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Tricia Ong
Edith Cowan University

Hadrian Geri Djajadikerta
Edith Cowan University

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Corporate governance and sustainability reporting in the Australia's resources industry: An empirical analysis

Tricia Ong[1] and Hadrian Geri Djajadikerta[1]*

[1]School of Business and Law, Edith Cowan University

*Corresponding author: h.djajadikerta@ecu.edu.au

Abstract:

Purpose: This study evaluates the impact of corporate governance on sustainability reporting by investigating companies operating in the Australia's resources industry.

Design/methodology/approach: This study investigates the relationships between the total sustainability disclosures and, separately, the three aspects of sustainability disclosures - economic, environmental and social - and corporate governance mechanisms proxy by various attributes of board composition. The sustainability disclosures were scored using Ong *et al*.'s (2016) index.

Findings: Significant positive correlations were found between the extent of sustainability disclosures and the proportion of independent directors, multiple directorships and women directors on the board.

Originality / value: Unlike traditional content analysis methods, this study adopts a newly developed Global Reporting Initiatives (GRI) based reporting index that identifies companies with good sustainability performance by aligning companies' disclosures to their sustainability performance.

Keywords: *Corporate governance, Sustainability reporting, Resources industry, Australia, Hard and soft disclosures*

1. Introduction

While literature and empirical studies on sustainability reporting have grown tremendously in recent decades, it is evident that sustainability reporting and sustainability performance are still limited and largely fragmented with little improvement in sustainable performance (Huang and Watson, 2015; Jain and Jamali, 2016; Rao and Tilt, 2016). Previous studies have established that corporate governance mechanism, which involves the system of rules, practices and processes by which a company is directed and controlled, plays a vital role in the quality of sustainability reporting and sustainability performance (Garcia-Torea *et al*., 2016; Gibson and O'Donovan, 2007; Kolk, 2008; Lau *et al*., 2016).

Recent developments in economic theory suggest that the board of directors (BOD) is an important part of a company's corporate governance structure (Fama and Jenson, 1983). The BOD of a company, which represents the highest level of management in a company (Keasey and Wright, 1993), has a major impact on a company's reporting practices and procedures. Consequently, many recent studies have identified a significant correlation between the composition of a company's BOD and the quality of its sustainability reporting (Michelon and Parbonetti, 2012; Post *et al*., 2011; Rao *et al*., 2012; Rupley *et al*., 2012; Webb, 2004).

While there have been many studies conducted on BOD, few have examined a board's impact towards sustainability reporting. Among the existing studies, most have tended to focus only on the environmental aspects of sustainability, without considering the economic and social aspects. Hence, this research addresses this gap to explore the impact of the composition of a company's BOD that is an important corporate governance mechanism on the quality of a company's sustainability reporting by reviewing several attributes of board composition.

The stakeholder theory posits that a company has a binding fiduciary duty to value the different stakeholders' needs. This is in line with the recommendations of the Australian Corporate Governance Council (ACGC) in the call for companies to be transparent in their corporate governance mechanism. The ACGC sets out principles and recommendations, which related to corporate governance for listed companies in Australia, to promote central principles that include acting ethically and responsibly, safeguarding integrity in corporate reporting and making timely and balanced disclosure. According to Kolk (2008), the increased call for transparency about corporate behaviour comes from two different angles and has recently shown some overlap. One of the angles is accountability requirements in the context of corporate governance that have expanded from internal operating mechanisms relating to board of directors and managers to include ethical aspects such as remuneration, managerial and employee behaviour and complaint mechanisms. The other angle is sustainability reporting that was originally focused primarily on the environmental aspect, but has broadened in scope to include ethical/social issues such as employee and community matters. Thus, Kolk concluded that the two rather distinct angles of transparency have shown convergence in terms of topics and also in a broader targeted audience.

