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Measuring the quality and identifying influencing factors of sustainability reporting: Evidence from the resources industry in Australia

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ABSTRACT

The lack of a standardised reporting framework in sustainability reporting has resulted in companies producing unaudited generic sustainability information that are not reflective of companies' actual sustainability performance. The disclosures also differ in quality and hinder comparison. This study addresses these problems with the development of a new scoring index that integrates the hard and soft principles in Clarkson, Li, Richardson and Vasvari's (2008) environmental index with performance indicators of the Global Reporting Initiatives (GRI) framework. The newly developed index comprises all three aspects of sustainability (economic, environmental and social) and adopts a standardised scoring scale that is reflective of companies' sustainability performance.

The new index was applied to evaluate annual reports and stand-alone sustainability reports of listed companies in the resources industry of Australia. This study investigates whether significant correlations existed between the extent of sustainability disclosures (economic, environmental and social) and company characteristics (company size, financial performance, board composition and type of resources extracted).

This study found that companies generally produced minimal sustainability information with vast diversity in their disclosure items. Significant positive correlations were found between sustainability disclosures and company size, company financial performance, 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. However, no significant differences in sustainability disclosures were identified between companies operating in the metals and mining sector and the energy and utilities sector. Companies disclosed more soft than hard disclosure items and significantly more information on the economic aspect than the environmental and social aspects.

This industry-specific study suggests that improvements identified by the new index is essential to enhance the current sustainability reporting practices and performance and to promote a benchmark for quality sustainability reporting.

DECLARATION

I certify that this thesis does not, to the best of my knowledge and belief:

(i) incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education;

(ii) contain any material previously published or written by another person except where due reference is made in the text of this thesis; or

(iii) contain any defamatory material.

Siew Hoon Ong (Tricia)

November 2016

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Table of Contents

List of Tables

List of Figures

List of Appendices

CHAPTER ONE

INTRODUCTION

Sustainability was formally addressed in the General Assembly of the United Nations in 1987 and sustainable development was officially defined in the report that followed as the ability to “ensure that [development] meets the needs of the present without compromising the future generations to meet their own needs” (World Commission on Environment Development, 1987). Applying this definition to a business context, companies are expected to not compromise their social responsibility in their pursuit of high economic performance. According to Gherghina and Simionescu (2015), this implies that the role of companies is to maximise its shareholders’ wealth as well as to create value for the society. They argue that this will result in a win-win proposition for both companies and society and thereby develop a long term innovative strategy with many business opportunities. Many prior research studies have proven that companies that adopted this strategy have yielded many competitive advantages over their competitors such as increase in market share and enhancement in reputation and brand value (Schaltegger & Burritt, 2006), reduced operating costs and improvement in financial performance (Adams & Zutshi, 2004) and increased sales and customer loyalty (Creyer, 1997; Mohr & Webb, 2005).

Many companies have recognised the importance of including non-financial information such as sustainability disclosures in their annual financial and stand-alone sustainability reports to demonstrate their contribution to sustainability (Aras & Crowther, 2009; Cho, Guidry, Hageman, & Patten, 2012; Higgins, Milne, & Gramberg, 2015; Patten & Zhao, 2014). Hence, in the last few decades, the concept of sustainability, which involves corporate social responsibility, has received renewed attention among diverse groups such as academic researchers, company stakeholders, government organisations and industry groups to study the development of sustainability reporting (Byrch, Milne, Morgan, & Kearins, 2015; Cho, Michelon, Patten, & Roberts, 2015; Higgins et al., 2015). Burritt and Schaltegger (2010) classified this development of sustainability reporting into two main paths: critical path and managerial path.

The critical path adopts a critical theory perspective. It consists of critical theorists who argue that sustainability remains ambiguous and highly contestable in its definition (Gray, 2010; Milne & Gray, 2013; Patten & Zhao, 2014), and they question the feasibility of implementing sustainability (Aras & Crowther, 2009; Gray, 2010; Milne & Gray, 2013). They also query the validity of sustainability disclosures provided by companies (Atkins, Atkins, Thomson, & Maroun, 2015; Gray, 2010) and the ability to reflect actual performance that could contribute to a sustainable society (Atkins et al., 2015; Cho et al., 2012; Gray, 2010; Gray & Milne, 2002; Hopwood, 2009; Milne & Gray, 2013).

The managerial path recognises sustainability reporting as an important tool that assists managers in making effective decisions. These management theorists posit that managers can effectively apply information in sustainability disclosures to assess deliberate actions for sustainable developments (Burritt & Schaltegger, 2010; Hawkins, 2006; Schaltegger & Burritt, 2006; Weidinger, Fischler, & Schmidpeter, 2014). They believe that managers are driven by both external and internal stakeholders to ensure quality sustainability measures are implemented. The managers are thus motivated to engage in strategies that can produce good results in sustainable development to meet stakeholders' expectations.

Both paths suggest a need for a standardised and comprehensive reporting framework that can effectively measure practical sustainability performance with disclosures that are verifiable and comparable. Supporters of the critical path are demanding that companies' sustainability disclosures demonstrate actual contributions to sustainable development (Atkins et al., 2015; Milne & Gray, 2013) while proponents of the managerial path require a framework that provides guidance in sustainability reporting to make managers' contributions towards sustainability evident (Deegan & Gordon, 1996; Emery, 2002; Frost, Jones, Loftus, & Laan, 2005). However, the lack of a standardised reporting framework has resulted in inconsistencies in the extent of sustainability disclosures, which hinder verifiability and comparability.

In addition to the lack of a standardised reporting framework, there are other influencing factors that have caused vast differences among companies' sustainability

reporting. Prior research studies have identified that companies with differences in various company characteristics such as companies' size, financial performance and governance structure tend to differ in their sustainability reporting (Aras & Crowther, 2008; Deegan & Gordon, 1996; Kolk, 2006; Tagesson et al., 2009). This research addresses these problems by developing a framework that can effectively measure and compare companies' sustainability performance and disclosures.

This introductory chapter introduces the background information which underpins the importance and purpose of this study. It also explains the research questions developed from relevant theoretical frameworks and prior studies and presents a summary of the structure of this research.

1.1 Research Background

Discussions about sustainable development and concern over the impact of economic and industrial development on the environment have increased significantly since the 1970s. In the past, many considered sustainable development to be "nothing more than an ideal" notion which could not be easily achieved (Deegan, 2013, p. 383). An important step in raising awareness about sustainable development occurred when it was included in the agenda at the General Assembly of the United Nations in 1987 (De Jong, Brown, & Lessidrenska, 2009; Deegan, 2013; Hussey, Kirsop, & Meissen, 2001). A report published after the assembly entitled *Our Common Future* provided a definition for sustainable development. The report claimed that sustainable development should be "a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are made consistent with future as well as present needs" (World Commission on Environment Development, 1987, p. 9). The report also highlighted the need for governments and companies to consider the impacts on the economy, society and environment when making decisions and formulating policies. It concluded with a unanimous call for nations to adopt relevant changes for a common goal towards sustainability development.

Many companies globally have responded to this call by disclosing sustainability information about the economic, social and environmental impact of the companies'

operations (Betianu, 2010; Deegan, 2013). Government legislation, media pressure and public interest groups have also demanded for greater transparency in companies' sustainability disclosures as they expect companies to not only be profitable but also socially and environmentally responsible.

According to Kolk (2006), 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.

This increasing demand for sustainability disclosures from broader and diverse groups of stakeholders has resulted in a significant increase in research studies in sustainability and sustainability disclosures in recent decades. Cho et al. (2015) studied the development of research studies in sustainability and examined whether the recent studies have differed from those of the 1970s. In the initial stage, researchers generally focused on the discussion of the definition for sustainability, the significance of sustainability and the drivers for companies to disclose sustainability information (Deegan, 2002; Patten, 1992). With the increased acceptance of the notion of sustainability and the adoption of sustainability reporting, the focus of the research shifted to the accounting aspects of sustainability that address disclosure issues such as what, when and how to include information on sustainability (Deegan & Gordon, 1996; Emery, 2002). In more recent research, studies have focused on empirical evidence that examine factors affecting sustainability reporting (Cho et al., 2015; Clarkson, Li, & Richardson, 2004; Jones, Frost, Loftus, & Laan, 2007; Tagesson, Blank, Broberg, & Collin, 2009) and have investigated the relationship between sustainability disclosures and practical sustainability performance (Cho et al., 2012; Clarkson, Li, Richardson, & Vasvari, 2008; Patten & Zhao, 2014).

Despite the changes in the research focus performed by researchers across different decades and among different geographical locations, many of these prior studies have identified the lack of a standardised sustainability reporting framework as a common problem (Adams & Frost, 2007; Betianu, 2010; Crawford & Williams, 2010; De Jong et al., 2009; Dingwerth & Eichinger, 2010; Gibson & O'Donovan, 2007; Gray, Javad, Power, & Sinclair, 2001; Hussey et al., 2001; Tagesson et al., 2009) and suggested the urgent need of "innovative techniques for enhanced sustainability accounting and stewardship" (Atkins et al., 2015). Kolk (2006, p. 1) highlighted another common problem of sustainability reporting where companies, especially multinational enterprises, are also challenged with more complex situations because they are "confronted with a multitude of requests from shareholders and other stakeholders in different markets with frequently varying regulations and governance systems". Without a standardised framework to guide companies' disclosures, companies have produced sustainability reports that differ extensively in both the amount and nature of sustainability information and this has hindered comparison. Furthermore, the sustainability disclosures generally do not provide sufficient quantified information on companies' actual performance that may have an effective contribution towards sustainability development.

Hence, this research addresses these problems with the development of a new scoring framework that integrates verifiable and comparable measures into a current comprehensive sustainability reporting framework, the Global Reporting Initiative (GRI). The new index is applied to examine the effects of companies' size, financial performance and governance structure on sustainability reporting.

1.2 Research Rationale

1.2.1 Disclosures not reflective of performance

The development of sustainability reporting has formed two main paths: critical path and managerial path (Burritt & Schaltegger, 2010). While researchers from the critical path found companies' sustainability reporting on business activities having no or little

relevance to sustainability (Gray, 2010; Gray et al., 2001; Gray & Milne, 2002; Milne & Gray, 2013), others from the managerial path are using their knowledge on sustainability to implement feasible business systems that drive effective business strategies to achieve better sustainability performance (Burritt & Schaltegger, 2010; Weidinger et al., 2014).

Gray (2010, p. 48) from the critical path explained that the "relationships and interrelationships [of sustainability] are simply too complex" and any simple assessment that is used to evaluate the relationship between "a single organisation and planetary sustainability is virtually impossible". He believed that it is not possible to put any tangible meaning to sustainability at an organisational level as this means ignoring the correct understanding of sustainability altogether because sustainability is a systems-based concept that would be difficult to conceptualise at the level of eco-system. He questioned the ability of companies to understand this complex concept of sustainability to produce appropriate and measurable accounts of sustainability that are related to effective sustainable developments for society. His views were supported by many prior researches in the critical path (Aras & Crowther, 2009; Gray et al., 2001; Milne & Gray, 2013) .

Similar to other prior research (Cho et al., 2012; Milne & Gray, 2013), Gray (2010, p. 50) alleged that companies nowadays tend to use these reports as "linguistic devices" to proclaim their social responsibility while diverting attention away from actual sustainability performance. He asserted that these reports "do not constitute genuine accounts of sustainability, but are "powerful fictions" because it is common to assume a successful business will have to be socially and environmentally responsible and thus there would be generally no verification to ensure that the business is actually socially responsible. According to Gray, this consequently leads to a decline in real sustainability performance and causes un-sustainability that ironically contradicts the fundamental notion of sustainability.

In a recent empirical study performed by Patten and Zhao (2014) on the retail industry in the United States, they found companies were disclosing more information on initiative programmes and strategy than relevant performance data. Companies with standalone sustainability reports that were assessed to be more environmentally

reputable were not genuinely good environmental performers. This result was consistent with the findings in Cho et al. (2012) where negative relationships were found between companies' environmental performance and both reputation scores and memberships in Dow Jones Sustainability Index (DJSI). Cho et al. (2012) also found companies' environmental performance to be negatively related to their environmental disclosure. Similar results were yielded in prior research (Hopwood, 2009).

This study addresses the gap identified by researchers of the critical path by developing a scoring index that establishes the missing connection between companies' disclosures to their actual sustainability performance.

1.2.2 Limitations of existing reporting framework

Despite the availability of a comprehensive sustainability reporting guidelines - the Global Reporting Initiatives (GRI) framework, the GRI framework has several limitations. Gray (2010) claimed that the GRI framework merely includes all three aspects (social, economic and environment) of sustainability but it still fails to establish relationships between the demand for sustainability performance to the reported disclosures. Milne and Gray (2013, p. 21) described the GRI framework as "both partial and incoherent". They argued that the GRI framework is partial as the full range of performance indicators represent on one part the difficulty to produce acceptable indicators and the other part which companies are reluctant to produce as they are too demanding. They also claimed that the GRI framework is not coherent as there is a lack of over-arching theory to guide the selection of reporting indicators and to ensure that the selected indicators are related to one another and capable to address the issues of concern.

Clarkson et al. (2008) classified the GRI environmental performance indicators into hard and soft disclosure items. Hard disclosure items refer to disclosures that are "relatively difficult for poor environmental performers to mimic" and thus these disclosures are awarded higher scores as they represent companies' real commitments to sustainability (Clarkson et al., 2008, p. 313) . On the other hand, soft disclosure items relate to information which is relatively difficult to verify with

companies' actual efforts to protect the environment, such as companies' vision and environmental strategy claims, and hence they are allocated with lower scores. Clarkson et al.'s (2008) index provides an improved measurement to evaluate environmental disclosure because companies with genuine contributions to environmental sustainability can be identified through the higher scores awarded by the index. This study builds on the fundamental principles of Clarkson et al.'s (2008) environmental index and develops a new index that also includes the social and economic aspects of sustainability which were not covered by Clarkson et al.

1.2.3 Inconsistent empirical results

Previous researchers have attempted to establish relationships between companies' characteristics (such as company's size, financial performance, governance structure and industry type) and the extent of sustainability disclosures (Deegan & Gordon, 1996; Frost, 2007; Gray et al., 2001; Ho & Taylor, 2007; Rupley, Brown, & Marshall, 2012; Tagesson et al., 2009; Webb, 2004).

1.2.3.1 Company size

Tagesson et al. (2009) studied listed companies in Sweden and found some variables that have significant correlations to the extent of social and environmental disclosures. These include the size of the company, the industry in which the company operates, and the profitability and ownership structure of the company. Positive relationships were found between the extent of disclosures and the company's size and profitability. It was also found that companies in environmentally sensitive industries and state-owned companies engaged in greater sustainability disclosures. Tagesson et al. (2009, p. 354) concluded that 'industry – together with size – was the most common variable for explaining the extent and content of social and environmental disclosures'.

In general, larger corporations are expected to possess greater capabilities and resources to engage in a greater extent of information disclosure. In addition, larger companies which attract greater publicity are generally under greater scrutiny (Frost, 2007). These suggest a positive relationship between the size of a company and the

extent of its environmental disclosure. While some findings from previous research have confirmed this suggestion (Frost, 2007; Gray et al., 2001; Ho & Taylor, 2007; Tagesson et al., 2009), some other research have found that this relationship is only applicable to companies operating in environmentally sensitive industries (Deegan & Gordon, 1996). To further explore these inconsistent results, this research revisits selected Australian listed companies in the resources industry and analyse, using all three aspects of the GRI framework, the extent of sustainability disclosures provided by these companies in their annual financial reports and standalone sustainability reports.

1.2.3.2 Company financial performance

Evidence from prior studies suggests that companies with superior financial performance tend to produce more environmental disclosure (Gray et al., 2001; Ho & Taylor, 2007; Tagesson et al., 2009). Jones et al.'s (2007) study of Australian companies yielded a different result when his group analysed companies' financial performance based on a wider range of financial indicators. Two out of nine financial performance indicators studied by Jones et al. (cash to total assets and price to book value) indicated negative relationships with companies' sustainability disclosures. In view of the conflicting results, this research seeks to explore the relationships between companies' sustainability disclosures and their financial performances using financial indicators such as operating revenue, earnings before interest and tax, return on assets, return on equity, book value per share and year-end share price.

1.2.3.3 Company board composition

Corporate governance structure comprises the policies, rules and procedures by which a company is directed and controlled. Recent developments in economic theory suggest that the board of directors (BOD) is an important part of a company's governance structure (Fama & Jenson, 1983). The BOD of a company, which represents the highest method of internal control of top management (Fama & Jensen, 1983; Keasey & Wright, 1993), has a major impact on a company's reporting practices and procedures. 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 et al., 2012; Siregar & Bachtiar, 2010; Webb, 2004). These studies have identified that the extent of sustainability disclosures is affected by the following aspects of BOD:

- Proportion of independent non-executive directors (Michelon & Parbonetti, 2012; Post et al., 2011; Rao et al., 2012; Rupley et al., 2012)
- Proportion of female directors (Post et al., 2011; Rao et al., 2012; Rupley et al., 2012)
- Proportion of directors with multiple directorships (Rupley et al., 2012)
- CEO duality (i.e. company CEO acting as board chairman) (Michelon & Parbonetti, 2012; Rupley et al., 2012)
- Ownership concentration (Rao et al., 2012)
- Board size (Rao et al., 2012; Siregar & Bachtiar, 2010)
- Existence of a sustainability committee (Michelon & Parbonetti, 2012; Rupley et al., 2012)

While there have been many studies conducted on BOD in recent research, few have focused on a board's impact towards sustainability reporting. Furthermore, they have tended to concentrate only on the environmental aspects of sustainability. Hence, this research addresses this gap to explore the impact of the composition of a company's BOD on the quality of its sustainability reporting.

1.2.3.4 Company industry type

Prior studies in sustainability reporting have found that companies in environmentally sensitive industries provide more sustainability disclosures than those companies in other industries (Bachoo, Tan, & Wilson, 2013; Cho et al., 2015; Dong & Burritt, 2010; Frost, 2007; Gray et al., 2001; Jones et al., 2007; Tagesson et al., 2009). This supports the legitimacy theory which suggests that companies operating within environmentally sensitive industries will respond to social expectations of corporate behaviour by providing more sustainability disclosures to legitimise their business operations. Cho et al.'s (2015) study that analysed the development of sustainability reporting for the

last five decades since 1970s have found strong influence of legitimacy factors on sustainability disclosures over the decades.

Governments in different countries have adopted varying degrees of mandatory sustainability disclosure for companies across different industry types. While some European countries such as Denmark and the Netherlands (Emery, 2002; Frost, 2007) have required all listed companies to provide mandatory environmental reports, many countries have adopted voluntary disclosure.

In Australia, the first legal requirement for sustainability disclosure was implemented in 1998. The Corporations Act (2001) section 299 sets out that:

> (1) The directors' report for a financial year must :
>
> (f) if the entity's operations are subject to any particular and significant environmental regulation under a law of the Commonwealth or of a State or Territory, give details of the entity's performance in relation to environmental regulation.

Since then, companies with operations bound by environmental regulations have been required by the Act to provide mandatory disclosure on environmental issues in their annual reports (Frost, 2007; Jones et al., 2007). Companies in environmentally sensitive industries such as the resources, manufacturing and transportation industry are affected by this legislation as the nature of their business operations has significant impact on the environment (Deegan & Gordon, 1996; Dong & Burritt, 2010; Wilmshurst & Frost, 2000).

Although companies in the Australian resources industry are mandated to provide environmental disclosure, they are not obliged to report on the social and economic aspects of sustainability. In this study, the implementation of the new GRI-based reporting index facilitates the review of all three aspects of sustainability disclosures (social, economic and environmental) to determine if resources companies have placed more emphasis on environmental disclosure compared to the economic and social aspects, which may indicate their compliance to the legal requirements. In addition, the study reviews whether companies disclose more hard disclosure items in

each aspect of sustainability to portray themselves as effective sustainability performers.

1.3 Research Scope

Frost (2007) explored the impact of the first legislation in 1998 on the environmental reporting of Australian companies by studying companies in environmentally sensitive industries which were most likely to be affected under this regulation. He selected companies from the resources (mining, oil and gas), utilities and infrastructure, and paper and packaging industries. Evidence from his selected sample revealed that since the introduction of the legislation, the number of Australian companies providing environmental disclosure has significantly increased. However, despite this increase, Frost (2007) noted that there were large variations in the nature of the disclosures, which suggested considerable differences in the interpretation of the legislation and raised concerns about its practical application.

Recent studies in sustainability reporting have shown an increasing interest in industry-specific contexts, such as oil and gas, food and beverages, retail and water and energy (Dong & Burritt, 2010; Guthrie, Cuganesan, & Ward, 2008; Patten & Zhao, 2014; Stray, 2008). Consistent with Frost's (2007) results, these studies found that companies generally provide broad and generic sustainability disclosures which are not useful in assessing their sustainability performance (Dong & Burritt, 2010; Guthrie et al., 2008). Shareholders, investors and regulators have realised that sustainability issues affect different industry sectors in different ways (Dong & Burritt, 2010). Hence, there is an increasing demand for more industry-specific sustainability disclosures to assist companies' stakeholders make better business decisions. Furthermore, companies have realised that any major environmental damage that is caused by a single company in an industry may attract the media attention, and effectively the whole industry has to bear the consequences. Parker (cited in Wood & Ross, 2008, p. 6) commented that 'environmental management and accountability become an industry rather than a single company issue'.

Industry-based sustainability reporting is also emphasised by the Australian Government and the GRI (Dong & Burritt, 2010). Industry bodies are encouraged by the Australian Government to produce sector-wide reports on sustainability as reporting benchmarks for companies within the industry. The GRI has supplied sector supplements for selected sectors to assist companies to consider specific performance indicators relevant to their industry types. This promotes comparability of sustainability reports and allows monitoring and benchmarking for quality reporting practices.

Derived from the above discussion, this research aims to measure the quality of sustainability reporting by adopting a similar industry-specific approach and focusing on the current leading environmentally sensitive industry in Australia – the resources industry.

This research has chosen to focus on Australia's resources industry for several reasons. First, the resources industry is an important industry sector in Australia. According to the Australian Securities Exchange's (ASX) classification used in 2012 at the time of the data collection for this study, the resources industry includes two sectors: Metals and Mining, and Energy and Utilities. As at December 2014, these two sectors made up the largest industry sector in ASX, representing 60% of the total number of listed companies. The resource industry was also the second largest industry sector measured by market capitalisation, making up 29% of the total market capitalisation after the financial sector (Australian Security Exchange, 2015). Second, despite the requirement for companies operating in the resources industry to include mandatory environmental reporting, the lack of a prescribed reporting framework has resulted in large variations in companies' sustainability reporting, making comparisons and benchmarking very difficult. Third, while many prior studies have been conducted in the Australian context, very few of them are industry-specific. Hence, this research addresses this issue by developing a comprehensive sustainability reporting index to promote comparability among companies' sustainability reports, and therefore, assists to set a benchmark for good reporting practices in the resources industry.

1.4 Research Analysis

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 et al., 2015; Clarkson et al., 2008; Clarkson, Overell, & Chapple, 2011; Comyns & Figge, 2015; Dong & Burritt, 2010; Frost et al., 2005; 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; Frost et al., 2005; 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 (Frost et al., 2005; Martínez‐Ferrero et al., 2015; Tagesson 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 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 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).

1.5 Research Framework

This research measures the quality of sustainability reporting in the Australian resources industry through the use of a newly developed index based on the GRI guidelines. This study critically reviews prior studies' contradictory findings related to the relationships between company size, financial performance, composition of BOD and types of resources extracted and the extent of sustainability disclosures to develop the research questions. This research addresses the following questions:

- To what extent do Australian listed companies in the resources industry disclose sustainability information in their annual financial reports and standalone sustainability reports?
- Are there any significant relationships between the extent of sustainability disclosures (social, economic and environmental) and company characteristics (company size, financial performance, composition of BOD and type of resources extracted)?

This research selects the sample from companies listed on the resources industry of the Australian Securities Exchange (ASX). This study collects data from both the annual financial reports and standalone sustainability reports of these companies for the period ending 2012 using stratified sampling to obtain equal representation from the two sectors within the resources industry (i.e. Metals and mining and Energy and utilities). Adopting similar criteria that have been used in many prior studies (Adams, Hill, & Roberts, 1998; Dong & Burritt, 2010; Frost et al., 2005; Guthrie & Parker, 1990; Hackston & Milne, 1996; Ho & Taylor, 2007; Jones et al., 2007; Rao et al., 2012; Suttipun & Stanton, 2012), this study selects the top 100 companies listed on both the sectors of ASX resources industry based on market capitalisation. This represents approximately 20% of the total number of listed resources companies as at June 2012.

Findings from this study address the research questions and provide empirical evidence to measure the quality of sustainability reporting in the listed companies of the Australian resources industry. It identifies significant relationships between the extent of social, economic and environmental disclosures and company size, financial performance, composition of BOD and type of resources extracted. Market capitalisation, total sales and total assets of companies are used as measures of a company's size. A wide range of financial measures such as operating revenue, earnings before interest and tax, return on assets, return on equity, book value per share and year-end share price. Various aspects relating to the composition of a company's BOD, such as the proportion of independent directors, multiple directorships, CEO duality, proportion of women directors on board and the existence of a sustainability committee, are also considered.

In addition, this study aims to investigate if resources companies have focused more on environmental disclosure compared to the economic and social aspects and reviews whether companies disclose more hard disclosure items in each aspect of sustainability.

Figure 1.1 below illustrates the research framework that is used in this study.

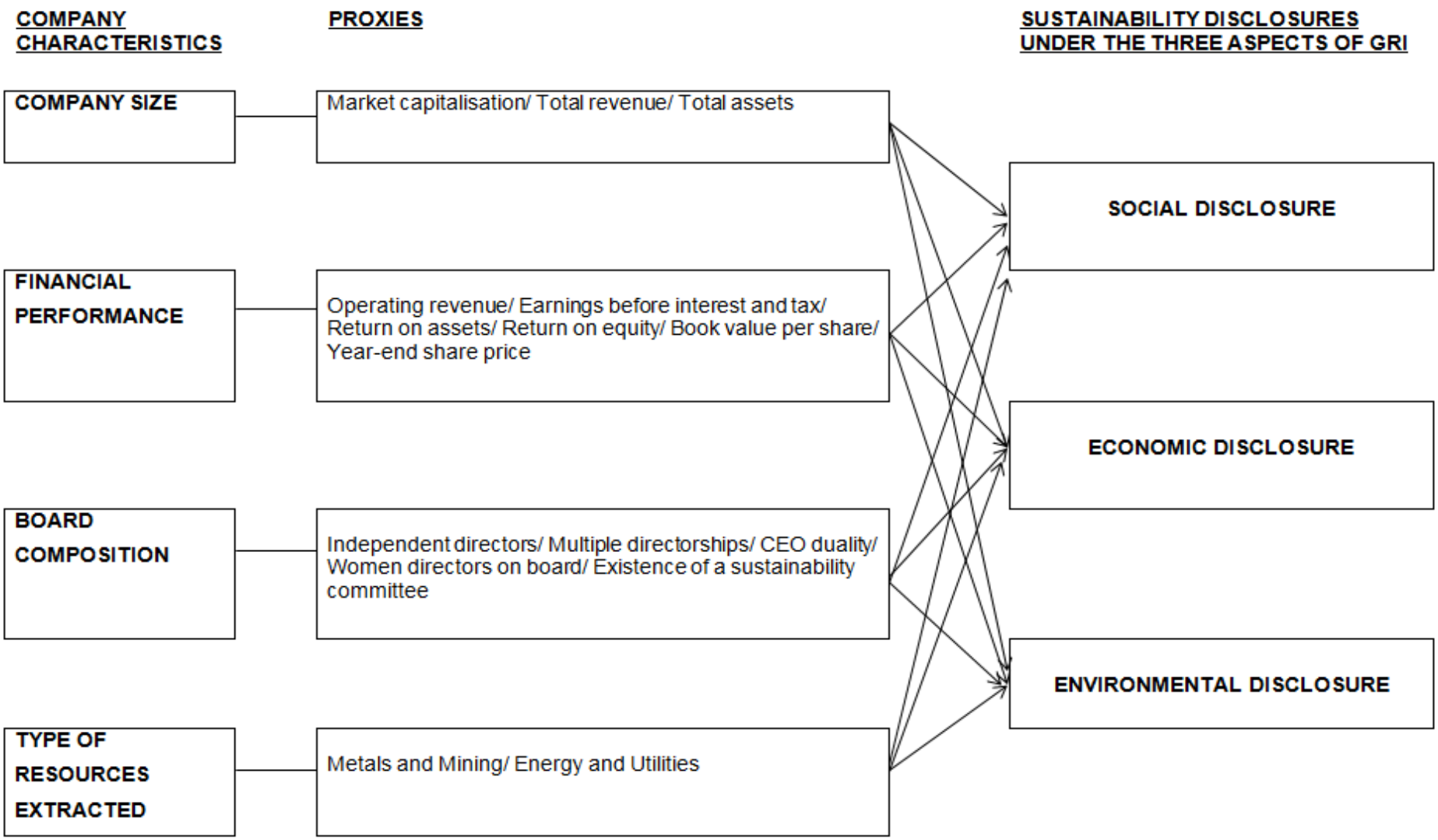


Figure 1.1 Research framework

1.6 Research Significance

The development of a new and comprehensive sustainability reporting index in this research provides an improved measurement for sustainability disclosures. It addresses the fundamental problem of a lack of a standardised sustainability reporting index. The ability of the index to align company's sustainability disclosure to reflect its practical performance resolves the concern raised by critical theorists and supports proponents from the managerial path by assisting business managers in preparing sustainability reports that are reflective of their genuine contribution in sustainability developments.

The results from this research have practical implications for regulators, investors and shareholders who rely on both financial and non-financial information to formulate policies and make business decisions. The outcomes of this industry-specific study address the demands for industry-based sustainability information. In addition, it promotes comparability between companies' sustainability reports and provides a benchmark for quality sustainability reporting.

Empirical evidence from this research enhances the understanding of the relationships between various company characteristics (company size, financial performance, composition of BOD and types of resources extracted) and the extent of all the three aspects of sustainability disclosures (social, economic and environmental). The findings from this study also contribute significantly to companies in the Australian resources industry, which is currently the leading Australian industry sector.

1.7 Research Organisation

This introduction chapter provides the background and rationale for this study and establishes the significance and contributions for this research. The following chapter critically reviews the relevant literature in sustainability and sustainability reporting. Chapter three explains details of the theoretical framework and traces the development of hypotheses. Following that, chapter four outlines the research methodology for this study and chapter five describes the development of the new

GRI-based scoring index. Chapter six presents the results of the implementation of the index with a pilot test and chapter seven discusses the results of the main study. Finally, chapter 8 concludes the study by summarising the main findings and presenting the limitations, implications and suggestions for future research.

CHAPTER TWO

LITERATURE REVIEW

This chapter reviews the literature related to sustainability and sustainability reporting. It commences with an overview of the concept of sustainability followed by an evaluation of the importance and the drivers for companies to engage in sustainability reporting. Recent developments in sustainability reporting in global trends are reviewed before focusing specifically on developments in Australia. The theoretical framework for this research including the legitimacy theory and the stakeholder theory is presented. The chapter continues with a discussion on the Global Reporting Initiatives (GRI) and Clarkson et al.'s (2008) framework for sustainability disclosures before concluding with a critical review of the variables that have been identified in prior studies that have impacted on sustainability disclosures.

2.1 Concepts of Sustainability

Some of the recent literature has treated sustainability as a relatively new issue. However, discussions around the concept of sustainability began much earlier albeit the term was more commonly known as corporate social responsibility (CSR) at that stage.

The World Business Council for Sustainable Development defines CSR as "the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as the local community and society at large" (cited in Rankin, 2011, p. 49). According to Rankin, this definition of CSR suggests companies' willingness to accept their social responsibilities, sustainability standards and codes of ethics above legal requirements. The basis of this view is that companies adopting CSR principles strive to achieve economic development while monitoring their operating activities to ensure that they are not harming the society and the environment. Rankin highlighted the similarities in the definition, components and measuring scope of CSR and sustainability. He argued that since sustainability, which comprises three aspects –

economic, social and environmental -could not be achieved without maintaining sustainability in all three aspects simultaneously, companies that practice CSR will attain sustainability.

The report of the World Commission on Environment and Development (WCED) provided a formal definition of sustainability as the ability to meet the needs of the present generation without compromising the needs of the future generations (World Commission on Environment Development, 1987). Much of the prior literature on sustainability has adopted this definition and referred to both CSR and sustainability as the efforts and responsibilities towards sustainable development as defined by WCED (Deegan, 2013; Guenther, Hoppe, & Poser, 2006; Guthrie & Parker, 1990). The Global Reporting Initiative (GRI), a non-profit organisation which developed a comprehensive reporting framework for sustainability, defines sustainability reporting as reporting on "how an organization contributes, or aims to contribute in the future, to the improvement or deterioration of economic, environmental and social conditions, developments, and trends at the local, regional or global level" (Global Reporting Initiatives, 2013, p. 17). The GRI (2013) explains that organisations should seek to present a broader concept of sustainability that "involves discussing the performance of the organization in the context of the limits and demands placed on environmental or social resources at the sector, local, regional, or global level" (p. 17). These broad definitions for sustainability and sustainability reporting are adopted by KPMG and PricewaterhouseCoopers in their regular global survey on CSR (KPMG, 2015; PricewaterhouseCoopers, 2014).

The roots of the concept of corporate social responsibility can be traced to the beginning of the twentieth century when the business community began to express concern towards its impact on society (Carroll, 1979). During the Industrial Revolution, businesses were mainly concerned about employee issues such as exploitation of labour and child labour (Crane, McWilliams, Matten, Moon, & Siegel, 2008). The emphasis of CSR shifted to environmental issues when the problems of pollution arose, especially after the disastrous oil spill incident in Alaska in 1989 (Patten, 1992) and the discovery of the depletion of the ozone layer in 1985 by Farman et al. (cited in Shanklin & Jones, 1995, p. 409).

Murphy (cited in Crane et al., 2008, p. 24) classified the development of the concept of CSR into four eras: philanthropic, awareness, issue and responsiveness. He suggested that the period up to the 1950's was the 'philanthropic' era when companies demonstrated their social responsibility by donating to charities. The period from 1953 to 1967 was categorised as the 'awareness' era when organisations recognised more 'overall responsibility' and contributed to community affairs. The period 1968 to 1973 was known as the 'issue' era when companies began 'focusing on specific issues' such as racial discrimination and problems of pollution. Finally, the period from 1974 to 1978 and beyond was classified as the 'responsiveness' era when companies began to undertake relevant management actions to address CSR. Companies in this era generally responded through examining corporate ethics and implementing corporate social disclosures.

The corporate world responded to the imperatives of social responsibility in various ways. Sethi (cited in Crane et al., 2008, p. 31) examined the different dimensions of corporate social performance and proposed that corporate behaviour could be termed 'social obligation', 'social responsibility' and 'social responsiveness'. He distinguished 'social obligation' as the corporate response to CSR due solely to legal constraints. According to Sethi, 'social responsibility' differs as it goes beyond 'social obligation' by bringing CSR to a level of performance that meets the prevailing social norms, values, and expectations. The next stage in Sethi's model is 'social responsiveness' and this highlights the proactive efforts of companies that take anticipatory and preventive measures in CSR.

