

**Impact of corporate governance on sustainability reporting: Empirical study in the
Australian resources industry
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Abstract:

This empirical study evaluates the impact of corporate governance on sustainability reporting by investigating companies operating in the Australia's resources industry. Specifically, this study investigates the relationships between the total disclosures and, separately, the three aspects of sustainability disclosures - economic, environmental and social - and various attributes of board composition, including independent directors, multiple directorship, and women directors. Significant positive correlations were found between sustainability disclosures and the proportion of independent directors, multiple directorships and women directors on the board. Companies without CEO duality and those with a sustainability committee disclosed more sustainability information. These results provide empirical evidence to support that companies with greater board diversity that promotes more effective corporate governance are providing greater extent of sustainability disclosures.

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

1.0 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 & Watson, 2015; Jain & Jamali, 2016; KPMG, 2015; Rao & Tilt, 2016). Many prior 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, Fernandez-Feijoo & de la Cuesta, 2016; Gibson & O'Donovan, 2007; Kolk, 2008; Lau, Lu & Liang, 2016; Walls, Berrone & Phan, 2012).

Recent developments in economic theory suggest that the board of directors (BOD) is an important part of a company's corporate governance structure (Fama & Jensen, 1983). The BOD of a company, which represents the highest level of management in a company (Fama & Jensen, 1983; Keasey & 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 & Parbonetti, 2012; Post, Rahman, & Rubow, 2011; Rao, Tilt, & Lester, 2012; Rupley, Brown and Marshall, 2012; Siregar & Bachtiar, 2010; Webb, 2004).

While there have been many studies conducted on BOD, few have examined a board's impact towards sustainability reporting. Furthermore, they 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.

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. 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 concludes that the two rather distinct angles of transparency have shown convergence in terms of topics and also in a broader targeted audience.

The ACGC sets out principles and recommendations related to corporate governance for listed companies in Australia. The principles and recommendations are structured to promote central principles that include acting ethically and responsibly, safeguarding integrity in corporate reporting and making timely and balanced disclosure. Using these principles, Gibson and O'Donovan (2007) established the link between sustainability reporting and corporate governance. They explained that one of the key principles of good governance recommended by the ACGC is to disclose the extent of compliance with, and any departure from, best practice suggested in the annual reports. This suggested that companies with good governance should incorporate information about their company's sustainable developments in their annual reports. Gibson and O'Donovan claimed that good governance is now closely associated with the concept of sustainability and accountability, and corporate social responsibility can be demonstrated by increasing annual report disclosures. Using the board composition as an element of company governance mechanism (Baysinger & Bulter, 1985), this study investigates the impact of corporate governance on sustainability disclosures by reviewing several attributes of board composition.

This study adopts a newly developed Global Reporting Initiatives (GRI) based reporting index that was used in Ong, Trireksani and Djajadikerta (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, Li, Richardson & Vasvari (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 evaluate 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.

2.0 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 & Jensen, 1983; Goodstein, Gautam, & Boeker, 1994; Pfeffer, 1972). Kang, Cheng and Gray (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, De Dreu, & Homan, 2004) and board diversity implies that members are more representative of the different stakeholders (Wang & Dewhirst, 1992). These impacts from board diversity supports stronger corporate governance. Rupley at 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.

Rupley et al. (2012) studied 127 US firms across five industries (chemical, oil and gas, electrical utilities, pharmaceutical and biotech, and food and beverage) over a period of six years (2000-2005). They empirically tested the characteristics of corporate governance and media in relation to voluntary environmental disclosures. Their results suggested that companies provided more voluntary environmental disclosures when they were exposed to greater media coverage, especially when this was negative exposure. They also found significant positive relationships between company voluntary environmental disclosures and several attributes of the board composition: board independence, multiple directorships and proportion of women directors. Similarly, Rao et al. (2012) found positive relationships between board independence and proportion of women directors and environmental disclosure when they examined the 2008 annual reports of the largest 100 Australian companies listed on the Australian Securities Exchange (ASX).