KPMG's survey in 2017 provides more evidence of this convergence (KPMG, 2017). In their global surveys of sustainability disclosures on the world's 250 largest companies by revenue (G250) and top 100 companies (N100) of many different countries, they found a significant number of companies adopting the principles of sustainability and providing sustainability disclosures in their annual reports to stakeholders. 93% of the G250 and 73% of the N100 have reported on sustainability issues. These percentages showed significant increases of the sustainability disclosures made by the companies from the results shown in the first set of similar surveys that were conducted in 2000 (i.e., 35% of the G250 and 24% of the N100). It was also found that 78% of the G250 and 60% of the N100 provided sustainability disclosures in their annual financial reports, and the Global Reporting Initiatives (GRI) remained to be the most popular reporting framework used for sustainability disclosures.

Notwithstanding the increase in sustainability reporting made by companies and the availability of reporting frameworks such as the GRI framework, previous studies have suggested that there are still a lack of a standardised reporting framework and an ambiguity in the way reporting scope and requirements are interpreted. These have resulted in inconsistency in the practice and the extent of companies' sustainability disclosures. For decades, companies have still been facing issues such as defining the scope of sustainability, and deciding what to include, how to report, and when to disclose information relating to sustainability (Adams and Frost, 2007; Betianu, 2010; Crawford and Williams, 2010; De Jong *et al*., 2009; Dingwerth and Eichinger, 2010; Emery, 2002; Gibson and O'Donovan, 2007; Gray *et al*., 2001; Hussey *et al.*, 2001).

In addition to these challenges, companies have also found that it is often difficult to link sustainability practices to their reporting. The main question that continues to linger is whether sustainability disclosures can be considered as a true reflection of companies' practices and performances in sustainability that could in effect contribute constructively towards a sustainable society (Atkins *et al.*, 2015; Cho *et al.*, 2012; Gray, 2010; Gray and Milne, 2002; Hopwood, 2009; Milne and Gray, 2013).

Schaltegger and Burritt (2015) mentioned that corporate sustainability management, which includes all activities that design, measure, analyse and improve environmental, social and economic activities, is essential to "firstly create a sustainable development of the organisation itself, and secondly to enable the company to contribute to sustainable development of the economy and society as a whole" (p.242).

Schaltegger *et al.* (2017), concurred with Jokinen *et al.* (1998), and suggested that sustainability should not be considered as a final objective, but as a continuous process of change. Therefore, Schaltegger *et al.* (2017) posited that creating innovations in sustainability is important because a continuous process of innovations is essential for sustainability management. They also argued that the existing conventional accounting systems were incapable of describing a genuine picture of a company's sustainability impacts and improvements. Accordingly, they asserted that innovative approaches to sustainability information management were essential.

This study adopts a newly developed Global Reporting Initiatives (GRI) based reporting index that was used in Ong *et al*. (2016). Ong *et al*.'s index was developed by integrating the GRI reporting framework with the fundamental principles of hard and soft disclosure items in Clarkson *et al.* (2008). Clarkson *et al*. classified the GRI environmental performance indicators into hard verifiable and soft non-verifiable disclosure items. Ong *et al*. expanded on the index used in Clarkson *et al*. to include the economic and social aspects of sustainability. The newly developed Ong *et al*.'s scoring index differentiates companies with good sustainability performance by awarding higher scores to companies' disclosures that are aligned to improved sustainability performance.

There are several benefits in using Ong *et al*.'s (2016) index. First, it facilitates the evaluation of companies' sustainability reporting based on both the quantity and quality of the disclosures. It analyses the quantity of disclosures in company sustainability reports through the use of the comprehensive performance indicators available in the GRI framework and

evaluates the quality of the disclosures by applying the principles of Clarkson *et al*. (2008) on hard and soft disclosure items. Second, by distinguishing companies' sustainability disclosures between hard and soft items, it assists the identification of a firm's genuine commitment to sustainability by allocating higher scores to disclosure items which demonstrate authentic contributing efforts to sustainability. Third, the index enhances the current GRI framework and provides a consistent tool to analyse all three aspects of sustainability simultaneously to give users a balanced perspective of a company's sustainable development. The index provides an improved and standardised measurement and promotes comparability of company sustainability disclosures and performances. This study focuses on the Australia's resources industry and applies Ong *et al*.'s (2016) to evaluate sustainability reporting practices of companies operating in this environmentally sensitive industry.