Both Murphy's classification of CSR and Sethi's analysis of corporate behaviours reveal how the concept of CSR has developed through the decades to a level where companies are expected to demonstrate a much higher level of social responsibility towards the community. Today, the community is expecting this responsibility to extend beyond words to actual commitments and genuine actions to benefit the community (Heard & Bolce, 1981; Lessem, 1977).

2.2 Importance and Drivers of Sustainability

Many companies have responded to the community's demand for sustainability information with a proactive approach. They provide voluntary non-financial information as they have recognised the importance for them to be socially responsible and economically profitable in order to attain sustainability for long term viability. Adams and Zutshi (2004, p. 31) assert that the demand for corporate social responsibility has become "essential" for corporate "long term survival".

Werther and Chandler (2011) identified several key reasons to explain the importance for companies to be proactive in volunteering sustainability information. Growing affluence has given consumers the 'power' to make purchasing decisions based on preferences for companies. Improved living standards have given people the ability to choose the brand and quality of their purchases. In general, consumers prefer to select companies which are deemed to be more socially responsible. Werther and Chandler also claimed that globalisation and the internet have made information globally and readily available, resulting in companies being especially cautious about the type of image they project to potential consumers. The increasing power of the media, environmentalists and other activist groups are also driving forces for sustainability reporting. There is an increasing imperative to preserve the environment as people become more aware and concerned about the depletion of limited resources and the damaging impact of industrialisation. These driving forces underpin the emphasis on sustainability and have created a greater demand for transparency in companies' business activities (Werther & Chandler, 2011).

Prior research studies in sustainability reporting have identified that companies can benefit in many various ways when they adopt a proactive approach in their disclosures. Sandhu and Kapoor (2010) have compiled a list of these benefits that include:

- Reduced operating costs and improvement in financial performance (Adams & Zutshi, 2004; Bachoo et al., 2013; Porter & van der Linde, 1999)
- Enhanced reputation through establishing brand image (Adams & Zutshi, 2004)

- Increased sales and customer loyalty (Creyer, 1997; Mohr & Webb, 2005)
- Increased ability to recruit and retain employees (Adams & Zutshi, 2004)
- Better access to capital (Bachoo et al., 2013)

Werther and Chandler (2011, p. 105) gave an empirical example of the benefits when they compared the approaches taken by two petroleum companies: BP and ExxonMobil. BP, which repositioned itself as an environmentally responsible petroleum company, significantly outperformed ExxonMobil, which was attacked by non-government organisations for their socially irresponsible practices leading to consumers boycotting their products. However, Werther and Chandler highlighted that these positive brand building efforts need genuine commitment in the actual business operations to realise their full benefits. Werther and Chandler gave the example of when BP was criticised for the lethal accidents at key refineries in the United States and for the extent of its investments in alternative energy sources. These infringements have undermined BP's efforts and investments in building a positive brand image.

2.3 Recent Developments in Sustainability Reporting

Recent decades have seen renewed attention on sustainability issues and reporting. As business organisations respond to increasing concerns about social and environmental issues by producing sustainability reports, a lack of a standardised reporting framework and an ambiguity in interpreting the reporting requirements and coverage have resulted in inconsistency in the extent of their disclosures. Hence, for decades, companies have been facing persistent problems such as defining the scope of sustainability, and deciding what to include, how to report and when to disclose information related to sustainability (Adams & Frost, 2007; Betianu, 2010; Crawford & Williams, 2010; De Jong et al., 2009; Dingwerth & Eichinger, 2010; Emery, 2002; Gibson & O'Donovan, 2007; Gray et al., 2001; Hussey et al., 2001; Tagesson et al., 2009).

2.3.1 Developments in academic research

A recent longitudinal study performed by Huang and Watson (2015) provided a summary of recent developments in academic studies relating to sustainability. They reviewed prior research studies relating to corporate social responsibility (CSR) completed in the last decade by examining journal papers published in thirteen prominent accounting journals. Their study adopted a broad definition of sustainability and included journal papers where different terms such as “corporate responsibility”, “corporate social responsibility” and “sustainability” were used. They identified 47 papers fitting these selection criteria. They investigated the focus of these studies and classified them into four general themes: determinants of CSR, CSR and financial performance, consequences of CSR and CSR disclosure and assurance.

Huang and Watson (2015) found prior research studies identified several determinants of CSR that have significant implications on CSR. These studies found that managers’ personal philosophy, religion and accountability can shape companies’ CSR orientation (Parker, 2014). Besides, concerns of other stakeholders such as clients and creditors have affected companies’ choice of management strategy and environmental control systems (Rodrigue, Magnan, & Boulianne, 2013) and managers’ motivation to create sustainable value for their shareholders by being eco-efficient (Figge & Hahn, 2013). Although being eco-efficient may not have a direct influence on a company’s financial performance, it has a mediating effect on a company’s financial performance (Henri & Journeault, 2010). Similarly, Rodrigue et al. (2013) have also found that being eco-efficient can improve CSR performance through managers’ desire to outperform their competitors in being industry leaders.

While there is considerable evidence about the relationship between CSR and financial performance (Jones, 1995; Porter & Kramer, 2007), Huang and Watson (2015) found that results from prior studies are not conclusive about this relationship and highlighted the study of Lys, Naughton, and Wang (2015) that investigated the possibility of a “reverse causality” (Huang & Watson, 2015, p. 7). According to Lyns et al., it is common for prior studies to assume that a positive correlation between CSR and financial performance implies that CSR expenditures have led to improvement in companies’ financial performance. They argued that the link between CSR and

financial performance is not casual and that this effect may have been misinterpreted in previous literature. Consequently, Lyns et al. hypothesised the reverse and posited that companies may undertake a CSR initiative because of their expectation for a better future financial performance.

Huang and Watson (2015) also found many prior studies considered one of the main consequences of CSR as the relationship between CSR performance and firm value (Cho, Lee, & Pfeiffer, 2012; Kim, Park, & Wier, 2012; Matsumura, Prakash, & Vera-Munoz, 2014). There are, however, limited studies focusing on studying the cost of CSR; hence, Huang and Watson suggested that future studies may consider investigating the cost behaviour of CSR expenditures and whether there is an opportunity cost of CSR.

Huang and Watson (2015) revealed that while studies of CSR have increased in recent decades, there are considerable differences among the studies. Most of the studies were relatively more shareholder oriented, and Huang and Watson suggested that future research should address the demands of a broader group of stakeholders. Another suggestion is that future CSR studies should consider the long term impact of CSR information. The qualitative and non-financial nature of CSR information has posed difficulties for credible evaluation of the CSR data, which suggests the need for assurance services for CSR information to increase their credibility (Junior, Best, & Cotter, 2014; Mock, Strohm, & Swartz, 2007; SeguÍ - Mas, Bollas - Araya, & Polo - Garrido, 2015; Wong & Millington, 2014).

2.3.2 Developments in the business sector

Atkins et al. (2015) argued that despite the improved methods used by many business corporations to produce sustainability reports, the current sustainability disclosures do not satisfy the needs of companies' broad stakeholder groups. They found that a majority of the reports produced by companies "fail to make a strong connection between climate change, environmental management and financial reporting" (Atkins et al., 2015, p. 663). They advocated that unless sustainability information becomes a driver for change, the information is yet another example of companies merely

satisfying legal requirements and image management, which does not address the crucial problem of climate destruction. They stressed that companies need to adopt practical business changes that can effectively reduce climate change risks and their carbon footprints. They concluded that a traditional accounting reporting framework that focuses only on financial information is not effective for sustainability accounting, and that there is an urgent need for an enhanced stewardship and improved accounting framework to address the problem.

PricewaterhouseCoopers's (PwC) conducted a survey on a diverse mix of institutional investors to gain a deeper understanding of whether sustainability issues are affecting investors' decisions related to their investment strategies and practices (2014). They found that investors considered sustainability issues such as corporate social responsibility and climate change as relevant when they made decisions regarding shareholder and corporate engagement, proxy voting and investment strategy. It is also interesting to note that the likelihood that investors consider these sustainability issues increases with investors that manage a larger amount of assets. More than 84% of investors participating in the survey expected that they would continue to consider these sustainability issues in investment decisions in the next three years.

According to the PwC survey, mitigating risk is the major driving force for investors to consider sustainability issues when making investment decisions. Other significant drivers include enhancing investment returns and avoiding business corporations who demonstrate unethical conduct. Consistent with other PwC surveys, investors expressed a high level of dissatisfaction with companies' sustainability disclosures. Investors were significantly more dissatisfied then satisfied in all eight sustainability topics included in the survey (PricewaterhouseCoopers, 2014). Topics surveyed include how risks and opportunities are identified and quantified in financial terms, comparability of sustainability reporting, and relevance and implications of sustainability risks. This recent survey has provided empirical evidence that indicates a lack of useful sustainability information available for investors to make good investment decisions.

2.3.3 Developments in global trends

KPMG perform regular global surveys of corporate responsibility (CR) reports on the world's 250 largest companies by revenue (G250) and top 100 companies (N100) of many different countries. In the most recent survey, KPMG (2015) analysed thousands of company annual financial reports, corporate responsibility reports and websites. They presented the results from the survey in three parts: accounting for carbon, quality of CR reporting among the G250, and global CR reporting trends among the N100.

They found that there is a lack of consistency in carbon reporting from the G250, "making it almost impossible to accurately compare one company's carbon performance with another" (KPMG, 2015, p. 9). 20% of these large companies in the high carbon sectors such as mining and chemicals did not report on carbon. 47% of the companies did not publish targets on carbon reduction. Of those that reported on the set targets, only 35% of the companies provided reasons for their chosen targets on carbon reduction. The average time frame set for corporate carbon reduction was approximately 11 years, with some using the 15 year targets set by many national governments. Among the G250, European companies are the most likely to report on carbon, while companies in the United States and Asia Pacific countries including China are the least likely to report.

Part two of KPMG's report, which focused on the quality of CR reporting among the G250, found that there was no overall improvement since 2013, except on the topic of CR trends and risks. KPMG described this as "disappointing" as the previous positive improvement in the 2013 survey had not continued (KPMG, 2015, p. 24). KPMG viewed this as contradicting the emphasis on the quality of CR reporting made by the Global Reporting Initiatives (GRI) in their latest G4 version.

It was found in the survey that about 73% of N100 companies reported on CR, which is a small rise from 71% in the 2013 survey. KPMG also found that 92% of the G250 reported on CR. Over the last four years of the survey, the percentage of G250 companies that reported on CR has fluctuated between 90% and 95%, and KPMG

concluded that this is largely due to the change in the composition of the G250 list. The main driver for CR reporting in both N100 and G250 continues to be legislative.

The survey conducted across 45 different countries globally found the Asia Pacific to be the leading region in CR reporting compared to the United States and European countries. This growth has been driven by increasing mandatory and voluntary reporting requirements in countries such as India, Taiwan and South Korea. Four countries have emerged as having the greatest increases in country CR reporting rates since 2013: India (+27 percentage points), South Korea (+25), Taiwan (+21) and Norway (+17). Three out of these four countries attributed the growth to the introduction of mandatory reporting requirements. KPMG concluded from the results that "it is unlikely that rates of over 90 percent will be achieved in any country without some legislative driver" (KPMG, 2015, p. 32).

With increasing demand for improvement in companies' environmental performance as a measurement towards their sustainability contribution, recent research studies have focused on studying data related to companies' carbon and gas emissions (Chapple, Clarkson, & Gold, 2013; Clarkson et al., 2008; Clarkson et al., 2011; Comyns & Figge, 2015; Cowan & Deegan, 2011; Guenther et al., 2006; Li, Eddie, & Liu, 2014). Comyns and Figge (2015) conducted a longitudinal study between 1998 and 2010 on 245 sustainability reports of 45 oil and gas companies listed on the 2011 Global Fortune 500 index. They explored the quality of greenhouse gas (GHG) information reported in companies' sustainability disclosure by classifying the information into 'search', 'experience', 'credence' and 'mixed'.

'Search' information is information which can be easily verified by a report reader without special expert knowledge or cost outlay. This includes information such as location of activities and awards won that can be easily verified. The 'search' information is considered to be of high quality and would remain as high quality information over time as users of this information can easily verify the data. This type of information may even be improved over time with increased pressure from stakeholders for more disclosures.

‘Experience’ information is information that cannot be verified immediately but which can be verified at some future date. This includes forward looking statements or future targets set by companies. Thus, ‘experience’ information is considered initially to be of low quality but is expected to improve in quality as the information becomes apparent and verifiable.

‘Credence’ information is that which cannot be verified by the report reader. This information includes quantitative emissions information that requires expert knowledge or significant cost outlay. The quality of this information is considered poor and is expected to remain poor even in the longer term as it cannot be used to drive improvement since stakeholders cannot determine its quality.

Comyns and Figge (2015) found that companies were reporting poor quality information despite the increasing focus on the issue of climate change internationally during the study period, and there is scientific evidence linking GHG emissions to the climate change issue. The results from their study have indicated that the adoption of guidelines alone does not result in better quality reporting and that the quality of information in companies’ disclosures varied significantly. The various types of information were also not significantly different among the three types of information during the 12 year period of study. Comyns and Figge (2015) concluded that more regulation is necessary to improve the quality of information in the ‘experience’ and ‘credence’ categories. They posited that regulation may still be required to ensure that specific information such as third party assurance is included to improve the quality of ‘search’ information.

Comyns and Figge’s (2015) findings supported those obtained by Guenther et al. (2006) which indicated that the quantitative GHG emissions data is poor and reporting by companies in the oil and gas industry is also low compared to the reporting benchmark (Dong & Burritt, 2010).

Recent developments in sustainability reporting have identified a strong demand globally from both academics and stakeholders of business organisations to see an alignment of sustainability disclosure to sustainability performance. This study addresses this increasing demand through the development of a new reporting

framework that ensures companies' disclosures are in line with good sustainability performances that lead to improvements in sustainability developments.

2.4 Sustainability in the Australian Context

Sustainability reporting in Australia remains predominantly voluntary especially in relation to social issues since mandatory reporting only applies to environmental reporting and is confined to companies that are bound by environmental regulations. Consequently, there has been ongoing debate as to whether sustainability reporting should be made mandatory through legislation. Some studies have shown that greater legal requirements have produced more sustainability disclosures (Adams & Frost, 2007; Crawford & Williams, 2010; Frost, 2007). They claim that the extent of sustainability disclosures will decrease under a system of voluntary disclosures as companies can be selective about the amount, scope and nature of the information disclosed in their reports (Crawford & Williams, 2010; Deegan & Gordon, 1996; Deegan & Rankin, 1996; Guthrie & Parker, 1990). However, some studies advocate retaining voluntary reporting, as they claim that mandating the reporting may result in minimal information being disclosed purely to satisfy statutory requirements (Adams & Frost, 2007; Ho & Taylor, 2007). This view was supported by PricewaterhouseCoopers (PwC) in their reply to an inquiry by the Commonwealth Parliamentary Joint Committee on Corporations and Financial Services (PJCCFS) reported in June 2006 regarding corporate responsibility and reporting in Australia. PwC claimed that "any further legislation on environmental and social matters using the current reporting framework will only burden Australia with little value being added to stakeholders" (Adams & Frost, 2007, p. 3; Cowan & Deegan, 2011).

2.4.1 Regulatory framework

Since 1 July 1998, companies with operations bound by environmental regulations have been required by section 299(1)(f) of the Corporations Act (2001) to provide mandatory reporting on environmental issues in their annual reports. Other companies that do not fall under this jurisdiction volunteer this type of information (Adams & Frost, 2007; Clarkson et al., 2011; Deegan & Gordon, 1996; Frost, 2007; Jones et al., 2007).

Following the introduction of section 299(1)(f), a Practice Note (PN 68) was issued by the Australian Securities and Investments Commission (ASIC) in November 1998 to provide guidelines for complying with the section. Despite this, it has been criticised for being broad-spectrum and not providing sufficient guidelines necessary for reporting (Bubna-Litic, 2008; Burritt, 2002; Frost, 2007). Several Australian bodies attempted to provide more guidance to their members in the early 1990s by producing environmental reporting guidelines. These include the Australian Institute of Company Directors, the Australian Institute of Management, the Business Council of Australia, the Australian Manufacturing Council (Deegan & Rankin, 1996), Minerals Council of Australia and Australia Industry Group (Frost et al., 2005). However, Deegan and Gordon (1996, p. 192) claimed that the guidelines provided by these Australian bodies were not useful as they "typically provide minimal guidance in relation to disclosure policies". As a result, the environmental reports produced by Australian companies do not follow a standardised framework and this hinders comparison between companies. Besides, the mandatory reports of companies are not subject to an audit process by ASIC which Frost (2007) suggested as a possible indication that active implementation of the act is lacking. Bubna-Litic (2008, p. 81) confirmed Frost's suggestion when she quoted from ASIC that a "hands-off" approach is adopted to the enforcement of section 299(1)(f).

There are two primary regulatory bodies to which Australian companies are compelled to report (Bachoo et al., 2013). First, from 1997, companies have been required to report to the National Pollutant Inventory (NPI) of the Department of Environment the emissions of any of 93 registered pollutants emitted in excess of the prescribed threshold (Bachoo et al.). Second, companies whose energy usage or greenhouse gas emissions exceed prescribed thresholds are obliged to report to the Clean Energy Regulator (previously the Department of Climate Change) of the Department of Environment under the jurisdiction of the National Greenhouse and Energy Reporting Act 2007 (Bachoo et al.; Cowan & Deegan, 2011). The first emissions reduction policy was proposed in early 2008 but was repeatedly voted down by the Parliament in 2008, 2009 and 2010. It was finally approved in November 2011 after some significant changes that include an increase in the emissions threshold (Li et al., 2014). According

to Li et al. (2014), this new legislation has resulted in additional economic costs and social responsibilities to companies that are regulated under this legislation.

2.4.2 Prior research studies

Higgins et al. (2015) analysed sustainability reporting practices of Australian business organisations over an extended period of more than twenty years. They examined companies in Australia that produced stand-alone sustainability reports and discovered the earliest reporting by a company in Australia began in 1995. Higgins et al. (2015) classified the companies into early adopters or late adopters according to the time when the companies began to produce stand-alone reports. They examined companies' sustainability disclosures and objectives of disclosures and determined if they differed among companies with different characteristics such as the level of impact to physical environment, the level of public visibility, company size and customer base.

They found that sustainability reporting has "spread widely across the business community in Australia" (Higgins et al., 2015, p. 462). Most of the early adopters were companies in high-impact industries such as mining, utilities and energy. More recent adopters came from low-impact industries such as legal and real estate property companies. Two apparent patterns emerged from their study. First, the depth of the disclosures has improved in only a small number of high-impact industries that were associated with negative environmental impacts. Second, sustainability reporting has spread to many low-impact industries such as the finance and services sector where most of the recent growth has occurred.

Unlike most prior research that found companies in the high-impact industries were disclosing more information than those in the low-impact industries due to higher legitimacy and stakeholder pressure, Higgins et al. (2015) found no differences between the two groups. According to Higgins et al., this suggests that sustainability reporting "has matured, changed, and in need for further investigation" (p. 447). However, they found that commonly, sustainability reporting is tied to companies' strategic priorities, management of social and environmental impacts and, to some

extent, the number of government customers companies have. Two clusters of sustainability reporters were evident. The first was consumer-oriented, later adopter, low-impact companies with mixed levels of visibility; the second was high-impact, early adopter companies with higher visibility. Higgins et al. suggested that the first cluster of early adopters are likely to engage in sustainability reporting to gain advantage through differentiating their sustainability strategies. The second cluster of late adopters, which were more experienced, has fewer incentives for competitive positioning, and are probably keen to show the strategic importance of legitimacy and responsiveness.

Earlier research studies on sustainability reporting in Australia have focused on environmental aspects of sustainability reporting (Bubna-Litic, 2008; Deegan & Gordon, 1996; Deegan & Rankin, 1996; Frost, 2007; Frost et al., 2005; Galbreath, 2013). These prior research studies have yielded some consistent results that include the following:

- There has been a general increase in environmental disclosures in recent decades (Cowan & Deegan, 2011; Deegan & Gordon, 1996; Frost, 2007; Frost et al., 2005; Gibson & O'Donovan, 2007).
- The driver for the increase in environmental disclosures is largely due to regulatory requirements (Cowan & Deegan, 2011; Frost, 2007).
- There is ambiguity in the legislative requirements relating to environmental disclosures (Burritt, 2002; Frost, 2007; Gibson & O'Donovan, 2007).
- The environmental reporting is typically self-laudatory in nature and companies tend to disclose only good news (Deegan & Gordon, 1996; Deegan & Rankin, 1996; Frost et al., 2005; Guthrie & Parker, 1990) and this may be misleading to users of this information (Deegan & Rankin, 1996).
- There is a positive relationship between the extent of environmental disclosure and the environmental sensitivity of the company's industry type (Deegan & Gordon, 1996; Frost, 2007).

Despite these similarities, there were inconsistent results obtained between company's size and the extent of environmental disclosures. Jones et al. (2007)

identified a positive correlation between the company's size and industry type and the extent of environmental disclosure. However, Deegan and Gordon (1996) concluded in their study that the positive relationship only exists for companies that operate in an environmentally sensitive industry type. Prior studies have also yielded different results about the relationship of sustainability reporting and other company characteristics such as companies' financial performance and their board composition. These inconsistent results are examined in this study.

More recent research on sustainability reporting in Australia has included other aspects of sustainability (Bachoo et al., 2013; Frost et al., 2005; Williams, Wilmshurst, & Clift, 2011). However, to date, few of these studies have evaluated all three aspects (social, economic, and environmental) of sustainability in a single study. One of the main objectives of this research is to evaluate the quality of sustainability reporting in the Australian resources industry through an examination of all the three aspects of sustainability.

2.4.3 Research studies in the resources industry

Companies operating in the Australian resources industry are required to provide mandatory environmental disclosures in their annual reports according to the regulation in section 299(1)(f) of the Corporations Act (2001) (Frost, 2007; Jones et al., 2007). The resources industry, which involves exploration and extractive activities of minerals, energy and other natural materials from the environment, is classified as an 'environmentally sensitive' industry because of the nature of its operating activities which have significant impact on the environment (Deegan & Gordon, 1996; Dong & Burritt, 2010; Wilmshurst & Frost, 2000).

Many prior studies have identified that companies operating in an environmentally sensitive industry tend to provide more environmental disclosures in their reports (Deegan & Gordon, 1996; Deegan & Rankin, 1996; Frost, 2007; Patten, 1992). Many cited the legitimacy theory as the main reason for this as companies in an environmentally sensitive industry attempt to reduce potential political costs by providing more information.

Wood and Ross (2008) investigated Australian financial managers' response to several environmental social controls (ESC) such as mandatory disclosures and their capital investment decision processes across three industry types – extractive, food manufacturing and heavy metals manufacturing. These industries were selected as companies in these industries produce pollutant chemicals that are regulated for National Pollutant Inventory (NPI) reporting. The mining companies in the extractive industries are required to disclose environmental information and costs by the accounting standard AASB1022 Exploration and Evaluation costs and Australian Accounting Standard AAS 7 Accounting for the Extractive industries. While companies in the food industry are required to provide environmental disclosure on their usage of highly toxic chemicals, those in the metal industry must disclose information that relate to hazardous waste and disposal.

According to Wood and Ross (2008), in Australia, there are four key ESCs that are adopted to promote better industry environmental behaviour, namely mandatory disclosure, regulation, subsidies and stakeholder opinion. They found statistically significant differences among the three industries. These significant differences were evident across the disclosure indicators in all four ESCs.

The extractive industry is found to have the highest level of responsiveness to all four ESCs. Wood and Ross (2008) suggested that a probable reason for this high level of responsiveness is that mining is highly capital intensive and relies on large investments for site acquisitions and purchase of plant and equipment. It is also noted that the extractive industry is under a high level of public scrutiny, resulting in environmental issues being viewed as a crucial issue for this industry. Although mandatory disclosure was found to have the lowest responsiveness among the 4 ESCs in this industry, it is still relatively high compared to the food and heavy metals manufacturing industry. Wood and Ross (2008) observed that managers of the extractive industry have indicated a higher awareness of disclosure requirements and this is likely due to more stringent disclosure requirements for this industry. Companies in this industry are also highly influenced by the regulatory indicators such as site restoration, licenses and permits, and environmental fines and penalties. Stakeholders such as investors, insurers and creditors were perceived by managers of the extractive

industry as more influential than employees and customers. A probable reason is that this industry caters largely to the export market whose customers are mainly from other countries and therefore less concerned with environmental performance in Australia. In addition, companies in this industry are mainly public listed companies that are highly influenced by investors (Wood & Ross, 2008).

Wood and Ross (2008) observed that the food manufacturing industry has, despite its heavy usage of highly toxic chemicals, shown least concerned with site restoration, but is highly influenced by regulatory indicators such as fines, licenses and permits. On the other hand, the heavy metals manufacturing industry has the lowest influence relative to the other two industries. Companies in the heavy metals manufacturing industry have shown significant concern towards 'hazardous waste treatment and disposal' and 'future increases in compliance costs' regulation indicators. They have also indicated that customers and employees are the most influential groups of stakeholders. The lower influence from investors may be explained by the number of proprietary companies in the metal industry compared to the other two industries. Mandatory disclosure is also less influential in this industry compared to the extractive industry as the metal industry supply predominantly to other manufacturers. Wood and Ross (2008) proposed that this has seemed to divert public scrutiny to companies in the extractive industry. These significant differences among the three industries have led Wood and Ross (2008) to conclude that it is important to understand industry differences to increase the effectiveness of ESC.

Dong and Burritt (2010) conducted an industry-specific sustainability study on the Australian oil and gas industry. A content analysis approach was applied to 25 listed companies in the Australian Stock Exchange 300 index in 2006. They found that companies had reported on a broad range of social and environmental issues. However, there was a lack in both the quantity and quality of information provided. On average, each individual company was reporting 13 sentences of information and there was a lack of quantification of targets or outcomes. It was even lower in both volume and quality of disclosures that relate specifically to the oil and gas industry.

While companies in the oil and gas industry were reporting on many social and environmental disclosures, the information was about employees and the environment,

neglecting other stakeholders such as the community and consumers. Dong and Burritt (2010) described this reporting practice as “relatively narrow focus and under-provides information relative to the industry guidelines” (p.116). It is suggested that the lack of specific relevant information has undermined the credibility of companies’ disclosures, leading to a reduction in investor confidence in their investment decision making.

Dong and Burritt (2010) also highlighted the limited information on actual sustainability performance which hindered readers ‘assessment of the actual outcomes and achievements of the companies. It was very rare for companies to provide quantitative information on outcomes and achievements in numerical terms against their predictions. This has pointed to the fact that industry-specific indicators are not integrated with effectiveness and efficiency to assess companies’ progress against a benchmark. There was also omission of information that compares expectations with actual performance. Dong and Burritt (2010) stressed that this omission has failed to allow a measurable performance gap to be identified so that appropriate action can be carried out to improve performance.

While companies in the Australian resources industry are obliged to provide mandatory environmental disclosures, there are no specific requirements or guidelines to promote effective sustainability reporting practice. Moreover, the companies are not mandated for the other two aspects of sustainability disclosures – social and economic. Prior research studies have also identified a lack of a comprehensive and standarised reporting framework to benchmark reporting practice in the resources industry (Dong & Burritt, 2010; Frost, 2007; Guenther et al., 2006; Wood & Ross, 2008). This research addresses these problems encountered by companies in the resources industry through the development of a new reporting index based on all three aspects (social, economic and environmental) of sustainability.

2.5 Theoretical Framework for Sustainability

This research focuses on two fundamental theoretical frameworks that underpin sustainability and sustainability reporting: the stakeholder theory and the legitimacy

theory (Cho et al., 2015; Elijido-Ten, 2007; Michelon & Parbonetti, 2012; O'Donovan, 2002; Patten, 1992; Roberts, 1992; van Staden & Hooks, 2007; Wilmshurst & Frost, 2000). Prior empirical studies on the two theories are critically reviewed in this chapter.

2.5.1 The stakeholder theory

2.5.1.1 Definition of stakeholders

Freeman and Reed (1983) recognised that the business environment had changed and companies' obligations were no longer limited to just stockholders who are the holders of companies' equity. Companies are faced with a more complex business environment and management theories, which used to focus on companies operating efficiently and effectively within a traditional simple and predictable business environment, need to accommodate this shift. Hence, Freeman and Reed asserted that companies have obligations towards wider groups "who can affect the achievement of the firm's objectives" (Freeman & Reed, 1983, p. 91) and proposed the adoption of a broader definition of the term 'stakeholder'. Consequently, Freeman and Reed (1983, p. 91) defined the stakeholder to be "any identifiable group or individual who can affect the achievement of an organisation's objectives or who is affected by the achievement of an organisation's objectives". This broader definition implies that shareholders, creditors, employees, suppliers, consumers, government, media, interest groups and the general public are considered to be the stakeholders of a company (Freeman, 2010; Freeman & Reed, 1983). This study has chosen to adopt this broad definition of stakeholders because it is relevant in the context of this study that focuses on sustainability disclosures of companies under the current business environment.

2.5.1.2 Stakeholders' demand for sustainability disclosures

The increased attention on sustainability in recent decades has brought about an increased demand for sustainability information by stakeholders (Crawford & Williams, 2010; Deegan & Rankin, 1997; Ho & Taylor, 2007; O'Donovan, 2002). Applying the

broad definition of stakeholders in Freeman and Reed (1983) to the context of sustainability reporting, companies are obliged to provide all aspects (social, economic and environmental) of sustainability information to satisfy the stakeholders' demand. However, the various groups of stakeholders can have diverse information needs (Michelon & Parbonetti, 2012). For example, shareholders who have direct financial interest in a company's profit distribution are likely to focus on the economic aspects of sustainability, whereas the environmentalist groups tend to be more concerned about the environmental aspects. Furthermore, internal stakeholders, such as managers and employees of companies, are expected to demand more information relating to the social aspects because they can be assured of better employee welfare if they are working for socially responsible companies (Adams & Zutshi, 2004).

Deegan and Rankin (1997) investigated the materiality of environmental information for different groups of stakeholders who were users of company annual reports. They found most of the stakeholders (shareholders, accounting academics, representatives of financial institutions, organisations including Australian Council of Trade Unions, environmental lobby groups, industry and consumer associations) considered environmental information to be material and relevant for their business decisions. However, stockbrokers and analysts did not consider environmental information to be material. This is consistent with the findings of Business in Environment (cited in Deegan & Rankin, 1997) that analysed the attitudes of 85 British investment analysts on environmental issues, concluded that "assessments are made on rational, financial criteria. Issues considered moral or emotional are not seen as part of the analysts remit, unless such issues have identifiable financial consequences" (p. 566).

Freeman (2010) argues that it is inappropriate for stakeholders to perceive a company's social responsibility as isolated from its economic performance. Freeman claimed that these stakeholders, who have considered corporate social responsibility as merely an additional item to business operations when companies can afford it, have failed to understand the complex interconnections between economic and social forces. Freeman emphasised that it is important for companies to consider all aspects of these forces to better predict the business world in order to be successful.

2.5.1.3 Different perspectives of the stakeholder theory

Deegan (2013) classified the stakeholder theory into two main perspectives: the 'normative' (ethical) and the 'positive' (managerial) perspective. According to Deegan, the normative branch, which is the prescriptive view, argues that all stakeholders, regardless of their influencing power, should be treated equally and companies should be ethical and accountable to all stakeholders. Expanding on the broad definition of stakeholders in Freeman and Reed (1983), Clarkson (1995) divided stakeholders into primary and secondary stakeholders. Clarkson defined primary stakeholders as those "without whose continuing participation the corporation cannot survive as a going concern" (p. 106) and these include stakeholder groups, such as shareholders, customers, suppliers and employees. Secondary stakeholders are defined as those "who influence or affect, or are influenced or affected by the corporation, but they are not engaged in transactions with the corporation and are not essential for its survival'" (p. 107). These include the media and special interest groups. Clarkson asserted that corporate managers' responsibilities go beyond satisfying shareholders' demand for wealth creation; they are also responsible to all other primary stakeholders. This implies that corporate managers are required to resolve fairly any conflicting interests among the various primary stakeholder groups because unfair treatment towards any primary stakeholder may result in them seeking alternatives and eventually lead to their withdrawal from the corporate's stakeholder system, threatening a corporation's survival.

While Clarkson (1995) focused solely on primary stakeholders, the broader normative perspective of the stakeholder theory posits that all stakeholders, which include both primary and secondary, deserve a right to be provided with information about the company that affects them (Deegan, 2013). Hence, companies are deemed to have an obligation to provide all relevant information, including sustainability information, to all their stakeholders.

In contrast, the positive branch seeks to explain how corporate managers are affected by the stakeholders' power and results in management providing more information according to the stakeholders' power of influence (Deegan, 2013; Godfrey, 2010; Ullmann, 1985). While the normative branch prescribes the ethical requirements of

business management, the positive branch may in fact be more dominant, assuming that managers are driven by individual self-interest according to the positive accounting theory (Watts & Zimmerman, 1978).

Ullmann (1985) studied stakeholders' power in relation to corporate social responsibility and developed a three-dimensional conceptual model that consisted of stakeholders' power, strategic posture and economic performance. The model was adopted to explain the correlations among social disclosure and social and economic performance. Ullman contended that a stakeholder's power to influence a company's management is positively correlated to the stakeholder's degree of control over resources required by a company. It is expected that a stakeholder that controls resources that are critical to the continued viability and success of a company will have its demand addressed, resulting in a positive relationship between stakeholder power and social disclosure and performance (Roberts, 1992). Hence, it is often predicted that the objectivity of sustainability reporting practice may be compromised, especially under a voluntary disclosure system.

Critics have argued that companies may be inclined to disclose only positive information to satisfy the information demands of stakeholders. Guthrie and Parker (1990) compared the corporate social disclosure practices in the United States, the United Kingdom and Australia in 1983. They found that no Australian company provided 'bad news' about its activities in the aspect of environmental disclosures. A significant proportion of companies in the United Kingdom and the United States reported on 'bad news' basically at the instigation of government or accounting profession regulations.

This is consistent with the findings from Deegan and Gordon (1996) and Deegan and Rankin (1996). Both studied the environmental disclosure practices of Australian corporations and obtained similar results. They concluded that the reports were generally "self-laudatory" in nature. They noticed that firms were disclosing 'positive' news, but were suppressing 'negative' news (Deegan & Gordon, 1996). Deegan and Gordon (1996) argued that the credibility of the environmental disclosures may be questioned when there is a total omission of 'negative' news as users of the company's

annual reports would generally expect a certain degree of potentially harmful company activities.

2.5.1.4 Empirical studies of the stakeholder theory

While most literature on sustainability has assumed the importance of sustainability information to company's stakeholders, Deegan and Rankin (1997) provided empirical evidence when they investigated the materiality of environmental information to the users of company's annual reports. They studied various groups of company stakeholders including shareholders, stockbrokers and research analysts, accounting academics, representatives of financial institutions, environmental lobby groups and business associations. They analysed the stakeholders' demand for environmental information and the stakeholders' perception of the importance of environmental information compared to other social and financial information. Based on 123 responses of their questionnaires, Deegan and Rankin concluded that all of the stakeholders, except the stockbrokers and research analysts, indicated that environmental information was material to them. However, the level of importance of environmental information perceived by the stakeholders demonstrated significant divergence, evidenced by the large statistical deviations in their study.

