

Materiality Disclosure in Sustainability Reporting: Evidence from Malaysia

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ABSTRACT

Manuscript type: Research paper

Research aims: This paper aims to examine the determinants that influence companies to report material sustainability information in their corporate annual reports.

Design/Methodology/Approach: To validate the determinants influencing materiality disclosure, content analysis was conducted on the annual reports of the top 113 Malaysian public listed companies in 2016, and the smart partial least squares technique was employed to examine the proposed relationships.

Research findings: The empirical results indicate that board activity and board independence play a significant role in the determination of materiality disclosure. The results also reveal that board size, company size, profitability, leverage and industry are insignificant predictors of materiality disclosure. The results indicate that many listed companies in Malaysia disclose some amount of material sustainability information. However, the level of disclosure remains relatively low.

Theoretical contribution/Originality: Notwithstanding that materiality is regarded as a key reporting principle in the preparation of sustainability reports, research on the application of the materiality concept in sustainability reporting remains to be an unexplored theme in Malaysia. This work sheds light on materiality disclosure in sustainability reporting of large companies operating in Malaysia through the combined views of the stakeholder and legitimacy theories.

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Practitioner/Policy implications: The results should be of great interest to policymakers who are concerned with formulating sustainability policies to achieve greater materiality disclosure. It also provides strategic insights to companies that board characteristics, such as board activity and board independence, influence materiality disclosure. Board members are urged to consider the importance of the reporting materiality determination process; otherwise, poor reporting may result in conflict with major stakeholder groups who do not see the material issues disclosed in the sustainability reports.

Research limitation/Implications: The results are limited to the context of Malaysia. Future researchers can compare materiality disclosure with other countries, such as Singapore and Thailand, to enrich the sustainability reporting literature.

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

JEL Classification: M41

1. Introduction

Stakeholders are increasingly concerned about the social and environmental impacts of business, particularly those of multinational companies. In response to stakeholder demands, it is becoming a mainstream annual exercise for large companies to inform investors and major stakeholder groups about the impact of their sustainability activities (economic, social, environmental and governance) through sustainability reports. Sustainability reporting has been recognised as one of the critical elements contributing to a company's sustainability performance. The aim of disclosing sustainability information is to enhance corporate reputation and legitimacy, to enable benchmarking against competitors, to assist the control and information process, to increase transparency and accountability to stakeholders, and to signal competitiveness (Herzig & Schaltegger, 2006).

Two opposing views arise on whether the sustainability report provides useful information about a company's actual sustainability performance. On the one hand, companies are thought to provide information to stakeholders concerning their sustainability commitments through sustainability reports, which are useful in indicating sustainability performance. On the other hand, companies are thought to use these reports to influence stakeholder perceptions without putting much effort into sustainability activities; in other words, greenwashing, which

is not representative of the actual sustainability performance (Herbohn et al., 2014; Mahoney et al., 2013).

These two opposing views can be explained using stakeholder theory and legitimacy theory. The success of a company's relationships with internal and external stakeholders may be critical to its survival (Freeman, 1984). According to the stakeholder theory lens, sustainability reporting should reflect material issues that can influence stakeholder perceptions. However, the major issue with sustainability reporting is that reporters only publish what they consider to be material information, so sustainability reports do not accurately reflect actual sustainability performance due to over-reporting positive aspects and omission of damaging information. In today's sustainability reporting environment, the adoption of materiality is a key principle in sustainability reports (Mungoni, 2014). Determining materiality issues for sustainability reports requires the consideration of the economic, social and environmental impacts that exceed a certain threshold in terms of their impact on the ability to meet the needs of the current generation without compromising the needs of future generations (Global Reporting Initiative [GRI], 2011a). These material issues frequently have a significant impact on companies, either in the short or long term.

Whilst the stakeholder theory postulates that non-financial information disclosure is part of stakeholder management, which is driven by external demands, the legitimacy theory concentrates on internal demands in order to gain its legitimacy or social acceptance to operate in society (Adams, 2002). Hence, companies seek legitimacy to fulfil the needs of stakeholders, and thereby, gain their support (Pfeffer, 1981). The perception of stakeholders can be changed by companies' social and environmental actions to enhance their legitimacy status. In this vein, the process of stakeholder engagement is pivotal to understand the needs and expectations of stakeholders (Calabrese et al., 2015). In this context, sustainability reporting can be used as a communication medium that enables companies to publish material non-financial information to create organisational legitimacy. To maintain organisational legitimacy, materiality can serve as a legitimisation tool in defining the content of the report and disclosing matters that are considered material from the viewpoint of a company and its stakeholders.

Beske et al. (2020) pointed out that materiality disclosure can improve corporate reporting, and research has started to explore the information disclosed in the sustainability reports and determinants influencing materiality disclosure. Extensive existing accounting re-

search on the determinants of sustainability reporting recommends that company characteristics, board characteristics and other variables are determinants that cause variation in sustainability disclosures across companies. The determinants of sustainability reporting have been grouped by Hahn and Kühnen (2013) into internal and external determinants based on a review of 178 articles from 1999 to 2011. The internal determinants of sustainability reporting are financial performance (leverage, profitability, gearing, or indebtedness), social and environment performance, company size and ownership structure, whereas the external determinants of sustainability are country-of-origin, corporate visibility, legal requirements and sector affiliation.

1.1 Research Gap

Much research has been conducted in developing countries, particularly Malaysia, to examine the external and internal determinants of sustainability reporting and corporate social reporting (Abdullah et al., 2011; Ahmed Haji, 2013; Amran & Haniffa, 2011; Shamil et al., 2014). However, prior studies did not take materiality into account. Numerous studies in Malaysia have recently developed conceptual models on materiality disclosure in sustainability reporting by examining board composition (Bing & Amran, 2017; Ngu & Amran, 2018a; 2018b). Based on prior literature, empirical research on materiality in Malaysia is a relatively unexplored research field because the materiality concept is a new reporting principle for sustainability reporting. So far, the research on materiality disclosure of non-financial information has focused on European and other Western countries (Edgley, 2014; Mio et al., 2020; Puroila, 2015). Unerman (2014) highlighted that materiality in the research field remains understudied. Given the significance of the research, this paper contributes by filling this research gap using empirical evidence to integrate the materiality concept in sustainability reporting by public listed companies in Malaysia.

This paper evaluates public listed companies that adopt the materiality concept in disclosing sustainability issues in their corporate annual reports. In this regard, the research objective in this paper is, therefore, to identify the determinants that impact companies disclosing material sustainability information, and to analyse the empirical linkage of determinants and materiality disclosure in sustainability reporting. The focus of this paper is on the social and environmental dimensions rather than the economic dimension, which is consistent with the function of

materiality disclosure in the sustainability reports (Papoutsis & Sodhi, 2020). In this paper, the term ‘materiality disclosure’ refers to the extent to which a company discloses sustainability issues that it considers to be material. This paper does not focus on whether the material issues identified by companies are truly material (Puroila & Mäkelä, 2019).