2. Literature review and hypotheses development

The role of a company's board of directors (BOD) is to "oversee the actions and decisions of corporate management" (Rupley *et al*., 2012, p. 614). The board composition would affect how effectively the board fulfils this important role (Fama and Jensen, 1983; Goodstein *et al*., 1994; Pfeffer, 1972). Kang *et al.*, (2007) defined the "variety in the composition of the BOD" as board diversity (p. 195). Prior research have found that board diversity promotes more discussion of ideas to improve performance (Chandler, 2005; van Knippenberg *et al.*, 2004) and board diversity implies that members are more representative of the different stakeholders (Wang and Dewhirst, 1992). These impacts from board diversity supports stronger corporate governance. Rupley *et al.* (2012) posited that a board composition that supports stronger board governance will result in broader awareness and concern for companies' stakeholders, and this tends to result in a higher quality of sustainability reporting. Rao and Tilt (2016), however, commented that although board diversity has shown its influence on financial performance and reporting in many prior literature, few have examined whether this influence is also applicable in non-financial performance and reporting, such as sustainability reporting.

The next section details the development of the hypotheses after a thorough analysis and evaluation of the literature review relating to sustainability and sustainability reporting. The hypotheses are tested for the existence of relationships between the extent of sustainability disclosures in the annual reports and stand-alone sustainability reports (the dependent variables) and the corporate governance mechanisms proxy specifically by several attributes of the board composition (the independent variables), namely the proportion of independent directors, directors with multiple directorships and female directors. The individual aspects of sustainability – economic, environmental and social – are also tested separately with each of the identified board composition attributes. The hypotheses are developed based on prior literature that indicates board composition that supports effective corporate governance mechanisms are disclosing higher-quality sustainability disclosures.

2.1. Independent directors

Independent directors are directors that have no personal or professional relationship with a company, other than being a board member. They are also often referred to as external directors. The presence of independent directors on a board can help to segregate the management and control tasks of a company and this is expected to offset inside members' opportunistic behaviours (Jensen and Meckling, 1976). In addition, independent directors generally have stronger and extended engagement with wider groups of stakeholders (Wang and Dewhirst, 1992) and they tend to have a broader perspective that is likely to result in a greater exposure to reporting requirements (Rupley *et al*., 2012). Hence, a higher proportion of independent directors is expected to support stronger board governance and more sustainability disclosures. Numerous empirical studies have found a positive correlation between the proportion of independent directors on the board and the extent of sustainability disclosures (Post *et al*., 2011; Rao *et al*., 2012; Rupley *et al*., 2012).

Michelon and Parbonetti (2012), however, did not find any direct correlation between the proportion of independent directors and the extent of sustainability disclosures in their study. Instead, they found a significant correlation between the proportion of community influential board members and the extent of sustainability disclosures. They suggested that board composition should be measured "beyond the traditional outsider/insider dichotomy" (p. 504) and consider the individual characteristics of directors. Baysinger and Hoskisson (cited in Michelon and Parbonetti, 2012) recognised that independent directors were not "homogeneous in terms of specific skills, knowledge, and expertise" (p. 485).

This study follows the results of many previous studies which suggest that independent directors are generally less aligned to the management's interests; hence, they are expected to have a tendency to focus on the needs of a wider group of stakeholders and demand companies to provide more sustainability disclosures. Thus, the first set of hypotheses are proposed as follows:

H1: There is a positive relationship between the proportion of independent directors on the board and the extent of total disclosure provided by companies in the resources industry.

H1A: There is a positive relationship between the proportion of independent directors on the board and the extent of economic disclosure provided by companies in the resources industry.

H1B: There is a positive relationship between the proportion of independent directors on the board and the extent of environmental disclosure provided by companies in the resources industry.

H1C: There is a positive relationship between the proportion of independent directors on the board and the extent of social disclosure provided by companies in the resources industry.