Roberts (1992) empirically tested the stakeholder theory using the three-dimensional framework developed by Ullmann (1985). He selected 130 large companies that were investigated in 1984, 1985 and 1986 by the Council on Economic Priorities, whose studies focus on large Fortune 500 companies because these companies are influential and generally establish trends in the social responsibility area. His results supported Ullmann's framework and provided strong empirical evidence that is consistent with the stakeholder theory. The findings suggested that social responsibility disclosures are affected by stakeholder groups such as shareholders, government and creditors.

Elijido-Ten (2007) analysed sustainability reporting practice in Australia using the stakeholder theory. She selected 61 Australian listed companies in the Australian Securities Exchange (ASX) which were the top ranked companies in Australian

Conservation Foundation's (ACF) environmental performance and adopted Ullmann's (1985) three-dimensional framework comprising stakeholder power, strategic posture and economic performance to analyse the determinants of corporate environmental performance. She studied the relationship between the powers of various stakeholder groups (shareholders, creditors, government) and the extent of environmental disclosures using the 2002 ACF environmental performance ranking. Her findings provided empirical evidence to support the stakeholder theory. Among the three groups of stakeholders, Elijido-Ten observed that the powers of the shareholders and the government were significantly related to the environmental performance. However, no significant relationship was found between the creditors' power and the environmental performance.

2.5.2 The legitimacy theory

According to Lindblom (cited in Deegan, 2013), legitimacy exists when "an entity's value is congruent with the value system of the larger social system of which the entity is a part" (p. 348). As such, Suchman (1995) defined legitimacy as "a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (p. 574). This implies that companies need to act according to the expectations of the community (Dowling & Pfeffer, 1975; Guthrie & Parker, 1990; Patten, 1992; Wilmshurst & Frost, 2000) and are expected to carry out their business activities within the boundaries of what the society accepts to be the norm (Dowling & Pfeffer, 1975; Wilmshurst & Frost, 2000).

Dowling and Pfeffer (1975) posited that organisations that fail to demonstrate business activities that are congruent with general social norms and values may confront a threat to organisation legitimacy. Dowling and Pfeffer (1975) suggested that legitimacy is not "defined solely by what is legal or illegal" (p. 124) and they proposed three possible reasons for a low correlation between legality and legitimacy. First, a legal change would require more time than a change of societal norm and thus current legality may not be fully reflective of current societal norm. Second, norms may at times be contradictory while legal codes are presumed to be more consistent. Third,

societies are generally more tolerant of certain behaviours informally than accepting them legally, and this again could result in differences between legality and legitimacy. Dowling and Pfeffer (1975) advocated that organisations will take these factors into account and strive to engage in behaviours that meet all the criteria, thereby engage in business operations that are economically viable, legal and legitimate.

Suchman (1995) classified legitimacy in organisations into three types: pragmatic, moral and cognitive. Suchman's study assumed that these three types of legitimacy adhere to general social norms and adopt practices that are acceptable to the public at large, however, he differentiated them according to their behavioural dynamic. Pragmatic legitimacy refers to legitimacy based on exchange or influence factors between an organisation and its audiences. This type of legitimacy often involves a support for an organisational policy or action because it has a direct influence on the audience's well-being. Unlike pragmatic legitimacy that focuses on the benefits to the audience, moral legitimacy reflects a positive normative behaviour where an organisation's practice is accepted because it is deemed to be morally right. Cognitive legitimacy, according to Suchman (1995), involves either comprehensibility that leads to an affirmative backing of an organisation or an acceptance merely on the basis of some "taken-for-granted cultural account" (p. 582). Cognitive legitimacy by comprehensibility refers to a form of legitimation where an organisation's activities are accepted because organisations can provide plausible explanations to make its activities predictable and meaningful. In contrast, the taken-for-granted legitimacy refers to legitimacy that is accepted because the alternatives are impossible and unthinkable.

2.5.2.1 Legitimacy gap

Heard and Bolce (1981) observed that the expectations of society on companies are no longer limited to the traditional view of providing goods and services, jobs and wealth creation. Society expects businesses to also "attend to the human, environmental and other social consequences of business activities" (Heard & Bolce, 1981, pp. 247-248). These expectations include more stringent enactment of regulations restricting business activities which affect the society, utilisation of public

opinion surveys, and increased advocacy movements and lobbying groups. Consequently, to conform to society's expectations on sustainability issues, companies are required to act in a socially responsible manner and be accountable for sustainability disclosures (Heard & Bolce, 1981).

The legitimacy theory posits that companies that deviate from the bounds of these societal expectations may experience difficulties in obtaining the necessary resources for their business operations, which may eventually threaten their survival (Deegan, 2013; Deegan & Rankin, 1997). Deegan (2013) uses the term 'legitimacy gap' to describe a situation where there is "a lack of correspondence between how society believes an organisation should act and how it is perceived that the organisation has acted" (p. 348). Deegan suggested that this can arise when a company fails to make disclosures to show its compliance with societal expectations or when the business activities of a company fail to satisfy the expectations of the society. According to Sethi (cited in Deegan, 2013), there are two major sources of legitimacy gaps: the gap may arise due to a change in societal expectations, resulting in a legitimacy gap even when companies have continued operating in the same manner, or when new information that was previously unknown becomes known.

Dowling and Pfeffer (1975) suggested three strategies that organisations can adopt to address the legitimacy gap. First, the organisation can adapt its business operations to conform to existing definitions of legitimacy. Second, the organisation can attempt to alter the current definition of social legitimacy through communication, so that the definition conforms to the organisation's existing values and practices. Lastly, the organisation can attempt, through communication, to become identified with values or institutions that have a very strong base of social legitimacy.

Suchman (1995) contended that the appropriateness of legitimacy strategies is largely dependent on the nature of an organisation's challenges. Suchman classified organisations' challenges for legitimation into gaining, maintaining and repairing legitimacy. Organisations that are embarking on a new product or business operation are classified as organisations that are attempting to gain legitimacy, because there are no or fewer precedent social norms and thus a need to acquire societal acceptance and validity. Organisations belonging to this category need a proactive approach to

build legitimacy. Organisations that are classified as maintaining legitimacy are deemed to have an easier task than those attempting to gain or repair legitimacy. Suchman proposed different strategies for this classification depending on whether organisations are seeking to maintain legitimacy due to anticipated future changes or to protect past achievements. Organisations need to focus on their ability to recognise their audiences' reactions in the case of emerging changes. In addition to this, organisations attempting to protect past achieved legitimacy should avoid unexpected events that may trigger new scrutiny. Suchman suggested that organisations can provide explanations for the change and focus on making the change seem "natural and inevitable" (p. 596). Organisations that are classified as repairing legitimation are deemed to be similar to those attempting to gain legitimacy, except that the approach for them is considered to be reactive instead of proactive. Organisations that seek to repair legitimacy are expected to respond to any unforseen reaction from society.

2.5.2.2 Empirical studies of the legitimacy theory

Most prior literature uses the legitimacy theory to explain actions that companies have undertaken to regain their legitimacy when they encounter events which threaten their legitimacy status. Companies may increase environmental disclosures in the annual reports to legitimise their business operations to the community (Deegan & Rankin, 1996; Patten, 1992). In contrast, O'Donovan (2002) proposed that the legitimacy theory can be used strategically by companies to gain competitive advantage over their competitors through adequate information disclosures.

O'Donovan (2002) adopted the classification in Suchman (1995) related to the different challenges encountered by companies in the process of legitimation. O'Donovan aimed to apply the legitimacy theory by investigating possible relationships between a potential legitimacy threat from an environmental issue and several related issues such as the choice of and purpose for legitimacy strategies and the disclosures made in company annual reports. O'Donovan interviewed six senior managers from three large Australian companies which operate in the mining (BHP Ltd), chemical (Oric Ltd) and paper and pulp (Amcor Ltd) industries. These companies were selected because they were the leading disclosers of environmental information within the

industry group for the year 1983 to 1997 in a study by Gibson and O'Donovan (cited in O'Donovan, 2002, p. 353).

The results from O'Donovan (2002) supported the legitimacy theory and provided empirical evidence that the legitimacy theory can explain managers' decisions on environmental disclosures in the annual reports. A strong correlation was found between the significance of an environmental issue decisions on environmental disclosures. An environmental issue of low significance would not be considered a legitimacy threat and this would normally not warrant a need to use any strategies, resulting in no disclosures. For environmental issues of medium and high significance, companies that are seeking to maintain a high level of legitimacy and those seeking to repair legitimacy are likely to adopt strategies to alter societal perspectives or to conform to society's expectations. Companies seeking to gain legitimacy are likely to adopt a strategy to alter societal perspectives and are unlikely to adopt strategies to conform. Hence, O'Donovan concluded that companies' decisions on environmental disclosures and adopted strategies are made on the basis of projecting a positive and legitimate corporate image.

Whereas O'Donovan (2002) focused on investigating companies' reactive approach to a potential legitimacy threat in environmental issues, van Staden and Hooks (2007) examined companies' proactive approach towards achieving legitimacy. Van Staden and Hooks assessed the relationship between companies' environmental responsiveness and their voluntary environmental disclosures. Van Staden and Hooks defined environmental responsiveness as "a measure of an entity's sense of responsibility for its environmental impact and includes the development of strategies, policies, objectives and targets to address this responsibility" (p. 198). Van Staden and Hooks used the 2002 environmental responsiveness ranking from the survey results of the Centre for Business and Sustainable Development (CBSD) to measure the companies' environmental responsiveness. The CBSD has conducted yearly survey since 1999 on New Zealand companies and the survey does not based its information on companies' disclosures but collects information directly from a responsible officer of each company. The rankings awarded to companies by the CBSD was considered to be reliable and valid by van Staden and Hooks because they were provided by an independent external part that has professional knowledge in environmental issues.

Van Staden and Hooks evaluated companies' voluntary environmental disclosures using companies' environmental reporting in various different resources that includes annual reports, stand-alone environmental reports and company websites. Positive correlation was found between companies' environmental responsiveness and disclosures, indicating that responsive companies are taking a proactive approach to organisational legitimacy.

Similarly, Patten (1992) study provided evidence that supported the legitimacy theory when he found increased environmental disclosures by petroleum companies after the Alaskan oil spill incident. He examined the annual reports of 21 listed petroleum companies of the 1989 Fortune 500 for environmental disclosures and found a significant increase in environmental disclosures after the disaster.

Deegan and Rankin (1996) also provided empirical evidence that supported the legitimacy theory. They investigated the environmental disclosures of twenty Australian companies that were successfully prosecuted by the Environmental Protection Authorities during 1990 to 1993. They found eighteen of the selected companies provided increased environmental information in their annual reports. The information disclosed was predominately favourable qualitative disclosures and only two out of the eighteen companies provided details of the prosecutions. Deegan and Rankin (1996) suggested that the legitimacy theory could explain the increase in environmental disclosures as it appeared that the companies felt the necessity to legitimise their business operations through disclosing positive environmental news.

Recent research conducted by Cho et al. (2015) provided strong evidence that legitimacy is still a significant factor affecting companies' environmental and social disclosures. They reviewed annual reports of companies from the Fortune 500 companies for the period 1977 and 2010. The results from their study indicates that legitimacy factors continued to be important as the differences in the environmental and social disclosure items remain largely unchanged over time.

However, the results from Wilmshurst and Frost (2000) provided limited support for the legitimacy theory. They analysed management's motivation for environmental disclosures in company annual reports. While most had provided a higher level of

environmental disclosures in response to the perceived stakeholders' demand for sustainability information, their study failed to establish a correlation between specific environmental issues that require legitimating and environmental disclosures that were disclosed in the annual reports.

A longitudinal study of BHP Ltd by Guthrie and Parker (1990) also failed to confirm the legitimacy theory's explanation of the social disclosures in BHP Ltd's annual reports over 100 years to 1985. Deegan, Rankin, and Tobin (2002) re-examined BHP Ltd's annual reports for 15 years from 1983-1997 for social and environmental disclosures, focusing on the impact of public concern through the media. Deegan et al. (2002) noticed that greater media attention had increased corporate disclosures, and annual reports were used to regain legitimacy especially when there was adverse media opinion.

2.6 The Global Reporting Initiative (GRI) Framework

Prior research studies have found that many companies globally have been utilising the Global Reporting Initiative (GRI) reporting framework for their sustainability reporting, and the framework has become commonly regarded as the leading standard for sustainability reporting (Adams & Frost, 2007; Betianu, 2010; Dingwerth & Eichinger, 2010; Frost et al., 2005; Hussey et al., 2001; Tiong & Anantharaman, 2011). This is evident from the results of a survey conducted by KPMG on more than 2200 companies including Global Fortune 250 (G250) and the 100 largest companies by revenue (N100) in 22 countries. KPMG found more than three-quarters of the G250 and nearly 70% of the N100 used the GRI framework for their reporting (KPMG, 2008). In a recent survey conducted by KPMG (2015), it was found that the GRI remains the most popular voluntary reporting guideline worldwide, even though it was noted that there has been a decline in the use of the GRI reporting framework by the world's largest companies.

2.6.1 Formation and development of the GRI

The roots of the GRI, which was established in 1997, can be traced to the Coalition for Environmental Responsible Economics (CERES) and the Tellus Institute in the United States. The idea to develop an environmental reporting framework was pioneered by two individuals: Dr Robert Massie (CERES President) and Dr Allen White (Tellus Institute Acting Chief Executive). A department was formed for the 'Global Reporting Initiative' project with the primary aim being to ensure that corporations are following CERES principles for responsible environmental conduct. The department established the guidelines for the reporting of non-financial environmental information ("GRI's History," n.d.).

Initially, the department focused solely on environmental issues. Within a year, in 1998, a steering committee was formed and the scope of the GRI expanded to include the triple bottom line concept (Brown, de Jong, & Lessidrenska, 2009; Elkington, 1999) that included reporting on social, economic and environmental issues. By 2001, the GRI was operating separately as an independent organisation ("GRI's History," n.d.).

2.6.2 The GRI framework

The GRI stipulates that sustainability reports should first identify topics and related performance indicators that are relevant and appropriate for reporting by considering the reporting principles of materiality, stakeholder inclusiveness, sustainability context, and completeness ("Defining Report Content: The Process," n.d.). The framework provides guidance to assist users to determine what content and issues are reportable for sustainability. It guides users through each of the reporting principles by defining, explaining and providing a set of tests for each individual principle. Any information that has a significant impact on the social, economic and environmental context or that substantially affects the stakeholders' decisions requires reporting under the GRI framework. Reporting organisations are expected to identify their stakeholders and explain how their sustainability reports have responded to their stakeholders' interests. The framework also requires organisations to include information on their current contributions to and future development plans in relation to sustainability. In addition,

the GRI framework stresses the importance of completeness in the organisations' coverage of their sustainability disclosures.

The GRI framework aims for organisations to provide quality information in their sustainability reports by ensuring that the disclosed information has the following attributes: balance, comparability, accuracy, timeliness, clarity and reliability ("Reporting principles for defining quality," n.d.). The framework provides details about how each of these attributes can be attained. It specifies that quality information should balance favourable and unfavourable disclosures. Sustainability disclosures are required to be presented in a way that allows comparisons within the organisations, across periods and among other organisations. The disclosures should also be sufficiently accurate to provide stakeholders with details to assess the organisations' performances and the reporting needs to be done regularly to ensure timely information is presented with clarity to stakeholders so that they can make informed decisions. In addition, the sustainability disclosures should be reliable, suggesting that the information "should be gathered, recorded, compiled, analyzed, and disclosed in a way that could be subject to examination" ("Reporting principles for defining quality," n.d.).

Adopting the above conceptual principles, the first version of the GRI sustainability reporting framework was launched in 2000. The framework promoted transparency and accountability in organisations by developing comprehensive performance indicators in three aspects of sustainability: social, economic and environmental. The second version of the GRI framework, G2, was introduced in 2002 at the World Summit on Sustainable Development in Johannesburg ("GRI's History," n.d.) and was embraced by the United Nations Environment Program. In 2006, the GRI launched the G3 version with more than 3000 experts that participated in the development process. These participants consisted of multi-stakeholder groups, which included business, civil society and labour movement groups. This evidently demonstrated the GRI's core approach for stakeholders' involvement in its activities. Subsequently, the GRI published the G3.1, an updated and completed version of performance indicators in March 2011.

The latest version of the GRI framework, G4, was released in May 2013. The G4 version was developed with the aim of making the guidelines more user-friendly than previous versions and emphasised that organisations should focus on reporting issues that are material to their business and key stakeholders ("G4 Development Process," n.d.).

This research has chosen to utilise the GRI G3.1 version framework rather than the latest G4 version to develop the new scoring index as the G4 version had just been released when this research commenced and subsequently has not yet been adopted by the majority of companies. In addition, this research study is designed to apply the newly developed index to analyse the sustainability information disclosed in companies' reports in 2012. Therefore, the G3.1 version is considered to be the most recent and relevant version for this process.

2.6.3 The GRI application levels

The GRI developed three application levels (A, B or C) that reporting organisations can use to evaluate their sustainability disclosures. The GRI listed reporting criteria that companies can check against to determine their level of disclosures. A level A indicates that the companies have reported on all the performance indicators in the G3 framework and has provided explanations for the omitted indicators. Corporations in the level A are also required to provide a statement on their management approach to the indicators. A level B and C indicate that the companies have reported on a minimum of twenty and ten performance indicators respectively.

Using the GRI application levels, companies are required to self-declare the level of their disclosures based on their own assessments. Companies can choose to either have a third party verification or request the GRI to confirm their self-declaration. Companies that successfully completed a GRI application level check are awarded a special GRI-checked icon with information about their assessment bodies. Companies with the GRI award are also granted a statement to formally confirm that their sustainability disclosures conform to the criteria set out by the GRI for a particular application level. The GRI also recommends companies to engage a third party to

have their sustainability reports externally assured to increase the credibility of the reports ("GRI Application Levels," n.d.).

2.6.4 Empirical studies on the GRI framework

Hussey et al. (2001) studied ten global companies from three industry groups (energy and oil, consumer goods, and health care products) that have made a formal commitment to be sustainable in their products, processes and services. The ten global companies include British Petroleum (BP), Shell, and Sunoco in the energy and oil industry; Procter and Gamble (P&G), 3M, DaimlerChrysler and Volvo in the consumer goods industry; and Bristol-Myers Squibb, Johnson and Johnson, and Baxter International in the health care products industry. They reviewed a total of 23 environmental reports of these ten companies that were published during the period 1995 through 2000 by matching the disclosures against the GRI framework. They found that all the companies reported mainly in the environmental aspect, with very minimal information in the economic and social aspects of the GRI framework. They proposed that these companies focused on the environmental aspect due to regulatory requirements; reporting on the economic and social aspects was minimal as they were considered to be at their early stages.

As part of the study, Hussey et al. (2001) compared the GRI framework with other available reporting frameworks such as the Global Environmental Management Initiative (GEMI) and the Coalition for Environmental Responsible Economics (CERES). It was found that the other frameworks are either too high level or too general which make them less comprehensive compared to the GRI guidelines. Hussey et al. thus concluded that the GRI framework appears to be the 'best available tool' for sustainability reporting.

Tagesson et al. (2009) used the GRI framework to evaluate the extent of social and environmental disclosures of 267 Swedish listed companies on the Stockholm Stock Exchange. The empirical data for their study was collected from the companies' annual reports and websites. Tagesson et al. divided the GRI performance indicators into three areas: environmental, ethics and human resources. They analysed the data

using an unweighted scoring approach with a total of 22 performance indicators categorised into environmental disclosures (8), ethics disclosures (8) and human resources disclosures (6). Tagesson et al. examined the relationships between the extent of the social and environmental disclosures and companies' characteristics (size, industry type, profitability, and ownership structure and ownership identity). They found significant positive correlations between the extent of the disclosures and the companies' sizes and profitability. Corporations within the consumer goods industry provided more disclosure about ethics while those in the raw materials industry provided more disclosure about the environment. It was also found that state-owned companies provided more disclosures than the privately-owned ones.

Frost et al. (2005) reviewed the sustainability reporting in Australia using the GRI G2 framework. With a total of 40 performance indicators categorised into 24 social performance indicators (labour practice: 11, human rights: 7, society: 3 and product responsibility: 3) and 16 environmental performance indicators, Frost et.al. assessed 25 companies from the top 500 listed on the Australian Stock Exchange (ASX) which issued discrete sustainability reports as at September 2003. They studied the sampled companies' annual reports, discrete sustainability reports and their corporation websites. Frost et al.'s study revealed the following results:

- There were very few sustainability disclosures in the annual reports as most of the sampled companies had produced discrete sustainability reports.
- The overall number of disclosures using the GRI performance indicators was generally low. The average number of indicators used in the discrete reports was 7.24 while that used in the website was 6.28.
- There is significant variation among the companies over the range of GRI performance indicators used.
- Not all companies use the GRI framework as a checklist for their reporting.

A more recent empirical study conducted by Tiong and Anantharaman (2011) applied the latest GRI G3 guidelines and the GRI (2008) financial services sector supplement to three banks in Australia. The three banks (ANZ, NAB and Westpac) were selected as they have employed the GRI G3 framework in their sustainability reporting. All the

three selected banks' sustainability reports were awarded a level "A" by the GRI. Despite satisfying the highest level in the GRI framework, Tiong and Anatharaman still identified flaws in the banks' sustainability reports. Westpac was found to provide information on all the 95 GRI required performance indicators; ANZ failed to provide disclosures on 11 indicators, but had provided reasons for their omissions; NAB, however, omitted a total of 31 indicators and failed to justify the reasons for their omissions.

2.6.5 Limitations of the GRI framework

While the usefulness and comprehensive attributes of GRI are appreciated by most prior research studies (Betianu, 2010; Frost, 2007; Frost et al., 2005; Hussey et al., 2001), others have critiqued the GRI. Brown et al. (2009) highlighted the impracticality and inconsistency between the expectations of the GRI developers and the users. The GRI developers demand high quality sustainability reporting from companies that adopt the GRI framework for their reporting. However, according to Brown et al., smaller firms tend to find the GRI framework too complicated and demanding, while larger companies find the GRI framework too standardised or insufficiently specific. This is concurred by Frost et al. (2005), who suggested that "there will always be potential problems with the adoption of a generic set of reporting guidelines given the diversity of the issues covered and the complex nature of corporations" (p. 90).

Furthermore, Brown et al. (2009) pointed out that the GRI framework does not provide insight to the actual progress of an organisation towards sustainability. The extent of the disclosures under the GRI reporting framework is also one of the major concerns, as the sustainability reports are neither audited for their contents nor verified against actual sustainability performance.

Dingwerth and Eichinger (2010) analysed the GRI framework and highlighted several drawbacks regarding its actual implementation by corporations. They raised a possibility of contradictory relationships between the GRI's ambitious objectives and its fundamental principles. They also questioned whether the GRI's ambitious calls for transparency and comparability in the sustainability disclosures are actually feasible

and achievable. Dingwerth and Eichinger described the GRI's definition for transparency as normatively demanding because it demands all relevant sustainability disclosures (social, economic and environmental) that would significantly impact the community or would substantially affect the stakeholders' decisions. According to Dingwerth and Eichinger, this demand for transparency may at times contradict companies' other business targets. Using the example of multinational companies that aim to increase their market share, Dingwerth and Eichinger questioned whether these companies would provide all sustainability disclosures including those which might have a negative impact on their companies in securing market leadership.

In addition, Dingwerth and Eichinger (2010) raised the problem of comparability of companies' disclosures. Despite using the same GRI principles and performance indicators, companies' sustainability disclosures could still be substantially different. This is because companies might have not reported on similar indicators as not all the GRI indicators would be equally relevant to all companies. It was also highlighted that companies might address different social and environmental issues in their reports even when the same performance indicators were used. Hence, the comparison problem is still unresolved.

Although the GRI framework awards companies on various application levels to assist users of sustainability reports to determine companies' level of disclosures, these application levels are not reflective of companies' actual sustainability performance and contributions. The focus of the application levels is on assessing the number of disclosures made by companies, without reference to their sustainability performance.

To address the above limitations while at the same time enhancing the comprehensive guidelines provided by the GRI framework, this research developed a new GRI-based scoring index by integrating the GRI framework with the hard and soft principles of Clarkson et al. (2008).

2.7 Clarkson, Li, Richardson and Vasvari's (2008) Environmental Index

To date, the research on the GRI framework has tended to focus on dichotomy studies where only the presence or absence of the GRI performance indicators is recorded. No weighting, scoring or ranking is given to the disclosures; thus, the nature of the disclosures is not evaluated. Clarkson et al. (2008), however, developed a scoring scale based on the GRI G2 environmental performance indicators with the assistance of an expert who was an original member of the GRI Steering Committee. They categorised discretionary information of companies' environmental disclosures into hard and soft items. Hard disclosure items refer to items that were difficult for poor environmental performers to mimic and were awarded higher scores as they represented companies' real commitments in sustainability. Lower scores were allocated for soft disclosure items such as companies' vision and environmental strategy claims that were considered relatively easy for companies to mimic. Clarkson et al. developed an improved measurement with a scoring scale to evaluate the extent of environmental disclosures, as companies that displayed true contributions to environmental sustainability were awarded higher scores to recognise the higher extent of environmental disclosure.

While most of the items in Clarkson et al.'s (2008) environmental index are scored as either '1' or '0' for the existence or absence of the item, there is a section A3 in the hard disclosure category that assesses the extent of a firm's environmental disclosure on specific GRI performance indicators. Disclosure items in this section are awarded a range of scores from 0 to 6, based on performance data presented relative to a range of indicators. A point each is awarded when the performance data is presented and additional points are awarded when the data is presented with information that contains details in each of the following: relative to peers or industry; compared with previous period; compared to targets set; provided in both aggregate and normalised form; or detailed at disaggregate level.

Clarkson et al. (2008) used their index to evaluate the environmental disclosures of 191 companies from the five most polluting industries in the United States: pulp and

paper, chemicals, oil and gas, metals and mining and utilities. They analysed the relationship between the discretionary environmental disclosures in the media, such as the companies' corporate websites and discrete sustainability reports, and the actual pollution discharge data from the United States Environmental Protection Agency's toxics release inventory. A positive correlation was found between environmental performance and the level of environmental and social disclosures in Clarkson et al.'s study. They also found that although companies with good environmental performance were producing more disclosures than those with poor environmental performance, the scores of good environmental performers were still generally low, which suggested substantial improvements were required. In particular, they found that companies whose environmental legitimacy was threatened were making soft disclosure claims to be committed to the environment.

Clarkson et al. (2011) conducted a similar study on 51 Australian listed companies that reported their pollutant emissions data to the National Pollutant Inventory (NPI) in both 2001-2002 and 2005-2006. Using the index developed by Clarkson et al. (2008) , they compared the discretionary environmental disclosures in the companies' annual reports and discrete sustainability reports to the data collected from the NPI for these two periods. Clarkson et al. (2011) found that there was only modest improvement between 2002 and 2006 in the companies' environmental disclosures. They also documented a positive relationship between the discretionary environmental disclosures and the level of emissions. This result is contrary to those obtained in Clarkson et al. (2008) where good performers were producing more disclosures. The results in Clarkson et al. (2011) has raised concerns as poor performers, as indicated in this more recent study, were also disclosing more environmental disclosures. This, apparently, indicates the need to scrutinise companies' sustainability disclosures to ensure companies' disclosures are reflective of their true sustainability performance.

It is evident that Clarkson et al.'s (2008) environmental index enhances the GRI environmental guidelines by distinguishing companies' hard verifiable disclosures from their soft disclosures, which can be easily followed by poor environmental performers. While the hard and soft principles used in Clarkson et al.'s index allows companies with effective environmental performance to be identified, the index is limited by its ability to analyse only the environmental aspect of sustainability. The

primary aim of this research study is to address this gap by integrating the hard and soft principles to include the social and economic aspects of sustainability to yield a comprehensive GRI-based sustainability reporting framework that is capable of identifying companies that have effective sustainability performances in all three aspects of sustainability.

2.8 Company Characteristics Affecting Sustainability Disclosures

Prior research studies have identified a number of company characteristics such as company size, industry type, profitability and management structure that have significant correlations with the amount and nature of sustainability disclosures (Frost, 2007; Gibson & O'Donovan, 2007; Gray et al., 2001; Jones et al., 2007; Michelon & Parbonetti, 2012; Post et al., 2011; Rao et al., 2012; Rupley et al., 2012; Sandhu & Kapoor, 2010; Siregar & Bachtiar, 2010; Tagesson et al., 2009; Webb, 2004). However, these studies have not yielded consistent results. The following factors are likely to have contributed to these inconsistent results: they were conducted at different time periods, they utilised different evaluation methods, they involved different sample sizes, and they analysed companies operating in different countries.

This study has chosen to focus on investigating company characteristics that have been identified as having a correlation with sustainability disclosures that may be explained by the legitimacy theory and the stakeholder theory. The legitimacy theory predicts that larger companies and those with superior financial performance tend to engage in more sustainability disclosures. Larger companies normally attract greater publicity and tend to be under greater scrutiny from their stakeholders. The legitimacy theory suggests that larger companies are more likely to use media as a tool to provide more voluntary sustainability disclosures to legitimise their business activities. These larger companies are also expected to have more human resources and technical knowledge to engage in more active sustainability reporting. Theoretically, profitable companies are also relatively more exposed to political pressure and public scrutiny; therefore, they attempt to provide more sustainability disclosures to minimise potential political costs in the form of increased tax and wages (Deegan, 2013). In addition, profitable companies are deemed to have the economic capacity to produce better

quality sustainability reports. Hence, this study examines the impact of company size and financial performance on sustainability disclosures.

The stakeholder theory stresses the importance of providing sustainability information to companies' different stakeholder groups (Deegan, 2013). Providing sustainability disclosures not only assists companies to gain stakeholder support, it also helps them to assess potential risks in their business operations and improve their sustainability performance (Rao et al., 2012). Larger companies, which have greater number of stakeholders and more diverse stakeholder groups, are expected to engage in more diverse sustainability reporting to satisfy the different needs of their stakeholders. Managers working in companies with better financial performance may be expected to provide more detailed sustainability disclosures to other stakeholder groups to show that corporate social responsibility is not compromised for better financial performance.

According to the stakeholder theory, 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 structure, which involves the system of rules, practices and processes of companies. The ACGC sets out principles and recommendations related to corporate governance for listed companies in Australia. The principles and recommendations are structured to promote the following eight central principles:

- Lay solid foundations for management and oversight
- Structure the board to add value
- Act ethically and responsibly
- Safeguard integrity in corporate reporting
- Make timely and balanced disclosure
- Respect the rights of security holders
- Recognise and manage risk
- Remunerate fairly and responsibly

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 structure (Baysinger & Bulter, 1985), this study investigates the impact of corporate governance on sustainability disclosures through reviewing several aspects of a company's board composition.

The legitimacy theory suggests that companies in environmentally sensitive industries such as the resources industry are more likely to conform to society's expectations for better environmental performance and provide more sustainability reporting (Heard & Bolce, 1981). Evidence from prior research has supported this view and indicated that companies in environmentally sensitive industries provide more sustainability disclosures, especially in relation to environmental aspects (Deegan & Gordon, 1996; Deegan & Rankin, 1996; Frost, 2007; Patten, 1992). Renewed attention to sustainability and increased regulatory obligations in relation to environmental reporting and responsibilities have also resulted in an increased demand for environmental disclosure by stakeholders of resources companies (Dong & Burritt, 2010; Guenther et al., 2006; Wood & Ross, 2008). Stakeholders such as shareholders, governments and public interest groups are interested to know about the additional risks and potential increases in costs that may result from these changes. The stakeholder theory suggests that these companies will likely disclose more environmental related information to satisfy their stakeholders (Deegan & Rankin, 1997; Elijido-Ten, 2007).

Australian resources companies have been required to provide mandatory environmental reporting in their annual reports since July 1 1998 (Adams & Frost, 2007; Deegan & Gordon, 1996; Frost, 2007; Jones et al., 2007; Wood & Ross, 2008). The resources industry is also governed by the extractive industry accounting standard

AASB 1022 which stipulates that environmental information such as provision for site restoration and land rehabilitation and associated costs for treatment of waste materials is disclosed in company annual reports (Deegan, 2013). Furthermore, companies in the resources industry are governed by regulatory measures which include pollution taxes and penalties for breaches of environmental regulations monitored by the Environment Protection Authority in Australia. These companies are involved in the exploration and extraction of minerals, oil and gas and other natural materials, which have significant impacts on the environment and they generally generate "a sufficient output of pollutant chemicals" (Wood & Ross, 2008, p. 7); therefore, they are subjected to high public scrutiny and strict environmental regulations. This research aims to explore the impact of regulatory compliance on the two sectors (metals and mining sector and energy and utilities sector) within the resources companies listed in the Australian Securities Exchange.

While some studies have been conducted on sustainability reporting in the mining and oil and gas industries, only a few of these studies have compared the two industries. Furthermore, most of these studies have focused on the environmental disclosures with little discussion on the social and economic aspects of sustainability. Hence, this research investigates whether companies in the resources industry provide relatively more environmental disclosures over the social and the economic aspects of sustainability due to the legal obligation for mandatory environmental reporting. In addition, this study explores whether the type of resources extracted by companies affect the extent of sustainability disclosures. Sectors within the resources industry are studied to determine if sustainability reporting practices differ significantly between the metals and mining sector and the energy and utilities sector.

The legitimacy theory and the stakeholder theory, together with prior research studies in sustainability, have identified various company characteristics that have impacted sustainability disclosures. This research focuses on investigating the relationships between these company characteristics (company size, financial performance, board composition, and industry types) and sustainability disclosures using the newly developed scoring index.

2.9 Summary

This chapter highlights the developments in sustainability reporting practices and performance. The discussion on the Global Reporting Initiative framework and the Clarkson et al.'s (2008) environmental index explains the reasons and the method that is adopted to develop a new reporting scoring index. The stakeholder theory and the legitimacy theory lay the theoretical foundation and identify the company characteristics that are tested in this study. The next chapter continues this literature review in the development of the hypotheses.

CHAPTER THREE

HYPOTHESIS DEVELOPMENT

This chapter details the development of the hypotheses to address the research questions in this study. The research hypotheses were established 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 selected company characteristics (the independent variables) including company size, financial performance, board composition, and industry types, as explained in Chapter 2.

This project studies all three aspects of sustainability disclosures by investigating the correlations between social, economic and environmental disclosures and company characteristics. Most of the studies which have utilised the Global Reporting Initiatives (GRI) framework have assessed the extent of sustainability disclosures based on the number of GRI performance indicators reported. This study develops a new GRI-based reporting index that integrates the hard and soft principles used in Clarkson et al. (2008) into all three aspects of the GRI framework. The hypotheses formulated are tested using the newly developed reporting index.

3.1 Company Size

Company size has been commonly considered an influencing factor in the analysis of the extent of sustainability disclosures (Adams et al., 1998; Hackston & Milne, 1996; Roberts, 1992). Larger companies are generally under greater public scrutiny due to greater media exposure (Frost, 2007), which attracts greater attention from both the general public and special interest groups (Roberts, 1992). The legitimacy theory suggests that larger companies tend to provide more sustainability disclosures to demonstrate their compliance to responsible corporate behaviours that are expected by the society. In addition, larger companies have more diverse groups of stakeholders,

such as shareholders and employees, who are concerned about their companies' sustainable developments and who tend to demand and exert greater pressure on companies to provide more extensive sustainability disclosures. Furthermore, large companies are expected to have more financial and human resources to engage in more extensive disclosures.