Previous empirical studies have claimed that non-financial information disclosure emanates from board members because board members constitute a corporate governance mechanism (Frias-Aceituno et al., 2013; Hafsi & Turgut, 2013). Based on this argument, we claim that board characteristics (board activity, board size and independent board) are determinants of material non-financial information by public listed companies in Malaysia. Many scholars have concluded that financial performance is a significant predictor that has a direct relationship with social and environmental disclosure (Brammer & Pavelin, 2006; Cowen et al., 1987). As a result, this study explores two financial performance indicators – profitability and leverage – as the determinants of materiality disclosure. Several studies have also proved that company size is an important company characteristic in determining information disclosure (Dang et al., 2018; Shamil et al., 2014). Previous literature has also shown that companies operating in high-risk environmental industries tend to publish more non-financial information than other industries (Amran et al., 2009; Freedman & Jaggi, 2005). Hence, this paper adopts company size and industry as another two determinants of disclosing material non-financial information. In summary, this paper examines four potential drivers of materiality disclosure: board characteristics, financial performance, company size and industry.

To address this research objective, the discussion of this paper is arranged as follows. Section 2 reviews the past literature and underpinning theory, whereas the hypothesis development is discussed in Section 3. Next, the data and methodology are described in Section 4. Then, the results and discussion are discussed in Section 5, and the conclusion is discussed in Section 6.

2. Literature Review

2.1 Sustainability Reporting in Malaysia

Sustainability reporting is an offshoot of the accelerating sustainability movement that requires companies to examine the impact of economic, environmental, social and governance on investor and stakeholder

decisions (GRI, 2013). In 2006, Bursa Malaysia required the ACE Market and Main Market listed companies to publish the social and environmental activities in their annual reports. However, this requirement focused more on the social aspects of the business (i.e., people and community). In 2012, Bursa Malaysia re-positioned its corporate social reporting framework by focusing on business sustainability to attain value creation. In 2016, Bursa Malaysia published a sustainability reporting guide. Bursa Malaysia required the Main Market listed companies with a market capitalisation of RM2 billion and more as of 31 December 2015 to make a sustainability-related disclosure in their annual reports with effect from the 2016 reporting period (Bursa Malaysia Securities Berhad, 2016).

Research on sustainability reporting has reached a considerable level in Malaysia. Some empirical studies have analysed the impact of corporate social reporting on firm performance (Ismail & Chandler, 2005; Smith et al., 2007). Some other empirical studies have examined the external and internal determinants of sustainability reporting and corporate social reporting (Abdullah et al., 2011; Amran & Haniffa, 2011).

2.2 Materiality in Sustainability Reporting

Materiality, in the context of the sustainability context, refers to material topics that reflect the significance of the economic, social and environmental impact on a company, its stakeholders and society at large; or that reflect the sustainability impact on the stakeholders' decisions (GRI, 2013). The materiality concept stems from financial reporting and is now applied in sustainability reporting (Jones et al., 2016). Both materialities in financial reporting and sustainability reporting select the most important topics; however, their targeted audiences differ (Whitehead, 2017). Materiality sustainability has a wider scope that focuses on issues that are important to major stakeholder groups, whereas financial materiality emphasises issues important to shareholders (Jones et al., 2016).

Materiality is a reporting threshold in sustainability reporting, and hence, major stakeholder groups and important topics are recognised. The threshold for determining material topics should be set to identify the risks and opportunities that are most crucial to the companies, stakeholders, environment, economy and society (GRI, 2011a). The process of materiality determination requires making judgements on material non-financial information to be included and immaterial non-financial information to be excluded from sustainability reports, whereas the

materiality concept influences both the quality and quantity of the content of sustainability reports (Edgley, 2014). The materiality matrix is presented by the Global Reporting Initiative (GRI) G4 guidelines to illustrate the findings of the materiality analysis. The materiality matrix is generally used by companies to prioritise the relevant sustainability topics of the relevant stakeholders (Puroila & Mäkelä, 2019).

Despite the extensive body of research on sustainability reporting, it is criticised for lacking credibility and quality because of the reporters' discretionary leeway in terms of the freedom of choice of the reported content. The sustainability report must include topics that are relevant to a company and its stakeholders. Materiality is a key principle in sustainability reporting to avoid the problem of incredibility in sustainability reports (Fasan & Mio, 2017). Lubinger et al. (2019) contended that materiality is an emerging trend in sustainability reporting in terms of making sustainability reports more relevant to stakeholders. The materiality determination process can enhance the reported content in a structured way and cover topics that are material from the perspective of stakeholder (Hsu et al., 2013). The process of stakeholder engagement is also necessary for understanding the diverse stakeholder expectations to define sustainability activities (GRI, 2011b). Unless companies are involved in the materiality determination process and stakeholder engagement process, the sustainability reports will not be fully credited to the major stakeholder groups.

2.3 Prior Literature on Materiality in Sustainability Reporting

Empirical studies on materiality disclosure in sustainability reporting have concentrated on European and western countries. For instance, Hsu et al. (2013) employed failure modes and effects analysis to identify material issues for disclosure in sustainability reports of Taiwan. Their results showed that the adoption of the material concept varies between companies. Besides, they also concluded that the process of identifying and prioritising material non-financial information is challenging. Likewise, Mungoni (2014) also reported that the material determination process and stakeholder engagement process are complex research areas with many challenges due to the diversity in purpose and approach. Unerman (2014) highlighted that researchers must take materiality into account when they want to interpret particular sustainability disclosures as companies can use or misuse it as a justification to omit negative information.

Edgley et al. (2015) analysed the difference between financial audit materiality and sustainability materiality from the perspective of assurers. Puroila (2015) investigated how the materiality concept can be used to identify material issues in sustainability reports. Guix et al. (2018) addressed the importance of alignment between disclosure on materiality, inclusiveness and responsiveness in the sustainability reporting of the 50 largest hotel groups worldwide because it can enhance the role of sustainability reports as an accountability mechanism.

Lubinger et al. (2019) investigated the materiality matters in G4-sustainability reports of 33 universities worldwide; their results showed that the identified material aspects are not appropriately reported in the sustainability reports. Additionally, Puroila and Mäkelä (2019) explored the socio-political nature of materiality disclosure in the sustainability reports of the world's top 44 leading companies; they concluded that the materiality assessment process disclosure demonstrates different approaches, assumptions and choices. Moreover, Calabrese et al. (2019) used the GRI materiality matrix to prioritise sustainability issues based on their importance to a company and stakeholders. Their results showed that the GRI materiality matrix can provide useful information for aligning sustainability decision-making and sustainability reporting, as well as overcoming the vagueness, subjectivity and uncertainty that affects judgements.

Recently, a content analysis was conducted by Machado et al. (2020) on the GRI-based 140 sustainability reports. Their results showed that companies did not disclose detailed information about their methods for identifying material topics, and 22% of materiality-related indicators were not disclosed in the sustainability reports. Additionally, they concluded that third-party assurance, location of headquarters, and type of GRI standard were unlikely to influence the transparency of materiality analysis in sustainability reporting. Beske et al. (2020) assessed the disclosure of materiality analysis in the sustainability reports, their results showed that 33 German companies only disclosed a small amount of related information, but they failed to discuss the methods for selecting material topics and identifying stakeholders. Mio et al. (2020) examined the differences between the integrated reporting and sustainability reporting approaches to materiality and discovered that listed companies in Italy implemented two different standards.