2.2. Multiple directorships

Fama and Jensen (1983) proposed that directors signal their expertise by serving on multiple boards. Board members are likely to be exposed to more firm practices and gain knowledge by interacting with other board members if they serve on more than one board (Rupley *et al*., 2012). Rupley *et al*. (2012) posited that, in the context of environmental disclosure, firms with board members serving on multiple boards tended to have greater exposure to reporting practices of various firms and this would result in a greater extent of disclosures. This claim was confirmed by their findings that showed a significant positive relationship between the proportion of multiple directorships and environmental disclosures. Lipton and Lorsch (1992), however, made a cautious comment that multiple directorships could adversely affect the corporate governance of a firm as directors were often distracted by other organisations' matters and this affected their performance in their monitoring roles.

While the issue of multiple directorships has been commonly explored in the area of corporate governance, only a few studies have focused on its impact on sustainability disclosures. This research, which focuses on Australian resources companies, argues that resources companies with directors serving on multiple boards are likely to have greater exposure to sustainability reporting requirements in different industries, including those required in the resources industry. This is expected to provide the companies' boards with a wider perspective on sustainability reporting and, accordingly, enhance the willingness of the companies to provide more disclosures in all three aspects of sustainability. Thus, the second set of hypotheses are proposed as:

H2: There is a positive relationship between the proportion of directors with multiple directorships and the extent of total disclosure provided by companies in the resources industry.

H2A: There is a positive relationship between the proportion of directors with multiple directorships and the extent of economic disclosure provided by companies in the resources industry.

H2B: There is a positive relationship between the proportion of directors with multiple directorships and the extent of environmental disclosure provided by companies in the resources industry.

H2C: There is a positive relationship between the proportion of directors with multiple directorships and the extent of social disclosure provided by companies in the resources industry.

2.3. Women directors

Adams and Ferreira (2009) raised the issue of the importance of gender diversity on a board in their proposals for governance reform. Rao *et al*. (2012) have also stated that the recognition of women directors' contribution has continuously risen. Some of the benefits of having women on the board have been highlighted in prior studies:

- The board became more committed and involved; more prepared; and more diligent; and overall it created better atmosphere (Huse and Solberg, 2006).
- Internally it improved decision making process; increased board effectiveness; and resulted of better attendance and participation (Adams and Ferreira, 2009).
- It showed the board that had greater responsibilities; more philanthropically driven; and less concerned with economic performance (Ibrahim and Angelidis, 1994).
- It enhanced board independence (Kang *et al*., 2007).
- It associated with firms that were more socially responsible (Webb, 2004).
- It increased board effectiveness and shareholder value (Carter *et al*., 2003).

Fernandez-Feijoo *et al*., (2014) examined the sustainability reporting practices of the global fortune 250 (G250) and the 100 largest companies (N100) in 22 countries using the 2008 KPMG international survey of corporate social responsibility reporting. They found that companies with more than three women directors on their boards provided more sustainability disclosures compared to companies with three or less women directors on their boards.

Based on the results from prior research, this study argues that companies with more women directors on their boards are likely to improve their corporate governance through increased board independence and accountability. Women directors are expected to possess a greater passion for their companies' sustainable developments (Adams and Ferreira, 2009; Webb, 2004). Thus, the third set of hypotheses are proposed, as follows:

H3: There is a positive relationship between the proportion of women directors on the board and the extent of total disclosure provided by companies in the resources industry.

H3A: There is a positive relationship between the proportion of women directors on the board and the extent of economic disclosure provided by companies in the resources industry.

H3B: There is a positive relationship between the proportion of women directors on the board and the extent of environmental disclosure provided by companies in the resources industry.

H3C: There is a positive relationship between the proportion of women directors on the board and the extent of social disclosure provided by companies in the resources industry.

In summary, this study investigates the relationships between the total disclosures and, separately, the three aspects of sustainability disclosures - economic, environmental and social - and attributes of board composition – proportion of independent directors, multiple directorships, and women directors. The hypotheses are developed to test whether board composition that supports more effective corporate governance mechanisms provides greater extent of sustainability disclosures.