Many prior studies have established a positive relationship between company size and the extent of sustainability disclosures and results were generally consistent with samples from many different countries that include the following: Australia (Jones et al., 2007); Denmark (Andrikopoulos & Kriklani, 2013); Japan and the United States (Ho & Taylor, 2007); Netherlands, Switzerland, France, Germany and the United Kingdom (Adams et al., 1998); New Zealand (Hackston & Milne, 1996); Sweden (Adams et al., 1998; Tagesson et al., 2009); Indonesia (Siregar & Bachtiar, 2010); and Thailand (Suttipun & Stanton, 2012).

Adams et al. (1998) examined 150 annual reports from six European countries (Netherlands, Switzerland, France, Germany, Sweden and the United Kingdom) and found that larger companies provided more sustainability disclosures in all three categories studied – environmental, employee and ethical issues. Similar significant results were observed across all the six different countries studied by Adams et al. Thus, they concluded in their study that significant correlation existed between the company size and the extent of sustainability disclosures, in spite of several apparent differences across the European countries: culture, accounting systems, banking and finance systems, government and legislative systems, and influences of pressure groups.

Adams et al. (1998) also observed that there was a significant inter-relationship between company size and company industry membership and disclosures on environmental and employee issues. Larger companies in more sensitive industries were found to be disclosing significantly more information about the environmental and employee issues. However, there was no consistent effect on their disclosures on ethical issues.

This result was consistent with Hackston and Milne (1996) study on New Zealand companies. Hackston and Milne found a 'size-industry' disclosure relationship.

Roberts (cited in Hackston & Milne, 1996) classified profile industry as "those with consumer visibility, a high level of political risk or concentrated intense competition" (p. 87). They found that "size-disclosure relationship is much stronger for the high-profile industry companies than for the low-profile industry companies" (p. 102). These findings are in line with the study of Deegan and Gordon (1996) on Australian companies which found that large companies are only disclosing more environmental disclosures when they operate in environmentally sensitive industries.

Jones et al. (2007) investigated the top 100 listed companies on the Australian Securities Exchange (ASX) in 2004 and analysed the environmental and social information disclosed in these companies' annual reports, sustainability reports and corporate websites. Unlike the results found in Adams et al. (1998) where ethical issues did not reflect the 'size-industry' relationship, Jones et al. found that larger firms and resource companies are associated with significantly higher sustainability disclosure index scores that include both environmental and social indicators.

Focusing on an environmentally sensitive industry - Australian resources - this research investigates if a significant relationship exists between a company's size and the extent of sustainability disclosures. This study determines if significant correlations exist between company size and total sustainability disclosures, as well as between company size and each individual aspect of sustainability – social, economic and environmental. Results from prior studies have suggested that company size is positively associated with all three aspects of sustainability disclosures and thus this study proposes the following hypotheses:

H1: There is a positive relationship between company size and the extent of total sustainability disclosure provided by companies in the resources industry.

H1A: There is a positive relationship between company size and the extent of total economic disclosure provided by companies in the resources industry.

H1B: There is a positive relationship between company size and the extent of total environmental disclosure provided by companies in the resources industry.

H1C: There is a positive relationship between company size and the extent of total social disclosure provided by companies in the resources industry.

Numerous variables that have been used in prior studies to proxy company size are used in this study. These include market capitalization (Hackston & Milne, 1996; Ho & Taylor, 2007; Jones et al., 2007), total revenue (Adams et al., 1998; Hackston & Milne, 1996; Tagesson et al., 2009) and total assets (Andrikopoulos & Kriklani, 2013; Hackston & Milne, 1996).

3.2 Company Financial Performance

Prior studies have tested company financial performance against the extent of sustainability disclosures. Evidence has suggested that companies with greater financial performance tend to provide more sustainable disclosures (Gray et al., 2001; Ho & Taylor, 2007; Jones et al., 2007; Tagesson et al., 2009). Jones et al. (2007) suggested several reasons for this positive relationship. First, companies with better financial performance are likely to have more financial resources to devote to voluntary sustainability disclosures. Second, these profitable companies tend to be more effectively managed companies. Consequently, it is probable that companies that can effectively manage financial issues are likely to be effective in their management of other activities such as sustainability reporting. Lastly, profitable companies, especially those in highly regulated and reputable industries such as resource companies and banks, may be subjected to additional political cost in the absence of adequate disclosures. Jones et al. proposed that these companies would likely be more motivated to provide more extensive sustainability disclosures to justify their strong financial performance.

These suggested reasons are consistent with those proposed in other prior studies. Watts and Zimmerman (1978) indicated that demands placed on companies by interest groups such as governments, trade unions and environmental lobby groups might be affected by the accounting performance of the companies. Companies with high profit records may attract political costs in the form of increased taxes, increased wage claims or product boycott (Deegan, 2013). Thus, it is predicted that companies

may attempt to avoid these political costs by voluntarily providing both financial and sustainability information to justify that their social responsibilities have not been compromised while pursuing the objective of earning high profits.

Jones et al.'s (2007) study yielded a mixed result when they analysed company financial performance of the top 100 listed companies in the ASX. They examined the firms' abnormal stock market returns and other various financial performance indicators. They explored a total of nine financial variables: cash position to total assets, net operating cash flow to total assets, total liabilities to total equity (leverage), working capital to total assets, retained earnings to total assets, price to book value, net tangible asset per share, capital expenditure to total assets and interest cover ratio. They found strong statistical relationships between the extent of sustainability disclosures and seven of the nine selected financial performance indicators. Only cash position to total asset and price to book value were found to be negatively correlated to the extent of sustainability disclosures.

Tagesson et al. (2009) conducted their study to evaluate the relationship of companies' disclosures in environmental, ethics and human resource disclosures and their financial performance using return on asset (ROA) and return of equity (ROE) as proxies for financial performance variables. Their study yielded a significant positive relationship between company financial performance and the extent of sustainability disclosures. In contrast, Ho and Taylor (2007) obtained a different result when they examined the 50 largest companies from both the United States and Japan. They discovered a negative relationship between financial performance (leverage and liquidity) and the extent of sustainability disclosures.

Prior research has employed different proxies to determine company financial performance. While most studies have established a positive correlation between company financial performance and sustainability disclosures, there have been some inconsistent results, especially when different proxies were used. This research analyses the relationship between a company's financial performance and its extent of sustainability disclosures in the three aspects of sustainability (social, economic and environmental) using various proxies such as operating revenue, earnings before

interests and taxes (EBIT), return on assets (ROA), return on equity (ROE), book value per share and year-end share price.

According to the results and analysis from prior studies, it is expected that companies in the resources industry, which is an environmentally sensitive industry, are likely to provide a greater extent of sustainability disclosures to justify their better financial performance to avoid potential political costs. Hence, the following hypotheses are proposed.

H2: There is a positive relationship between company financial performance and the extent of total disclosure provided by companies in the resources industry.

H2A: There is a positive relationship between company financial performance and the extent of economic disclosure provided by companies in the resources industry.

H2B: There is a positive relationship between company financial performance and the extent of environmental disclosure provided by companies in the resources industry.

H2C: There is a positive relationship between company financial performance and the extent of social disclosure provided by companies in the resources industry.

3.3 Board Composition

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). Hence, it is posited that a board composition that supports stronger board governance will result in broader awareness and concern for companies' stakeholders, and this situation may lead to a higher quality of sustainability reporting (Rupley et al., 2012).

Gibson and O'Donovan (2007) also claimed that corporate governance is closely related to sustainability reporting. This concept is in line with the Global Reporting Initiative's definition for sustainability when governance performance is included as a component of sustainability. Previous research has also provided empirical evidence that sustainability reporting is affected by important corporate governance attributes such as the composition of the board of directors (BOD) of a company (Michelon & Parbonetti, 2012; Post et al., 2011; Rao et al., 2012; Rupley et al., 2012; Siregar & Bachtiar, 2010; Webb, 2004).

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 aspects 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.

While recent research has tested the relationship between environmental disclosure and board composition, they have tended to focus only on the environmental aspect of sustainability. This study fills this gap by extending the study to evaluate the relationships of board composition with all three aspects of sustainability disclosures, including the economic and social aspects. This research studies the various aspects of board composition including the proportion of independent directors, multiple directorships, Chief Executive Officer (CEO) duality, women directors on the board and the existence of a sustainability committee.

3.3.1 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 following hypotheses are proposed.

H3(i): 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.

H3(i)A: 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.

H3(i)B: 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.

H3(i)C: 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.

3.3.2 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 following hypotheses are proposed:

H3(ii): 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.

H3(ii)A: 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.

H3(ii)B: 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.

H3(ii)C: 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.

3.3.3 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 hypotheses as follows.

H3(iii): Companies in the resources industry with CEO duality provide a lesser extent of total disclosure.

H3(iii)A: Companies in the resources industry with CEO duality provide a lesser extent of economic disclosure.

H3(iii)B: Companies in the resources industry with CEO duality provide a lesser extent of environmental disclosure.

H3(iii)C: Companies in the resources industry with CEO duality provide a lesser extent of social disclosure.

3.3.4 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, Cheng, & Gray, 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, several hypotheses are proposed, as follows:

H3(iv): 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.

H3(iv)A: 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.

H3(iv)B: 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.

H3(iv)C: 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.

3.3.5 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 following hypotheses:

H3(v): Companies in the resources industry with a sustainability committee provide a greater extent of total disclosure.

H3(v)A: Companies in the resources industry with a sustainability committee provide a greater extent of economic disclosure.

H3(v)B: Companies in the resources industry with a sustainability committee provide a greater extent of environmental disclosure.

H3(v)C: Companies in the resources industry with a sustainability committee provide a greater extent of social disclosure.

3.4 Resources Industry

Companies in the Australian resources industry are legally obliged to provide mandatory environmental reporting. They are also under strong public scrutiny to include additional voluntary sustainability disclosures. Furthermore, various benefits such as increased sales, reduced operating costs and increased customer loyalty have given companies incentives to be proactive in their sustainability reporting (Adams & Zutshi, 2004; Creyer, 1997; Mohr & Webb, 2005). However, the lack of a standardised reporting framework for these companies has yielded varying degrees of sustainability disclosures (Dong & Burritt, 2010; Guenther et al., 2006; Perez & Sanchez, 2009).

The resources industry in the Australian Securities Exchange (ASX) has two sectors: metals and mining and energy and utilities. The two sectors differ in the types of resources extracted. The metals and mining sector consists of companies involved in mineral exploration, development and production. On the other hand, the energy sector comprises companies that engage in the exploration and development of coal, uranium, oil and gas, and renewable energy assets. Companies in the utilities sector are generally involved in water, electricity and gas distribution. Both sectors belong to the larger extractive industry and they share some similarities: they are required to comply with the AASB 1022 accounting requirements for extractive industries; their operating activities have significant impacts on the environment; they are subjected to high levels of public scrutiny; and they generally need to demonstrate significant efforts in sustainability for approval of their operating licenses.

However, according to Guenther et al. (2006), the two sectors do differ in other ways. They have different professional industrial associations that produce varying guidelines to assist in their environmental disclosures. Also, companies in the two sectors have placed different emphasis on different environmental performance indicators. Firms in the mining sector have tended to disclose more information in

areas such as land use and rehabilitation while companies in the oil and gas sector have disclosed more details on transportation methods and oil spill incidents. Furthermore, companies in the mining industry have followed the GRI guidelines more closely than companies in the oil and gas industry, which followed the guidelines developed by their industry associations. In their study, Guenther et al. found that in general the mining industry reported a higher number of environmental performance indicators compared to the oil and gas industry. They concluded that the differences between the reporting practices in the two sectors were likely due to varying reporting strategies and monitoring methods in the two industries.

In contrast, Bolívar (2009) yielded different results when he compared listed Spanish companies in the utility and resources sectors. He found that the sampled companies in the utility sector disclosed more environmental disclosure than those companies in the resources industry. He noted that companies in the utility sector had disclosed their company code of conduct and published contact details of the personnel in charge of sustainability to facilitate feedback. These reporting features were not found in the sampled companies from the resources sector. They also noticed that companies in the resources sector had focused on reporting on environmental revenue aspects that were closely linked to environmental grants and tax deductions for environmental investments. While Bolivar's study provided valuable insights into the reporting practices in these two sectors, his findings may not be representative due to a small sample size of nine.

Perez and Sanchez (2009) and Dong and Burritt (2010) conducted studies on the mining sector and the oil and gas sector respectively. Both found that their sampled companies provided broad coverage of the disclosed information, and companies in both sectors failed to provide disclosures with quantified targets and outcomes. Generally, they found that the companies disclosed wide-ranging information such as statement of economic goals, but failed to provide meaningful disclosures relating to specific volume and quality or comparison to standard or regional levels.

While many studies have been conducted on sustainability reporting in the mining and oil and gas industry, only a few of these have compared the two industries. Furthermore, most of these studies have focused on the environmental disclosures

with little discussion on the social and economic aspects of sustainability. Due to this limited research comparing the two sectors, it is difficult to predict which sector may be producing more sustainability disclosures. However, it is expected that there are differences in their extent of disclosures due to different reporting practices in the two sectors (Guenther et al., 2006). Therefore, this study proposes alternative hypotheses as follows:

H4: There are differences in the extent of total disclosure provided by companies in the metals and mining sector compared to those in the energy and utilities sector.

H4A: There are differences in the extent of economic disclosure provided by companies in the metals and mining sector compared to those in the energy and utilities sector.

H4B: There are differences in the extent of environmental disclosure provided by companies in the metals and mining sector compared to those in the energy and utilities sector.

H4C: There are differences in the extent of social disclosure provided by companies in the metals and mining sector compared to those in the energy and utilities sector.

Figure 3.1 below sums up the selected independent variables (company characteristics) and proxies that are used in this research. The independent variables with the relevant proxies are statistically tested for their correlations to the dependent variable (extent of sustainability disclosures).

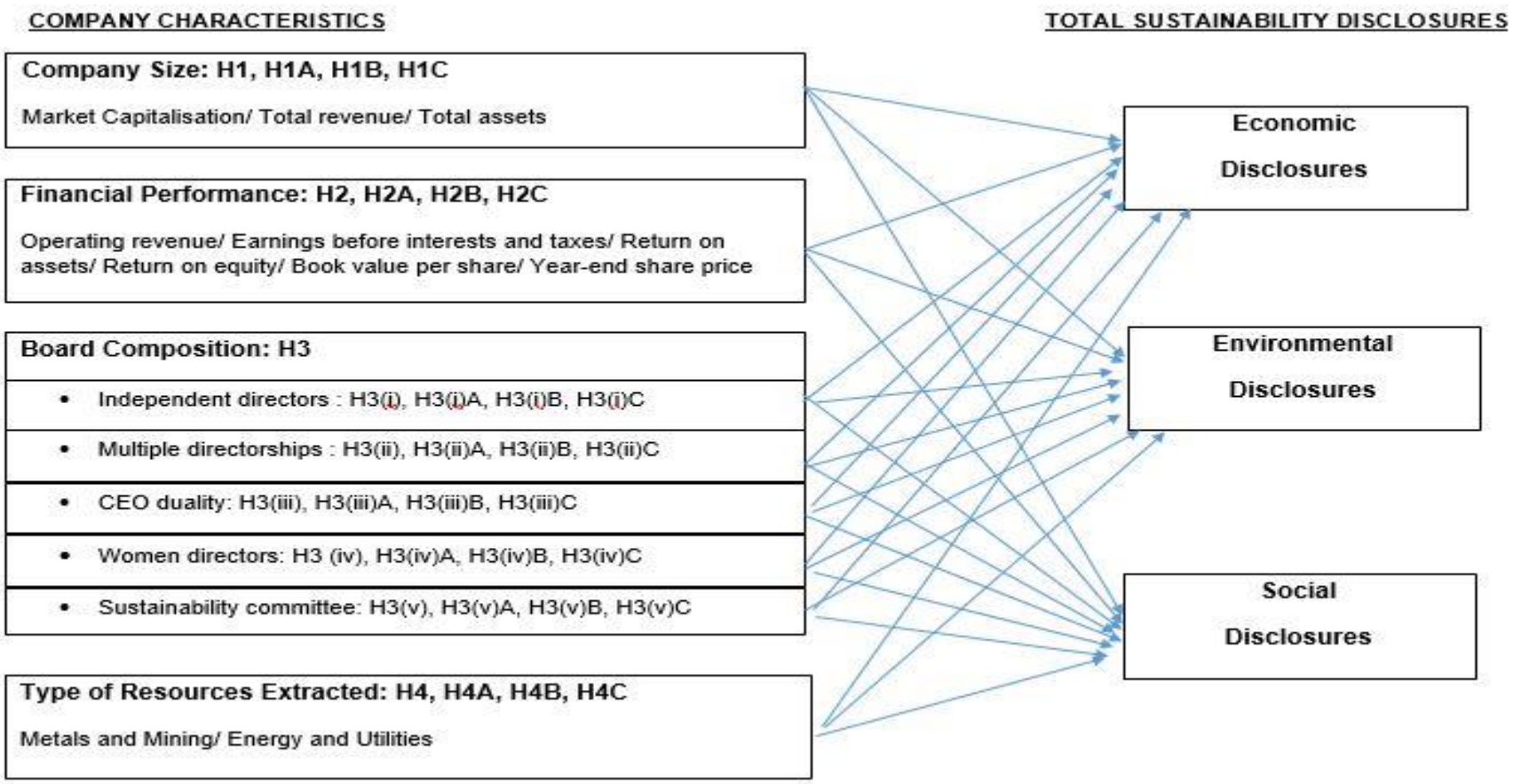


Figure 3.1 Research hypothesis framework

3.5 Hard and Soft Disclosure Items

Prior studies that have used the Global Reporting Initiative (GRI) framework to analyse the extent of sustainability disclosures have tended to focus on the evaluation of content based on the number of indicators reported. The same criterion is used in the GRI awarding system. Organisations are graded A, B or C on their sustainability disclosures by the GRI, according to the number of indicators reported in their company sustainability reports. The sustainability indicators are given equal importance by the GRI framework – no scorings are assigned to them.

This research develops a new GRI-based reporting index to measure the quality of company sustainability reporting. It integrates the hard and soft principles of an environmental index developed by Clarkson et al. (2008) into GRI G3 performance indicators in all three aspects of the GRI framework. Clarkson et al. assigned higher scores to hard environmental GRI performance indicators that were difficult for poor environmental performers to follow. Lower scores were awarded to soft performance indicators such as a company's mission statement that were easily followed by poor environmental performers. Clarkson et al.'s index facilitated an improved measurement of a company's environmental disclosures by awarding higher scores for genuine contribution towards improving the environment. Similar principles are adopted in this study to develop the scoring indexes for the social and economic aspects of sustainability disclosures.

There were two competing predictions that Clarkson et al. (2008) put forward in their study for testing. They claimed that the voluntary disclosure theory predicted that companies who had performed well environmentally would disclose more hard disclosure items to differentiate themselves from their competitors as being 'superior' in environmental performance. On the other hand, social-political theories, such as the legitimacy theory and the stakeholder theory, predicted that companies would disclose more soft disclosure items to simply satisfy their stakeholders' desire for information. These companies would attempt to change stakeholders' perception about their actual

performance by disclosing more soft disclosure items that might be difficult for stakeholders to verify.

Using the same environmental index that was developed by Clarkson et al. (2008), Clarkson et al. (2008) and Clarkson et al. (2011) conducted two separate studies to investigate the relationship between environmental performance and environmental disclosure of companies in the United States and Australia respectively. The two studies yielded contrasting results that were previously discussed in section 2.7 of chapter 2. The results in Clarkson et al. (2008) supported the social-political theories in that companies were disclosing more soft disclosure items, especially those who had their legitimacy threatened. On the contrary, the results in Clarkson et al. (2011) supported the voluntary disclosure theory where companies were found to be disclosing more hard disclosure items to demonstrate their contribution towards sustainability.

Given that the nature of soft disclosure items relates to items that require less effort and commitment from reporting companies, it is predicted that companies in the resources industry are likely to provide more soft disclosure items, especially in the environmental aspects, to satisfy the mandatory reporting requirements in Australia. This argument is in line with results obtained in prior research where the legitimacy theory has been found to be the dominating factor, particularly in environmentally sensitive industries (Cho et al., 2015; Clarkson et al., 2008; O'Donovan, 2002). In a recent longitudinal study performed by Cho et al. (2015) on Fortune 500 data from the late 1970s and 2010, they found that the relationship between legitimacy factors and sustainability disclosures does not differ across the two time periods.

In the absence of a standardised reporting framework that stipulates specific reporting items to be disclosed, companies tend to provide minimum, vague and broad disclosures with little verifiability in the contents (Dong & Burritt, 2010; Guenther et al., 2006; Guthrie et al., 2008). This ensures that they meet the required regulations and satisfy stakeholders, without being penalised for items that are left undisclosed. Hence, it is posited that companies in the resources industry may provide more soft than hard sustainability disclosures in their reports and the following hypothesis is suggested:

H5: Companies in the resources industry provide more soft disclosure items than hard disclosure items.

3.6 Three Aspects of Sustainability Disclosures

This study adopts the Global Reporting Initiative's (GRI) definition for sustainability reporting that includes the provision of information about a company's economic, environmental, social and governance performance ("Sustainability reporting," n.d.). Thus, information disclosed in all three aspects of sustainability (social, environmental and economic) constitutes a total sustainability disclosure. Figure 3.2 below summarises the measurement for the total sustainability disclosure. The framework in Figure 3.2 will be used in this research to measure the total sustainability disclosure of companies in the Australian resources industry.

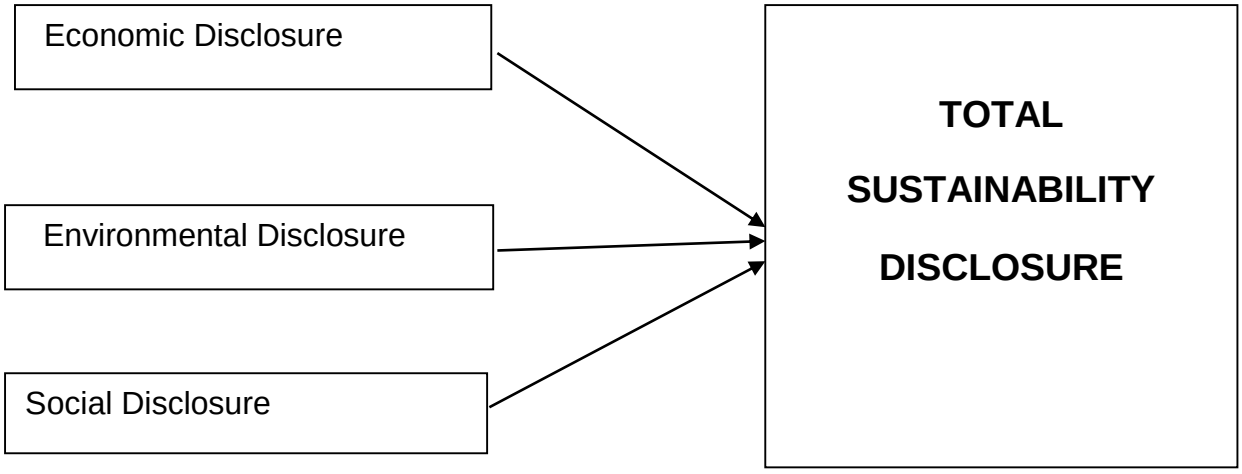


Figure 3.2 Measurement for total sustainability disclosure

Many prior studies have found that companies in the resources industry provide the most sustainability disclosures (Dong & Burritt, 2010; Frost et al., 2005; Guenther et al., 2006; Wood & Ross, 2008).

Rikhardsson, Raj and Bang (cited in Bolívar, 2009, p. 186) found that environmentally intensive companies reported more environmental disclosure than social disclosure.

They observed that companies in environmentally sensitive industries tend to provide more disclosures in environmental issues such as emissions and resource consumption.

Likewise, Yongvanich and Guthrie (2005) study of 100 top mining companies listed on the Australian Securities Exchange yielded consistent results. They noticed that the mining companies have focused on the environmental aspects of sustainability reporting and their reports have "concentrated in a narrow group of reporting elements" (p. 116). They found that companies reported approximately 40.59% of their disclosures in the environmental aspects which concentrated on a few reporting items such as compliance (94.12%), emissions, effluents and waste (88.24%), and energy (58.82%).

Companies in the Australian resources industry are required to provide mandatory environmental disclosures. Their business operations are closely related to the environment and have massive impact on it. As such, they are subjected to high levels of public scrutiny to ensure their compliance. On the contrary, economic and social disclosures are generally voluntary for these companies. Hence, it is proposed that companies in the resources industry are likely to place more emphasis on the environmental aspect of sustainability and produce more environmental disclosures to fulfil the legislative requirements and to satisfy their stakeholders. Consequently, the following hypothesis is proposed:

H6: Companies in the resources industry provide more environmental disclosures than social and economic disclosures in their sustainability disclosures.

3.7 Summary

This chapter has discussed the development of hypotheses that are tested to evaluate the extent of sustainability reporting in the Australian resources industry. These hypotheses are statistically tested in this study through the use of a newly developed GRI-based scoring index that enhances the current GRI framework by distinguishing

between hard and soft disclosure items. The methodology adopted for this study and the details of the testing process are presented in the next chapter.

CHAPTER FOUR

METHODOLOGY

This chapter discusses the procedures and analysis that were used to measure the extent of sustainability disclosures of companies in the Australian resources industry. The research design and method, sample selection, data collection and analysis that were adopted for this study are presented.

4.1 Research Design

Bryman (2016) defines a research design as “a framework for the collection and analysis of data” (p. 40). The research is specifically designed to achieve the main objective of measuring companies’ sustainability disclosures using an enhanced Global Reporting Initiative (GRI) based reporting scoring index. The research design consists of three stages: develop a new scoring index, conduct a pilot study and undertake the main study.

The development of a new scoring index provides an improved instrument to collect and code the data. A pilot study is conducted to assess the appropriateness of the new instrument and to help identify any required revisions prior to the main study. Finally, the main study is undertaken to generate more robust results using a larger sample.

Figure 4.1 below depicts the research design framework.

Figure 4.1 Research design framework

4.2 Research Method

The following sub-sections cover the research methods adopted in the three different stages of the research design.

4.2.1 Develop a new scoring index

This study addresses the problem of a lack of a standardised sustainability reporting framework by developing a new Global Reporting Initiatives (GRI) - based scoring index. This index integrates the fundamental principles of hard and soft disclosures used in the environmental index of Clarkson et al. (2008) into all three aspects (social, economic and environmental) of the GRI G3.1 version.

The G3.1 version of the GRI framework is used to develop this scoring index rather than the latest G4 version, because the G4 version was only released in May 2013 and had not been adopted by many companies at the commencement of this research.

The G3.1 version is considered to be the most relevant version for this study as it is applied to collect data from companies' annual reports and sustainability reports for the period ending 2012.

The development process involves the incorporation of Clarkson et al.'s (2008) environmental index with modifications to form the environmental aspect of the new scoring index. The fundamental principles of the hard and soft disclosure items underlying Clarkson et al.'s index are adopted to develop the social and economic aspects of the new scoring index. Figure 4.2 below summarises and illustrates the development process. A detailed account of the entire integration process is presented in Chapter 5.

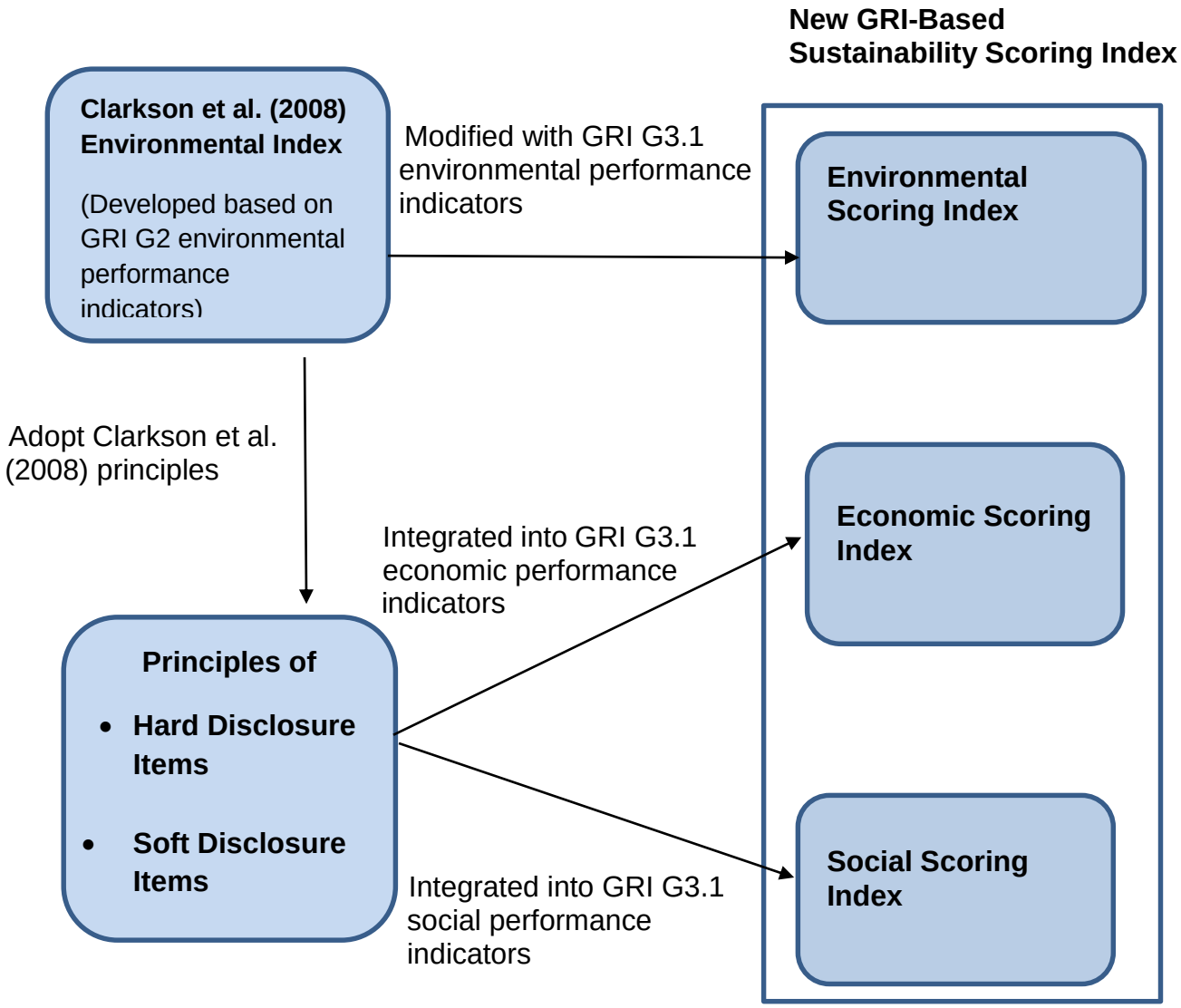


Figure 4.2 Development of a new GRI-based sustainability scoring index

4.2.2 Conduct a pilot study

A pilot study was conducted using the newly developed GRI-based sustainability scoring index to evaluate companies' sustainability disclosure. The pilot study was designed to achieve the following objectives:

- review the validity and feasibility of the newly developed GRI-based sustainability scoring index,
- maintain consistent scoring criteria in the application of the scoring index,
- identify necessary revisions to improve the scoring index,
- provide preliminary findings, and
- review the research design for the main study.

During the pilot study, annual and sustainability reports of selected companies were scored using the new scoring index to test the validity and feasibility of the index. A scoring check list was developed to record the criteria adopted in the scoring process to ensure that consistency is maintained throughout the process. It was crucial to identify any necessary revisions at this initial implementation stage, before the scoring index is applied in the main study. The preliminary results from the pilot study provided an initial overview of the extent of sustainability reporting in the Australian resources industry. The methods, including the procedures for sample selection and data collection, are evaluated in the process of the pilot study to identify any modifications necessary to improve the main study. The details and the implications of the pilot study are explained in Chapter 6.

4.2.3 Undertake the main study

Revisions to the new scoring index identified in the pilot study are implemented before the revised version is applied to a larger sample in the main study. Data collected in the main study is analysed using the Statistical Package for Social Science (SPSS) program version 22 and is applied to test the hypotheses developed in Chapter 3.

4.2.4 Content analysis method

The method of content analysis was applied extensively in both the pilot and the main study. Content analysis method has been widely used to analyse the extent of sustainability disclosures in companies' reports (Gray, Kouhy, & Lavers, 1995; Guthrie & Abeysekera, 2006; Guthrie & Parker, 1990; Steenkamp & Northcott, 2007).

Krippendorff (2013) defines content analysis as "a research technique for making replicable and valid inferences from texts (or other meaningful matter) to the contexts of their use" (p. 24). Krippendorff (2013) emphasises that content analysis, being a research technique, is expected to be reliable and must have the ability to yield valid results. This implies that it should result in findings that are replicable, meaning that researchers that apply the same technique to the same data should obtain the same results despite working at different times and under different circumstances (Krippendorff, 2013).

Chadwick, Bahr, and Albrecht (1984) posit that "content analysis involves systematically coding messages, or information in them, into categories, thus allowing quantitative analysis" (p. 239). Chadwick et al. (1984) argue that one important advantage of content analysis is that it is normally nonreactive in that no human participants are involved in the form of an interview, a questionnaire or a lab test. Content analysis also tends to be relatively inexpensive as the materials involved are usually readily available. It is also the preferred method when direct surveying or observing of the studied population is not feasible. However, drawbacks of content analysis include the difficulty of locating information that is directly linked to the research questions and its inability to be used to test causal relationships between variables.

This study applies content analysis to collect data for both the pilot and the main study by reviewing company annual financial reports and stand-alone sustainability reports. Content analysis was conducted by awarding scores for sustainability information disclosed in these reports based on the scoring criteria of the newly developed GRI-based scoring index. The standardised scoring criteria address potential problems that may arise from the drawbacks of using the content analysis method by ensuring

that content analysis technique can be replicated by the researcher throughout the data collection process. The scoring criteria stipulate a set of comprehensive guidelines to ensure consistency is maintained in the scoring process.

According to Krippendorff (2013), the data coded may be biased if there is only a single coder. To address this problem, this study has engaged another independent coder with experience in using content analysis to revisit a sample of the company reports before the pilot study was conducted. The initial results indicated that there was a small percentage of variance (1%) in the scoring of the researcher and the independent coder. As suggested by Krippendorff (2013), the differences were reviewed by the researcher and the independent coder. The problem was resolved through further discussion and clarification, resulting in the addition of more specific guidelines to the scoring criteria for further coding work. The independent coder applied these additional guidelines when conducting further checking and confirmed that the scoring process was not biased with a single coder. This process is in line with the approach suggested by Chadwick et al. (1984) whereby different coders performed independent coding before their results are compared for reliability. Thereafter, further coding was undertaken by a single coder who had undergone the training process. The same coding and training practice is also adopted in other prior studies (Adams et al., 1998; Jones et al., 2007; Yongvanich & Guthrie, 2005). Further details relating to the specific coding guidelines and their practical applications in the coding process is presented in section 4.4.4 of this chapter.

The data was screened and cleaned before it was analysed. The screening process includes checking for errors and missing data. Checking for errors was done by ensuring that the minimum and maximum values for the variables were within the range of their possible scores. Missing variables were checked and valid values were updated.