In summary, past empirical studies examined the materiality disclosure in sustainability reporting in European and other western countries. The research on the determinants influencing materiality

disclosure in sustainability reporting is still an unexplored theme in Malaysia. Hence, this paper integrates the stakeholder and legitimacy theories to enhance the knowledge of the statistical relationship between board characteristics (board activity, board independence and board size), financial performance (profitability and leverage), company size and industry in the context of Malaysia.

2.4 Theoretical Background

The research on the sustainability reporting field has been analysed using several theories, which can be categorised as social- or political-based theories, and economic-based theory. The economic-based theories (i.e., agency theory, signalling theory, or voluntary disclosure theory) focus on the market outcomes and financial stakeholders of sustainability reporting; thus, companies can use non-financial information disclosure to differentiate themselves from other companies (Fernando & Lawrence, 2014). In contrast, social or political-based theories (i.e. institutional theory, stakeholder theory, or legitimacy theory) acknowledge that companies operate in a broader societal context and hence, have to respond to social pressures because the companies' survival dependent on diverse stakeholder groups (Cormier et al., 2005).

This paper is based on the combined views of the stakeholder and legitimacy theories to explain the determinants of materiality disclosure. These two theories assist in interpreting the motives of disclosure of material non-financial information, which can ensure that the clarity of the sustainability report is not diminished by too much detail on minor topics that obscure concentration on the major topics. Deegan (2002) pointed out that the stakeholder and legitimacy theories have been used in a complementary way as they are closely related. The stakeholder theory can be used to support the disclosure of material sustainability information (Nishant et al., 2016). This theory explains that stakeholder advocacy is vital for the long-term survival of a business; thus, companies should integrate sustainability into their business strategy to address diverse stakeholder interests. To the extent that companies recognise the legitimacy of their stakeholders' interests, they tend to disclose non-financial information to meet their expectations. The benefits of reporting material issues include increased accountability and transparency to stakeholders (Vaz et al., 2016).

In addition to the stakeholder theory, the legitimacy theory is also often used in sustainability reporting because companies face both

social and political pressures and therefore, they are more concerned with achieving a high level of sustainability performance (Cho & Patten, 2007). As such, companies react to these pressures by publishing more sustainability information in order to maintain the image of a legitimate business in legitimate ways and to prevent the negative effects due to legitimacy crises (De Villiers & Van Staden, 2006). The research model of this paper is presented in Figure 1, which extends the stakeholder and legitimacy theories to explain the determinants that influence materiality disclosure in sustainability reporting of large Malaysian companies.

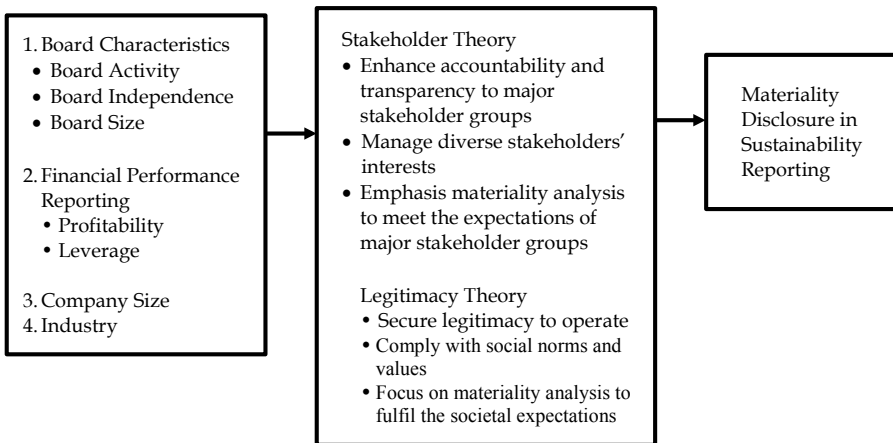


Figure 1: Research Model

3. Hypothesis Development

Based on the existing literature, board characteristics, financial performance indicators, industry and company size were selected as the determinants of materiality disclosure.

3.1 Board Characteristics

This paper explores the impact of the board governance structure on materiality disclosure by focusing on three different board characteristics: board activity, board size and board independence.

Two arguments are presented by research on the impact of board activity on non-financial information disclosure. On the one hand, it is argued that having more board meetings enables board members to more effectively oversee and manage their business operations (Lipton

& Lorsch, 1992); whereas, on the other hand, it is argued that more board meetings may have a negative impact on business performance as it is a sign of inefficiency (Frias-Aceituno et al., 2013). According to the stakeholder theory, sustainability reports have become more complex, and frequent board meetings ensure that a business remains sustainable by identifying the relevant material issues for sustainability reporting and prioritising those issues based on stakeholder needs. Dienes and Velte (2016) claimed that sustainability issues, such as a sudden occurrence of an environmental disaster, require regular board meetings for immediate reaction to any negative impact on the business. This study hypothesises that:

H₁: There is a positive correlation between materiality disclosure in sustainability reporting and board activity.

Drawing on the legitimacy theory, the process of materiality determination can be seen as a strategy aimed at closing a perceived legitimacy gap between stakeholders and management via external directors. External directors are seen as a balancing mechanism because they are outsiders on the board and, therefore, they are expected to be more objective in ensuring that the company acts in the best interests of its shareholders and stakeholders (Prado-Lorenzo et al., 2009). Empirical research, such as Prado Lorenzo et al. (2009), reported that information disclosure has been positively influenced by an independent board, whereas other past research found that it has been either a negative correlation (Prado-Lorenzo & Garcia Sanchez, 2010) or no correlation (Garcia Sanchez et al., 2011). We propose that boards dominated by external directors have a higher level of materiality disclosure as they represent the interests of the stakeholder groups.

H₂: There is a positive correlation between materiality disclosure in sustainability reporting and board independence.

Applying the stakeholder theory lens, boards help to link a company to its external stakeholders. A larger board consisting of directors with diverse expertise can identify and address material issues, potentially improving the quality of the information disclosed (Said et al., 2009). In contrast, Lipton and Lorsch (1992) claimed that a large board may prevent board members from achieving its objective due to a lack of cohesiveness. Another group of studies concluded that the size of the board was not a significant predictor of the disclosure of information (Cheng & Courtenay, 2006; Karamanou & Vafeas, 2005). We propose

that the larger the relative size of the board, the better the materiality disclosure. As such, the hypothesis is stated as follows:

H₃: There is a positive correlation between materiality disclosure in sustainability reporting and board size.

3.2 *Financial Performance Indicators*

Many authors have found a significant empirical relationship between financial performance and sustainability disclosure. Thus, another objective of this paper is to examine more specifically the impact of two different financial indicators on materiality disclosure: profitability and leverage.

Profitability is undeniably pivotal to the continuity of any business. A profitable company has a large pool of financial resources to carry out and inform its sustainability activities to the public (Prado-Lorenzo & Garcia Sanchez, 2010). A less profitable company does not have funds to cover the cost of preparing sustainability reports. For instance, Haniffa and Cooke (2005) documented that profitability was positively associated with information disclosure. However, some studies failed to provide a significant association between social and environmental disclosure and profitability (Brammer & Pavelin, 2006; Cowen et al., 1987). Previous studies posited that profitable companies report more non-financial information to show their contribution to society (legitimise their existence); hence, the hypothesis is as follows:

H₄: There is a positive correlation between materiality disclosure in sustainability reporting and profitability.