3. Methodology

Previous studies on sustainability reporting have traditionally focused on content analysis whereby the quantity of words or meaning of paragraphs is used to evaluate the extent of sustainability disclosures (Deegan and Gordon, 1996; Frost, 2007; Gibson and O'Donovan, 2007). In the recent decade, researchers have employed content analysis technique by focusing on the information disclosed through the use of indexes such as the GRI framework, and the environmental index of Clarkson *et al*. (2008) (Cho *et al.*, 2015; Clarkson *et al.*, 2008; Clarkson *et al*., 2011; Comyns and Figge, 2015; Dong and Burritt, 2010; Martínez-Ferrero *et al*., 2015). In recent research, more are focusing on measuring sustainability information in relation to its sustainability performance (Cho *et al*., 2012; Galbreath, 2013; Meng *et al*., 2014). Despite the various methods used in prior research studies, the lack of a standardised reporting framework has hindered comparison of sustainability information (Burritt, 2002).

This research seeks to rectify this problem with the newly developed reporting index in Ong *et al*. (2016) that enhances the comprehensive guidelines stipulated in the GRI social, economic and environmental indicators with the integration of hard and soft principles from Clarkson *et al.* (2008).

The sample for this study was selected from the list of large resources companies listed on the Australian Securities Exchange (ASX) based on market capitalisation. The data for this study were collected using content analysis method by scoring companies' sustainability disclosures in their audited annual reports and stand-alone sustainability reports for the year ending 30 June 2012. This study chosed to focus on using company annual reports as this data source had been used extensively in many prior studies (Adams *et al*., 1998; Dong and Burritt, 2010; Gray *et al*., 1995; Guthrie and Parker, 1989) and the data was considered to be important and highly credible since it was the only document that was mandatorily sent to the companies' shareholders by all companies (Adams *et al*., 1998).

Sustainability disclosures were scored using Ong *et al*.'s (2016) index. There were altogether seven different categories, A1 to A7, in the index. Category A1 to A4 related to hard verifiable disclosure items and these hard disclosure items were awarded a score of zero to six, depending on whether the information disclosed is presented relative to a range of indicators. A point is awarded when the data was presented and additional points were awarded when the data were presented relative to each of the following five indicators: peers/rivals or industry; previous periods (trend analysis); targets; both in absolute and normalised form; and at a disaggregated level. The soft disclosure items, category A5 to A7, were scored one or zero based on the presence or absence of a disclosure item. The details including the different categories, disclosure items and maximum scores in the hard and soft categories of Ong *et al*.'s index is contained in the Appendix.

A normality test was first performed on both the dependent and independent variables using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The results on both the dependent and independent variables from the Kolmogorov-Smirnov and Shapiro-Wilk tests revealed that most of the variables did not follow a normal distribution. As the normality rule was violated, non-parametric statistical tests were applied. Non-parametric techniques are ideal and useful

for small samples and when the data do not meet the stringent assumptions of the parametric techniques (Pallant, 2013).

Kendall's tau-b was used for the statistical tests. Kendall's tau-b coefficient is a non-parametric statistic used to measure correlation. Kendall's tau-b coefficient is considered more rigorous than that in Spearman's rho as "it tends to provide a better estimate of the true population correlation, and is not artificially inflated by multiple tied ranks" (Allen and Bennett, 2014, p. 293). Field (2013) also recommends that Kendall's tau-b coefficient be used when the data set is small with a large number of tied ranks. Hence, Kendall's tau-b coefficient was applied to analyse correlation in the testing of the hypotheses. To increase the robustness of the statistical tests, an additional bootstrapping process was performed with 1000 bootstrap samples with a 95% confidence interval. Bootstrapping provides a better estimation of the properties of the sampling distribution in the case where the sample lacks normality (Field, 2013). In addition, the effect size was measured using the range proposed in Cohen (1988).

4. Empirical results and discussions

4.1. Hypotheses 1: Proportion of independent directors

The results from the non-parametric Kendall's tau-b on a one-tailed test indicated that there were significant positive correlations between the proportion of independent directors and the total sustainability disclosure (Kendall's tau-b correlation coefficient, τ= 0.135, p= 0.013, N= 133), economic disclosure (τ= 0.122, p= 0.027, N= 133), and social disclosure (τ= 0.125, p= 0.020, N= 133). Hence, Hypotheses H1, H1A and H1C were supported at the 5% significance level. The results were robust with the bootstrap tests passed at a 95% confidence interval. However, no significant statistical result was obtained to support Hypotheses H1B on environmental disclosure (τ= 0.083, p= 0.090, N= 133).