4.3 Sample

4.3.1 Selection criteria

This research has chosen to focus on the Australian resources industry for the reasons explained in section 1.3 of Chapter 1. Many prior studies have noted that there is still considerable scope for improvement in sustainability reporting in Australia despite the increase in disclosures in recent years (Clarkson et al., 2011; Dong & Burritt, 2010; Frost et al., 2005; Rao et al., 2012; Yongvanich & Guthrie, 2005). Due to the limited sustainability disclosures among Australian companies, this study targets large companies only, as prior studies have identified that they are representative and generally responsible for establishing corporate trends within their industry; also, they have been found to disclose relatively more sustainability information (Adams et al., 1998; Andrikopoulos & Kriklani, 2013; Dong & Burritt, 2010; Elijido-Ten, 2007; Guthrie & Parker, 1990; Hackston & Milne, 1996; Siregar & Bachtiar, 2010; Tagesson et al., 2009). Hence, purposive sampling is adopted for this study for comparability and relevance (Krippendorff, 2013).

The sample has been selected from listed companies in the resources industry in the Australian Securities Exchange (ASX) for comparability to other prior studies and relevance to the industry focus of this study. Listed companies are chosen as they are normally larger in size (Yongvanich & Guthrie, 2005), are often the most visible, and have significant influence on the economy as both large producers and employers (Andrikopoulos & Kriklani, 2013). The industry classification of the ASX also ensures that companies selected are operating in the resources industry as classified by the Global Industry Classification Standard and can provide relevant data to address the designed research questions.

There are two sectors within the resources sector of the ASX: metals and mining and energy and utilities. This study selected large companies from both sectors of the ASX resources industry based on market capitalisation. Many prior studies have also adopted market capitalisation as their criteria for sample selection (Adams et al., 1998; Dong & Burritt, 2010; Frost et al., 2005; Guthrie & Parker, 1990; Hackston & Milne,

1996; Ho & Taylor, 2007; Jones et al., 2007; Rao et al., 2012; Suttipun & Stanton, 2012).

4.3.2 Selection process

The sample for the pilot study was selected using the sector profile lists produced by the ASX. First, the top 50 companies listed in both the metals and mining and the energy and utilities sectors as at 30 June 2012 were identified. Companies that have a different reporting year-end period are considered to be invalid for inclusion as sample companies for this study. This is because the study, which focuses on a single year of study, uses numerous year-end figures, such as market capitalisation and other balance sheet items, in the analysis. Annual financial reports with a different year-end date and figures will hinder comparison and result in an inaccurate analysis. Hence, companies with a different year-end date were eliminated.

Subsequently, the remaining companies on the top 50 list that had the same reporting currency, Australian dollars, were selected for the pilot study. There were 23 companies from each of the two sectors that matched these selection criteria, making a total sample size of 46 companies for the pilot study. The list of companies and their respective market capitalisation is contained in Appendix 4-1.

A larger sample was planned for the main study. To resolve the problem caused by different reporting currencies in companies' annual financial statements, a common financial database – DatAnalysis - was used. DatAnalysis is a finance database provided by Morningstar, Inc. who is a leading provider of independent investment research in North America, Europe, Australia and Asia. The company commenced operation in 1984 in Chicago and has since grown into a company that has operations in 27 countries, with more than $180 billion in assets under advisement and management as at 31 March 2016. It provides data on approximately 525,000 investment instruments including stocks, mutual funds, and real-time market data on nearly 18 million equities, indexes, futures, options and commodities (Morningstar Inc). A total of 5 and 10 companies from the metals and mining sector and energy and utilities sector respectively were added to the sample for the main study. This brought the total sample for the main study to 61 as shown in Table 4.1 below.

To increase the number of sample companies for the main study, the ASX's list of top 100 stocks for the next quarter – 30 September 2012 - was referred to. A list of the top 100 stock list as at 30 September 2012 was produced by the ASX. A total of 72 companies (32 from the metal and mining sector and 40 from the energy and utilities sector) that matched the selection criteria were included in the sample for the main study. Table 4.1 below presents the entire sample selection process and the number of companies that were selected at each of the stages. The list of sample companies and their respective market capitalisation for the main study is contained in Appendix 4-2.

Table 4.1 Sample selection process for pilot study and main study

Stage	Step	Selection criteria	Metals and Mining	Energy and Utilities	Total	Remarks
Pilot Study		**From the ASX's list of top 50 stock as at 30 June 2012**	50	50	100	
	1	Companies without financial year-end date on 30 June 2012	22	17	19	Eliminated from this study
	2	Companies with financial year-end date on 30 June 2012 and reporting currency in Australian dollars	23	23	46	Sample for pilot study (Appendix 4-1)
	3	Companies with financial year-end date on 30 June 2012 and does not reporting currency in Australian dollars	5	10	15	Included for main study
Main Study		**Total number of valid sample companies for main study (Step 2 and 3)**	**28**	**33**	**61**	
	4	**From the ASX's list of top 100 stock as at 30 September 2012 (Step 2 to 4)**	**32**	**40**	**72**	Included for main study
Final sample for main study			**60**	**73**	**133**	**(Appendix 4-2)**

4.3.3 Descriptive summary

According to DatAnalysis, there were a total of 913 resources companies with a total market capitalisation of $557,769.76 million listed in ASX as at 30 June 2012. This made up the total population intended for this study. 46 companies (5.04% of population) with a total market capitalisation of $79,011.23 million (14.17% of population) were included in the pilot study. For the main study, 133 companies with a total market capitalisation of $284,348.49 million were included. This made up 14.57% and 50.98% of the total population based on the number of companies and total market capitalisation respectively. Table 4.2 below provides a summary of the sample for both the pilot and the main study. The percentages in the table indicate the percentages of each item relative to the total population.

Table 4.2 Summary of sample for pilot study and main study

	Metals and Mining	**Energy and Utilities**	**Total**
Total number of listed companies in ASX	661	252	913
Total market capitalisation of listed resources companies in ASX (millions in Australia Dollars)	437,072.44	120,697.32	557,769.76
Number of companies in pilot study	23 (3.48%)	23 (9.13%)	46 (5.04%)
Total market capitalisation of companies used in pilot study (millions in Australia Dollars)	36,425.33 (8.33%)	42,585.90 (35.28%)	79,011.23 (14.17%)
Number of companies in main study	60 (9.08%)	73 (28.97%)	133 (14.57%)
Total market capitalisation of companies used in main study (millions in Australia Dollars)	229,451.94 (52.50%)	54,896.55 (45.48%)	284,348.49 (50.98%)

*All figures above are based on information as at 30 June 2012. Percentages displayed in brackets indicate the percentages relative to the total population (total listed resources companies in ASX).

4.4 Data Collection

4.4.1 Data source

This study collects data from companies' annual financial reports and stand-alone sustainability reports. A company's annual report is considered to be the most important source of information about a company's activities as it is the only document that is sent to shareholders by all companies (Adams et al., 1998). The information disclosed in a company's annual reports is considered reliable because they are a mandatory requirement under the Companies Act (Gray et al., 1995) and listed companies in Australia are required by the ASX to have their annual reports audited. There is also evidence that companies have consistently used annual reports as a primary source for sustainability disclosures (Adams & Zutshi, 2004; Brown & Deegan, 1998). In a recent KPMG survey on global trends in sustainability reporting, it was found that approximately 56% of companies have included sustainability information in their annual reports (KPMG, 2015). This rate has almost tripled, compared to 20% in a similar survey in 2011. Hence, this study has chosen to focus on the use of companies' annual reports because of their high credibility (Guthrie & Parker, 1989; Wilmshurst & Frost, 2000), widespread distribution, standardised data approach over long periods of time and easy availability (Dong & Burritt, 2010).

There are other information channels for sustainability disclosures in addition to companies' annual reports. Some companies prepare a separate sustainability report and some provide sustainability information on their companies' corporate websites (Frost et al., 2005; Tagesson et al., 2009; van Staden & Hooks, 2007). While the increased use of the internet has seen more companies provide sustainability information on their corporate websites, information available on the internet has the risk of information overload (Debreceny, Gray, & Rahman, 2002). It is normally diverse in nature (Frost et al., 2005) and the information disclosed in this category is non-regulated; thus, it is difficult to assess its credibility (Xiao, Yang, & Chow, 2004). As this study is an exploratory attempt to utilise a newly developed scoring index to score companies' sustainability disclosures, disclosures on companies' websites are beyond the scope of this study so as to avoid the problems of information overload and issues

relating to diversity. However, sustainability disclosures provided in companies' standalone sustainability reports are included in this study as companies that produced a separate sustainability report tend to disclose more sustainability information in these reports than in their annual reports (Frost et al., 2005; Higgins et al., 2015; van Staden & Hooks, 2007).

This study focuses on a single year of study (2012) instead of a longitudinal one as it aims to evaluate the most recent disclosures available at the time of study. Annual financial reports and stand-alone sustainability reports of companies in the sample group for the year ending 30 June 2012 were downloaded from the companies' corporate websites. Sustainability information disclosed directly on the company's corporate website that was not reported in companies' formal financial reports and sustainability reports were excluded from this research.

4.4.2 Dependent variables

The dependent variable of this research is the extent of companies' sustainability disclosure. This is measured by scores awarded to companies' sustainability information disclosed in their annual reports and sustainability reports based on the scoring criteria of the newly developed scoring index. Adopting the scoring scale of Clarkson et al.'s (2008) index, the new scoring index consists of two main scoring scales, one for soft disclosure items and another for hard disclosure items.

While soft disclosure items are awarded a score of 1 for presence and 0 for absence of the disclosure item, hard disclosure items are awarded a range of scores from 0 to 6. For hard disclosure items, a point is awarded for each of the following items:

(1) Performance data is presented;
(2) Performance data is presented relative to peers/rivals or industry;
(3) Performance is presented relative to previous periods (trend analysis);
(4) Performance data is presented relative to targets;
(5) Performance data is presented both in absolute and normalised form; and
(6) Performance data is presented at a disaggregated level.

According to Clarkson et al. (2008), hard disclosure items with the above details are useful in the assessment of a company's genuine environmental performance. Hence, the design of Clarkson et al.'s scoring criteria was developed so that higher points reflect better environmental performance. Accordingly, the newly developed scoring index awards scores only to information disclosed that indicates an improvement in sustainability performance. This is because the intended aim of this new index is to measure actual sustainability performance rather than the extent of sustainability disclosure. It is designed so that a higher score is meant to reflect a company's better sustainability performance, which can be demonstrated in the form of achieving a set target, outperforming its peers or attaining better performance than the industry average. As a result, non-compliance or a decline in sustainability performance is not awarded any points. Table 4.3 below provides the details of the scoring criteria that are applied in this study.

Table 4.3 Scoring criteria for hard disclosure items

Disclosures:	Scoring Criteria:	Scoring Method:
1. Performance data is presented	Performance data is disclosed (in any form or nature).	Information provided may be presented: • in any form or nature; • by descriptions in words or quantified in numeric terms; or • in a general or specific context.
2. Performance data is presented relative to peers/rivals or industry	Performance data is compared to companies in a similar industry or industry average.	Peers/rivals or industry-related information is included. Information may include: • compliance to legislative requirements specific to the industry; or • better performance compared to peers/rivals or industry average.
3. Performance data is presented relative to previous periods	Performance data of previous periods is presented.	Information that relates to improved performance compared to previous period.
4. Performance data is presented relative to targets	Performance data is reviewed against previously set targets.	Information related to set targets is included. Information may include: • actual performance met or surpassed the set targets; or • company performed better than their expectations.
5. Performance data is presented both in absolute and normalised form	Performance data is disclosed in raw data and also presented in ratio or percentage.	Information is presented in both raw and comparative data. Raw data may be presented in absolute numeric terms and also reflected as a ratio or percentage of comparable data.
6. Performance data is presented at disaggregate level	Performance data is presented with breakdown.	Information may be presented with breakdown details relative to: • Business unit; or • Geographic segments; or • Projects.

4.4.3 Independent variables

The independent variables of this study are company characteristics that include company size, financial performance and composition of board of directors (BOD). Table 4.4 below indicates the chosen proxies for the independent variables to measure the respective company characteristics. These proxies were selected based on

commonly used indicators in prior studies on sustainability that were found to be associated with sustainability disclosures as discussed in Chapter 3.

Table 4.4 Proxies used for independent variables

Independent variables		Proxies used
Company Characteristics	Company Size	Market capitalisation Total revenue Total assets
	Financial Performance	Operating revenue Earnings before interest and tax (EBIT) Return on assets (ROA) Return on equity (ROE) Book value per share Year-end share price
	Board Composition	Independent directors Multiple directorships Chief executive officer (CEO) duality Women directors Sustainability committee

While reviewing the companies' annual financial reports during the data collection stage, it was observed that there were differences in the companies' reporting currency and that they were using different formulas for the financial ratios shown in their reports. As a result, it was inappropriate to collect data of the companies' characteristics directly from companies' annual financial reports. To overcome these problems that hinder effective comparison, the data was collected via the same database - 'DatAnalysis' explained in section 4.3.2.

4.4.4 Content analysis process

A recording score sheet was developed to record and compile the data for the dependent variables (scores of sustainability disclosure items) and the independent variables (company characteristics).

There are numerous advantages in using a recording score sheet to document the scoring process, including:

(a) To ensure completeness in the data collection as it provides a comprehensive checklist for the scoring process.
(b) To identify the scoring items and their respective maximum points to be awarded.
(c) To consolidate the data collected with the corresponding references.
(d) To provide a distinctive classification between the hard and soft sustainability information collected.
(e) To sort the sustainability information disclosed in the companies' reports according to the different aspects of sustainability - economic, environmental and social.
(f) To facilitate the compilation of the total scores in the different categories of the scoring index.

In the initial stage of the recording process, pages of the companies' reports that contained relevant sustainability disclosures scored by the index were copied. The relevant words and paragraphs were highlighted and marked with the corresponding index codes to record the scoring process. The respective page numbers of the companies' reports with the sustainability disclosures were also recorded on the recording sheet. In cases where there were complex scoring issues, justifications for the scores awarded were also recorded. This assisted in the compilation of a list of scoring criteria to ensure that consistency is maintained throughout the scoring process.

4.5 Data Analysis

Data collected was analysed using the Statistical Package for the Social Science (SPSS) program version 22. A normality test was first performed on both the dependent and independent variables using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The two tests compare the variables of the sample to a normally distributed set of scores with the same mean and standard deviation (Field, 2013). If the result of the test is significant with p-value greater than 0.05, it means that the distribution of the tested sample tested is not significantly different from that of a normal distribution. However, if the result indicates a p-value that is less than the significance level of 0.05,

it shows that the distribution of the tested sample does not follow a normal distribution. It is generally considered more appropriate to use the Shapiro-Wilk test when the sample is small (Allen, Bennett, & Heritage, 2014).

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, Mann-Whitney U, Wilcoxon signed rank and Friedman two way ANOVA tests were the main non-parametric analyses used for the statistical tests in the pilot study. 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 correlations between variables in this pilot study.

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,
- companies with a sustainability committee to those that are without, and
- companies that operate in the Metals and Mining sector to those in the Energy and Utilities sector.

The Wilcoxon signed rank, which works with the same theoretical concept as the Mann-Whitney test, is used with related samples. This test is used to determine if there is any significant difference between the disclosures of hard items and soft items.

The Friedman two way ANOVA is another non-parametric statistical test that is used to analyse the data. It is used to ascertain if there are significant differences in the disclosures among the three aspects of sustainability. It is also used to test for significant differences among the four different social performance indicators within the broader social aspect of sustainability.

These non-parametric statistical tests were applied to the data collected to yield preliminary results of the pilot study. The preliminary results identified existing correlations between the variables and answered hypotheses developed for the pilot study.

4.6 Summary

This chapter has presented the methodology used in this study, including the process of sample selection, data collection and data analysis. The next chapter, Chapter 5, discusses the detailed development process of the new GRI-based scoring index followed by Chapter 6, which presents the process and results from the pilot study where the newly developed index is pilot-tested.

CHAPTER FIVE

DEVELOPMENT OF NEW SCORING INDEX

This study addresses the problem of a lack of a standardised sustainability reporting framework by developing a new Global Reporting Initiatives (GRI) - based scoring index by integrating the fundamental principles of hard and soft disclosures used in Clarkson et al. (2008) into all three aspects (social, economic and environmental) of the GRI G3.1 version. The index enhances the existing GRI guidelines, creates an improved measurement for sustainability reporting, and establishes a standardised framework to measure the quality of sustainability reporting for future research projects.

Further to the development process described in Chapter 4 (section 4.2.1), this chapter presents an account of how the index is developed. The new completed scoring index is tested in a pilot study (Chapter 6) to identify any required revisions. This chapter explains the development process in the following order:

1. Section 5.1 provides a summary of the GRI G3.1 framework detailing the different parts within the framework and the respective information items that are disclosed under each part.

2. Section 5.2 provides an overview of the environmental index used in Clarkson et al. (2008), explaining the hard and soft disclosure principles and the scoring criteria used in their index.

3. The first phase of the development process is covered in section 5.3. This phase involves incorporating Part I (company's profile disclosures) of the GRI framework into the new scoring index.

4. Section 5.4 discusses the second phase of the development process. This section covers the process of incorporating a new part of the GRI G3.1 framework, Part II, which involves disclosures on management approach (DMA) of the company to the three aspects of sustainability.

5. Finally, section 5.5 explains the process of incorporating the scoring criteria used in Clarkson et al.'s (2008) index for hard and soft disclosure items to Part III of the GRI framework that covers the specific sustainability performance indicators.

5.1 The GRI G3.1 Framework

The GRI G3.1 framework consists of three major parts: Part I profile disclosures; Part II disclosures on management approach (DMA); and Part III performance indicators. Table 5.1 below shows the structure of the GRI G3.1 framework. Companies are expected to provide their profile information in Part I that consists of four sections: strategy and analysis; organisational profile; report parameters; and governance, commitments and engagement. Part II identifies the companies' disclosures on management approach (DMA) to sustainability issues and comprises six different sections on sustainability. These sections provide the users with information on how the company manages these material aspects of sustainability. Part III of the GRI G3.1 framework consists of reportable items known as performance indicators which are directly related to operating information in the various aspects of sustainability. Table 5.1 summarises the respective disclosure items under each part of the GRI framework.

Table 5.1 The GRI G3.1 framework

Part	Disclosure items:
Part I: Profile disclosures	1. Strategy and analysis 2. Organisational profile 3. Report parameters 4. Governance, commitments, and engagement
Part II: Disclosures on management approach (DMA)	• Economic (DMA EC) • Environmental (DMA EN) • Social: Labour practices and decent work (DMA LA) • Social : Human Rights (DMA HR) • Social: Society (DMA SO) • Social: Product responsibility (DMA PR)
Part III : Performance indicators	• Economic : EC1 to EC9 • Environmental : EN1 to EN30 • Social – Labour practices and decent work: LA1 to LA14 • Social – Human Rights: HR1 to HR11 • Social – Society: SO1 to SO8 • Social – Product responsibility: PR1 to PR9

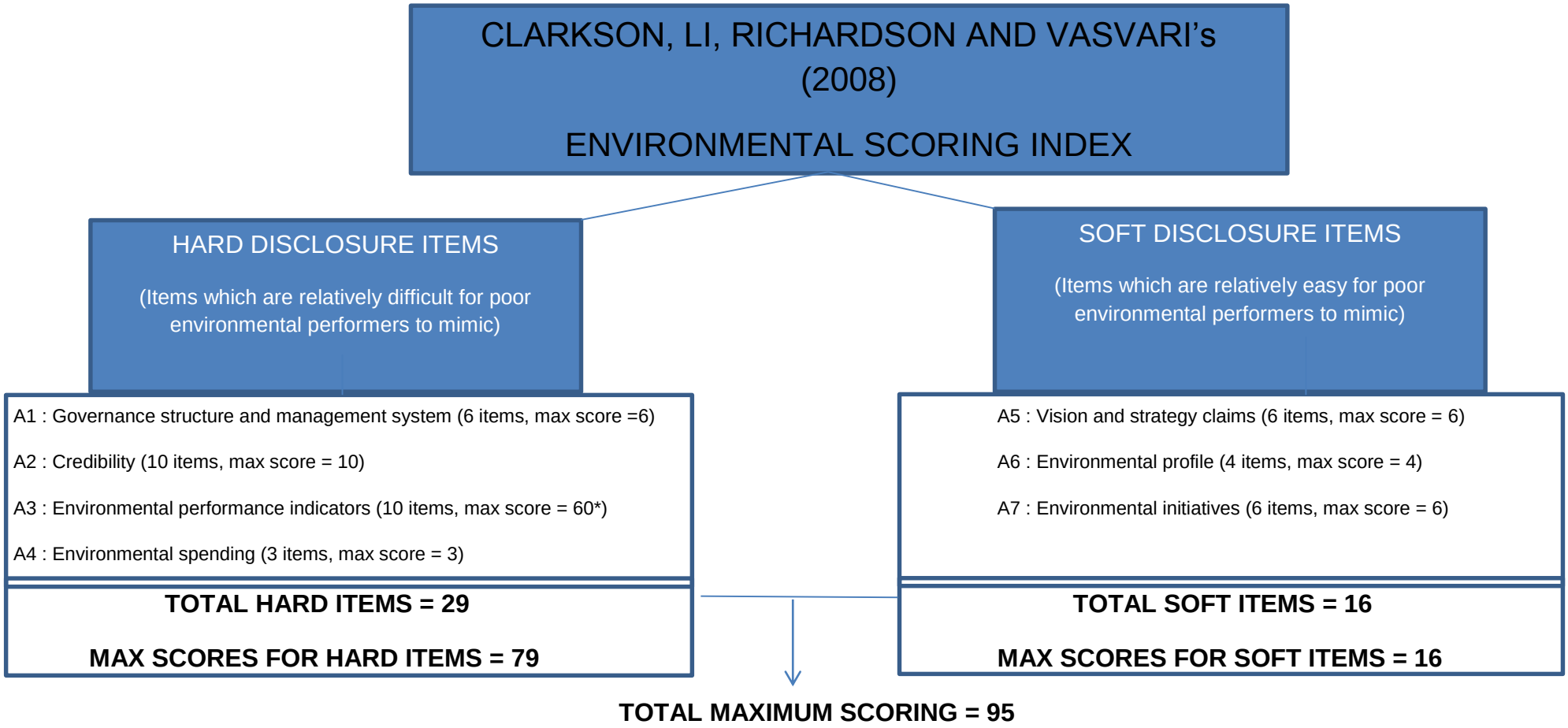
5.2 Clarkson, Li, Richardson and Vasvari's (2008) Environmental Index

Clarkson, Li, Richardson and Vasvari's (2008) environmental index focused solely on the environmental aspect of sustainability and they categorised the GRI G2 environmental performance indicators into hard and soft disclosure items. They classified items that are relatively difficult for poor environmental performers to mimic as hard disclosure items. These hard disclosure items refer to information items that a third party can verify and validate, such as quantified savings in a water conservation project or documented expenditure of a sustainability orientated research project. On the other hand, those items that are relatively easy for poor environmental performers to mimic are defined as soft disclosure items. Examples of soft items include a mission statement or a future vision about sustainability.

As shown in Figure 5.1 below, there are four sub-classifications (A1 to A4) of the hard disclosure items. A1 focuses on a firm's disclosures pertaining to its governance structure and management system relating to environmental protection. A2 measures the credibility of a firm's environmental disclosure report, and A3 assesses the extent of a firm's environmental disclosure on specific GRI performance indicators. The last

sub-classification in the hard disclosure items, A4, indicates a firm's spending on environmental aspects. While individual items in A1, A2 and A4 are scored as either '1' or '0' for the existence or absence of the item, items in A3 are allocated a range of scores from 0 to 6. A score for each disclosure item in section A3 is allocated based on performance data presented relative to a range of indicators. A point is awarded when performance data is presented and more points are awarded if the data is presented with information relative to peers or industry; relative to previous period; relative to targets; in both aggregate and normalised form; or at disaggregate level (Clarkson et al., 2008). The details of the scoring system are shown in Figure 5.2.

The soft disclosure items consist of three sub-classifications (A5 to A7). A5 measures a firm's vision and strategy claims and A6 assesses a firm's environmental profile. The last classification, A7, scores a firm's environmental initiatives. All the individual items in A5 to A7 are scored '1' or '0' depending on the presence or absence of each item.



*The scoring scale for each environmental performance indicator in category A3 ranges from 0 to 6. A point is awarded for each of the following items : (1)Performance data is presented; (2) Performance data is presented relative to peers/rivals or industry; (3) Performance data is presented relative to previous periods (trend analysis); (4) Performance data is presented relative to targets; (5) Performance data is presented both in absolute and normalised form; (6) Performance data is presented at disaggregate level (i.e. plant, business unit, geographic segment) (Clarkson et. al, 2008, p. 313).

Figure 5.1 Clarkson, Li, Richardson and Vasvari's (2008) environmental scoring index

5.3 Development Phase One: Incorporation of Profile Disclosures into the New Scoring Index

The development process is divided into three phases. The first phase involves incorporating the GRI G3.1 Part I (profile disclosure) into the new scoring index. This incorporation process consists of several steps.

First, disclosure items in the GRI G3.1 version are matched against Clarkson et al.'s (2008) index to identify the items that are listed in the GRI G3.1 version but not found in Clarkson et al.'s index. Second, these unlisted items are critically evaluated to determine the probable reasons for its exclusion from Clarkson et al.'s index. Lastly, these reasons are examined to form the criterion to determine if the items are relevant for its inclusion into the new scoring index. To help determine if the item will be included, the item will be evaluated based on the value of the information disclosed, such as whether it would assist users of this information to improve their understanding of a company's sustainability efforts or approaches. Items that are considered to enhance a company's sustainability disclosures in any of the three aspects (environmental, social and economic) of sustainability are included.

Table 5.2 below compares the disclosure items between the GRI G3.1 Part I and Clarkson et al.'s (2008) index. The table also presents a summary of the results after the above-mentioned steps were taken for development phrase one. This generates the list of disclosure items to be included in the new innovative GRI-based scoring index. Subsequently, this list of disclosure items is sorted according to the different categories, A1 to A7, used in Clarkson et al. (2008).

Table 5.2 Comparison between disclosure items in the GRI G3.1 part I and Clarkson et al.'s (2008) index

GRI G3.1 Part I: Profile Disclosures		Incorporated in Clarkson et al.'s (2008)	Possible reason for exclusion	Revision taken for new scoring index
1. Strategy and Analysis	1.1 – 1.2	Category A5: Vision and strategy claims		
2. Organisational Profile	2.1 – 2.9	Not included	Proprietary information	Not included
	2.10	Category A2: Credibility		
3. Report Parameters	3.1 – 3.5	Not included	Proprietary information	Not included
	3.6 – 3.8	Not included	Define scope of report	Not included
	3.9	Category A1: Governance structure and management system		
	3.10 – 3.11	Not included	Define scope of report	Not included
	3.12	Not included	Not a reportable item in previous GRI G2	Not included. This item identifies the location of disclosure content in the report. This information does not affect sustainability disclosure.
	3.13	Category A2: Credibility		
4. Governance, Commitments, and Engagement	4.1 – 4.7	Category A1: Governance structure and management system		
	4.8 – 4.9	Category A5: Vision and strategy claims		
	4.10	Category A1: Governance structure and management system		
	4.11	Category A5: Vision and strategy claims		
	4.12 – 4.13	Category A2: Credibility		
	4.14	Not included	Not a reportable item in previous GRI G2	Not included. This item provides a list of stakeholder groups engaged by the organisation. This information does not affect sustainability disclosure.
	4.15	Not included	Proprietary information	Not included
	4.16 – 4.17	Category A1: Governance structure and management system		

Note: Categories A1 to A4 are hard disclosure items and categories A5 to A7 are soft disclosure items.

5.4 Development Phase Two: Incorporation of Disclosures on Management Approach (DMAs) into the New Scoring Index

Part II of the GRI G3.1 version, which consists of companies' disclosures on management approaches (DMA) to sustainability and was not required by the earlier G2 version, is embedded into the new scoring index. The reporting on the DMAs provides an overview of how companies manage different aspects of their sustainability issues. This may include disclosure on evaluation processes and results of the effectiveness of companies' management approaches in sustainability. As shown in Table 5.1, there are six categories in the DMAs, namely DMA Economic (DMA EC), DMA Environmental (DMA EN), DMA Labour practices and decent work (DMA LA), DMA Human rights (DMA HR), DMA Society (DMA SO), and DMA Product responsibility (DMA PR).

The significance of reporting the DMAs is reflected in three ways: the addition of an entirely new section of DMAs absent in the earlier G2 version; the need to include the DMAs in companies' sustainability reports to be awarded a level B or better grade by the GRI; and the provision of detailed guidance and explanations on how each category of the DMAs is to be reported in the latest G4 version. Hence, the reporting on the DMAs is included into the new scoring index. This approach also concurs with one of the main objectives of this study which is to evaluate the actual implementation of sustainability policies through reviewing of companies' management approach towards sustainability issues.

All six categories in the DMAs are included in the new scoring index as they are relevant for the analysis of the economic, environmental and social aspects of sustainability. The reporting of DMAs is classified as soft disclosure items according to Clarkson et al.'s (2008) definition as they relate to the internal management controls and procedures which are difficult to verify and validate and thus are easier for poor sustainability performers to mimic. Consistent with the scoring of soft disclosure items by Clarkson et al., scores for this category are awarded a '1' or '0' respectively for the presence or absence of the DMAs in the GRI G3.1 Part II as shown in Table 5.3 below.

Table 5.3 New scoring index for the category on DMAs

Category	Disclosure item	Min -Max Scores
DMA EC – Disclosure on Management Approach Economic	Economic performance	**0 – 3 (3 items)**
	Market presence	
	Indirect economic impacts	
DMA EN – Disclosure on Management Approach Environmental	Materials	**0 – 9 (9 items)**
	Energy	
	Water	
	Biodiversity	
	Emissions, effluents and waste	
	Products and services	
	Compliance	
	Transport	
	Overall	
DMA LA – Disclosure on Management Approach Labour	Employment	**0 – 6 (6 items)**
	Labour/management relations	
	Occupational health and safety	
	Training and education	
	Diversity and equal opportunity	
	Equal remuneration for women and men	
DMA HR – Disclosure on Management Approach Human Rights	Investment and procurement practices	**0 – 9 (9 items)**
	Non-discrimination	
	Freedom of association and collective bargaining	
	Child labour	
	Prevention of forced and compulsory labour	
	Security practices	
	Indigenous rights	
	Assessment	
	Remediation	
DMA SO – Disclosure on Management Approach Society	Local communities	**0 – 5 (5 items)**
	Corruption	
	Public policy	
	Anti-competitive behaviour	
	Compliance	
DMA PR – Disclosure on Management Approach Product Responsibility	Customer health and safety	**0 – 5 (5 items)**
	Product and service labelling	
	Marketing communications	
	Customer privacy	
	Compliance	
		Total: 0 – 37 (37 items)

5.5 Development Phase Three: Incorporation of Performance Indicators into the New Scoring Index

Part III of the GRI G3.1 framework consists of specific sustainability performance indicators that reflect company performance in the economic, environmental and social aspects of sustainability. Within each of these three aspects of sustainability, the GRI

framework has developed specific performance indicators to assist in the preparation of sustainability reports. Table 5.4 below indicates the performance indicators in Part III of the GRI G3.1 framework.

Table 5.4 The GRI G3.1 part III performance indicators

Three Aspects of Sustainability		Disclosure item	Performance Indicators
Economic		Economic performance	EC1 – EC4
		Market presence	EC5 – EC7
		Indirect economic impacts	EC8 – EC9
Environmental		Materials	EN1 – EN2
		Energy	EN3 – EN7
		Water	EN8 – EN10
		Biodiversity	EN11 – EN15
		Emissions, effluents and waste	EN16 – EN25
		Products and services	EN26 – EN27
		Compliance	EN28
		Transport	EN29
		Overall	EN30
Social	**Labour**	Employment	LA1-LA3, LA15
		Labour/management relations	LA4 – LA5
		Occupational health and safety	LA6 – LA9
		Training and education	LA10 – LA12
		Diversity and equal opportunity	LA13
		Equal remuneration for women and men	LA14
	Human Rights	Investment and procurement practices	HR1 – HR3
		Non-discrimination	HR4
		Freedom of association and collective bargaining	HR5
		Child labour	HR6
		Prevention of forced and compulsory labour	HR7
		Security practices	HR8
		Indigenous rights	HR9
		Assessment	HR10
		Remediation	HR11
	Society	Local communities	SO1, SO9-SO10
		Corruption	SO2 –SO4
		Public policy	SO5 – SO6
		Anti-competitive behaviour	SO7
		Compliance	SO8
	Product Responsibility	Customer health and safety	PR1 – PR2
		Product and service labelling	PR3 – PR5
		Marketing communications	PR6 – PR7
		Customer privacy	PR8
		Compliance	PR9

Clarkson et al. (2008) classified the environmental performance indicators of the GRI framework as hard disclosure items under category A3 because they relate to data "that

firms can disclose to convince stakeholders about their environmental commitments" (p. 310). Clarkson et al. also introduced a scoring system for these hard environmental performance indicators. These hard disclosure items are divided into two categories: category A3 for the non-monetary environmental performance indicators and category A4 for monetary environmental spending. While category A4 was awarded a '1' or '0' for the presence or absence of the disclosure, Clarkson et al. applied special scoring criteria to category A3. For each performance indicator in category A3, a range of scores from 0 to 6 was awarded based on how the performance data was presented relative to a range of indicators. A point was awarded for each of the following six disclosures: peers or industry; previous period; targets; aggregate and normalised form; and disaggregate level.

Applying similar intention and scoring criteria used by Clarkson et al. (2008) for performance indicators under category A3, the new developed scoring index in this study awards scores only to information disclosed that indicates an improvement in sustainability performance. A non-compliance or a decline in sustainability performance will result in no points being awarded. Hence, a company's awarded scores are reflective of its actual sustainability performance. The scoring criteria for performance indicators under category A3 follow the scoring for hard disclosure items. The details for the scoring has been explained in Table 4.3 of Chapter 4.

The scoring criteria used for categories A3 and A4 respectively are adopted to develop the new scoring index for this study. This study modifies Clarkson et al.'s (2008) environmental index to reflect the latest GRI G3.1 version which has additional environmental performance indicators. Furthermore, the new scoring index expands the same scoring system to the economic and social performance indicators of the GRI G3.1 version, which have not been included by Clarkson et al. Figure 5.2 below depicts the development process in phase three to yield category A3 (hard non-monetary disclosure items) and category A4 (hard monetary disclosure items) of the new scoring index.

