application of the GRI G4 and another increase in 2017, where the assessed companies must recognize further reporting requirements through CSR legislation in Germany. Further, the ongoing increase in the disclosure index in the four years gave also some support for the results of Gerwanski et al. (2019) that identified the learning effect as one determinant of disclosure regarding a materiality analysis.

With respect to the single components of the index revealed in 2017, only a small number of companies report on their identification methods for stakeholders, a changing number of definitions of a materiality analysis (distinction between internal and external stakeholders) and a slightly increased number of explanations regarding the identification methods for relevant topics. Therefore, changes in the disclosure index have to be interpreted carefully and under the consideration of its components. Thus, possible reporting cycles and process designs should be recognized. Additionally, sustainability related topics and aspects as well as different stakeholders could be constant over a period of time for a specific company. Therefore, the application of a more rigorous set of standards can only be one factor that explains a higher level of disclosure. Lastly, to summarize these patterns, companies extended their reporting on materiality with the adoption of a higher set of GRI standards. Nevertheless, they enlarged their reporting despite these standards are voluntary in use. Thus, it could be argued that a set of norms was given and extended and the companies reacted in order to show conformity to these voluntary sets of standards but the materiality process at all is not understandably communicated, which also underlines the perspective of legitimacy theory.

5. Concluding remarks

A materiality analysis is an important part in sustainability and integrated reporting. Despite increased reporting requirements from non-governmental standard setters, there is little empirical information on how companies conduct such analysis and how they report on their efforts. Thus, this study offered a disclosure index to collect information on how companies use this instrument and sheds light on the underlying processes (what methods do companies use and how these are conducted) through their reporting. Another contribution lies in the explicit application of two relevant theoretical approaches in sustainability and integrated reporting, the legitimacy and stakeholder theory. Both approaches require a company to engage with several interest groups but with a different scope. Whereas legitimacy theory highlights a broad societal engagement, managerial stakeholder theory concentrates on the most powerful stakeholders as relevant audience.

The study indicates that companies put effort in the determination of material stakeholders, aspects and topics but the reporting on materiality seems to be a means for purpose in sustainability reporting and, at least, the commitment to stakeholder engagement. Overall, the results indicate that reporting on materiality information lacks detailed descriptions of the underlying processes in this sample and thus, fits to the assumptions underlying legitimacy theory.

The collection of information on the disclosure of materiality analyses raises further questions about limitations of this study. The items of the disclosure index are only binary. Thus, it can only be used to assess the extent of the disclosure, not the quality. To obtain more granular data about the quality of the content, the index could be expanded with more than a binary coding scheme. Further, because many methods in the materiality assessments were mentioned, there is potential to observe and understand how companies design their processes in detail. For this purpose, in a first step a systematization of similar methods and wording differences and secondly, the collection of qualitative data through interviews with different companies could be useful. Because of the unequal distribution of the assessed companies in the sub-indices of the HDAX in this study, companies' motivations for providing sustainability or integrated reports and their engagement in a materiality analysis can additionally questioned and assessed through qualitative interviews. In addition, with respect to RQ3, we are aware that there might also other explanatory factors of why reporting on materiality analyses increased over the period studied, such as mimicry effects. Moreover, the effect of the German CSR directive on materiality disclosure could be an interesting study, because it prescribes companies a binding materiality concept which differs from the GRI. In addition, there could be differences in materiality processes because of the use of different frameworks or a simultaneous use of for example the GRI, integrated reporting or SASB frameworks. Therefore, more balanced samples could be compared. Further limitations regard to the surveyed sample: Future research can add companies with different characteristics to gather more information on materiality analysis. Comparisons could distinguish between listed and non-listed companies, companies with different owner structures voluntary and mandatory reporting or companies from different countries to obtain more comprehensive information about materiality processes. Moreover, sustainability and integrated reports without a materiality analysis could be assessed as to whether there are differences in content, compared to reports with a materiality analysis. Thus, the results of this study are not generalizable. Lastly, if there are deeper insights on what are (potential) key stakeholders of an organization and how they are determined, another question arises, how companies deal with different/divergent interests and how they are aggregated during the materiality process. This is finally relevant for the resulting report because this weighting can have much influence on the relevance of one specific topic.

Despite its limitations, this paper provides valuable contributions. The results of this study are of importance to research by providing an indication that in the sample, legitimacy theory better explains reporting about materiality analysis than stakeholder theory does. Therefore, the study suggests, that a materiality analysis could possibly be misused by companies to apply legitimization strategies when reporting is fuzzy and the underlying processes remain unclear. This is in line with for example Melloni et al. (2017), who state, that companies adopt different legitimization strategies simultaneously and Clarkson et al. (2008), who confirm these fuzzy reporting pattern as legitimization strategy in sustainability reporting. Nevertheless, following the argument that powerful stakeholders are able to put pressure on companies and influence the reporting, a second strategy is proposed by which a company explains its materiality analysis and the basis for the report well, to show commitment and improve report content for these specific stakeholders (Junior et al., 2014). In addition, private sector standard setters, in particular GRI in this case, are given an indication about how their guidelines are adhered to. This study also provides interesting managerial and social implications: Managers are urged to regard the importance of reporting about ongoing materiality assessments as otherwise, concerns about the overall reliability of the information presented may arise. Poor reporting about materiality assessments might also lead to potential conflicts with stakeholders that do see their important topics not sufficiently added into the sustainability or integrated report. Therefore, practitioners, i.e. reporting companies can learn about the variety of methods used by others companies, which might even inspire them also to use more innovative methods of stakeholder and topics identification.

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Notes

1. The terms “sustainability reporting” and “CSR reporting” are used interchangeably in this study. They are also used as a superordinate term for voluntary (economic, ecologic and societal) reporting that is also labelled triple bottom line, ESG, Corporate Citizenship or corporate responsibility reporting. See Gray et al. (1995), Lock and Seele (2016).

2. One exception is South Africa. The South African stock exchange requires listed companies to publish integrated reports through the King Code of Governance Principles for South Africa 2009 (King III).

3. The macro-perspective of legitimacy tries to explain how institutions or institutional structures as a whole obtain acceptance from the society at all, see Tilling (2004).

4. The term “aspects” is used as a broader concept in this paper, whereby a “topic” reflects one facet of a specific aspect, see GRI (2015a).

5. Because of a broad range of materiality definitions, the Corporate Reporting Dialogue was initiated to increase coherence, consistency and comparability between different frameworks and standards. https://corporatereportingdialogue.com/wp-content/uploads/2016/03/Statement-of-Common-Principles-of-Materiality1.pdf.

6. For the composition see the following link: https://www.dax-indices.com/zusammensetzung.

7. The following keywords were used in English and German language: Materiality; Materiality analysis; Materiality matrix, Matrix; Matrices; Dialogue; Stakeholder dialogue; Stakeholder, Aspects, Material aspects; GRI; G4; Identification; Identify; Report profile; Format.

8. For the data collection the framework of the GRI G4 was used. It was recognized that also integrated reporting adopters were part of the sample (3 companies) but they also were GRI adopters (2 in 2014 GRI G4 and one GRI G3.1 and 3 GRI G4 adopters since 2015).

9. For (a) materiality analysis, e.g. the German terms „Materialitätsanalyse“, „Materialität“ or „Wesentlichkeit“, for (b) stakeholders, e.g. the German terms „Stakeholder“, „Anspruchsgruppen“ or „Interessensgruppen“ and for (c) methods used e.g. „Identifikation wesentlicher Themen“.