A significant positive correlation was found between the proportion of independent directors and total sustainability disclosure. This result supports prior research that found a similar relationship between the proportion of independent directors and total sustainability disclosure (Post *et al*., 2011; Rao *et al*., 2012; Rupley *et al*., 2012). Post *et al*. (2011) adapted and scored sustainability disclosures using Clarkson *et al*.'s (2008) environmental index on 78 companies that were in the 2006 and 2007 list of Fortune 1000 American companies. In contrast to the correlations found in Post *et al*. between the proportion of independent directors and environmental disclosure, this study, which uses a greater number of environmental performance indicators, did not yield a significant result. This could be attributed to the differences between the two studies in the following areas: geographical location, company industry type, number of environmental indicators used and period of study.

The significant results that supported Hypotheses H1, H1A and H1C indicate that board diversity in the form of board independence measured by the proportion of independent directors increases the extent of total sustainability, economic and social disclosures of companies. Independent members are placed on the board to assist companies achieve their

goals by monitoring, influencing and providing external perspectives that will enhance transparency in the information presented to a more diverse group of stakeholders *(*Rupley *et al.,* 2012). Having greater board independence in the BOD broadens the external perspectives of the BOD and encourages the exposure of more sustainability information. This conclusion concurs with the findings in Post *et al.* (2011). Post et al. suggested that independent directors tend to be more concerned with a company's reputation and sustainability. They claimed that the independent directors might enhance companies' sustainability performance through their recommendations to set up an environmental issues committee, to implement an accredited program such as ISO14001, to demand more in-depth environmental reports and to ensure better environmental practices according to government initiatives. They also suggested that independent directors tend to have a different perspective when considering investments in environmental issues. The independent directors may place greater emphasis on long term economic benefits compared to those in the short term.

4.2. Hypotheses 2: Proportion of multiple directorships

The results from the non-parametric Kendall's tau-b tests showed that all the hypotheses were fully supported statistically (one-tailed, N=131) at the 5% significance level. These results were based on a sample size of 131, instead of the total 133 sample companies, as there were two companies that did not record the information of multiple directorships of their BOD in their annual reports. Significant positive correlations were found between the proportion of directors on the board that hold multiple directorships and the total sustainability disclosure (τ= 0.179, p= 0.002), economic disclosure (τ= 0.211, p= 0.001), environmental disclosure (τ= 0.199, p= 0.001), and social disclosure (τ= 0.133, p= 0.015). These robust results were obtained with bootstrapping performed at 95% confidence level. Hence, the results fully supported the set of Hypotheses 2. Similar results are also in Rupley *et al*.'s (2012) study.

These consistent results support the reasons suggested by Rupley *et al*. (2012) that having more directors with multiple directorships in the BOD provides the board with a better understanding and exposure to sustainability reporting practices and this, consequently, increases the extent of sustainability disclosure.

4.3. Hypotheses 3: Proportion of women directors

The results from the Kendall's tau-b tests showed that all the hypotheses were fully supported statistically (one-tailed, N=133) at the 1% significance level. Significant positive correlations were found between the proportion of women directors on the board and the total sustainability disclosure (τ= 0.281, p< 0.001), economic disclosure (τ= 0.227, p= 0.001), environmental disclosure (τ= 0.216, p= 0.001), and social disclosure (τ= 0.288, p< 0.001). The robustness of the tests was increased through the performance of bootstrapping at 95% confidence level. Hence, the results fully supported the set of Hypotheses 3.

Recent research has seen an increased interest in investigating the impact of women directors on BOD performance. Many have found that having women director on the BOD has resulted in improved board effectiveness and better governance practice (Adams and Ferreira, 2009).

Women directors are generally found to have less attendance problems than male directors (Adams and Ferreira, 2009). Companies are also found to be engaging in more sustainability reporting when the proportion of women directors in the BOD increases (Rao *et al*., 2012; Rupley *et al*., 2012). The results from this study support these prior findings.