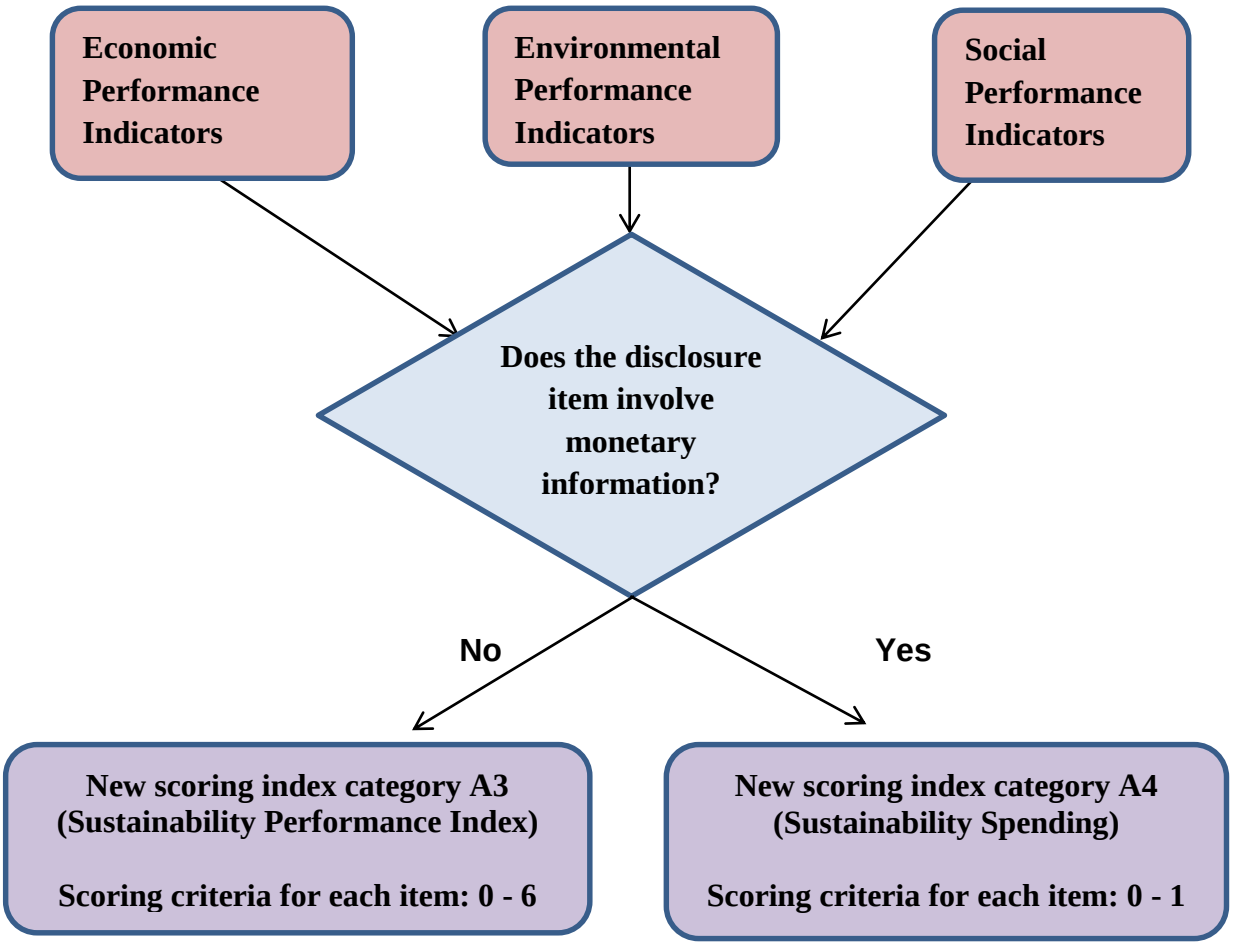


Figure 5.2 Flowchart for index development process phase three

5.5.1 Economic performance indicators

The economic aspect of the new scoring index was developed by adopting the economic performance indicators of the GRI G3.1 framework. The classification method and scoring system used in Clarkson et al. (2008) were incorporated into the new scoring index. As shown in Figure 5.3 above, each economic performance indicator in the GRI G3.1 framework is first classified to either category A3 or category A4 depending on whether the disclosure item involves monetary information. Following Clarkson et al.'s classification, those economic performance indicators that do not involve monetary

spending are classified to section A3 while those with monetary spending are classified to section A4.

The GRI G3.1 framework consists of nine economic performance indicators (EC1 to EC9) as displayed in Table 5.4. The two monetary performance indicators, EC1 and EC4, are classified under category A4, and the remaining seven non-monetary economic performance indicators are classified under category A3 of the new scoring index. The seven non-monetary economic performance indicators were sorted into three groups according to the nature of their disclosure items. The scoring system applicable to category A3 is applied to each of the three groups. Each group are awarded a range of scores from 0 to 6. Table 5.5 below presents the results after the classification process.

Table 5.5 Category A3 economic performance indicators of the new scoring index

Aspect of sustainability	Disclosure item	Performance indicators of the GRI G3.1 framework	Recoded for new scoring index	Number of Groups	Scores (Min – Max)
Economic	1. Economic performance	EC2 - EC3	A3 ECP1	3	0 – 18
	2. Market presence	EC5 – EC7	A3 ECP2		
	3. Indirect economic impacts	EC8 – EC9	A3 ECP3		

5.5.2 Environmental performance indicators

Clarkson et al.'s (2008) index, which focuses solely on the environmental aspects of sustainability, used only the environmental performance indicators in the GRI G2 framework in their index. The following steps were carried out to modify Clarkson et al.'s index, specifically category A3 (environmental performance indicators), to develop the environmental performance indicators for the new scoring index:

i. The GRI G3.1 framework consists of thirty environmental performance indicators (EN1 to EC30). EN30 that relates to monetary expenditures and investments of environmental protection is classified under category A4 (Sustainability spending).

ii. The remaining 29 environmental performance indicators in the GRI G3.1 are matched against the list in Clarkson et al.'s (2008) category A3.
iii. Those environmental performance indicators that are not included in Clarkson et al.'s index are added to the new scoring index.
iv. The newly developed list of environmental performance indicators are sorted and grouped according to the nature of their information disclosed.
v. The groups are recoded for the new scoring index.

Table 5.6 below summarises the revision and classification process to Clarkson et al.'s (2008) category A3 on environmental performance indicators to incorporate the newer GRI G3.1 version.

Table 5.6 Summary of revision to environmental performance indicators classified under Clarkson et al.'s (2008) category A3

Aspect of sustainability	Disclosure item	Performance indicators of the GRI G3.1 framework	Incorporated in Clarkson et al.'s (2008)	Revision taken for new scoring index	Recoded for new scoring index
Environmental	Materials	EN1 – EN2	Not included	Included as a new group	A3 ENP1
	Energy	EN3 – EN7	(A3) Item 1		A3 ENP2
	Water	EN8 – EN10	(A3) Item 2		A3 ENP3
	Biodiversity	EN11 – EN15	(A3) Item 8		A3 ENP4
	Emissions, effluents and waste	EN16 – EN18	(A3) Item 3		A3 ENP5
		EN19 – EN20	(A3) Item 4		A3 ENP6
		EN21, EN23	(A3) Item 6		A3 ENP7
		EN22	(A3) Item 5 & 7		A3 ENP8
		EN24	Not included	Included and placed in new code with A3 ENP8 as it relates to waste management that is similar to EN22	A3 ENP8
		EN25	Not included	Included and placed in new code with A3 ENP7 as it relates to other discharges that are similar to EN21 and EN23	A3 ENP7
	Products and services	EN26 – EN27	(A3) Item 9		A3 ENP9
	Compliance	EN28	(A3) Item 10		A3 ENP10
	Transport	EN29	Not included	Included as a new group	A3 ENP11

The 29 non-monetary environmental performance indicators are sorted into eleven groups as shown in Table 5.6 above. The scoring system applicable to category A3 is applied to each of the eleven groups and each group is awarded a range of scores from 0 to 6.

5.5.3 Social performance indicators

The GRI G3.1 framework has four sub-categories for the social aspects of sustainability: labour practices and decent work; human rights; society; and product responsibility. For each of these four sub-categories, the same incorporation process as described in section 5.5.1 is adopted to develop the social aspect of the new scoring index. Firstly, social performance indicators that involve monetary amounts are classified under category A4 and the non-monetary social performance indicators are classified under category A3. Following that, the disclosure items that are classified to categories A3 and A4 are re-classified to different groups within each category based on the information type of its disclosure. Finally, the different scoring systems applicable to categories A3 and A4 are also applied to each of the two categories. Table 5.7 below shows the results after the process.

Table 5.7 Category A3 social performance indicators of the new scoring index

Aspect of sustainability		Disclosure item	Performance Indicators of the GRI G3.1 framework	Recoded for new scoring index	Number of Groups	Scores (Min – Max)
Social	**Labour Practices and Decent Work (LA)**	Employment	LA1-LA3, LA15	A3 LAP1	6	0 - 36
		Labour/management relations	LA4 – LA5	A3 LAP2		
		Occupational health and safety	LA6 – LA9	A3 LAP3		
		Training and education	LA10 – LA12	A3 LAP4		
		Diversity and equal opportunity	LA13	A3 LAP5		
		Equal remuneration for women and men	LA14	A3 LAP6		
	Human Rights (HR)	Investment and procurement practices	HR1 – HR3	A3 HRP1	9	0 – 54
		Non-discrimination	HR4	A3 HRP2		
		Freedom of association and collective bargaining	HR5	A3 HRP3		
		Child labour	HR6	A3 HRP4		
		Prevention of forced and compulsory labour	HR7	A3 HRP5		
		Security practices	HR8	A3 HRP6		
		Indigenous rights	HR9	A3 HRP7		
		Assessment	HR10	A3 HRP8		
		Remediation	HR11	A3 HRP9		
	Society (SO)	Local communities	SO1, SO9-SO10	A3 SOP1	5	0 – 30
		Corruption	SO2 –SO4	A3 SOP2		
		Public policy	SO5 – SO6	A3 SOP3		
		Anti-competitive behaviour	SO7	A3 SOP4		
		Compliance	SO8	A3 SOP5		
	Product Responsibility (PR)	Customer health and safety	PR1 – PR2	A3 PRP1	5	0 – 30
		Product and service labelling	PR3 – PR5	A3 PRP2		
		Marketing communications	PR6 – PR7	A3 PRP3		
		Customer privacy	PR8	A3 PRP4		
		Compliance	PR9	A3 PRP5		

5.6 Modification to the New Scoring Index

The final phase of the development process involved the assembly of the various incorporated parts of the scoring index. The overall incorporated scoring index is reviewed and the following modifications are applied.

1. Disclosure items within categories A1 to A7 are reviewed. Items that were previously restricted solely to environmental disclosure are revised to reflect all three aspects of sustainability.
2. Common disclosure items that are repetitive are deleted.
3. The disclosure items in the scoring index are again mapped to the entire list of disclosure items in all the three parts of the GRI G3.1 framework (Part I, Part II and Part III) to ensure completeness. Items that could lead to duplication in the scoring process are reviewed and deleted where required.

Table 5.8 presents a summary of the final scoring index indicating the maximum possible scores in each category. A detailed scoring index is contained in Appendix 5-1.

Table 5.8 The new scoring index

Hard Disclosure Items (A1-A4)			
Category	**Disclosure items**	**Items**	**Max Scores**
A1	Governance structure and management systems	9	9
A2	Credibility	5	5
A3	Economic Performance Indicators (ECP)	3	18
	Environmental Performance Indicators (ENP)	11	66
	Social Performance Indicators		
	Labour Practices and Decent Work (LAP)	6	36
	Human Resource (HRP)	9	54
	Society (SOP)	5	30
	Product Responsibility (PRP)	5	30
A4	Spending related to sustainability	2	2
Total Hard Disclosure			**250**

Soft Disclosure Items (A5-A7)			
Category	**Disclosure items**	**Items**	**Max Scores**
A5	Vision and strategy claims	7	7
A6	Sustainability Initiatives	3	3
A7	Disclosure of Management Approach (DMA)		
	Economic	3	3
	Environmental	9	9
	Labour Practices and Decent work	6	6
	Human Rights	9	9
	Society	5	5
	Product Responsibility	5	5
Total Soft Disclosure			**47**
Total Disclosure = 250 +47 = 297			

5.7 Test of New Scoring Index Using a Pilot Study

The new GRI-based scoring index is tested through a pilot study described in Chapter 6. The pilot study aims to assess the feasibility of the scoring index and to identify revisions necessary to improve the index for the main study. It also provides preliminary findings about the extent of sustainability disclosure of listed companies in the Australian resources industry.

CHAPTER SIX

PILOT STUDY

A pilot study was conducted using the newly developed GRI-based sustainability scoring index to evaluate companies' sustainability disclosure and to identify revisions required to improve the scoring index. This chapter presents the design, processes and results of the pilot study. Implications for the main research identified through the pilot study are discussed and a summary of the revisions required to improve the main study are presented.

6.1 Design

The pilot study was specifically designed to achieve the list of objectives discussed in Chapter 4 section 4.2.2. Figure 6.1 below depicts the design of the pilot study with a summary of the steps and procedures undertaken. The sample selection process was explained in Chapter 4 section 4.3. The other processes of the pilot study are discussed in the remaining sections of this chapter, following the sequence shown in Figure 6.1.

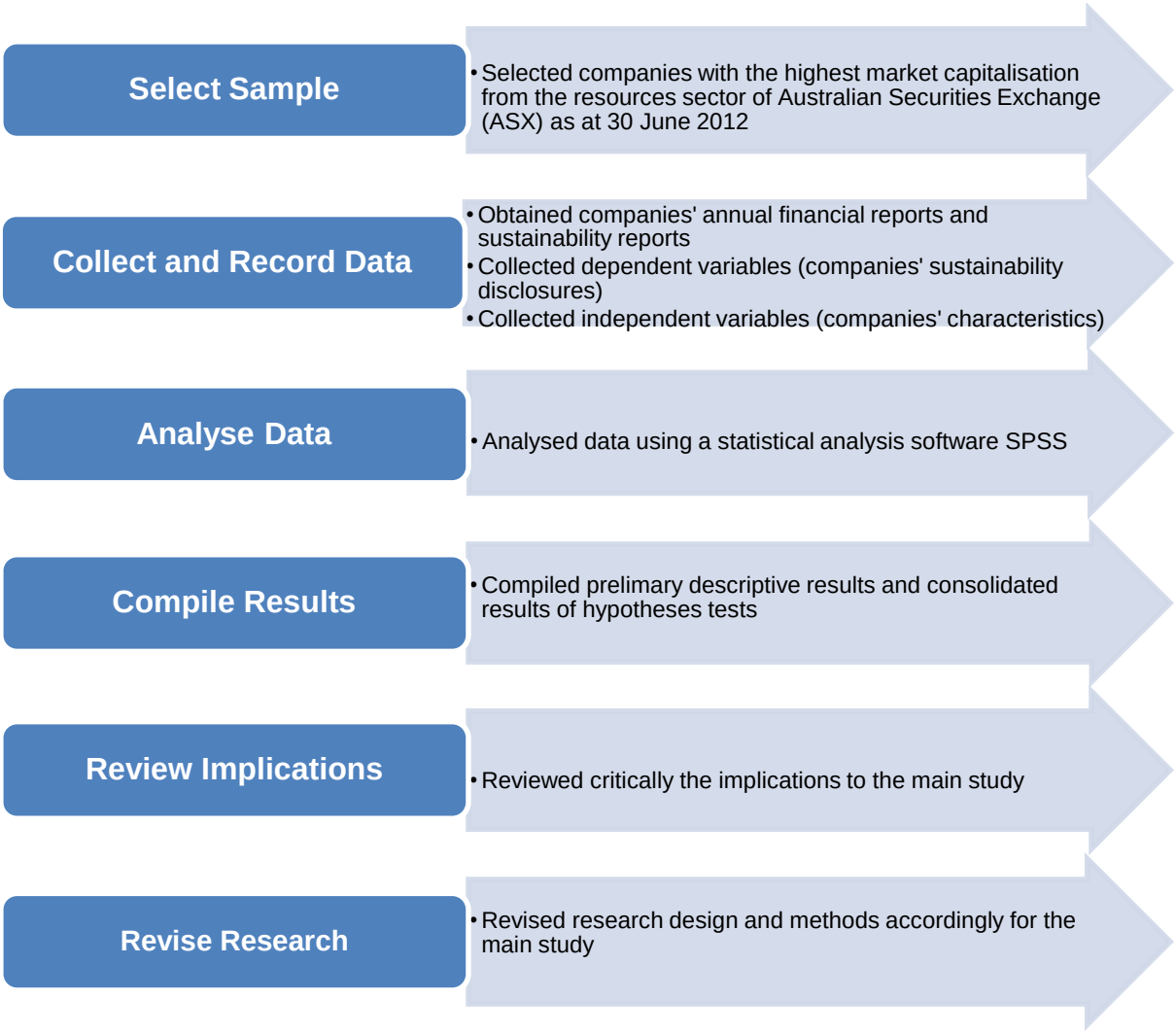


Figure 6.1 Design of the pilot study

6.2 Collection and Recording of Data

6.2.1 Data collection

The data source for the dependent variables are companies' annual financial reports and stand-alone sustainability reports. First, the reports of the sample companies for the year ended 30 June 2012 were collected. Then, content analysis method was applied on each of the companies' reports, and the data were coded and scored according to the scoring criteria applicable to the soft and hard disclosure items as explained in Chapter 4 section 4.4.2. The respective scoring criteria were applied specifically to each of the disclosure items in the different categories of the newly developed scoring index. The classifications

and details of these disclosure items are contained in Appendix 5-1 as explained in Chapter 5. Finally, the data for the independent variables were collected via the DatAnalysis database.

6.2.2 Data recording

A recording worksheet was developed to record and compile the data for the dependent and the independent variables. Table 6.1 below presents a summary of the various categories and sub-categories on the recording worksheet. A copy of the recording worksheet including a detailed classification is presented in Appendix 6-1.

Table 6.1 Summary of recording worksheet

Variable	Category	Sub-categories
1.Company Profile	Company Size	Market capitalisation Total revenue Total assets
	Financial Performance	Operating revenue Earnings before interest and tax (EBIT) Return on assets (ROA) Return on equity (ROE) Book value per share Year-end share price
	Board Composition	Independent directors Multiple directorships Chief executive officer (CEO) duality Women directors Sustainability committee
2. Hard Disclosure Items	A1: Governance structure and management system	
	A2: Credibility	
	A3: Performance indicators	Economic Performance (ECP) Indicators Environmental Performance (ENP) Indicators Labour Performance (LAP) Indicators Human Rights Performance (HRP) Indicators Society Performance (SOP) Indicators Product Responsibility (PRP) Indicators
	A4: Spending on sustainability related expenditures	
3. Soft Disclosure Items	A5: Vision and strategy claims	
	A6: Sustainability initiatives	
	A7: Disclosure on Management Approach (DMA)	Economic (DMA ECP) Environmental (DMA ENP) Labour (DMA LAP) Human Rights (DMA HRP) Society (DMA SOP) Product Responsibility (DMA PRP)

As shown in Table 6.1 above, the recording worksheet comprises three variables: company profile, hard disclosure items (A1-A4) and soft disclosure items (A5-A7). The first variable, company profile, consists of company information that formed the independent variables for the hypotheses testing. This includes information on company size, financial performance and board composition. The second variable, hard disclosure items, consists of four categories A1 to A4 that identify hard sustainability disclosures that are relatively easier to verify. The recording sheet provides a list of disclosure items within each category to guide the coder in the data collection process. The third variable, soft disclosure items, has three categories, A5 to A7, which collect data related to sustainability disclosures that are relatively more difficult to verify.

While soft disclosure items are scored based on the presence and absence of a disclosure item, hard disclosure items are awarded a score of zero to six, depending on whether the information disclosed is presented relative to the respective indicators as shown and highlighted in Table 6.2 below. Table 6.2 presents an extract of the recording worksheet used to record hard disclosure items.

Table 6.2 An extract of the recording worksheet for hard disclosure items

New Index Code	(A3) Environmental Performance (ENP) Indicators (Max score is 66)	Map to GRI G3.1	Data Present	Relative to Peers/ Industry	Relative to Previous Period	Relative to Targets	Absolute and Normalised form	At Disaggregate level	Min-Max Score (0 -6)	Ref

A summary score chart is also developed in the data recording process to compile the total scores for each company, indicating clearly the scores awarded for the different categories. The total score for a company is the total scores awarded to variable 2 (hard disclosure items) and variable 3 (soft disclosure items) in Table 6.1. A copy of the summary score chart is contained in Appendix 6-2.

6.2.3 Data coding and scoring

The scoring process is illustrated through the use of two examples which explain how the scoring criteria are applied in the scoring process for hard disclosure items.

Example 1, company 'X', disclosed the following in its report: 'There have been no known breaches of the tenement conditions, and no such breaches have been notified by any Government agencies during the year ended 30 June 2012.' This disclosure was awarded a score of two points under the sub-category 'A3-ENP' (Environmental Performance) in the item 'A3 ENP 10' that relates to 'compliance'. One point was awarded for the presence of data relating to the company's compliance because the company reported no breaches of any environmental legislation. Another point was awarded for the disclosure of data in relation to the industry as the data relates to the environmental regulations pertaining to the industry. Table 6.3 below shows an extract of the information recorded for company 'X'. The page number that relates to the relevant disclosure was also recorded for further reference.

Table 6.3 Example 1: An extract of the information recorded for company 'X'

New Index Code	(A3) Environmental Performance (ENP) Indicators (Max score is 66)	Map to GRI G3.1	Data Present	Relative to Peers/ Industry	Relative to Previous Period	Relative to Targets	Absolute and Normalised form	At Disaggregate level	Min-Max Score (0 -6)	Ref
A3 ENP10	Compliance	EN28	1	1					2	*

*The relevant page number where the information was found was recorded in the 'Ref' column.

In contrast, in Example 2, company 'Y' was awarded a total of five points under the same sub-category A3-ENP in the same item A3 ENP10. As well as the provision of data to show its compliance to industry related legislation, company 'Y' had also included information on environmental compliance that was awarded additional points under the item A3 ENP10. The extra information included the following:

- compliance to the company's target to manage its environmental risk according to ISO 14001 Environmental Management Systems standard;
- compliance with the different forms of environmental risk such as biodiversity and water; and

- compliance in various projects across different geographical locations by providing specific project locations.

Table 6.4 below indicates how the above awarded scores were recorded.

Table 6.4 Example 2: An extract of the information recorded for company 'Y'

New Index Code	(A3) Environmental Performance (ENP) Indicators (Max score is 66)	Map to GRI G3.1	Data Present	Relative to Peers/ Industry	Relative to Previous Period	Relative to Targets	Absolute and Normalised form	At Disaggregate level	Min-Max Score (0 -6)	Ref
A3 ENP10	Compliance	EN28	1	1		1	1	1	5	*

*The relevant page number where the information was found was recorded in the 'Ref' column.

6.2.4 Further guidelines for data scoring

It was noted in the data scoring process that there were few recurring issues requiring further guidelines to ensure that a consistent scoring process is maintained throughout the study. This section provides an account of the issues encountered and discusses the decisions made to resolve these issues and the implications to the scoring process.

6.2.4.1 Environmental performance indicators

Companies in the resources industry are generally required to submit an Environmental Impact Assessment (EIA) to the Environmental Protection Authority (EPA) for evaluation of their site operation plans. Companies are mandated to provide information on how their operations may impact the environment in their EIA submission. The EPA assesses companies' proposals based on the appropriateness and practicability of the projects according to the Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2012. It was noted in the pilot study that companies generally disclosed this information in their annual and sustainability reports when describing the progress of their projects. However, this type of environmental disclosure tended to focus on the feasibility of a project and the emphases were generally placed on the cost of extracting the minerals and the potential mineral content of a site; there was minimal or

no information on the actual impact on the environment. Hence, it is concluded that no points will be awarded to such general environmental information that is mandated by the EIA. Only information that relates to environmental performance indicators specified in section A3 ENP1 to ENP11 of the newly developed reporting index are to be included for scoring.

6.2.4.2 Economic performance indicators

The data of this study is collected predominantly from companies' annual financial reports as companies have included sustainability disclosures in these reports (Adams & Zutshi, 2004; Brown & Deegan, 1998; KPMG, 2015). As the fundamental purpose of an annual financial report is to provide a company's shareholders with information on its financial performance during the financial period, it contains largely regulated financial information that complies with the accounting standards and are required for reporting by the Australian Securities and Investments Commission (ASIC). Generally, it contains a company's economic information such as the statement of financial position and the statement of comprehensive income. The new scoring index has designed scoring criteria that awards scores to reflect companies' sustainability performance. Hence, generic financial information that has no direct implication on sustainability or sustainability performance is not awarded scores in the scoring process. However, financial expenditures or losses due to climate change, or investments and financial savings that relate to sustainability initiatives are awarded scores.

6.2.4.3 Compliance

There are four items in section A3 (performance indicators) of the scoring index that record companies' compliance in sustainability performance: A3 ENP10, A3 HRP9, A3SOP5 and A3 PRP5 that relate to compliance in environment, human rights, society and products responsibility respectively. As the scoring index is designed for a higher score to reflect a better sustainability performance, it is contradictory if disclosures in companies' reports that relate to non-compliance in sustainability performance are given additional points. Hence, a company is to be awarded a zero score if it reports a non-compliance in any of the above aspects of sustainability performance. This is to take precedence over any previous scores that may be awarded for compliance in the same

aspect. However, it should not affect the individual scores that were awarded in the specific performance indicators.

For example, a company is given a score of three for A3 ENP10 (Compliance in Environmental aspect) because they complied with water treatment according to set target, industry level and improved from the previous period. However, if they were fined for an incident of oil spillage, this disclosure is to take precedence and the score for A3 ENP10 is thus reduced to zero. This, however, does not affect any previous scoring under the specific performance indicator item A3 ENP3 (Water) which may relate to disclosure of an improved usage of recycled water.

6.3 Data Analysis, Results and Discussion

6.3.1 Data analysis

A normality test was conducted using the Kolmogorov-Smirnov and Shapiro-Wilk tests on a total of 29 variables that included both the independent and dependent variables. The two statistical tests indicated that more than 93% of these variables violated the normality assumption as their significance is less than 0.05. It is generally considered more appropriate to use the Shapiro-Wilk test when the sample is small (Allen et al., 2014). Only one variable has passed the normality test based on the Shapiro-Wilk test. Hence, non-parametric statistical tests were applied to analyse the data. Appendix 6-3 provides the detailed results of the normality tests.

6.3.2 Overview of results

A total of 46 companies were selected to be pilot-tested. Only seven of the 46 companies (15.22%) analysed produced separate stand-alone sustainability reports. These sustainability reports have contributed substantially to the companies' total sustainability disclosures. The seven companies with stand-alone sustainability reports disclosed an average of 48.1% more sustainability information in their sustainability reports than their annual financial reports.

Table 6.5 below presents an overview of the results from the pilot study. The table shows the mean scores of companies' total disclosure, total hard disclosure and total soft disclosure. The mean scores are also reported as percentages of their respective maximum scores to facilitate comparison. The results suggest that companies in the Australian resources industry were generally providing very minimal sustainability information in their annual reports. On average, the mean score of the total disclosure is low (74.13) as it constitutes only 24.96% of the total maximum score of 297. Mean scores from both the hard and soft disclosure items are also low at 22.39% and 38.62% of their maximum scores of 250 and 47, respectively. The higher percentage in the total soft disclosure suggests that companies were disclosing more soft than hard disclosure items. In fact, further analysis indicates that all of the 46 companies disclosed more soft than hard disclosure items.

Table 6.5 Overview of results from pilot study

Disclosure Items	Range of scores (Min – Max)	Mean Scores (A)	Median Scores	Maximum Possible Scores (B)	Percentage of Disclosure = A/B
Total hard disclosure (C)	10 – 203	55.98	48.00	250	22.39%
Total soft disclosure (D)	3 – 45	18.15	19.00	47	38.62%
Total disclosure (C + D)	13 - 248	74.13	68.00	297	24.96%

Note: A higher score denotes greater disclosure.

The large range of scores, shown in Table 6.5, indicates significant diversity in companies' disclosures on sustainability information. The results of a Friedman two way ANOVA test indicated statistically significant differences among the percentage of disclosure in total hard disclosure, total soft disclosure and total disclosure (Chi-Square= 92, df=2, N=46, $p<0.05$). While some companies provided extensive detailed information in a separate stand-alone sustainability report, some companies provided either a short sentence or paragraph about sustainability. In cases where companies provided such minimal information, it was usually related to a declaration of the company's compliance to environmental legislation. This behaviour is in line with the results from some prior studies (Dong & Burritt, 2010; Frost, 2007; Guenther et al., 2006; Wood & Ross, 2008) as companies operating in the Australian resources industry are mandated to provide

environmental information in their annual reports. Despite this, the lack of a standardised reporting framework has resulted in some companies reporting very minimal information to indicate their compliance to the legislation. This form of reported information is, however, limited and is generally not indicative of companies' true sustainability performance.

6.3.3 Descriptive statistics

Descriptive statistics of various dependent variables – companies' sustainability disclosures - from different categories of the scoring index were obtained after an initial exploratory analysis. Table 6.6 below summarises the results. A list of the detailed mean disclosure scores of each individual disclosure item by category and sub-categories are contained in Appendix 6-4.

Table 6.6 Descriptive statistics of companies' sustainability disclosures

Categories in New Scoring Index	Min	Max	Range	Mean (A)	Median	Standard Deviation	Maximum Possible Scores (B)	Percentage of Disclosure = A/B
A1: Governance	2	9	7	6.41	6.50	2.07	9	71.26%
A2: Credibility	0	5	5	1.74	2.00	1.76	5	34.78%
A3: Performance Indicator								
A3: Economic	2	18	16	7.09	6.00	4.15	18	39.37%
A3: Environmental	0	59	59	13.78	8.00	14.33	66	20.88%
A3: Social–Labour	1	31	30	13.65	14.00	8.08	36	37.92%
A3: Social-Human Rights	0	32	32	4.09	0.50	7.43	54	7.57%
A3: Social-Society	0	22	22	3.63	3.00	4.55	30	12.10%
A3: Social-Product Responsibility	0	29	29	4.74	1.50	6.66	30	15.80%
A4: Spending	0	2	2	0.85	1.00	0.73	2	18.26%
A5: Vision	0	7	7	5.28	7.00	2.63	7	75.47%
A6: Initiatives	0	3	3	0.54	0.00	0.96	3	18.12%
A7: Disclosure of Management Approach (DMA)								
A7: Economic	1	3	2	1.72	1.00	0.83	3	57.25%
A7: Environmental	0	9	9	3.54	3.00	2.40	9	39.37%
A7: Social–Labour	1	6	5	3.33	4.00	1.55	6	55.43%
A7: Social-Human Rights	0	8	8	1.54	0.50	2.31	9	45.41%
A7: Social-Society	0	5	5	1.09	1.00	1.15	5	21.74%
A7: Social-Product Responsibility	0	5	5	1.11	1.00	1.46	5	22.17%

Note: A higher score denotes greater disclosure. The percentage of disclosure is extracted from results in SPSS. Results may differ due to rounding.

A Friedman two way ANOVA test was performed on the percentage of disclosure in the 17 different categories of disclosures as shown Table 6.7 above. The results indicate significant differences among the percentage of disclosure of these categories (Chi-Square= 405.3, df=16, N=46, $p<0.05$).

As shown in Table 6.6 above, generally, the ranges across all the different disclosure categories were substantially large, especially for performance indicators under category A3. 12 out of 17 of the different categories had their ranges as large as the maximum possible scores. This was also reflected by their large standard deviation. For some, the standard deviation was also larger than their mean and median. This preliminary result is both interesting and critically important. The large standard deviation has provided

evidence to validate the reliability of the newly developed scoring index as it is capable of differentiating between companies disclosing better sustainability information and those that were not. Apparently, the large standard deviation in the data indicates that companies were disclosing significantly different amounts of sustainability disclosures and the scores awarded by the newly developed scoring index have made it possible to differentiate them. Companies disclosing more sustainability information can be easily identified by their higher scores. The next section elaborates on the contribution of the new scoring index due to its ability to identify the forms and nature of sustainability information that companies were disclosing and the types of information found lacking. This assisted companies to identify the reporting areas for improvement.

6.3.4 Disclosure items

To facilitate comparison among companies' disclosures in the various categories of the scoring index, the categories were ranked in descending order from the highest to the lowest based on their percentages of disclosures. The percentage of the disclosures of the various categories was obtained by taking their respective mean scores as a percentage of their respective maximum scores. Table 6.7 below shows the result of the ranking which assists in interpreting the extent of companies' disclosures in various categories of the new scoring index developed in this study.

Table 6.7 Ranking of companies' disclosures in various categories

Rank	Categories of Scoring Index	Percentage of Disclosure= A/B
1	A5: Vision	75.47%
2	A1: Governance	71.26%
3	A7: Economic	57.25%
4	A7: Social-Labour	55.43%
5	A7: Social-Human Rights	45.41%
6	A3: Economic	39.37%
7	A7: Environmental	39.37%
8	A3: Social-Labour	37.92%
9	A2: Credibility	34.78%
10	A7: Social-Product Responsibility	22.17%
11	A7: Social-Society	21.74%
12	A3: Environmental	20.88%
13	A4: Spending	18.26%
14	A6: Initiatives	18.12%
15	A3: Social-Product Responsibility	15.80%
16	A3: Social-Society	12.10%
17	A3: Social-Human Rights	7.57%

Note: 1. Ranking is based on the mean scores of each section as a percentage to their respective maximum scores.
2. Categories A1 to A4 are hard disclosure items and categories A5 to A7 are soft disclosure items.

Category A5 (Vision and strategy claim) is ranked first with 75.47%. This is followed closely by category A1 (Governance structure and management system) with 71.26%. It is apparent from the results shown that A5 was ranked first with the highest percentage among the soft disclosure items. This indicates that companies disclosed more soft disclosure items through setting vision statements and making claims of their sustainability strategies and plans. On the other hand, category A1, which had the highest ranking among the hard disclosure items, reveals that many companies have included more information about their corporate governance structure in the reports. This result confirms that many companies have widely embraced the Australian Securities Exchange (ASX) recommendations, which were introduced in 2003, to include information of their corporate governance practice in the annual reports (Gibson & O'Donovan, 2007; Kang et al., 2007). As shown in Table 6.6, the minimum score found in category A1 was 2. This indicates the importance of this category as all the 46 sampled companies, without exception, have included some information about corporate governance.

The results from Table 6.7 reveal that most of the soft disclosure items (categories A5 to A7) tend to rank higher than those of the hard disclosure items (categories A1 to A4). Detailed statistical tests were conducted using SPSS to compare companies' total disclosure on soft items to that on hard items. The result was used to test the hypothesis for any statistical differences between the disclosures on soft and hard items (section 6.4.4).

Table 6.8 below shows the ranking for the six performance indicators within category A3 (Performance indicators). They are ranked from the highest to the lowest based on the percentage of disclosure, calculated using their mean scores as a percentage of their respective maximum scores. The four social performance indicators Labour Performance (LAP), Human Rights Performance (HRP), Society Performance (SOP) and Product Responsibility Performance (PRP) are combined to yield the mean percentage of disclosure that reflects the social aspect of sustainability.

Table 6.8 Ranking for performance indicators within category A3

Rank	Aspects of Sustainability	Performance Indicators	Percentage of Disclosure
1	Economic	A3: Economic	39.37%
2	Environmental	A3: Environmental	20.88%
3	Social	A3: Social	18.35% (Mean percentage of the four performance indicators within the social indicators) Percentage of disclosure on individual performance indicators: A3: Social-LAP 37.92% A3: Social-PRP 15.8% A3: Social-SOP 12.10% A3: Social-HRP 7.57%

Note: Ranking is based on the mean scores of each section as a percentage to their respective maximum scores.

Table 6.8 indicates that companies have disclosed the most information in the economic aspect of sustainability, followed by the environmental aspect and the social aspect. One unanticipated result was that the economic aspect remains in the highest rank, despite stringent scoring criteria applied to the disclosure of economic information in this study. Only financial information that has direct implications to sustainability has been awarded

scores in the scoring process. Examples include financial expenditures or losses due to climate change, or investments that relate to sustainability initiatives. Other generic economic disclosure of company's financial performance, such as information found in an income statement or a balance sheet, is not awarded any score.