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, proportion of directors with multiple directorships, proportion of female directors, presence of CEO duality (i.e. company CEO acting as board chairman), and existence of a sustainability committee. For each set of hypotheses, the individual aspects – economic, environmental and

social – are also tested separately with the various attributes of the board composition. 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 & Meckling, 1976). In addition, independent directors generally have stronger and extended engagement with wider groups of stakeholders (Wang & 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 & Parbonetti, 2012) recognised that independent directors are not “homogeneous in terms of specific skills, knowledge, and expertise” (p. 485). Based on the results of Michelon and Parbonetti's study, independent directors of a company who were also community influential members contributed significantly to the extent of sustainability disclosures made by the company. Michelon and Parbonetti defined community influential members to be non-executive directors who assist the company to establish networking and reputation. Examples given in their study included retired politicians, academics, and members of social organisations. Hillman, Cannella and Paetzold (cited in Michelon & Parbonetti, 2012) claimed that these members provided contacts with the society and “provide valuable non-business perspectives on proposed actions and strategies” (p. 485).

This study follows the results of many prior research 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. These directors may share with other board members the knowledge and expertise of different sustainability reporting practices and regulations from other industry types. 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 directorship 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 directorship 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 directorship 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 directorship 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:

- More committed and involved; more prepared; more diligent; and creates better atmosphere (Huse & Solberg, 2006)
- Improves decision making process; increases board effectiveness; and better attendance and participation (Adams & Ferreira, 2009)
- Demonstrates greater responsibilities; more philanthropically driven; less concerned with economic performance (Ibrahim & Angelidis, 1994)
- Enhances board independence (Kang et al., 2007)
- Associated with firms that are more socially responsible (Webb, 2004)
- Increases board effectiveness and shareholder value (Carter, Simkins, & Simpson, 2003)

Fernandez-Feijoo, Romero, and Ruiz-Blanco (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. Likewise, Rupley et al. (2012) also found that gender diversity, which was measured by the proportion of female board members, was positively related to the extent of environmental disclosures.

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 & 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.

2.4 Chief Executive Officer (CEO) duality

Chief executive officer (CEO) duality refers to the leadership structure of a company where the CEO also serves as the board chair. There are two competing theories that explain the results of this organisation structure: agency theory and stewardship theory (Mohamed Yunos, 2011). Agency theory claims that the roles are conflicting as the board duties include the task of monitoring the CEO. However, the stewardship theory argues that the dual position enhances

the effectiveness of both the roles by reducing the information asymmetry problem between the board and the management, and thus facilitates timely decision making.

Forker (1992) supported the agency theory and posited that “a dominant personality commanding a company may be detrimental to the interest of shareholders” (p. 117), and hence under a duality arrangement, the monitoring role of the board chair may be compromised. Adams and Ferreira (2009) mentioned that CEO duality tends to constrain board independence since this arrangement increases the power of the CEO over the BOD, and consequently this may reduce good corporate governance. Fama and Jensen (1983) also explained that CEO duality could signal “the absence of separation between decision control and decision management” (p. 314). The consequences of a compromised monitoring role in CEO duality may result in adverse effects on corporate governance and company disclosures.

Empirical findings on the impact of CEO duality on sustainability disclosure have not yielded consistent results. While Gul and Leung (2004) found CEO duality to be negatively related to voluntary corporate disclosures, Chen and Jaggi (2000) and Cheng and Stephen (2006) did not find any relationship between these two variables in their studies.

This research argues that the separation of the monitoring role of board chair and the management role of CEO may avoid or reduce potential conflicting interest and increase firm transparency. This enhances the corporate governance of a company and promotes a greater extent of sustainability disclosures in all the three aspects. Hence, this research proposes the fourth set of hypotheses as follows:

- H4:** Companies in the resources industry with CEO duality provide a lesser extent of total disclosure.
- H4A:** Companies in the resources industry with CEO duality provide a lesser extent of economic disclosure.
- H4B:** Companies in the resources industry with CEO duality provide a lesser extent of environmental disclosure.
- H4C:** Companies in the resources industry with CEO duality provide a lesser extent of social disclosure.

2.5 Sustainability committee

A sustainability committee is typically in charge of reviewing the sustainability policies and conducting internal audits of a company’s sustainability efforts in the business operations. The existence of a sustainability committee in a company signals the importance of sustainability issues to the company. It highlights the board’s commitment towards the company’s sustainable developments and ensures that designated personnel are accountable for the sustainability issues. Following this rationale, it is expected that companies with a sustainability committee tend to engage in more active sustainability reporting.