Based on the legitimacy theory, management in a highly leveraged company will adopt a legitimisation strategy aimed at changing the perception of shareholders as well as stakeholders (i.e., creditors). Research reports that highly leveraged companies provide less environmental disclosure (Brammer & Pavelin, 2006). They found that companies with higher debts face significant pressure from stakeholders because they are unable to easily settle their debts. Highly leveraged companies also find it difficult to raise funds for non-financial information disclosure because most of the profit streams are devoted to meeting the interest payments to their debt holders. The empirical results of leverage are inconclusive, for example, Ismail and Chandler (2005) revealed a positive correlation between leverage and non-financial information disclosure. In contrast,

Ahmad et al. (2003) found a negative correlation. Another group of studies concluded that leverage is not the determinant of the non-financial information disclosed by Spanish companies (Inchausti, 1997) and Italian companies (Prencipe, 2004). Thus, the next hypothesis is:

H₅: There is a positive correlation between materiality disclosure in sustainability reporting and leverage.

3.3 Company Size

From the stakeholder theory perspective, a large company is more concerned about sustainability information disclosure to meet the demands of stakeholders. Previous studies have found that company size is directly related to information disclosure and argued that large companies are more visible because of their size and media (Dang et al., 2018; Welbeck et al., 2017). For instance, Shamil et al. (2014) reported that company size is one of the predictors of sustainability reporting. In contrast, Singh and Ahuja (1983) found no relationship between company size and corporate social reporting. Past literature generally found that large companies can afford to expend on sustainability initiatives; hence, we propose the following hypothesis:

H₆: There is a positive correlation between materiality disclosure in sustainability reporting and company size.

3.4 Industry

The type of industry is one of the determinants to explain the non-financial information disclosure in previous studies (da Silva Monteiro & Aibar-Guzman, 2010; Deegan & Gordon, 1996). For example, Haniffa and Cooke (2005) documented that industry was an important predictor of non-financial information disclosure of Malaysian public listed companies. Ahmad et al. (2003), in contrast, failed to find a significant correlation between environmental reporting and industry in Malaysia. Another group of studies revealed that companies that operate in less environmentally sensitive industries provided less environmental information disclosure (Hassan & Ibrahim, 2012). This is in line with the legitimacy theory, which states that the pressure to legitimise companies from environmentally sensitive industries is greater than companies from non-environmentally sensitive industries. As such, the above literature leads to H₇:

H₇: There is a positive correlation between materiality disclosure in sustainability reporting and industry.

4. Data and Methodology

4.1 Data Collection and Sample Size

Content analysis was undertaken to examine the research objective, which is the determinants of materiality disclosure. The data extracted from the 2016 annual reports were board activity, independent board, board size, company size, industry, leverage and profitability. The unit of analysis was the individual company. In 2016, there were a total of 850 companies listed on the Main Board of Bursa Malaysia. There was a mandatory requirement for public listed companies in Malaysia with a market capitalisation of RM2 billion and above as of 31 December 2015 to publish a sustainability statement for the financial year 2016. As such, the purposive sampling method was employed to select 113 companies that had met this mandatory requirement. The selected largest 113 companies were taken from 10 sectors: construction and real estate, plantations, industrial products, properties, infrastructure project companies, consumer products, hotel, technology, finance and trading services. This is a suitable technique to examine the current state of materiality disclosure as large companies are perceived to have higher non-financial information disclosure (Abdullah et al., 2011).

4.2 Inter-coder Reliability

This study employed an inter-coder method (Milne & Adler, 1999) to ensure the reliability of the data collected; the findings obtained from both coders were statistically tested to ensure that there were no significant variances between the scores obtained.

4.3 Measurement of Variables

To measure the materiality disclosure in sustainability reporting (dependent variable), this study applied the materiality and relevance disclosure index developed by Fasan and Mio (2020). The materiality disclosure index is based on the word count of the terms materiality or material divided by the number of pages per report when referring to the material determination process and material sustainability issues; the

relevance disclosure index measures the extent that a report discloses the materiality determination process. A score of 5 is given if the disclosure devotes significant attention to materiality issues, a score of 4 if the results of the materiality determination process are discussed in detail, a score of 3 if a report discloses and communicates the material issues, a score of 2 for a brief explanation of what is material, a score of 1 if materiality is a reporting principle to be adopted when preparing the corporate annual report, and a score of 0 for no disclosure.

Likewise, the analysis of measurements of independent variables was tabulated in a similar approach. The board meeting was assessed by the total number of board meetings held during the year (Said et al., 2009). The percentage of external directors was used to assess board independence (Cheng & Courtenay, 2006). The board size was examined using the total number of board members (Hafsi & Turgut, 2013). Profitability was measured by return on equity (Hafsi & Turgut, 2013). Leverage was assessed by total liabilities to total assets to capture the availability of financial resources (Brammer & Pavelin, 2006).

In this study, we used the natural logarithm of total assets to measure the company size (Cheng & Courtenay, 2006). To reduce the number of industries in the sample, we used two subsets according to their impact on the environment: environmentally sensitive industries (construction and real estate, plantations, industrial products, properties, infrastructure project companies, and consumer products) and non-environmentally sensitive industries (hotel, technology, finance, and trading services). Environmentally sensitive was tabulated using a dichotomous value of one and a value of zero for non-environmentally sensitive (Shamil et al., 2014).

5. Results and Discussion

This study used smart partial least squares structural equation modelling 3.0 to perform data analysis. The reliability and validity of the study variables were assessed in the measurement model, whereas the hypotheses were examined in the structural model.

5.1 Descriptive Analysis

Table 1 presents the descriptive statistics for the board activity, board independence, board size, company size, profitability, leverage, and materiality disclosure in sustainability reporting. The materiality ranged

from 0.02 to 0.55 with an average of 0.20, indicating that companies employed the words materiality or material between 0.02 to 0.55 times with an average of 0.20 times on each page of the report. The scores for relevance ranged from 0 to 5 with an average of 3.5. For board activity, many large companies have a minimum of 4 board meetings, a maximum of 20 board meetings, and an average of 7 board meetings per annum. Most of the sample companies had, on average, 8 directors on the board, a minimum of 4, and a maximum of 18 directors on the board. For board independence, the maximum (minimum) percentage of external directors on the corporate board was 78% (20%), while, on average, most of the companies had 47% external directors on the board. In terms of company size, most of the sample companies had total assets averaging 40,135,900,969, and a minimum (maximum) of 520,841,000 (735,956,253,000). Concerning profitability, ROE had a mean of 24%, whereas the minimum (maximum) of ROE was -45% (431%). For leverage, the minimum (maximum) leverage was 0% (462%), and the average was 60% in terms of the proportion of total liabilities to total assets. For the industry, 51% of the sample companies were categorised as environmentally sensitive, whereas 49% were classified as non-environmentally sensitive, as shown in Table 2.