There are also substantial differences among the four individual performance indicators within the social aspects of sustainability. The percentages of disclosure for the four performance indicators are shown in Table 6.6 and they are arranged in descending order. The labour performance indicator (LAP) has the highest percentage at 37.92%, while the human rights performance indicator (HRP) has the lowest percentage at only 7.57%. Companies tend to report more social information through labour related data and issues such as information on the company's employment, occupational health and safety, staff training and diversity in employment. This is in line with findings of prior studies: companies are under tighter scrutiny due to increased awareness of social issues related to child labour protection and public concern about labour exploitation (Deegan & Islam, 2014; Islam & Deegan, 2008; Kamal & Deegan, 2013). Recent years have also seen an increase in companies disclosing more social information on other labour issues such as occupational health and safety, diversity in employment and equal opportunity in gender (Yongvanich & Guthrie, 2005). Companies that provided more disclosures in these areas have included information such as comparisons with previous targets or more details at absolute and normalised format through a comparison with industry averages. Companies may also report this information at disaggregated level based on different project sites. The new scoring index identified companies that were disclosing these additional information and awarded them with higher scores.

As the sampled companies are operating in the resources industry, most of them have employees working in mining and other mineral exploration projects who are highly concerned about occupational health and safety issues. In the pilot study, most companies have included this information by reporting on the lost time frequency injury rate (LTIFR). The Australian Standards, an independent not-for-profit organisation that develops the national standards for a safe and sustainable environment, defined LTIFR as an occurrence that results in a fatality, permanent disability or time lost from work of one day/shift or more (Standards Australia, 1990). Companies will tend to compare the company performance in the year to that of the set targets and industry averages. They

may also provide LTIFR with a breakdown rate for different project sites with details in the form of number of incidents or as a percentage of a comparable performance scale. These factors may explain the higher percentage of disclosure found in LAP.

To further explore the differences among the three aspects of sustainability (economic, environmental and social), statistical tests were performed using SPSS and results obtained were used for hypotheses testing. This pilot study also performed statistical tests to determine if there are significant differences between the disclosures among the four performance indicators in the social aspect of sustainability.

6.3.5 Hypothesis testing

This pilot study examined the initial hypotheses that were developed and discussed in Chapter Three. The hypotheses were tested for the existence of relationships between the extent of sustainability disclosures in the annual reports, standalone sustainability reports (the dependent variables) and selected company characteristics (the independent variables). Initially, the main hypotheses were tested to determine relationships between each of the company characteristics and the total sustainability disclosure. Subsequently, each of the company characteristics were tested against each of the three aspects of sustainability – (A) Economic, (B) Environmental and (C) Social. The results of the hypotheses testing provided useful preliminary findings for the main study.

6.3.5.1 Hypotheses 1: Company size- H1, H1A, H1B and H1C

H1: There is a positive relationship between company size and the extent of total sustainability disclosure provided by companies in the resources industry.

H1A: There is a positive relationship between company size and the extent of total economic disclosure provided by companies in the resources industry.

H1B: There is a positive relationship between company size and the extent of total environmental disclosure provided by companies in the resources industry.

H1C: There is a positive relationship between company size and the extent of total social disclosure provided by companies in the resources industry.

Company size was tested with three proxies: market capitalisation, total revenue and total assets. As explained in section 6.3, the non-parametric Kendall's tau-b test was used to test the hypotheses. The results showed that all three proxies had significant positive correlations with total sustainability, economic, environmental and social disclosure. As a result, the main hypothesis and all the three subsequent hypotheses were supported.

The statistical tests performed are considered robust as 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 (2013), 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, based on the effect size as suggested in Cohen (1988), the results indicated a medium effect as all of the correlation coefficients are above 0.2 and below 0.5. A summary of the detailed results is presented in Table 6.9 below.

Table 6.9 Kendall's tau-b correlation results for Hypotheses 1 (company size)

Proxy for Company Size	Total Sustainability Disclosure	Economic Disclosure	Environmental Disclosure	Social Disclosure
Market capitalisation	0.368** [0.151, 0.553]	0.243* [-0.049, 0.483]	0.295** [0.096, 0.480]	0.369** [0.161, 0.554]
Total revenue	0.360** [0.101, 0.585]	0.255** [0.019, 0.464]	0.323** [0.072, 0.548]	0.295** [0.048, 0.522]
Total assets	0.436** [0.228 0.625]	0.284** [0.046, 0.498]	0.431** [0.211, 0.611]	0.398** [0.194, 0.587]

Note: **Correlation is significant at the 0.01 level (1-tailed).
*Correlation is significant at the 0.05 level (1-tailed).
Bias corrected accelerated bootstrap 95% confidence interval reported in brackets.

6.3.5.2 Hypotheses 2: Company financial performance- H2, H2A, H2B and H2C

H2: There is a positive relationship between company financial performance and the extent of total sustainability disclosure provided by companies in the resources industry.

H2A: There is a positive relationship between company financial performance and the extent of total economic disclosure provided by companies in the resources industry.

H2B: There is a positive relationship between company financial performance and the extent of total environmental disclosure provided by companies in the resources industry.

H2C: There is a positive relationship between company financial performance and the extent of total social disclosure provided by companies in the resources industry.

Six proxies were used in hypotheses tests related to company financial performance. Kendall's tau-b test was also used for this set of hypotheses. All the different proxies reflected positive correlation with the dependent variables. However, the results of the hypotheses varied among the different proxies used. Most of them showed a significant positive correlation to the dependent variables when operating revenue, earnings before interest and tax (EBIT) and book value per share were used as proxies for company financial performance. However, contrary results were obtained when ROE and year-end share price were used. Hence, the set of hypotheses tests for H2 is only partially supported. In the cases where the hypotheses were supported, the effect size is considered to be medium according to Cohen (1988). Table 6.10 below summaries the results for hypotheses 2.

Statistical testing has shown a significant strong positive correlation ($r=0.851$, p-value<0.001) exists between ROA and ROE. This implies that the two proxies will yield a similar result and thus only one of the two variables is used in the main study. As total assets is used as a proxy for company size in hypotheses one, ROE is selected instead of ROA for the main study so that the impacts from both company equities and assets are included in this study.

Table 6.10 Kendall's tau-b correlation results for Hypotheses 2 (company financial performance)

Proxy for Company Financial Performance	Total Sustainability Disclosure	Economic Disclosure	Environmental Disclosure	Social Disclosure
Operating revenue	0.361** [0.104, 0.586]	0.244* [-0.007, 0.464]	0.312** [0.058, 0.547]	0.288** [0.050, 0.509]
EBIT	0.286** [0.013, 0.515]	0.180* [-0.076, 0.431]	0.268** [0.022, 0.483]	0.253* [-0.011, 0.497]
ROE	0.096 [-0.131, 0.299]	0.123 [-0.095, 0.332]	0.095 [-0.120, 0.303]	0.044 [-0.189, 0.257]
Book value per share	0.354** [0.097, 0.574]	0.324** [0.094, 0.521]	0.324** [0.110, 0.517]	0.263** [-0.004, 0.497]
Year-end share price	0.107 [-0.171, 0.358]	0.199* [-0.042, 0.401]	0.086 [-0.167, 0.299]	0.110 [-0.150, 0.356]

Note: **Correlation is significant at the 0.01 level (1-tailed).
*Correlation is significant at the 0.05 level (1-tailed).
Bias corrected accelerated bootstrap 95% confidence interval reported in brackets.

6.3.5.3 Hypotheses 3: Board composition

Independent directors H3(i), multiple directorships H3(ii), CEO duality H3(iii), women directors H3(iv), sustainability committee H3(v)

Table 6.11 below indicates the sets of hypotheses that were tested. A summary of the results, including the respective statistical methods used, is provided in the table.

Table 6.11 Hypotheses 3 and the statistical methods used

Proxies for company board composition	Hypotheses and Results	Statistical methods	Statistical results
Independent directors	**H3(i):** There is a positive relationship between the proportion of independent directors on the board and the extent of total sustainability disclosure[+] provided by companies in the resources industry. **Supported hypothesis H3(i)**, H3(i)B* and H3(i)C*. H3(i)A was not supported.**	Kendall's tau-B correlation	Correlation coefficient [Bootstrap interval] H3(i): 0.276** [0.071 - 0.479] H3(i)A: 0.163 [-0.034 – 0.359] H3(i)B: 0.204* [-0.027 – 0.435] H3(i)C: 0.241* [0.038 – 0.432]
Multiple directorships	**H3(ii):** There is a positive relationship between the proportion of directors that hold multiple directorships on the board and the extent of total sustainability disclosure[+] provided by companies in the resources industry. **Supported hypothesis H3(ii)*. All 3(ii)A*, H3(ii)B** and H3(ii)C* were supported.**	Kendall's tau-B correlation	Correlation coefficient [Bootstrap interval] H3(ii): 0.239* [0.020 - 0.454] H3(ii)A: 0.213* [0.008 – 0.419] H3(ii)B: 0.284** [0.060 – 0.505] H3(ii)C: 0.190* [-0.025 – 0.399]
CEO Duality	**H3(iii):** Companies in the resources industry with CEO duality provide lesser extent of total sustainability disclosure[+]. **Supported H3(iii)A. Hypothesis H3(iii), H3(iii)B and H3(iii)C were not supported.**	Mann-Whitney test	H3(iii): U=82.5, p-value=0.099 H3(iii)A: U=72.0, p-value=0.049 H3(iii)B: U=82.5, p-value=0.099 H3(iii)C: U=85.0, p-value=0.121
Women directors	**H3(iv):** There is a positive relationship between the proportion of women directors on the board and the extent of total sustainability disclosure[+] provided by companies in the resources industry. **Supported hypothesis H3(iv)**. All H3(iv)A**, H3(iv)B* and H3(iv)C** were supported.**	Kendall's tau-B correlation	Correlation coefficient [Bootstrap interval] H3(iv): 0.329** [0.119 - 0.501] H3(iv)A: 0.320** [0.107 – 0.528] H3(iv)B: 0.240* [-0.029 – 0.470] H3(iv)C: 0.323** [0.113 – 0.501]
Sustainability committee	**H3(v):** Companies in the resources industry with a sustainability committee provide greater extent of total sustainability disclosure[+]. **Supported hypothesis H3(v). All H3(v)A, H3(v)B and H3(v)C were supported.**	Mann-Whitney test	H3(v): U=97.5, p-value=0.001 H3(v)A: U=142.5, p-value=0.013 H3(v)B: U=112.5, p-value=0.002 H3(v)C: U=115.5, p-value=0.002

Note: [+]To replace total sustainability disclosure to (A) economic disclosure for hypothesis A; (B) environmental disclosure for hypothesis B; and (C) social disclosure for hypothesis C.

[**]Significant at 0.01 level (1-tailed). [*]Significant at 0.05 level (1-tailed). Bias corrected accelerated bootstrap 95% confidence interval reported in brackets.

Table 6.11 above summarises the results of different sets of hypothesis tests relating to company board composition. There were significant positive correlations found between the total sustainability disclosures and the three proxies of the board composition: the proportion of independent directors (H3i), proportion of directors that hold multiple directorships (H3ii), and proportion of women directors (H3iv). This result is consistent among the economic, environmental and social aspects of sustainability. Except for hypothesis H3(i)A, all other hypotheses were supported.

The sets of hypotheses on CEO duality (H3iii) and sustainability committee (H3v) were analysed using a Mann-Whitney test. Of the total 46 companies in pilot study, 7 (15.2%) companies had CEO duality and 39 (84.8%) were without. The statistical results indicated that companies in the resources industry with CEO duality were not providing a significantly different total extent of sustainability disclosures compared to those without CEO duality as the significance (p-value=0.099) was greater than 0.05 and the null hypothesis was retained. This result was consistent with the environmental (p-value=0.099) and the social aspect (p-value=0.121), but differed with the economic aspect (p-value=0.049). Companies without CEO duality (mean rank= 25.25) were disclosing significantly more economic disclosures than those with CEO duality (mean rank=14.29).

All the hypotheses on sustainability committee (H3v) were supported. There were 18 (39.1%) companies that have a sustainability committee and 28 (60.9%) were without. Companies that have a sustainability committee (mean rank = 32.08) were providing a significantly greater extent of total sustainability disclosures than those without (mean rank = 17.98). This result was consistent for all three aspects of sustainability disclosures.

6.3.5.4 Hypotheses 4: Type of resources extracted - H4, H4A, H4B and H4C

H4: There are differences in the extent of total sustainability disclosure provided by companies in the metals and mining sector compared to those in the energy and utilities sector.

H4A: There are differences in the extent of economic disclosure provided by companies in the metals and mining sector compared to those in the energy and utilities sector.

H4B: There are differences in the extent of environmental disclosure provided by companies in the metals and mining sector compared to those in the energy and utilities sector.

H4C: There are differences in the extent of social disclosure provided by companies in the metals and mining sector compared to those in the energy and utilities sector.

A Mann-Whitney U test revealed no significant differences in the extent of total sustainability disclosure, total hard disclosures and total soft disclosures between the two sectors. Similar results were also obtained from a Mann-Whitney U test that was performed on the three aspects of sustainability disclosures for companies in the two different sectors. Table 6.12 below indicates the details of the results from the statistical tests. The significance levels (p-values) in all the tests were more than 0.05, indicating that the mean ranks of all the various tested variables were significantly the same between the two sectors. Hence, the entire set of hypotheses four was not supported and this indicated that there were no significant differences in sustainability disclosures between companies in the Metals and Mining (MM) sector and the Energy and Utilities (EU) sector. These consistent results suggest that similar sustainability reporting practices exist among companies operating in these two sectors. It also suggests that the two sectors are representative of the resources industry as a whole.

Table 6.12 Results of Mann-Whitney U test between MM and EU sectors

Variable	Significance (p-value)	Mean rank of MM	Mean rank of EU	Mann-Whitney U	Standardised Test statistic (z-value)
Total disclosures	0.921	23.30	23.70	260.00	-0.099
Hard disclosures	0.939	23.35	23.65	261.00	-0.077
Soft disclosures	0.676	24.33	22.67	283.50	0.418
Economic disclosures	0.841	23.11	23.89	255.50	-0.200
Environmental disclosures	0.783	22.96	24.04	252.00	-0.275
Social disclosures	0.606	22.48	24.52	241.00	-0.516

Note: n denotes total number of cases. There are 23 companies in each of the two (MM and EU) sectors

6.3.5.5 Hypothesis 5: Hard and soft disclosures - H5

H5: Companies in the resources industry provide more soft disclosure items than hard disclosure items.

A Wilcoxon signed rank Test revealed that companies in the resources industry were providing more disclosure in soft items than hard items. This result is statistically significant ($p < 0.001$) and hence H5 is supported. In fact, a further analysis reveals that all 46 companies included in this pilot study disclosed more soft than hard disclosure items. This suggests that companies tend to provide a significantly greater number of soft rather than hard sustainability disclosures in their reports. This is probably because it is generally easier to provide more generic soft disclosure items that are difficult for stakeholders to verify.

6.3.5.6 Hypothesis 6: Disclosures among the three aspects of sustainability - H6

H6: Companies in the resources industry provide more environmental disclosures than social and economic disclosures in their sustainability disclosures.

The results of the Friedman's Test indicated that there was a statistically significant difference in the disclosures across the economic, environmental and social aspects of sustainability (Chi-Square=46.44, df=2, n=46, $p<0.001$). Inspection of the median values showed a decrease in percentage of disclosure from economic (Md = 33.33%) to social (Md = 15.95%) to environmental (Md = 12.12%). This ranking is, however, different when the mean rank is reviewed. The arrangement in a descending order is from economic (mean rank = 2.82) to environmental (mean rank = 1.65) to social (mean rank = 1.53). Although the rankings are different, economic disclosure was the highest in both measures. Hence, H6 is not supported. The inconsistent result in the rankings suggests further evaluation is required to review the differences among the four performance indicators within the combined social disclosures.

A follow up test using Friedman two ANOVA was conducted on the four performance indicators within the social disclosure. The results of the Friedman's Test indicated that there was a statistically significant difference in the disclosures among the labour, society, product responsibility and human rights performance indicators within the social aspects of sustainability (Chi-Square= 76.45, df=3, n=46, $p<0.001$). Inspection of the median values showed a decrease in the percentage of disclosure from labour (Md = 38.89%) to society (Md = 10.00%) to product responsibility (Md = 5.00%) to human rights (Md = 0.93%). This ranking yields consistent results when the mean rank is reviewed.

The results from the two Friedman's Test suggest that significant differences among the four social performance indicators may have caused the inconsistent ranking results. This indicates the need to evaluate the extent of social disclosure by considering the four social performance indicators separately rather than combining them into one single social disclosure item.

6.4 Implications for Main Research

The pilot study has achieved the set objectives through the application of the newly developed scoring index to 46 listed companies in the resources industry of Australia. The validity and feasibility of the scoring index are demonstrated through the awarded scores that were able to differentiate companies with more sustainability information disclosed in their reports from those with less sustainability information disclosed in their reports. The pilot study has assisted in the compilation of a list of standardised scoring criteria to ensure that consistency is maintained in the scoring process for the main study. A recording worksheet has also prescribed a comprehensive list of data to be collected. The final scoring of each company is consolidated using a summary score sheet. The design, methods and scoring criteria have been reviewed and improved from the pilot study for the main study. The preliminary results that were obtained in the pilot study are used to compare those from the main study in the next chapter.

CHAPTER 7

DATA ANALYSIS, RESULTS AND DISCUSSION

Unlike traditional instruments used for sustainability disclosures that do not measure and reflect companies' sustainability performance (Atkins et al., 2015; Cho et al., 2012; Deegan & Gordon, 1996; Gray, 2010; Gray & Milne, 2002; Hopwood, 2009; Milne & Gray, 2013), this study measures the quality of sustainability reporting of companies in the Australian resources industry using a newly developed scoring index. The scoring index was pilot tested and the results and implications for the main study were discussed in the previous chapter. The analysis is expanded to a larger sample that included the use of the scoring index to evaluate the annual financial reports and stand-alone sustainability reports of 133 companies. This chapter reports the results obtained from statistical testing using the Statistical Package for Social Science (SPSS) and discusses the empirical results applicable to the hypotheses. The implications from these results are also presented.

7.1 Descriptive Results

Table 7.1 below summarises the descriptive statistics of scores awarded to the sample companies under the different categories of the new scoring index. A detailed record of the scores awarded to the sampled companies is contained in Appendix 7-1. Generally, the companies studied had few sustainability disclosures. On average, the companies were disclosing only 20.94% of the total disclosures. They disclosed 14.68% more soft disclosures (33.30%) than hard disclosures (18.62%). These results correspond to those found in the pilot study. They are also consistent with the results from prior studies which found that companies were generally producing disclosures that rarely provide quantitative information relating to actual outcomes that could be verified (Dong & Burritt, 2010; Frost, 2007; Guthrie et al., 2008).

The results also reveal that there is vast diversity in companies' disclosure items. The large range of scores among the various categories of disclosure items, shown in

Table 7.1, indicates the vast differences in the companies' disclosures on sustainability information. These results are in line with prior studies that found most companies were producing generally low amount of sustainability disclosures with disclosure items that varied immensely in their content (Dong & Burritt, 2010; Guenther et al., 2006; Rao et al., 2012).

Table 7.1 Descriptive statistics for dependent variables

Categories in scoring index	Maximum Possible Scores	Mean	Median	Standard Deviation	Minimum-Maximum	Range
A1: Governance	9	5.69	5.00	2.04	2 -9	7
A2: Credibility	5	1.33	0.00	1.66	0 - 5	5
A3: Performance Indicators						
A3: Economic	18	6.95	6.00	3.82	0 – 18	18
A3: Environmental	66	11.59	7.00	11.57	0 -59	59
A3: Social–Labour	36	11.35	11.00	7.25	0 – 31	31
A3: Social-Human Rights (HR)	54	2.83	0.00	6.21	0 -32	32
A3: Social-Society	30	2.68	1.00	4.13	0 – 26	26
A3: Social-Product Responsibility (PR)	30	3.54	0.00	5.72	0 – 29	29
A4: Spending	2	0.59	0.00	0.72	0 – 2	2
A5: Vision	7	5.33	7.00	2.44	0 -7	7
A6: Initiatives	3	0.36	0.00	0.77	0 – 3	3
A7: Disclosure of Management Approach (DMA)						
A7: Economic	3	1.56	1.00	0.79	0 – 3	3
A7: Environmental	9	2.92	2.00	2.12	0 – 9	9
A7: Social–Labour	6	2.90	3.00	1.47	0 – 6	6
A7: Social-HR	9	0.97	0.00	1.94	0 – 9	9
A7: Social-Society	5	0.79	1.00	1.02	0 – 5	5
A7: Social-PR	5	0.81	0.00	1.24	0 – 5	5
Total Hard (A1 to A4)	**250**	**46.55 (18.62%)**	**36.00 (14.40%)**	**35.17**	**10 - 203**	**193**
Total Soft (A5 to A7)	**47**	**15.65 (33.30%)**	**14.00 (29.79%)**	**8.99**	**2 - 47**	**45**
Total Disclosure (A1 to A7)	**297**	**62.20 (20.94%)**	**50.00 (16.84%)**	**43.74**	**12 - 248**	**236**

Note: Percentage in brackets is the percentage of the maximum possible score in the respective category.

Consistent with most empirical research in sustainability disclosures, this study found companies in Australian resources industry providing very minimal disclosures (Dong & Burritt, 2010; Frost, 2007). The mean of the total disclosure (category A1 to A7) was merely 20.94%, which is way below the passing mark of 50%. To exacerbate the problem, all 133 sample companies reported more soft than hard disclosure items. These results indicated the two-fold problems of sustainability reporting practices among companies in the Australian resources industry. Firstly, the level of sustainability disclosures was low. Secondly, the low level of disclosure consisted mainly of soft disclosure items that relate to generic non-verifiable information that suggests a low quality of sustainability disclosure.

The large range in values indicates the presence of extreme scores. Hence, in this case, the median is considered to be a better measure of the average than the mean as the median is relatively not affected by extreme scores (Field, 2013). As shown in Table 7.1 above, there are 7 out of 17 categories (41.18%) that have zero as their median. This suggests that, on average, the sample companies had no disclosure in seven categories: credibility (A2), two social performance indicators (A3: Social) – human rights and product responsibility, spending (A4), initiatives (A6), two disclosure of management approach (DMA, A7) – human rights and product responsibility.

7.2 Results of Hypothesis Testing

This study investigates the correlations between the three aspects of sustainability disclosures - economic, environmental and social - and selected company characteristics - company size, financial performance, board composition, and industry sector. Non-parametric analyses were applied for all the hypotheses testing because the distribution of the data was not normal. Appendix 7-2 and 7-3 contain the details of the independent variables (company characteristics) of the sample companies.

As explained in Chapter 4 on methodology, Kendall's tau-b was used for non-parametric correlation analysis for testing of Hypotheses 1, 2, 3(i), 3(ii) and 3(iv). The statistical tests performed are considered robust as an additional bootstrapping process was performed with 1000 bootstrap samples with a 95% confidence interval.

Mann-Whitney test was used to test Hypotheses 3(iii), 3(v) and 4 to compare two conditions between independent samples as the assumption of normality is violated in the distribution (Field, 2013). The Wilcoxon signed ranks Test and Friedman Two-Way Test were used for Hypotheses 5 and 6 respectively.

7.2.1 Hypotheses 1: Company size

The first set of hypotheses examines the correlation between company size and the extent of sustainability disclosure (H1), economic disclosure (H1A), environmental disclosure (H1B), and social disclosure (H1C). These hypotheses were proposed as:

H1: There is a positive relationship between company size and the extent of total sustainability disclosure provided by companies in the resources industry.

H1A: There is a positive relationship between company size and the extent of total economic disclosure provided by companies in the resources industry.

H1B: There is a positive relationship between company size and the extent of total environmental disclosure provided by companies in the resources industry.

H1C: There is a positive relationship between company size and the extent of total social disclosure provided by companies in the resources industry.

Three proxies, namely, market capitalisation, total revenue, and total assets were used for company size. The results from the non-parametric Kendall's tau-b tests showed that the three proxies had significant positive correlations with all the dependent variables tested. The first set of hypotheses were fully supported statistically (one-tailed, $p<0.001$, $N=133$). Table 7.2 below summarises the results from the Kendall's tau-b tests for correlation. The correlation coefficients, the respective p-values, and results of bootstraps are presented. Among the three proxies used for company size, total assets appear to have the strongest positive correlation with each of the dependent variables.

Table 7.2 Kendall's tau-b correlation results for Hypotheses 1 (company size)

Proxy for Company Size	Total Sustainability Disclosure	Economic Disclosure	Environmental Disclosure	Social Disclosure
Market capitalisation	0.332*** [0.217, 0.432]	0.247*** [0.135, 0.352]	0.260*** [0.135, 0.375]	0.341*** [0.242, 0.445]
Total revenue exclude interest revenue	0.296*** [0.173, 0.412]	0.217*** [0.085, 0.341]	0.239*** [0.108, 0.358]	0.303*** [0.180, 0.415]
Total assets	0.421*** [0.317, 0.513]	0.302*** [0.170, 0.418]	0.344*** [0.234, 0.449]	0.400*** [0.300, 0.489]

Note: ***Correlation is significant at the 0.001 level (1 tailed), Bias corrected accelerated bootstrap 95% confidence interval reported in brackets.

These results are in line with those obtained in prior research (Andrikopoulos & Kriklani, 2013; Ho & Taylor, 2007; Jones et al., 2007; Tagesson et al., 2009) and the pilot study. The results suggest that large companies report more sustainability disclosures. The large companies also disclose more in all the three aspects of sustainability. This study confirms the significant positive correlations between company size and extent of sustainability disclosures using a new measurement that emphasises verifiable sustainability performance. This further suggests that large companies have demonstrated better sustainability performance than smaller companies.

Large companies tend to have stronger financial capabilities and resources to engage in more sustainability reporting (Ho & Taylor, 2007; Jones et al., 2007; Tagesson et al., 2009). Patten (1992) suggested that the legitimacy theory also explains this phenomenon as larger companies normally attract greater publicity and more scrutiny from their stakeholders and are more likely to provide more sustainability disclosures to legitimise their business activities. Adams et al. (1998) also found that larger companies across all six European countries (Netherlands, Switzerland, France, Germany, Sweden and the United Kingdom) provided more sustainability disclosures in all three categories examined – environmental, employee and ethical issues.

7.2.2 Hypotheses 2: Company financial performance

The next set of hypotheses examines the correlation between company financial performance and the extent of sustainability disclosure (H2), economic disclosure

(H2A), environmental disclosure (H2B), and social disclosure (H2C). The company financial performance was represented by operating revenue, earnings before interest and tax (EBIT), return of equity (ROE), book value per share, and year-end share price. The hypotheses were suggested as:

H2: There is a positive relationship between company financial performance and the extent of total sustainability disclosure provided by companies in the resources industry.

H2A: There is a positive relationship between company financial performance and the extent of total economic disclosure provided by companies in the resources industry.

H2B: There is a positive relationship between company financial performance and the extent of total environmental disclosure provided by companies in the resources industry.

H2C: There is a positive relationship between company financial performance and the extent of total social disclosure provided by companies in the resources industry.

Hypothesis 2, which focused on total sustainability disclosure, was fully supported by all the five proxies that were used to represent company financial performance. Kendall's tau-b's correlation coefficient showed a significant positive relationship between total sustainability disclosures and company financial performance with bootstrapping tested. However, the results were not consistent among the other three hypotheses H2A, H2B and H2C. Table 7.3 below presents the results obtained from the Kendall's tau-b tests that were performed to analyse the second set of hypotheses.

Table 7.3 Kendall's tau-b correlation results for Hypotheses 2 (company financial performance)

Proxy for Company Financial Performance	Total Sustainability Disclosure	Economic Disclosure	Environmental Disclosure	Social Disclosure
Operating revenue	0.313*** [0.179, 0.432]	0.234*** [0.096, 0.369]	0.254*** [0.122, 0.375]	0.305*** [0.185, 0.417]
EBIT	0.160** [0.022, 0.293]	0.116* [-0.026, 0.262]	0.113* [-0.035, 0.259]	0.165** [0.021, 0.308]
ROE	0.140** [0.039, 0.247]	0.097 [-0.009, 0.218]	0.108* [-0.004, 0.224]	0.133* [0.029, 0.253]
Book value per share	0.403*** [0.305, 0.494]	0.305*** [0.185, 0.424]	0.307*** [0.198, 0.418]	0.356*** [0.243, 0.454]
Year-end share price	0.310*** [0.201, 0.425]	0.251*** [0.135, 0.368]	0.225*** [0.116, 0.339]	0.293*** [0.177, 0.404]

Note: ***Correlation is significant at the 0.001 level (1 tailed), **Correlation is significant at the 0.01 level (1 tailed), *Correlation is significant at the 0.05 level (1 tailed), Bias corrected accelerated bootstrap 95% confidence interval reported in brackets.

As shown in Table 7.3 above, the hypothesis H2A was supported when operating revenue, book value per share and year-end share price were used as the proxies for company financial performance. There was a significant positive correlation between economic disclosure and company financial performance (p-value < 0.001, 1 tailed). The positive correlation was also significant (p-value < 0.05, 1 tailed) when EBIT was used, but the bootstrapping test indicated a cross through the zero mark. There was no significant result (p-value = 0.058) obtained with the use of ROE.

Hypothesis H2B was partially supported with three out of the five proxies used yielding significant results with robust tests of bootstrapping (p-value < 0.001, 1 tailed). Although there was also a significant positive correlation between environmental disclosure and company performance when EBIT and ROE were used as the proxies (p-value < 0.05, 1 tailed), the robust test of bootstrapping was not passed in the case when both proxies were used.

Hypothesis H2C, however, was fully supported with all the five proxies used. The Kendall's tau-b's correlation coefficients with bootstrapping showed a significant positive relationship between social disclosure and company financial performance.

Comparing the above results with those obtained in the pilot study, more significant results were obtained in this main study with the use of a larger sample. The inconsistent results obtained with the use of different proxies for company financial performance are in line with those from prior studies (Ho & Taylor, 2007; Jones et al., 2007). Ho and Taylor (2007) investigated the relationship between total sustainability disclosure and company financial performance measured by leverage, liquidity and profitability. Their research, which focused on companies in the United States and Japan, obtained a generally negative correlation that implied companies with poorer financial performance were providing more sustainability disclosures. This correlation, however, was not consistent among the different proxies used. In the Australian context, Jones et al. (2007) also observed similar inconsistent results. Contrary to Ho and Taylor, Jones et al. found a generally positive correlation between company financial performance and sustainability disclosure with nine different proxies that were used to measure company financial performance. However, similar to Ho and Taylor, not all of the statistical tests performed in Jones et al.'s study yielded significant results and not all the nine proxies had similar positive relationships to sustainability disclosure.

The use of different proxies to measure company financial performance and the different methods that were used to measure sustainability disclosure have contributed to the inconsistent results (Ho & Taylor, 2007; Jones et al., 2007; Tagesson et al., 2009). In addition, the problem of multicollinearity that commonly exists among different proxies used for company financial performance (Tagesson et al., 2009) has also made it difficult to interpret the correlation between sustainability disclosure and company financial performance. Multicollinearity was checked at the stage of the pilot study for this research. Among the proxies used, only ROE and return on asset (ROA) were found to have strong positive correlation. As a result, only ROE was used in the main study to measure company financial performance as total assets was used as a proxy for company size in Hypotheses 1.

7.2.3 Hypotheses 3: Board composition

The board of directors (BOD) of a company, which represents the highest level of management in a company, has a major impact on a company's reporting practices and procedures (Fama & Jensen, 1983; Keasey & Wright, 1993). The composition of the BOD has major implications on how the BOD can effectively fulfil its role in providing effective management to the company (Goodstein et al., 1994; Pfeffer, 1972; Webb, 2004). Prior research supports board diversity as diversity generally promotes more discussion of ideas to improve performance (Chandler, 2005; van Knippenberg, De Dreu, & Homan, 2004) and diversity implies that members are more representative of the different stakeholders (Wang & Dewhirst, 1992). Kang et al. (2007) defined board diversity as "variety in the composition of the BOD" (p. 195). Prior literature has identified that a company's board composition influences companies' sustainability reporting (Michelon & Parbonetti, 2012; Post et al., 2011; Rao et al., 2012; Rupley et al., 2012; Siregar & Bachtiar, 2010; Webb, 2004). This study focuses on the examination of five attributes of board diversity namely the proportion of independent directors, proportion of directors with multiple directorships, presence of CEO duality (i.e. company CEO acting as board chairman), proportion of female directors, and existence of a sustainability committee.

7.2.3.1 Hypotheses 3(i): Proportion of independent directors

This set of hypotheses investigates the correlation between the proportion of independent directors and the extent of sustainability disclosure (H3i), economic disclosure (H3iA), environmental disclosure (H3iB) and social disclosure (H3iC).

According to agency theory, it is important to have a majority of independent directors in a company's BOD (Fama & Jensen, 1983; Jensen & Meckling, 1976). While there is no dispute about the importance of having a larger proportion of independent directors in the BOD, there are differences in the definition of independence (Kang et al., 2007). This study adopts the definition developed by the Australian Securities Exchange (ASX) Corporate Governance Council (CGC). ASX CGC defines an independent director as

> in the case of an externally managed listed entity, a director of the entity who is also an executive of the listed entity or a child entity and, in the case of an externally managed listed entity, a director of the responsible entity who is also an executive of the responsible entity or a related body corporate. (Australian Securities Exchange Corporate Governance Council, 2014, p. 37)

This implies that the director is not in a relationship that might influence materially his or her independent judgement and to act in the best interest of a company's stakeholders.

Prior studies have found that companies with a greater proportion of independent directors are disclosing more sustainability information (Post et al., 2011; Rao et al., 2012; Rupley et al., 2012). Hence, the set of hypotheses was proposed as:

H3(i): 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.

H3(i)A: 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.

H3(i)B: 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.

H3(i)C: 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.

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, Ƭ= 0.135, p= 0.013, N= 133), economic disclosure (Ƭ= 0.122, p= 0.027, N= 133), and social disclosure (Ƭ= 0.125, p= 0.020, N= 133). Hence, Hypotheses H3(i), H3(i)A and H3(i)C were supported. The results were robust with the bootstrap tests passed at a

95% confidence interval. However, no significant statistical result was obtained to support Hypotheses H3(i)B on environmental disclosure (Ƭ= 0.083, p= 0.090, N= 133).

These results vary from those obtained in the pilot study. In both the pilot study and the main study, there were significant positive correlations between the proportion of independent directors and total sustainability disclosure (H3i) and social disclosure (H3iC). In the pilot study, no significant correlation was found between the proportion of independent directors and economic disclosure (H3iA) but a significant positive correlation was found in the main study. However, the results for environmental disclosure (H3iB) indicate the reverse, as a significant positive correlation was found in the pilot study but not in the main study.

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 the new scoring index developed for 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 used in the new scoring index of the current 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 H3(i), H3(i)A and H3(i)C 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.

7.2.3.2 Hypotheses 3(ii): Proportion of multiple directorships

The set of Hypotheses 3(ii) examines the correlation between the proportion of directors on the board that hold multiple directorships and the extent of sustainability disclosure (H3ii), economic disclosure (H3iiA), environmental disclosure (H3iiB) and social disclosure (H3iiC).