However, Rupley et al. (2012) and Michelon and Parbonetti (2012) did not find any strong significant relationships between the existence of a sustainability committee and the extent of sustainability disclosures. Michelon and Parbonetti suggested two possibilities for the moderately significant results in their study. First, they had not considered the age of the sustainability committee which might have an impact on the relationship; and second, only 20.2% of the studied sample had a sustainability committee.

As there are limited existing studies that investigate the impact of a sustainability committee on the extent of sustainability disclosure, this study posits that the existence of a sustainability committee in a company is likely to reinforce a company's dedication to its sustainable developments. It is predicted that the sustainability committee is inclined to reflect their effective performances by providing more sustainability disclosures in their reports. In addition, this study presumes that members in the committee tend to possess greater knowledge and passion towards sustainability issues. Thus, this study proposes the last set of hypotheses:

- H5:** Companies in the resources industry with a sustainability committee provide a greater extent of total disclosure.
- H5A:** Companies in the resources industry with a sustainability committee provide a greater extent of economic disclosure.
- H5B:** Companies in the resources industry with a sustainability committee provide a greater extent of environmental disclosure.
- H5C:** Companies in the resources industry with a sustainability committee provide a greater extent of social disclosure.

In summary, this study investigates the relationships between the total disclosures and, separately, the three aspects of sustainability disclosures - economic, environmental and social - and various attributes of board composition – proportion of independent directors, multiple directorship, and women directors; as well as companies with CEO duality and those with a sustainability committee. The hypotheses are developed to test whether board composition that supports more effective corporate governance mechanisms are providing greater extent of sustainability disclosures.

3.0 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 & Gordon, 1996; Frost, 2007; Gibson & O'Donovan, 2007; Guthrie & Parker, 1990) . Researchers in earlier periods have employed content analysis by codifying expressed information based on the quantity of words, paragraphs or pages used in companies' annual reports. It is commonly agreed that one of the major limitations of employing this technique based on quantity of words used is the potential error in codification, especially when word counts do not significantly differ (Deegan & Gordon, 1996; Gibson & O'Donovan, 2007; Guthrie & Abeysekera, 2006; Steenkamp & Northcott, 2007). Hence, in recent decade, researchers have employed content analysis technique by focusing on the information disclosed (Cho, Michelon, Patten & Roberts, 2015; Clarkson et al., 2008; Clarkson, Overell, & Chapple, 2011; Comyns & Figge, 2015; Dong & Burritt, 2010; Martínez-Ferrero, Garcia-Sanchez, & Cuadrado-Ballesteros, 2015; Meng, Zeng, Shi, Qi, & Zhang, 2014).

Researchers have adopted different methods to analyse sustainability disclosures. Some categorised the disclosures into the individual aspects (i.e. social, economic, and environmental) of sustainability (Cho et al., 2015; Guthrie & Parker, 1990), and others classified disclosures according to their nature and details of information (Comyns & Figge, 2015; Guthrie & Parker, 1990; Meng et al., 2014). Many analysed the content using a content analysis index such as the GRI framework (Martínez-Ferrero et al., 2015; Tagesson, Blank,

Broberg & Collin et al., 2009) and the environmental index of Clarkson et al. (2008). In recent research, more are focusing on measuring sustainability information in relation to its sustainability performance (Cho, Lee & Pfeiffer, 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 an appropriate scoring index by enhancing 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 hypotheses formulated are tested using the newly developed reporting index in Ong et al. (2016).

The sample for this study is selected from the list of top resources companies listed on the ASX based on market capitalisation. The data for this study are collected using content analysis method by scoring companies' sustainability disclosures in their annual report and stand-alone sustainability reports for the year ending 30 June 2012. This study has chosen to focus on using companies' annual report as this data source is used extensively in many prior studies (Adams, Hill & Roberts, 1998; Adams & Zutshi, 2004; Brown & Deegan, 1998; Dong & Burritt, 2000; Gray, Kouchy & Lavers, 1995; Guthrie & Parker, 1989; Wilmshurst & Frost, 2000) and it is considered to be an important and highly credible source of document because it is the only document that is sent to the companies' shareholders by all companies (Adams et al., 1998).