Table 1: Descriptive Statistics of Continuous Study Variables

	Minimum	Maximum	Mean	Std. Deviation
Materiality	0.02	0.55	0.21	0.09
Relevance	0	5	3.51	1.55
Board Activity	4	20	7	3.73
Board Independence	20	78	47	12
Board Size	4	18	8	2
Company Size	520,841,000	735,956,253,000	40,135,900,969	102,082,587,014
Profitability	-45	431	24	47
Leverage	0	462	60	78

Table 2: Descriptive Statistics of Discrete Study Variable

	Frequency	Percentage
Environmentally sensitive	57	50.44
Non-environmentally sensitive	56	49.56
Total	113	100.00

5.2 Measurement Model

In this study, the indicators for the measurement items are reflective, whereas the board activity, independent board, board size, company size, industry, leverage, and profitability are single-item measures (Hair et al., 2016). The materiality disclosure in sustainability reporting was assessed using the materiality and relevance disclosure index; therefore, we examined the reliability and validity of the materiality disclosure construct.

To test the internal consistency reliability, the present study used composite reliability (CR) and Cronbach’s alpha. Also, loading and average variance extracted (AVE) were examined to check the convergent validity. As presented in Table 3, Cronbach’s alpha and CR were above 0.70, whereas the loadings and AVE were above 0.5. Our empirical results revealed that the internal consistency reliability and convergent validity were satisfactory (Hair et al., 2016). The heterotrait-monotrait ratio (HTMT) of the correlations was used to test the discriminant validity. As shown in Table 4, the HTMT values of materiality disclosure in sustainability reporting were below 0.85 (Henseler et al., 2015) and hence, our results achieved discriminant validity.

Table 3: Reliability and Validity Measures

Construct	Items	Loadings	Cronbach’s Alpha	CR	AVE
MDSR	Materiality	0.935	0.747	0.883	0.791
	Relevance	0.842			

Note: MDSR materiality disclosure in sustainability reporting.

Table 4: Discriminant Validity – HTMT

	Board Activity	Board Independence	Board Size	Company Size	Industry	Leverage	MDSR
Board Independence	0.239						
Board Size	0.260	0.072					
Company Size	0.472	0.263	0.157				
Industry	0.305	0.276	0.076	0.310			
Leverage	0.019	0.110	0.060	0.086	0.064		
MDSR	0.459	0.283	0.085	0.258	0.213	0.004	
Profitability	0.106	0.016	0.202	0.087	0.158	0.321	0.053

5.3 Structural Model

The correlation between constructs can be assessed in the structural model. The lateral collinearity issues can be analysed by a variance inflation factor (VIF). Table 5 presents that all the VIF values were below 5 (Hair et al., 2016); hence, there was no collinearity issue. The predictive accuracy of the present research model was assessed by the coefficient of determination. The R^2 value was 0.196, which revealed that seven determinants explained 19.6% of the changes in the level of materiality disclosure. Thus, R^2 was classified as moderate (Cohen, 1988).

Additionally, this study tested the effect size (f^2) of the determinants influencing the materiality disclosure. Referring to Kenny (2018), the variables that presented a larger effect size ($f^2 > 0.025$) to materiality disclosure were board activity ($f^2 > 0.105$) and board independence ($f^2 > 0.023$). Meanwhile, board size ($f^2 > 0.001$), company size ($f^2 > 0.002$), industry ($f^2 > 0.001$), leverage ($f^2 > 0.001$) and profitability ($f^2 > 0.001$) contributed little impact on the materiality disclosure. Moreover, the predictive relevance (Q^2) was employed to examine the predicted capability (Henseler et al., 2009). The present research model has predictive relevance as the Q^2 value was 0.098, which was greater than zero (Hair et al., 2016).

Bootstrapping was used to compute the t-value to examine the significance of the direct relationships. Table 5 shows the findings of the

Table 5: Hypothesis Testing for Direct Relationship

No.	Relationship	Path Coefficient	Std. Error	t-value	VIF	Decision
H ₁	Board Activity → MDSR	0.347	0.095	3.638***	1.422	Supported
H ₂	Board Independence → MDSR	0.147	0.085	1.737**	1.188	Supported
H ₃	Board Size → MDSR	-0.024	0.104	0.227	1.153	Not Supported
H ₄	Company Size → MDSR	0.041	0.119	0.348	1.382	Not Supported
H ₅	Industry → MDSR	-0.038	0.095	0.399	1.252	Not Supported
H ₆	Leverage → MDSR	0.036	0.124	0.292	1.190	Not Supported
H ₇	Profitability → MDSR	-0.027	0.096	0.283	1.230	Not Supported

direct relationships. Board activity was one of the critical determinants of materiality disclosure, with the finding being positively significant ($\beta=0.347$, $t=3.638$, $p=0.000$). Additionally, board independence revealed a significant correlation with the materiality disclosure ($\beta=0.147$, $t=1.737$, $p=0.041$). Therefore, hypotheses H_1 and H_2 were supported. Our study found that board size, company size, industry, leverage, and profitability were not significant predictors of materiality disclosure. Thus, hypothesis H_3 , H_4 , H_5 , H_6 and H_7 were not supported.

5.4 Discussion

Our empirical results confirmed that the frequency of board meetings was significantly and positively linked with the disclosure of material non-financial information. The results support the stakeholder theory, demonstrating that board members who meet more frequently can manage their business in an appropriate way that is fair to their shareholders as well as their stakeholders. The sustainability reports have become increasingly more complex, and require an immediate response and high-level discussion between the board members and the stakeholder groups to whittle down the material non-financial information topics from more than 30 to the top 10 topics in the sustainability reports (Ngu & Amran, 2018b).

Our results also revealed that materiality disclosure was positively influenced by board independence. This result is consistent with the study of Zhang (2012), the high proportion of external directors on the board is positively related to corporate social performance strength ratings. The results support the legitimacy theory; the boards dominated by external directors are expected to have more materiality disclosures to achieve greater transparency and better accountability by closing the legitimacy gap between management and stakeholders. It is empirically evidenced that external directors are seen as a balancing mechanism because they are expected to adopt greater objectivity in ensuring that the company acts in the best interests of diverse stakeholder groups.

Direct relationship between materiality disclosure and board size was found to be insignificant. This result seems in line with Lipton and Lorsh (1992), who believed that a large board may prevent board members achieve its objective due to a lack of cohesiveness. Similarly, Dienes and Velte (2016) also found that corporate social reporting was not influenced by board size in Germany. The results contradict the stakeholder theory in that a large board consisting of directors with

different skills can proactively engage stakeholders in the material determination discussions because they represent diverse stakeholder groups. The explanation may be that, on a large board, it is more difficult for board members to reach an agreement due to different stakeholders competing to have their sustainability topics categorised as material at the expense of other stakeholders.

We argued that a profitable company has more financial resources to expend on sustainability activities, and consequently, publish more material aspects of non-financial information to their stakeholders. The results revealed that materiality disclosure was not influenced by profitability of the business. The insignificant results are common as confirmed by past studies. The results are supported by Brammer and Pavelin (2006), Ganapathy and Kabra (2017), and Shamil et al. (2014) who concluded that profitability was not a significant predictor of social and environmental disclosure by UK and Indian large companies. Our results suggest that the disclosure of material matters in the sustainability reports is an important aspect of sustainable business operations irrespective of the financial status of a company.

This study failed to provide a significant relationship between leverage and materiality disclosure. The results for leverage are in line with the findings of Ganapathy and Kabra (2017), Prado-Lorenzo et al. (2009) and Prencipe (2004), who found that leverage was not the determinant of information disclosed by Indian, Spanish and Italian companies. The results reflected that legitimate companies engage major stakeholder groups in the materiality determination process to identify, prioritise and disclose the sustainability topics that are material to companies and stakeholders regardless of whether the leveraging of the companies is high or low.