Descriptive statistics from this study revealed that 99 companies out of the total 133 companies (74.4%) do not have women directors on the BOD. 20.3% of the companies had only one woman director and the remaining 5.3% had two women directors. Despite the low percentage of women directors in these companies, the significant positive correlation obtained in this study has indicated that women directors can contribute substantially to better sustainability reporting. A similar result was also found in Rao *et al*.'s (2012) study.

4.4. Summary of the results

This study overall finds significant relationships between the proportion of independent directors, the proportion of directors with multiple directorships, and the proportion of women directors on the board, with the extents of economic, environmental and social disclosures provided by companies in the Australia's resources industry.

5. Conclusion and implications

This empirical study evaluates the impact of corporate governance on sustainability reporting by investigating sustainability reporting practices in companies from the Australian resources industry. 133 companies' annual reports and stand-alone sustainability reports for the year ending 30 June 2012 were analysed using a newly developed scoring index, Ong *et al*.'s (2016) index that differentiates hard verifiable disclosure items from soft non-verifiable ones.

Significant positive correlations were found to exist between sustainability disclosures and the attributes of company board composition that support a better corporate governance mechanism. These attributes include the proportion of independent directors, multiple directorships and women directors on the board. The results are in line with the claims of Gibson and O'Donovan (2007) that corporate governance is closely related to sustainability reporting. They are also consistent with the GRI's definition for sustainability when governance performance is included as a component of sustainability. This suggests that the ASX's recommendations for good corporate governance are also applicable to assist companies in enhancing their sustainability reporting. The results from this research have many practical implications for regulators, investors, shareholders and managers who rely on both financial and non-financial information to formulate policies and make business decisions.

This study uses the new Ong *et al*.'s (2016) scoring index, which provides an improved means of evaluating the extent of environmental disclosures, compared to the standard GRI guidelines, because companies that displayed true contributions to environmental sustainability were awarded higher scores. This scoring system that is applied particularly to the hard "difficult to mimic" disclosure items provides opportunities for companies to gain

some details on how to report more verifiable information to demonstrate their effective sustainability performance.

Lastly, this industry-specific study has provided detailed industry-based sustainability information that may be useful for different stakeholders of companies operating in this industry.

This study has limited the collection of its data from annual and stand-alone sustainability reports of companies. As internet websites gain popularity, more companies are providing sustainability disclosures through their corporate websites, making this study lacking in sustainability information that was disclosed solely through companies' corporate websites. Companies that engage in integrated financial reporting were also excluded from the scope of this study. This study is limited to the Australian resources industry and has focused its examination in a single time period. These limitations have resulted in making the findings from this study to be less generalisable to conditions that differ from this study.

It is suggested that future research may include the companies' corporate websites as an additional data source. The application of the newly developed GRI-based Ong *et al*.'s (2016) index can be extended to companies in other industry types and across different countries for further examination. This research has limited its examination to a single time period. Hence, it is recommended that future research conduct a longitudinal study to assess the impact of time on the quality of sustainability reporting. Finally, this study has examined a limited number of attributes of board diversity to proxy corporate governance mechanism. Further investigations using different proxies for corporate governance mechanisms would enhance future research works.

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Appendix

The scoring index

Category		Items	Maximum score
Hard disclosure items: A1-A4			
A1	Governance structure and management systems	9	9
A2	Creditability	5	5
A3	Economic performance indicators (ECP)	3	18
	Environmental performance indicators (ENP)	11	66
	Social performance indicators – labour (LAP)	6	36
	Social performance indicators – human rights (HRP)	9	54
	Social performance indicators – society (SOP)	5	30
	Social performance indicators – product responsibility (PRP)	5	30
A4	Spending related to sustainability	2	2
	Total hard disclosure items	55	250
Soft disclosure items: A5-A7			
A5	Vision and strategy claims	7	7
A6	Sustainability initiatives	3	3
A7	Disclosures on management approach – economic	3	3
	Disclosures on management approach – environmental	9	9
	Disclosures on management approach – labour	6	6
	Disclosures on management approach – human Rights	9	9
	Disclosures on management approach – society	5	5
	Disclosures on management approach – product	5	5
	Total soft disclosure items	47	47
Total disclosures		102	297

Source: ‘Hard and soft sustainability disclosures: Australia's resources industry’ (Ong, et al. (2016), p. 206)