Sustainability disclosures were scored using Ong et al.'s (2016) index. There are altogether seven different categories, A1 to A7, in the index. Category A1 to A4 relate to hard verifiable disclosure items and these hard disclosure items are 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 is presented and additional points are awarded when the data are 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, are 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 do not follow a normal distribution. As the normality rule is 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 and Mann-Whitney U tests were the main non-parametric analyses 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 & Bennett, 2012, p. 279). 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 Hypotheses 1, 2 and 3. 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). According to Field, the results obtained from the bootstrap can confirm the robustness when the robust confidence intervals obtained from the bootstrapping do not cross zero. In addition, the effect size is measured using the range proposed in Cohen (1988). An effect size measures the size of an effect, which is the strength of a relationship between variables (Field, 2013). Cohen (1988) suggested the effect is considered small when the calculated effect size is less than 0.2. A value between 0.2 and 0.5 is considered a medium effect and a value greater than 0.5 is considered a large effect. The Mann-Whitney test is used to compare two conditions between independent samples when the assumption of normality is violated in the distribution (Field, 2013). This test is used to determine if there are significant differences between sustainability disclosures and the following categorical company characteristics such as:

- companies with Chief Executive Officer (CEO) duality to those that are without in Hypotheses 4, and
- companies with a sustainability committee to those that are without in Hypotheses 5.

4.0 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, $\tau = 0.135$, $p = 0.013$, $N = 133$), economic disclosure ($\tau = 0.122$, $p = 0.027$, $N = 133$), and social disclosure ($\tau = 0.125$, $p = 0.020$, $N = 133$). 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 ($\tau = 0.083$, $p = 0.090$, $N = 133$).

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. They found a similar significant positive correlation between the proportion of independent directors and total sustainability disclosures. They also found the same relationship existed among the individual categories: governance disclosure, credibility disclosure, and environmental performance indicators. These categories coincide respectively with A1, A2 and A3 of Clarkson et al.'s index and Ong et al.'s (2016) index used in this study. However, Post et al. used only six out of the ten environmental performance indicators in Clarkson et al.'s index A3 category. This is also different to a total of eleven environmental performance indicators in Ong et al.'s index used in this study.

In contrast to the correlations found in Post et al. (2011) 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 may 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 ($\tau = 0.179$, $p = 0.002$), economic disclosure ($\tau = 0.211$, $p = 0.001$), environmental disclosure ($\tau = 0.199$, $p = 0.001$), and social disclosure ($\tau = 0.133$, $p = 0.015$). 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 ($\tau = 0.281$, $p < 0.001$), economic disclosure ($\tau = 0.227$, $p = 0.001$), environmental disclosure ($\tau = 0.216$, $p = 0.001$), and social disclosure ($\tau = 0.288$, $p < 0.001$). 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 & Ferreira, 2009). Women directors are generally found to have less attendance problems than male directors (Adams & 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 Hypotheses 4: CEO duality

The sample was coded into two categories to differentiate those companies that had CEO duality from those that did not. Of the total sample of 133 companies, only 17 companies (12.78%) had CEO duality and the remaining 116 companies (87.22%) did not. Mann-Whitney U test is used to compare the extent of disclosures reported by the two categories of companies. The result from a Mann-Whitney U test indicated that there was no statistically significant difference in the total sustainability disclosure by companies with CEO duality compared to those without, thus Hypothesis H4 was not supported. However, companies with CEO duality were reporting a significantly lesser extent of economic, environmental and social disclosures than those companies without CEO duality. Hence, the remaining hypotheses, H4A, H4B and H4C were supported. Table 1 below presents the detailed results from the Mann-Whitney U tests.

Table 1 Results of Mann-Whitney U test for Hypotheses H4 on CEO duality

Variable	Significance (p-value)	Mean rank of companies without CEO Duality	Mean rank of companies with CEO Duality	Mann-Whitney U	Standardised Test statistic (z-value)	Effect Size, $r = z / \text{square root of } N$
Total disclosures	0.148	68.81	54.65	1196	1.445	0.125
Economic disclosures	0.022	69.91	47.18	1323	2.297	0.199
Environmental disclosures	0.017	70.05	46.18	1340	2.392	0.207
Social disclosures	0.029	69.79	47.97	1310	2.182	0.189

Note: N= Number of total cases = 133. Number of companies without CEO duality = 116, Number of companies with CEO duality = 17 companies.