The current study argued that a large company is more concerned about non-financial information disclosure to fulfil the expectation of diverse stakeholders. However, the results indicated that materiality disclosure was not influenced by company size. Studies by Ahmad et al. (2003), Gunawan (2007) and Ratanajongkol et al. (2006) found similar evidence that company size had no significant association with corporate responsibility reporting in certain Southeast Asian countries: Malaysia, Indonesia and Thailand. Our results provide evidence that companies that disclose the material non-financial information may do so to meet the demand of stakeholders but not due to their size.

We claim that the pressure to legitimise companies from environmentally sensitive industries is higher than companies from non-

environmentally sensitive industries. However, this study found no relationship between industry and materiality disclosure. The results seem to be consistent with Ahmad et al. (2003), who concluded that industries in Malaysia did not influence environmental reporting. Shamil et al. (2014) also found an insignificant association between industry and sustainability reporting in Sri Lanka. Sri Lanka is considered a developing economy with an emerging equity market. Drawing from legitimacy theory, a possible reason for the insignificant relationship could be that legitimate companies operating in environmentally sensitive and non-environmentally sensitive industries disclose material issues in an attempt to comply with the requirements of Bursa Malaysia and achieve high-level sustainability performance.

6. Conclusion

The current study focuses on the determinants of materiality disclosure in sustainability reporting. This paper investigates four potential drivers of materiality disclosure to achieve this research goal: board characteristics (board activity, board independence, and board size), financial performance (profitability and leverage), company size and industry. Our empirical findings show that board activity and independence are significant determinants of materiality disclosure, whereas board size has no such relationship. Our findings also show that profitability, leverage, company size and industry type are not statistically significant.

This study makes two contributions. To begin, this study is a pioneering investigation into the materiality disclosure of large companies operating in Malaysia using the combined perspectives of stakeholder and legitimacy theories. In Malaysia, research on the materiality concept in sustainability reporting is still in its early stages. This paper investigates the determinants of materiality disclosure in sustainability reporting to shed light on the concept of materiality. Second, this research has managerial implications. The findings should be of great interest to policymakers who are concerned with implementing sustainability disclosure policies in order to achieve greater materiality disclosure. It also provides reporting companies with strategic thinking on how to use the concept of materiality in the material determination process to increase the credibility of sustainability reports. Through reporting on materiality issues, reporting companies can strengthen their board governance structure (i.e., board activity and board independence) to improve the reliability of the information presented

to stakeholders and corporate sustainability. Board members are encouraged to consider the significance of the reporting materiality determination process; otherwise, poor reporting may result in conflict with major stakeholder groups who do not see the material issues disclosed in sustainability reports.

There are three limitations to this study that could be addressed in future research. First, in our study, the research model tested seven determinants of materiality disclosure. Future research could look into other factors that influence the level of materiality disclosure. Second, there are limitations to this study in terms of generalisation and sample size. In future research, the sample size should be increased to achieve greater generalisability. Third, the results are restricted to the Malaysian context. Future researchers can compare materiality disclosure in other countries, such as Singapore and Thailand, to add to the literature on sustainability reporting.

References

- Abdullah, S.N., Mohamad, N.R., & Mokhtar, M.Z. (2011). Board independence, ownership and CSR of Malaysian large firms. *Corporate Ownership & Control*, 8(3), 417–435. <https://doi.org/10.22495/cocv8i2c4p5>
- Adams, C.A. (2002). Internal organisational factors influencing corporate social and ethical reporting: Beyond current theorising. *Accounting, Auditing & Accountability Journal*, 15(2), 223–250. <https://doi.org/10.1108/09513570210418905>
- Ahmad, Z., Hassan, S., & Mohammad, J. (2003). Determinants of environmental reporting in Malaysia. *International Journal of Business Studies*, 11(1), 69–90.
- Ahmed Haji, A. (2013). Corporate social responsibility disclosures over time: Evidence from Malaysia. *Managerial Auditing Journal*, 28(7), 647–676. <https://doi.org/10.1108/MAJ-07-2012-0729>
- Amran, A., & Haniffa, R. (2011). Evidence in development of sustainability reporting: A case of a developing country. *Business Strategy and the Environment*, 20(3), 141–156. <https://doi.org/10.1002/bse.672>
- Amran, A., Rosli, A.M., & Hassan, C.H.M (2009). Risk reporting: An exploratory study on risk management disclosure in Malaysian annual reports. *Managerial Auditing Journal*, 24(1), 39–57. <https://doi.org/10.1108/02686900910919893>
- Beske, F., Hausteine, E., & Lorson, P.C. (2020). Materiality analysis in sustainability and integrated reports. *Sustainability Accounting, Management and Policy Journal*, 11(1), 162–186. <https://doi.org/10.1108/SAMPJ-12-2018-0343>
- Bing, N.S., & Amran, A. (2017). The role of board diversity on materiality disclosure in sustainability reporting. *Global Business & Management Research*, 9(4), 96–109. <https://doi.org/10.9756/IAJAFM/V5I2/1810020>

- Brammer, S., & Pavelin, S (2006). Voluntary environmental disclosures by large UK companies. *Journal of Business Finance & Accounting*, 33(7-8), 1168-1188. <https://doi.org/10.1111/j.1468-5957.2006.00598.x>
- Bursa Malaysia Securities Berhad (2016). *Sustainability reporting guide and toolkits*. <http://www.bursamalaysia.com/market/sustainability/sustainability-reporting/sustainability-reporting-guide-and-toolkits/>
- Calabrese, A., Costa, R., & Rosati, F. (2015). A feedback-based model for CSR assessment and materiality analysis. *Accounting Forum*, 39(4), 312-327. <https://doi.org/10.1016/j.accfor.2015.06.002>
- Calabrese, A., Costa, R., Ghiron, N.L., & Menichini, T. (2019). Materiality analysis in sustainability reporting: A tool for directing corporate sustainability towards emerging economic, environmental and social opportunities. *Technological and Economic Development of Economy*, 25(5), 1016-1038. <https://doi.org/10.3846/tede.2019.10550>
- Cheng, E.C.M., & Courtenay, S.M. (2006). Board composition, regulatory regime and voluntary disclosure. *The International Journal of Accounting*, 41(3), 262-289. <https://doi.org/10.1016/j.intacc.2006.07.001>
- Cho, C.H., & Patten, D.M. (2007). The role of environmental disclosures as tools of legitimacy: A research note. *Accounting, Organizations and Society*, 32(7-8), 639-647. <https://doi.org/10.1016/j.aos.2006.09.009>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Lawrence Erlbaum Associates.
- Cormier, D., Magnan, M., & Van Velthoven, B. (2005). Environmental disclosure quality in large German companies: Economic incentives, public pressures or institutional conditions? *European Accounting Review*, 14(1), 3-39. <https://doi.org/10.1080/0963818042000339617>
- Cowen, S.S., Ferreri, L.B., & Parker, L.D. (1987). The impact of corporate characteristics on social responsibility disclosure: A typology and frequency-based analysis. *Accounting, Organizations and Society*, 12(2), 111-122. [https://doi.org/10.1016/0361-3682\(87\)90001-8](https://doi.org/10.1016/0361-3682(87)90001-8)
- da Silva Monteiro, S.M., & Aibar Guzman, B. (2010). Determinants of environmental disclosure in the annual reports of large companies operating in Portugal. *Corporate Social Responsibility and Environmental Management*, 17(4), 185-204. <https://doi.org/10.1002/csr.197>
- Dang, C., Li, Z.F., & Yang, C. (2018). Measuring firm size in empirical corporate finance. *Journal of Banking & Finance*, 86, 159-176. <https://doi.org/10.1016/j.jbankfin.2017.09.006>
- De Villiers, C., & Van Staden, C.J. (2006). Can less environmental disclosure have a legitimising effect? Evidence from Africa. *Accounting, Organizations and Society*, 31(8), 763-781. <https://doi.org/10.1016/j.aos.2006.03.001>
- Deegan, C. (2002). Introduction: The legitimising effect of social and environmental disclosures - a theoretical foundation. *Accounting, Auditing & Accountability Journal*, 15(3), 282-311. <https://doi.org/10.1108/09513570210435852>

- Deegan, C., & Gordon, B. (1996). A study of the environmental disclosure practices of Australian corporations. *Accounting and Business Research*, 26(3), 187–199. <https://doi.org/10.1080/00014788.1996.9729510>
- Dienes, D., & Velte, P. (2016). The impact of supervisory board composition on CSR reporting: Evidence from the German Two-tier System. *Sustainability*, 8(1), Article 63. <https://doi.org/10.3390/su8010063>
- Edgley, C. (2014). A genealogy of accounting materiality. *Critical Perspectives on Accounting*, 25(3), 255–271. <https://doi.org/10.1016/j.cpa.2013.06.001>
- Edgley, C., Jones, M.J., & Atkins, J. (2015). The adoption of the materiality concept in social and environmental reporting assurance: A field study approach. *The British Accounting Review*, 47(1), 1–18. <https://doi.org/10.1016/j.bar.2014.11.001>
- Fasan, M., & Mio, C. (2017). Fostering stakeholder engagement: The role of materiality disclosure in integrated reporting. *Business Strategy and the Environment*, 26(3), 288–305. <https://doi.org/10.1002/bse.1917>
- Fernando, S., & Lawrence, S. (2014). A theoretical framework for CSR practices: Integrating legitimacy theory, stakeholder theory and institutional theory. *Journal of Theoretical Accounting Research*, 10(1), 149–178.
- Freedman, M., & Jaggi, B. (2005). Global warming, commitment to the Kyoto Protocol, and accounting disclosures by the largest global public firms from polluting industries. *The International Journal of Accounting*, 40(3), 215–232. <https://doi.org/10.1016/j.intacc.2005.06.004>
- Freeman, R.E. (1984). *Strategic management: A stakeholder approach*. Cambridge University Press.
- Frias-Aceituno, J.V., Rodriguez-Ariza, L., & Garcia Sanchez, I.M. (2013). The role of the board in the dissemination of integrated corporate social reporting. *Corporate Social Responsibility and Environmental Management*, 20(4), 219–233. <https://doi.org/10.1002/csr.1294>
- Ganapathy, E., & Kabra, K. (2017). The impact of corporate governance attributes on environmental disclosures: Evidence from India. *International Journal of Corporate Governance*, 10(1), 24–43. <https://doi.org/10.1177/0974686217701464>
- Garcia Sanchez, I.M., Rodriguez Dominguez, L., & Gallego Alvarez, I. (2011). Corporate governance and strategic information on the Internet: A study of Spanish listed companies. *Accounting, Auditing & Accountability Journal*, 24(4), 471–501. <https://doi.org/10.1108/09513571111133063>
- GRI. (2011a). *Technical protocol: Applying the report content principles*.
- GRI. (2011b). *G3.1, sustainability reporting guidelines*. <https://www.globalreporting.org>
- GRI. (2013). *G4, part1, reporting principles and standard disclosure*. <https://www.globalreporting.org>
- Guix, M., Bonilla-Priego, M.J., & Font, X. (2018). The process of sustainability reporting in international hotel groups: An analysis of stakeholder inclu-

- siveness, materiality and responsiveness. *Journal of Sustainable Tourism*, 26(7), 1063–1084. <https://doi.org/10.1080/09669582.2017.1410164>
- Gunawan, J. (2007). Corporate social disclosures by Indonesian listed companies: A pilot study. *Social Responsibility Journal*, 3(3), 26–34. <https://doi.org/10.1108/17471110710835554>
- Hafsi, T., & Turgut, G. (2013). Boardroom diversity and its effect on social performance: Conceptualization and empirical evidence. *Journal of Business Ethics*, 112(3), 463–479. <https://doi.org/10.1007/s10551-012-1272-z>
- Hahn, R., & Kühnen, M. (2013). Determinants of sustainability reporting: A review of results, trends, theory, and opportunities in an expanding field of research. *Journal of Cleaner Production*, 59, 5–21. <https://doi.org/10.1016/j.jclepro.2013.07.005>
- Hair, J.F., Hult, G.T.M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage Publications.
- Haniffa, R.M., & Cooke, T.E. (2005). The impact of culture and governance on corporate social reporting. *Journal of Accounting and Public Policy*, 24(5), 391–430. <https://doi.org/10.1016/j.jaccpubpol.2005.06.001>
- Hassan, A., & Ibrahim, E. (2012). Corporate environmental information disclosure: Factors influencing companies' success in attaining environmental awards. *Corporate Social Responsibility and Environmental Management*, 19(1), 32–46. <https://doi.org/10.1002/csr.278>
- Henseler, J., Ringle, C.M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Henseler, J., Ringle, C.M., & Sinkovics, R.R. (2009). The use of partial least squares path modeling in international marketing. In R.R. Sinkovics & P.N. Ghauri (Eds.), *New challenges to international marketing (Advances in international marketing, vol. 20)* (pp. 277–319). Emerald Group Publishing Limited. [https://doi.org/10.1108/S1474-7979\(2009\)0000020014](https://doi.org/10.1108/S1474-7979(2009)0000020014)
- Herbohn, K., Walker, J., & Loo, H.Y.M. (2014). Corporate social responsibility: The link between sustainability disclosure and sustainability performance. *Abacus*, 50(4), 422–459. <https://doi.org/10.1111/abac.12036>
- Herzig, C., & Schaltegger, S. (2006). Corporate sustainability reporting. An overview. In S. Schaltegger, M. Bennett, & R. Burritt (Eds.), *Sustainability Accounting and Reporting* (pp. 301–324). Springer. https://doi.org/10.1007/978-1-4020-4974-3_13
- Hsu, C-W., Lee, W-H., & Chao, W-C. (2013). Materiality analysis model in sustainability reporting: A case study at Lite-On Technology Corporation. *Journal of Cleaner Production*, 57, 142–151. <https://doi.org/10.1016/j.jclepro.2013.05.040>
- Inchausti, B.G. (1997). The influence of company characteristics and accounting regulation on information disclosed by Spanish firms. *European Accounting Review*, 6(1), 45–68. <https://doi.org/10.1080/096381897336863>