The results shown in Table 1 indicate that although companies with CEO duality disclosed significantly less information in the economic, environmental and social disclosure, the effects in each of the disclosures were considered small as they were below 0.3 (Cohen, 1988). These small effects found in each of the individual three aspects of sustainability may have contributed to the contrary result where no significant difference was found when the total sustainability disclosure was tested. A similar result was, however, obtained by Michelon and Parbonetti (2012) and Rupley et al. (2012) as they found no evidence to indicate that companies with CEO duality were disclosing less economic, environmental and social information.

4.5 Hypotheses 5: Sustainability committee

The sample was grouped into two categories according to whether a company had a sustainability committee before a Mann-Whitney U test was performed on the data. Out of a total of 133 companies studied, 32 companies (24.06%) had a sustainability committee and the remaining 101 companies (75.94%) did not. The results from Mann-Whitney U tests indicated the presence of significant differences in the total sustainability disclosure, economic disclosure, environmental, and social disclosure by companies with a sustainability committee compared to those that were without ($p < 0.001$, two-tailed). Hence, all the hypotheses in the set of Hypothesis H5 were supported. The Mann-Whitney U test indicated that companies with a sustainability committee reported a greater extent of total sustainability disclosures. They were also providing more information in all the individual aspects of sustainability compared to those companies without a sustainability committee. The effect size for the disclosure was considered medium as each of them is above 0.3 (Cohen, 1988). Table 2 below summarises the results of the Mann-Whitney test for Hypotheses H5.

Table 2 Results of Mann-Whitney U test for Hypotheses H5 on sustainability committee

Variable	Mean rank of companies with a sustainability committee	Mean rank of companies without a sustainability committee	Mann-Whitney U	Standardised Test statistic (z-value)	Effect Size, $r = z / \text{square root of } N$
Total disclosures	99.97	56.55	561	-5.554	0.482
Economic disclosures	88.72	60.12	921	-3.700	0.321
Environmental disclosures	96.75	57.57	664	-5.025	0.436
Social disclosures	98.22	57.11	617	-5.262	0.456

Note: N= Number of total cases = 133. Number of companies with a sustainability committee = 32, Number of companies without a sustainability committee = 101.

These results differ from those in Rupley et al. (2012). Rupley et al. did not find companies with a sustainability committee were disclosing more sustainability information. Michelon and Parbonetti (2012), however, found “weak evidence” (p. 503) of the relationship between the presence of a sustainability committee and social disclosure. They described these contrary results as “quite surprising” (p. 503) and suggested that some of these traditional proxies, such as independent directors, CEO duality and presence of sustainability committee, that were normally used for board composition may not be sufficient to represent the service role of the

board. Another possible reason for this is that many companies may not have a sustainability committee. Until the recent decade, not many companies had a specialised committee to manage sustainability issues. Those who did have a committee may not have members that are well-equipped and trained to know how and what sustainability information to disclose. These reasons may have provided explanations for the non-significantly different extent of sustainability information disclosed by companies with a sustainability committee.

In this study, the presence of a sustainability committee has shown enhancement in the extent of sustainability disclosure with medium effect. This indicates that companies with a sustainability committee have additional and dedicated resources to help companies improve their sustainability initiatives and performance. Unlike prior studies with contrary findings, the contribution of the sustainability committees in the sample has been demonstrated through a greater extent of sustainability disclosures found in the companies' reports.

5.0 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. Companies without CEO duality and those with a sustainability committee are more likely to disclose a greater extent of sustainability information. 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.

The new Ong et al.'s (2016) scoring index used in this study helps to identify the specific issues that companies have failed to report and address. The new scoring system that is applied particularly to the hard disclosure items provides companies with details on how to report more verifiable information to demonstrate their effective sustainability performance. This helps to promote a benchmark for quality sustainability reporting. The use of a standardised reporting framework with more specific guidelines would improve companies' sustainability disclosures. The successful implementation of the ASX's principles and recommendations on corporate governance has suggested that a similar strategy to provide companies with more precise guidelines can help companies to improve their sustainability reporting and 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 new GRI-based scoring index (Source: Ong, Trireksani & Djajadikerta, 2016, p.206)

Category		Items	Maximum scores
<i>Hard disclosure items: A1-A4</i>			
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
<i>Soft disclosure items: A5-A7</i>			
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