- Ismail, K.N.I.K., & Chandler, R. (2005). Disclosure in the quarterly reports of Malaysian companies. *Financial Reporting, Regulation and Governance*, 4(1), 1–26.
- Jones, P., Comfort, D., & Hillier, D. (2016). Materiality in corporate sustainability reporting within UK retailing. *Journal of Public Affairs*, 16(1), 81–90. <https://doi.org/10.1002/pa.1570>
- Karamanou, I., & Vafeas, N. (2005). The association between corporate boards, audit committees, and management earnings forecasts: An empirical analysis. *Journal of Accounting Research*, 43(3), 453–486. <https://doi.org/10.1111/j.1475-679X.2005.00177.x>
- Kenny, D.A. (2018). *Moderation*. <http://davidakenny.net/cm/moderation.htm>
- Lipton, M., & Lorsch, J.W. (1992). A modest proposal for improved corporate governance. *The Business Lawyer*, 48(1), 59–77.
- Lubinger, M., Frei, J., & Greiling, D. (2019). Assessing the materiality of university g4-sustainability reports. *Journal of Public Budgeting, Accounting & Financial Management*, 31(3), 364–391. <https://doi.org/10.1108/JPBAFM-10-2018-0117>
- Machado, B.A.A., Dias, L.C.P., & Fonseca, A. (2020). Transparency of materiality analysis in GRI-based sustainability reports. *Corporate Social Responsibility and Environmental Management*, 28(2), 570–580. <https://doi.org/10.1002/csr.2066>
- Mahoney, L.S., Thorne, L., Cecil, L., & LaGore, W. (2013). A research note on standalone corporate social responsibility reports: Signaling or greenwashing? *Critical Perspectives on Accounting*, 24(4-5), 350–359. <https://doi.org/10.1016/j.cpa.2012.09.008>
- Milne, M.J., & Adler, R.W. (1999). Exploring the reliability of social and environmental disclosures content analysis. *Accounting, Auditing & Accountability Journal*, 12(2), 237–256. <https://doi.org/10.1108/09513579910270138>
- Mio, C., Fasan, M., & Costantini, A (2020). Materiality in integrated and sustainability reporting: A paradigm shift? *Business Strategy and the Environment*, 29(1), 306–320. <https://doi.org/10.1002/bse.2390>
- Mungoni, T.B.S. (2014). *Stakeholder engagement in the determination of materiality for sustainability reporting*. (Doctoral dissertation, University of Pretoria). <http://hdl.handle.net/2263/44918>
- Ngu, S.B., & Amran, A. (2018a). Board diversity and materiality disclosure in sustainability reporting: A proposed conceptual framework. *International Academic Journal of Accounting and Financial Management*, 5(2), 96–109. <https://doi.org/10.9756/iajafm/v5i2/1810020>
- Ngu, S.B., & Amran, A. (2018b). Materiality disclosure in sustainability reporting: Fostering stakeholder engagement. *Strategic Direction*, 34(5), 1–4. <https://doi.org/10.1108/SD-01-2018-0002>
- Nishant, R., Goh, M., & Kitchen, P.J (2016). Sustainability and differentiation: Understanding materiality from the context of Indian firms. *Journal of Business Research*, 69(5), 1892–1897. <https://doi.org/10.1016/j.jbusres.2015.10.075>

- Papoutsis, A., & Sodhi, M.S. (2020). Does disclosure in sustainability reports indicate actual sustainability performance? *Journal of Cleaner Production*, 260, Article 121049. <https://doi.org/10.1016/j.jclepro.2020.121049>
- Pfeffer, J. (1981). *Power in organizations*. Pitman.
- Prado-Lorenzo, J-M., & Garcia-Sanchez, I-M. (2010). The role of the board of directors in disseminating relevant information on greenhouse gases. *Journal of Business Ethics*, 97(3), 391–424. <https://doi.org/10.1007/s10551-010-0515-0>
- Prado-Lorenzo, J-M., Garcia-Sanchez, I-M., & Gallego-Alvarez, I. (2009). Characteristics of the board of directors and information in matters of corporate social responsibility. *Spanish Journal of Finance and Accounting*, 38(141), 107–135.
- Prencipe, A. (2004). Proprietary costs and determinants of voluntary segment disclosure: Evidence from Italian listed companies. *European Accounting Review*, 13(2), 319–340. <https://doi.org/10.1080/0963818042000204742>
- Puroila, J. (2015). *What really matters? Materiality disclosures in sustainability reporting practices*. (Master dissertation, University of Tampere). <http://urn.fi/URN:NBN:fi:uta-201512032480>
- Puroila, J., & Mäkelä, H. (2019). Matter of opinion, exploring the socio-political nature of materiality disclosures in sustainability reporting. *Accounting, Auditing & Accountability Journal*, 32(4), 1043–1072. <https://doi.org/10.1108/AAAJ-11-2016-2788>
- Ratanajongkol, S., Davey, H., & Low, M. (2006). Corporate social reporting in Thailand: The news is all goods and increasing. *Qualitative Research in Accounting & Management*, 3(1), 67–83. <https://doi.org/10.1108/11766090610659751>
- Said, R., Hj Zainuddin, Y., & Haron, H. (2009). The relationship between corporate social responsibility disclosure and corporate governance characteristics in Malaysian public listed companies. *Social Responsibility Journal*, 5(2), 212–226. <https://doi.org/10.1108/17471110910964496>
- Shamil, M.M., Shaikh, J.M., Ho, P.L., & Krishnan, A. (2014). The influence of board characteristics on sustainability reporting: Empirical evidence from Sri Lankan firms. *Asian Review of Accounting*, 22(2), 78–97. <https://doi.org/10.1108/ARA-09-2013-0060>
- Singh, D.R., & Ahuja, J.M (1983). Corporate social reporting in India. *International Journal of Accounting*, 18(2), 151–169.
- Smith, M., Yahya, K., & Marzuki A.A. (2007). Environmental disclosure and performance reporting in Malaysia. *Asian Review of Accounting*, 15(2), 185–199. <https://doi.org/10.1108/13217340710823387>
- Unerman, J., & Zappetini, F. (2014). Incorporating materiality considerations into analyses of absence from sustainability reporting. *Social and Environmental Accountability Journal*, 34(3), 172–186. <https://doi.org/10.1080/0969160X.2014.965262>

- Vaz, N., Fernandez-Feijoo, B., & Ruiz, S. (2016). Integrated reporting: An international overview. *Business Ethics: A European Review*, 25(4), 577-591. <https://doi.org/10.1111/beer.12125>
- Welbeck, E.E., Owusu, G.M.Y., Bekoe, R.A., & Kusi, J.A. (2017). Determinants of environmental disclosures of listed firms in Ghana. *International Journal of Corporate Social Responsibility*, 2(1), 1-12. <https://doi.org/10.1186/s40991-017-0023-y>
- Whitehead, J. (2017). Prioritizing sustainability indicators: Using materiality analysis to guide sustainability assessment and strategy. *Business Strategy and the Environment*, 26(3), 399-412. <https://doi.org/10.1002/bse.1928>
- Zhang, L. (2012). Board demographic diversity, independence, and corporate social performance. *Corporate Governance: The International Journal of Business in Society*, 12(5), 686-700. <https://doi.org/10.1108/14720701211275604>