Directors serving on multiple boards are exposed to different company practices and they gain knowledge through interacting with other board members (Rupley et al., 2012). In the context of sustainability disclosure, directors with multiple directorships may acquire better exposure to different sustainability practices. These directors, who

are better equipped with sustainability knowledge and techniques in reporting, are expected to provide more sustainability disclosure. Thus, the hypotheses were suggested as follows:

H3 (ii): There is a positive relationship between the proportion of directors on the board that hold multiple directorships and the extent of total sustainability disclosure provided by companies in the resources industry.

H3(ii)A: There is a positive relationship between the proportion of directors on the board that hold multiple directorships and the extent of economic disclosure provided by companies in the resources industry.

H3(ii)B: There is a positive relationship between the proportion of directors on the board that hold multiple directorships and the extent of environmental disclosure provided by companies in the resources industry.

H3(ii)C: There is a positive relationship between the proportion of directors on the board that hold multiple directorships and the extent of social disclosure provided by companies in the resources industry.

The results from the non-parametric Kendall's tau-b tests showed that all the hypotheses were fully supported statistically (one-tailed, N=131). 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 3(ii). Similar results are found in the pilot study and 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.

7.2.3.3 Hypotheses 3(iii): CEO duality

The next set of hypotheses, Hypothesis 3(iii), was tested to determine whether CEO duality, which refers to the same person performing the roles of both the board chair and the CEO of a company, results in a lesser extent of sustainability disclosure. Adams, Almeida, and Ferreira (2005) claimed that CEOs with these dual positions are likely to have increased power over other board members and this reduces the independence of the board. This view was supported by Forker (1992) who asserted that CEO duality promotes the 'dominant personality' in CEOs and this tends to result in less disclosure. Thus, the hypotheses were proposed as:

H3(iii): Companies in the resources industry with CEO duality provide lesser extent of total sustainability disclosure.

H3(iii)A: Companies in the resources industry with CEO duality provide lesser extent of economic disclosure.

H3(iii)B: Companies in the resources industry with CEO duality provide lesser extent of environmental disclosure.

H3(iii)C: Companies in the resources industry with CEO duality provide lesser extent of social disclosure.

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. The 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 H3(iii) 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, H3(iii)A, H3(iii)B and H3(iii)C were supported. Table 7.4 below presents the results from Mann-Whitney U tests that were performed to analyse the above set of hypotheses.

Table 7.4 Results of Mann-Whitney U test for Hypotheses H3(iii) 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 / 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 7.4 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. These results were also different to those found in the pilot study when economic disclosure was the only disclosure that was found to be significantly different between companies that had CEO duality and those that did not. 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.

7.2.3.4 Hypotheses 3(iv): Proportion of women directors

The proportion of women directors on the BOD is another characteristic analysed in this set of hypotheses. Many prior studies have found a positive correlation between the proportion of women directors and sustainability reporting (Rao et al., 2012; Rupley et al., 2012). In line with these, the set of hypotheses was proposed as:

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

H3(iv)A: 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.

H3(iv)B: 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.

H3(iv)C: 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.

The results from the Kendall's tau-b tests showed that all the hypotheses were fully supported statistically (one-tailed, N=133). 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(iv). Similar results were found in the pilot study.

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.

7.2.3.5 Hypotheses 3(v): Sustainability committee

The final characteristic of the BOD examined in this set of hypotheses relates to the existence of a sustainability committee. Companies with a sustainability committee have demonstrated their proactive efforts on sustainability through the establishment of a specialised committee to manage sustainability issues. In line with this argument, the set of hypotheses was suggested as:

H3(v): Companies in the resources industry with a sustainability committee provide greater extent of total sustainability disclosure.

H3(v)A: Companies in the resources industry with a sustainability committee provide greater extent of economic disclosure.

H3(v)B: Companies in the resources industry with a sustainability committee provide greater extent of environmental disclosure.

H3(v)C: Companies in the resources industry with a sustainability committee provide greater extent of social disclosure.

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 H3(v) 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 7.5 below summarises the results of the Mann-Whitney test for Hypotheses H3(v).

Table 7.5 Results of Mann-Whitney U test for Hypotheses H3(v) 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 / 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 are consistent with those from the pilot study, but differ from those in Rupley et al. (2012). Rupley et al. (2012) 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.

7.2.4 Hypotheses 4: Type of resources extracted

While many studies have focused on companies in environmentally sensitive industries such as the resources industry, most of them have focused on comparing these companies to those that were operating in non-environmentally sensitive industries (Gibson & O'Donovan, 2007; Suttipun & Stanton, 2012; Wood & Ross, 2008). Others have only examined either the mining sector (Perez & Sanchez, 2009; Soutar, Christopher, & Cullen, 1998; Yongvanich & Guthrie, 2005) or the oil and gas sector (Dong & Burritt, 2010). A study that compared the disclosures between the mining and oil and gas industry was performed by Guenther et al. (2006). They found some differences in the disclosures of companies in the two sectors while Perez and Sanchez (2009) that focused on mining sector and Dong and Burritt (2010) that focused on oil and gas discovered some similarities. In view of the contrary results from the different studies, this study proposed alternative hypotheses as follows:

H4: There are differences in the extent of total sustainability disclosure provided by companies in the metals and mining sector compared to those in the energy and utilities sector.

H4A: There are differences in the extent of economic disclosure provided by companies in the metals and mining sector compared to those in the energy and utilities sector.

H4B: There are differences in the extent of environmental disclosure provided by companies in the metals and mining sector compared to those in the energy and utilities sector.

H4C: There are differences in the extent of social disclosure provided by companies in the metals and mining sector compared to those in the energy and utilities sector.

The sample was classified into two different categories according to the sectors – metals and mining (M&M) and energy and utilities (E&U) based on the type of resources extracted. There were 73 companies in the sample that operated in the E&U sector and 66 companies in the M&M sector. A Mann-Whitney U test was performed on the data. The results from the Mann-Whitney U tests indicated that there were no significant differences in the total sustainability disclosure, economic disclosure, environmental disclosure, and social disclosure by companies that were operating in the two different sectors ($p > 0.1$, two-tailed). Hence, all the hypotheses in the set of Hypothesis H4 (H4, H4A, H4B and H4C) were not supported. These results were in line with those obtained in the pilot study, but were contrary to those found in Guenther et al.'s (2006) study.

Further tests were performed on the different categories of the dependant variables, A1 to A7, using the Mann-Whitney U test to investigate any significant differences between the disclosures of companies in the M&M and E&U sectors. There were no significant differences in the information disclosed in the total hard and soft disclosure items between companies operating in the two sectors. Except for the social performance indicator on human rights (A3-HRP), sustainability initiatives (A6) and disclosure on management approach on economic aspect (A7-ECP), all the remaining dependent variables indicated no significant differences. The results from the Mann-Whitney U test indicated that companies operating in the M&M sector were disclosing significantly more information in A3-HRP ($p = 0.05$, two tailed), A6 ($p < 0.001$, two tailed) and A7-ECP ($p = 0.016$, two tailed) than those operating in the E&U sector. The calculated effects for A3-HRP, A6 and A7-HRP were 0.170, 0.309 and 0.209 respectively, and they were considered to be between small to medium (Cohen, 1988).

Similar tests were performed to investigate whether company characteristics were significantly different between companies in the two sectors. Proxies of the independent variables for company size, financial performance and board composition were used in the analysis. Results showed that the market capitalisation of companies

in the M&M sector (mean rank = 80.75, n = 60) were significantly larger than those in the E&U sector (mean rank = 55.7, n = 73), U = 3015, z = 3.73, p < 0.001, two-tailed. The effect can be described as medium (r = 0.323). Companies in the M&M sector also performed better than those in the E&U sector when three of the proxies – return on equity, book value per share and year-end share price – for company financial performance were analysed in a Mann-Whitney U test. However, companies in the two sectors did not show significant differences for the proportion of the independent directors, the proportion of directors with multiple directorships and the proportion of women directors.

The results suggest that companies operating in the M&M and E&U sectors share relatively similar sustainability reporting practices. While companies in the M&M sector tend to have a larger market capitalisation and they perform better financially, they have a fairly similar board composition. These results indicate that the two sectors are representative of the resources industry as a whole. However, they were not consistent with those found in Guenther et al. (2006) where companies in the two sectors have placed a different emphasis on various environmental performance indicators. They found that companies in the mining sector have disclosed more information in areas such as land use and rehabilitation while companies operating in the oil and gas sector have disclosed more details on transportation methods and oil spill incidents. However, this study did not yield a similar outcome as the result did not support hypothesis H3B when environmental disclosure was tested. Instead, this study found that disclosures provided by companies in the M&M and E&U sector differ in three categories: social performance indicator on human rights (A3-HRP), sustainability initiatives (A6), and disclosure on management approach on economic aspect (A7). These differences were not found in Guenther et al.'s study as they focused solely on the environmental aspect; the economic and social aspects of sustainability were not investigated.

7.2.5 Hypothesis 5: Hard and soft disclosures

This study adopts a new scoring scale to measure companies' sustainability disclosures. The disclosure items were classified into two broad categories: hard and

soft disclosure items. Each of the hard disclosure items is awarded a score that ranges from 0 to 6. A point is awarded to each disclosure item that includes information in comparison to each of the following six indicators: peers or industry, previous period, targets, aggregate and normalised form, and disaggregate level.

Prior research has found that companies are generally disclosing broad categories of data with very diverse disclosure items (Dong & Burritt, 2010; Guenther et al., 2006; Rao et al., 2012). This suggests that managers prefer to provide the minimal information through soft disclosure items such as proclaiming a vision statement to satisfy mandatory requirements and their stakeholders. They tend to avoid reporting the hard disclosure items that require detailed quantitative data to verify improvements in sustainability performance by comparing the actual performance with prior periods and pre-set targets. Hence, this study has proposed the hypothesis as:

H5: Companies in the resources industry provide more soft disclosure items than hard disclosure items.

The total raw scores of both the hard and soft disclosure were recoded as a percentage of their maximum possible scores in the hard (250) and soft disclosure categories (47) to facilitate comparison. Table 7.6 below displays the descriptive statistics for the percentages of hard and soft disclosures. In the category of hard disclosure, the percentage of disclosure has a minimum of 4% and a maximum of 81%. In the soft disclosure category, companies reported a minimum of 4% and there were companies that reported a full 100%. The results in Table 7.6 indicate that every company in the sample disclosed more soft than hard disclosure items.

Table 7.6 Descriptive statistics for hard and soft disclosures

Item	Mean	Median	Standard Deviation	Minimum-Maximum
Percentage of hard disclosure (A1 – A4)	18.62%	14.40%	14.07%	4% - 81%
Percentage of soft disclosure (A5 – A7)	33.31%	29.79%	19.13%	4% - 100%
Difference (Percentage of soft disclosure Minus Percentage of hard disclosure	14.69%	14.60%	7.57%	0% - 37%

A Wilcoxon signed rank test was performed to compare the companies' disclosures on hard and soft items. The percentage of disclosures in the two categories was used for the test. As anticipated from the descriptive results above, the statistical test showed no tied ranks and negative ranks. The result displayed all positive ranks which indicated that all the sample companies reported more soft disclosure items than hard disclosure items. The result is significant ($p < 0.001$, two tailed) and the effect, $r = 0.868$, was considered large as it was greater than 0.5 (Cohen, 1988). Hence, H5 is supported. This is in line with the result in the pilot study. Also, as in the pilot study, all companies studied were reporting more soft than hard disclosure items.

This result supports prior studies which found that companies are providing broad coverage of soft disclosure items that tend to be relatively generic and very little disclosures in hard items that provide quantitative information (Dong & Burritt, 2010; Perez & Sanchez, 2009; Yongvanich & Guthrie, 2005). Dong and Burritt, who studied the Australian oil and gas industry, found that companies "rarely provide quantitative information to enable readers to access actual outcomes and achievements in numerical terms against predictions" (p. 116). Perez and Sanchez (2009) also found that reports produced by mining companies included only a few indicators that disclose information "relative to output levels and almost none is compared to standards or regional levels" (p. 957). Yongvanich and Guthrie (2005), who also focused on the mining industry, found consistent results that companies rarely reported the specific performance indicators. These consistent results suggest that companies tend to

provide significantly more soft than hard sustainability disclosure items in their reports because it is easier for companies to provide more generic soft disclosure items that are difficult for stakeholders to verify. Data that require specific effort to collect are seldom reported (Guenther et al., 2006).

This study found similar results in the research on resources industry dating back to 2005 (Yongvanich & Guthrie, 2005). This implies that companies in the resources industry have made little progress in the last decade. While sustainability disclosure seems to have increased in volume in the recent decade (Adams & Frost, 2007; Crawford & Williams, 2010; Frost, 2007), the quality of information provided to the users of the sustainability reports has not changed. Companies are still reporting very generic and brief information without providing important and crucial sustainability information that is essential to make strategic business decisions.

7.2.6 Hypothesis 6: Disclosures among the three aspects of sustainability

Companies are encouraged to provide comprehensive sustainability disclosures in all three aspects of sustainability – economic, environmental and social. Companies operating in environmentally sensitive industries are normally under close scrutiny by regulators and their stakeholders. As these companies' business activities have major and direct impacts on the environment, stakeholders are concerned with how the companies are managing problems such as pollution and waste management that may give rise to potential future compliance costs for the companies. Thus, these companies tend to disclose more environmental disclosures to address their stakeholders' concerns (Deegan & Gordon, 1996). In addition, companies in Australia that operate in an environmentally related industry are required to produce mandatory disclosures in their annual reports (Frost, 2007). As a result, it is expected that companies operating in the Australian resources industry will focus on the environmental aspect of sustainability over the economic and social aspects. Hence, the hypothesis was proposed as:

H6: Companies in the resources industry provide more environmental disclosures than social and economic disclosures in their sustainability disclosures.

Scores awarded under the hard disclosure category A3 that relates to the specific performance indicators of the various aspects of sustainability were used in the analysis for this hypothesis. The raw scores of different performance indicators under the economic, environmental and social aspects were totalled. The social aspect was further classified into the following four sub-categories: labour, human rights, social and product responsibility. The total raw scores were reported as a percentage of their respective maximum scores. A summary of the descriptive statistics is presented in Table 7.7.

Table 7.7 Descriptive statistics of hard disclosure items in category A3 (performance indicators)

Categories in scoring index		Percentage of disclosure*		
		Mean	**Median**	
A3: Economic (ECP_Max)		38.60%	33.33%	
A3: Environmental (ENP_Max)		17.56%	10.61%	
A3: Social (TotalSOP_Max)	Labour (LAP_Max)	31.52%	30.56%	Percentage of disclosure in total social aspect: Mean=13.6% Median=10.67%
	Human rights (HRP_Max)	5.25%	0.00%	
	Society (SOP_Max)	8.92%	3.33%	
	Product Responsibility (PRP_Max)	11.80%	0.00%	

Note: *Percentage of disclosures = (Total raw scores of performance indicators / Maximum possible scores) in respective aspect

A Friedman two way ANOVA test was first applied to three dependent variables that have been reported to their respective percentage of disclosures: Economic (ECP_Max), Environmental (ENP_Max) and Social (TotalSOP_Max). The results of the test indicated that rankings of disclosures varied significantly across the three aspects of sustainability (economic disclosure, environmental disclosure, social disclosure), Chi-Square = 175.77, df= 2, $p < 0.001$. Inspection of the median values showed a decrease in percentage of disclosure from economic (Md = 33.33%) to social (Md = 10.67%) to environmental (Md = 10.61%). This ranking is, however, different when the mean rank is reviewed. The arrangement in a descending order is from economic (mean rank = 2.92) to environmental (mean rank = 1.68) to social (mean rank = 1.40). Despite the different results, economic disclosure had the highest

rank in both the median and the mean rank. Hence, H6 is not supported. Similar results were obtained in the pilot study.

Another Friedman two way ANOVA test was performed by using the four individual social performance indicators, instead of the combined social performance indicator. This second test was performed based on a total of six separate performance indicators that were also reported to their respective percentage of disclosures. The six sustainability performance indicators were Economic (ECP_Max), Environmental (ENP_Max), Social-Labour (LAP_Max), Social-Human Rights (HRP_Max), Social-Society (SOP_Max) and Social-Product Responsibility (PRP_Max). The results indicated that there was a statistically significant difference in the disclosures across the six performance indicators (economic, social-labour, environmental, social-product responsibility, social-society, and social-human rights), Chi-Square = 431.41, df = 5, $p < 0.001$. The rankings, which were based on the mean rank, in a descending order are economic (mean rank = 5.44), social-labour (mean rank = 4.97), environmental (mean rank = 3.73), social-product responsibility (mean rank = 2.59). social-society (mean rank = 2.44) and social-human rights (mean rank = 1.83).

Both sets of Friedman's test yielded similar results where the economic aspect was found to be the most significant type of disclosure. Thus, hypothesis H6 is not supported in both cases. This result corresponds to that found in the pilot study. This result was considered to be unanticipated as a stringent scoring system was applied to the economic aspects. General financial information of a company such as revenue or expense items that are not directly associated with sustainability activities was not included in the scoring. Only information directly related to sustainability performance or issues was included in the scoring. Hence, this consistent result from the pilot study and the main study provides strong empirical evidence that companies have focused mainly on providing information related to the economic aspects of sustainability in their reports.

To-date, research that has studied all three aspects of sustainability is still relatively limited. Most prior research studies have focused on specific aspects of sustainability, with most of them emphasising the environmental aspect. Others have focused on evaluating differences between different industries. As such, comparison of the results

from this study to other works is limited. Dong and Burritt (2010) and Yongvanich and Guthrie (2005), which studied the Australian oil and gas and mining industries respectively, found that companies were providing more environmental disclosures whereas in this study the economic aspect was found to have the largest extent of disclosures compared to the environmental and social aspects.

This study is consistent with findings in Dong and Burritt (2010) who observed that companies in the oil and gas industry focused on information about employees and environment while "other stakeholders, such as community and consumers, [were] relatively neglected" (p. 116). This study found that companies in the resources industry have tended to disclose more labour related information among the four sub-categories of the social aspect. This corresponds to the findings of Dong and Burritt who found that the majority of the disclosures were related to employees. This study also found that companies tend to disclose very little information in the sub-category of society and product responsibility which correspond to Dong and Buritt's findings that community and consumers were the least reported areas.

7.3 Level of Sustainability Reporting

Expanding on the results obtained from the hypotheses testing, further statistical analysis was conducted to examine the disclosure items provided by the companies in the various categories. The results and their implications are reviewed and discussed in the following sections.

First, the total raw scores obtained in each category of the individual sample company were recoded to their respective maximum scores using the SPSS software. This yielded the percentages of disclosure in each category that were used in further analysis. Table 7.8 below presents the descriptive statistics of the percentages of disclosure in each category after the recoding process.

Table 7.8 Descriptive statistics of percentages of disclosure in each category

Categories in scoring index	Maximum possible raw scores	Percentages of disclosures				
		Mean	Median	Mode	Standard Deviation	Minimum - Maximum
A1: Governance	9	63.24%	55.56%	44.00%	22.69%	22% - 100%
A2: Credibility	5	26.62%	0.00%	0.00%	33.28%	0% - 100%
A3: Performance Indicators						
A3: Economic	18	38.6%	33.33%	28.00%	21.21%	0% - 100%
A3: Environmental	66	17.56%	10.61%	9.00%	17.53%	0% - 89%
A3: Social–Labour	36	31.52%	30.56%	14.00%	20.14%	0% - 86%
A3: Social-Human Rights	54	5.25%	0.00%	0.00%	11.49%	0% - 59%
A3: Social-Society	30	8.92%	3.33%	0.00%	13.77%	0% - 87%
A3: Social-Product	30	11.80%	0.00%	0.00%	19.05%	0% - 97%
A4: Spending	2	29.70%	0.00%	0.00%	35.91%	0% - 100%
A5: Vision	7	76.15%	100.00%	100.00%	34.80%	
A6: Initiatives	3	12.03%	0.00%	0.00%	25.73%	
A7: Disclosure of Management Approach (DMA)						
A7: Economic	3	52.13%	33.33%	33.00%	26.39%	0% - 100%
A7: Environmental	9	32.50%	22.22%	11.00%	23.60%	
A7: Social–Labour	6	48.37%	50.00%	50.00%	24.52%	
A7: Social-Human Rights	9	10.78%	0.00%	0.00%	21.54%	
A7: Social-Society	5	15.79%	20.00%	0.00%	20.46%	
A7: Social-Product	5	16.24%	0.00%	0.00%	24.88%	

A non-parametric Friedman's two way ANOVA test was performed on the different categories to determine whether the means from the various percentages of disclosures were significantly different. The results of the test indicated that rankings of the disclosures varied significantly across the 17 categories of sustainability disclosures (Chi-Square = 1304.60, df= 16, $p < 0.001$). The mean ranks obtained from the statistical test are shown in Table 7.9 below. The percentages of disclosure in the various categories are arranged in descending order based on the mean ranks.

Table 7.9 Ranking of disclosures by category

Rank	Categories in scoring index	Mean rank
1	A1: Governance structure and management systems	15.20
2	A5: Vision and strategy claims	15.18
3	A7: DMA Economic	13.99
4	A7: DMA Labour	13.35
5	A3: Economic	11.79
6	A7: DMA Environmental	11.08
7	A3: Social- Labour	10.38
8	A4: Spending on sustainability expenditure	8.24
9	A2: Credibility	7.94
10	A3: Environmental	7.88
11	A7: DMA Social- Society	6.66
12	A7: DMA Social- Product Responsibility	6.50
13	A3: Social- Product Responsibility	5.56
14	A7: DMA Social- Human Rights	5.12
15	A3: Social- Society	5.06
16	A6: Sustainability initiatives	5.05
17	A3: Social- Human Rights	4.02

Note:
- A1 to A4 –Hard disclosure items
- A5 to A7 – Soft disclosure items
- A3: Performance indicators
- A7: Disclosure of management approach (DMA)

Although A5 (Visions and strategy claims) had the highest mean as shown in Table 7.8, it was ranked second after A1 (Governance structure and management systems) in the Friedman's ANOVA test. This was followed by A7 Disclosure of management approach (DMA) of economic and labour in the third and the fourth rank respectively. On the other hand, A3 performance indicator on human rights had the lowest rank, followed by A6 (Sustainability initiatives) on the second lowest and A3 performance indicator on society on the third lowest rank.

7.3.1 Categories with top rankings

The hard disclosure item, Al, which relates to governance structure and management systems of companies, was ranked the highest among a total of 17 categories. Category A1 contains companies' disclosures on their corporate governance structure with information about the composition of the board of directors. This result demonstrates the successful implementation of quality corporate governance principles recommended by the Australian Securities Exchange (ASX) Corporate Governance Council since 2003. The council has provided comprehensive guidelines to assist companies achieve effective governance outcomes and to guide them in disclosing this information in their reports. Companies are encouraged to adopt the 'if not, why not' approach in their disclosures to justify any deviations from recommended practice and explain the relevant circumstances and reasons. It is noted that all the sample companies in this study have embraced these recommended practices and disclosures even though they are not mandated to do so.

It is unsurprising for A5, which relates to companies' visions and strategy claims, to emerge as the second highest in the ranking. It is relatively simpler for companies to present their sustainability claims in category A5 as they do not require hard core quantitative data to support the claims. As the sample companies are mandated to provide environmental information in their annual reports, it is likely that companies are using disclosures in this category as a tokenistic gesture to fulfill legal requirements.

A7-Economic was ranked as the third highest category of disclosure. A possible explanation for this might be that the data was primarily collected from companies' annual financial reports, as only a small percentage of the sample companies have produced stand-alone sustainability reports. Although strict scoring criteria were applied to this category to prevent bias in the information, it is apparent that the information contained in the annual reports was still mainly focused on the economic aspect. In addition, A7 being a soft disclosure item that does not require verification could be another possible explanation for its high disclosure. Companies that provided disclosure in this category were providing information involving the current and future plans for the employees' benefits and remuneration polices. This further demonstrates

that companies are adopting effective governance practices recommended by ASX, where the importance of transparency in remuneration packages, especially those relating to the directors, are reinforced in the ASX guidelines.

7.3.2 Categories with low rankings

A3-HRP that relates to the hard specific performance indicators of human rights (HR) was ranked the lowest in the Friedman's test. Items in category A3 are scored based on the presence of six indicators: data presented, peer/industry, previous period, targets, absolute and normalised form, and disaggregated level. The difficulty of presenting information in the HR aspect, which tends to be more qualitative by nature, in the format of these six indicators is acknowledged. It is evident that companies generally do not set quantitative targets or refer to previous periods for human rights issues. It is also difficult for companies to obtain an industry average or benchmark that can be relevant and available as this is still a relatively new area in the sustainability arena where disclosure is limited.

The category that was ranked the second lowest was A6, which relates to sustainability initiatives. This category measures disclosures of companies' internal sustainability efforts that may include their provision of awards for staff who have demonstrated sustainability efforts and for companies with internal audit or certification in place for their sustainability activities. Companies with these initiatives have demonstrated genuine sustainability commitments by contributing valuable human and technical resources to develop these initiatives; thus, they are likely to include this information in their disclosures. Despite the likelihood of disclosure in this area, A6 was ranked the second lowest in the disclosure category. Romero, Lin, Jeffers, and DeGaetano (2014) explained that companies are often reluctant to invest in sustainability initiatives that require huge initial capital investment and compel companies to amend their processes and rebrand their products, given the uncertainty of measurable increased value to companies. It is also possible that companies are lacking adequate knowledge and skills to develop and implement suitable sustainability initiatives in their business operations.

A3-SOP that relates to hard specific performance indicators of society was ranked the third lowest in the Friedman's test. This result is anticipated as it is normally more difficult for companies to adhere to the requirements in the A3 category that require detailed information in various quantifiable data. In the A3-SOP categories, companies are expected to provide disclosures on companies' engagement with issues relating to local communities, corruption and public policy such as lobbying and anti-competitive behaviour. These issues that tend to be more sensitive and controversial could have resulted in companies' reticence to provide disclosures in this category.

7.3.3 Categories with minimal disclosure

A review of the results based on the percentages of disclosure presented in Table 7.8 above indicated that there were seven categories that had zero in both their mean and median. This helps to identify the categories that contain very minimal disclosure by the sample companies. These seven categories consist of four categories in the hard disclosure items and three categories in the soft disclosure items. They are credibility (A2), performance indicators of human rights and product responsibility (A3-HRP and A3-PRP), spending on sustainability expenditures (A4), sustainability initiatives (A6), disclosure on management approach to human rights and product responsibility (A7-HRP and A7-PRP).

Besides the complexity in the reporting of hard items possibly contributing to the low disclosure, information related to category A2 and A4 is problematic as it involves a third party's verification, which makes it difficult for poor sustainability performers to mimic. While disclosure that can be verified by an independent third party greatly increases its reliability and validity, companies that do not practise these would explain for the absence of disclosure in these categories.

A2 assesses the credibility of companies' sustainability disclosures and activities. It verifies this information by examining the reporting framework adopted by companies and determining whether companies engage a qualified independent assurer to audit the sustainability information presented. Companies that have participated in initiatives that improve sustainability practices recommended by industry specific and other organisations are also awarded scores under category A2. Assuming companies

that engage in these credible initiatives would have included them in their reports, the low disclosure in category A2 indicates that the majority of the companies in the Australian resources industry have not adopted these practices. Romero et al. (2014) highlighted the following concerns and problems raised in prior research on sustainability assurance: absence of a systematic procedure to assess the competence of assurance providers (Oelschlaegel, 2004); independence of assurance providers and the quality of assurance practice (O'Dwyer & Owen, 2005); lack of appropriate assurance criteria (Hasan et al., 2005) and limited guidance from assurance standards for practitioners (O'Dwyer, 2011). Hence, the low disclosure in category A2 could be attributed to the existence of these problems.

Likewise, category A4, which measures the monetary spending in sustainability, requires companies' genuine monetary contribution as verification can be easily performed with an independent third party. The minimal disclosure in this category reflects that most of the sample companies have not contributed their capital resources in sustainability issues. This phenomenon is likely due to the inconsistent outcomes from expenditure incurred to improve sustainability. While some studies found a positive correlation between company value and company's sustainability efforts (Ameer & Othman, 2012; Burnett, Skousen, & Wright, 2011), others did not find any association (Guidry & Patten, 2010) while other studies found a negative correlation (Lee, Faff, & Langfield-Smith, 2009). These inconsistent results identified in prior research also explain the minimal disclosure in category A6 as discussed in section 7.3.2.

Performance indicators (A3) and disclosure of management approach (A7) in the social aspects of human rights (HR) and product responsibility (PR) were also identified as categories with minimal disclosure among the sample companies. This outcome is most likely due to the context of the resources industry. Issues covered in the HR aspect such as non-discrimination, child labour and violation of human rights are less likely to occur in the resources industry because these companies are normally bound by very stringent labour laws that are enforced at their project sites with limited access to unauthorised staff. The resources companies, which operate mainly in the extraction of raw materials, have their clientele consisting large processing and manufacturing companies with good product knowledge. Hence,

issues in the PR aspect such as customer health and safety, product information and customer privacy are less relevant to these companies, resulting in a low disclosure.

7.4 Further Analysis on Disclosure Items in Each Category

The disclosure items in all the categories, except for category A3, are scored a '0' or '1' for the absence or presence of an indicator respectively. As a result, the mean of a disclosure item in these non A3 categories indicates the percentage of disclosure. Category A3, which has a different scoring scale, awards each of its disclosure items with a range of scores from zero to six; therefore, the percentage of disclosure is obtained by recoding the mean of the individual item to its possible maximum value of six. In this section, further analysis is performed on each individual category to evaluate companies' disclosure in the various disclosure items using the computed percentage of disclosure. A detailed list of the mean for each disclosure item under the various categories is contained in Appendix 7-4.

7.4.1 A1: Governance structure and management systems

Category A1 has a total of nine disclosure items as shown in Table 7.10. This category had the highest disclosure among the 17 categories. A review on the disclosure items in category A1 showed that more than 97% of the sample companies disclosed information about the board of directors in the following areas: CEO duality (A1-6); number of directors including their independence, multiple directorships, gender diversity and expertise (A1-7); and having measures to ensure conflicts of interest are avoided (A1-8).

Table 7.10 Descriptive statistics for disclosure items in category A1

(A1) Governance structure and management systems (max score is 9) Each item has a maximum score of 1.	Percentage of disclosures = Mean of disclosure item
1. Existence of a sustainability committee and/or management position for sustainability management	29%
2. Stakeholder involvement (include setting sustainability policies, existence of mechanisms for stakeholders to provide recommendations and management responses to key topics and concerns raised by stakeholders)	57%
3. Implementation of externally developed economic, environmental and social charters/ principles/ initiatives which organisation subscribes/ endorses	65%
4. Executive compensation is linked to sustainability performance	40%
5. Existence of explanation for data measurement techniques and the bases of calculations, including assumptions adopted in the compilation of sustainability information in the report	35%
6. Indication of whether the Chair of the highest governance body is also an executive officer	99%
7. Statement of the number, gender, expertise of members of the highest governance body such as the board of directors that are independent and/or non-executive members	99%
8. Processes in place for the highest governance body to ensure conflicts of interest are avoided	97%
9. Processes for evaluating the highest governance body's own performance, particularly with respect to economic, environmental, and social performance	47%

It is interesting to note that only 29% of the sample has a sustainability committee or a management position for sustainability management. This indicates that a majority of the companies do not have dedicated personnel to conduct or review plans for sustainability issues. The results of this study have shown that companies with a sustainability committee tend to produce a greater extent of sustainability information in their reports.

7.4.2 A2: Credibility

This category consists of five disclosure items that measure the credibility of sustainability information provided by companies. Credibility of information can be increased through the use of comprehensive reporting guidelines or an independent assurer's audit of the disclosed information. As shown in Table 7.11, only 11% of the sample in this study has adopted a comprehensive reporting framework such as the Global Reporting Initiatives (GRI) or CERES in their reporting, and no more than 12% of the sample has engaged an independent assurer to audit the sustainability

information reported in the company reports. These results are consistent with those found in prior studies where very few companies adopt a consistent framework for their sustainability reporting and even fewer have their reports audited (Junior et al., 2014).

Table 7.11 Descriptive statistics for disclosure items in category A2

(A2) Credibility (max score is 5) Each item has a maximum score of 1.	**Percentage of disclosures= Mean of disclosure item**
1. Adoption of GRI sustainability reporting guidelines or provision of a CERES report	11%
2. Independent verification/ assurance about environmental information disclosed in the environmental performance report/web, including external awards for providing quality sustainability information	12%
3. Independent verifications/ audits on sustainability systems/ performances, including external awards/certifications for good sustainability practices	28%
4. Participation in industry specific associations/initiatives to improve sustainability practices	44%
5. Participation in other organisations/association which promotes sustainability to improve sustainability practices	38%

However, it is interesting to note that 44% of the companies have participated in industry specific sustainability initiatives and 38% have participated in initiatives organised by other organisations to improve their sustainability practices. These high percentages indicate that companies, equipped with the knowledge and provided with the opportunities for sustainability initiatives, are willing to commit and participate in activities that are helpful to improve their sustainability practices. This suggests a possible avenue to improve companies' sustainability performance through the provision of effective training and initiation of quality practices.

7.4.3 A3 and A7: Performance indicators and disclosure on management approach

The analysis of categories A3 and A7 are discussed together in this section as they are closely related. Category A3 requires companies to report each disclosure item by

providing details on six different indicators. Category A7 may be considered as the unweighted measure of A3 as it is scored based on companies' disclosure on each item without evaluating the details of its disclosure. Table 7.12 below summarises the mean scores of the items in category A3 and their respective percentage of disclosure. It also depicts the corresponding percentages of disclosure in category A7.

Table 7.12 Descriptive statistics for disclosure items in category A3 and A7

Category A3 (Performance indicator)	Mean of A3 (Out of 6)	Percentage of disclosure = Mean of A3/6 x 100%	Category A7 (Disclosure of management approach)	Percentage of disclosure = Mean of A7
Economic Aspect				
1. Economic performance	4.75	79%	1. Economic performance	98%
2. Market presence	0.78	13%	2. Market presence	20%
3. Indirect economic impacts	1.41	24%	3. Indirect economic impacts	38%
Environmental Aspect				
1. Materials	0.41	7%	1. Materials	11%
2. Energy	0.73	12%	2. Energy	16%
3. Water	0.86	14%	3. Water	20%
4. Biodiversity	1.50	25%	4. Biodiversity	36%
5. Greenhouse emissions	1.41	24%	5. Emissions, effluents and waste	38%
6. Air emissions	0.55	9%		
7. Water effluents	0.61	10%		
8. Waste	0.51	9%		
9. Products and services	0.32	5%	6. Products and services	8%
10. Compliance	3.91	65%	7. Compliance	98%
11. Transport	0.78	13%	8. Transport	22%
			9. Overall	44%
Social - Labour				
1. Employment	2.65	44%	1. Employment	68%
2. Labour/ Management relations	0.29	5%	2. Labour/ Management relations	8%
3. Occupational health and safety	3.01	50%	3. Occupational health and safety	69%
4. Training and education	1.08	18%	4. Training and education	28%
5. Diversity and equal opportunity	3.28	55%	5. Diversity and equal opportunity	87%
6. Equal remuneration for women and men	1.04	17%	6. Equal remuneration for women and men	29%

Social - Human Rights				
1. Investment and procurement practices	0.53	9%	1. Investment and procurement practices	14%
2. Non-discrimination	0.45	8%	2. Non-discrimination	19%
3. Freedom of association	0.20	3%	3. Freedom of association	6%
4. Child labour	0.16	3%	4. Child labour	6%
5. Forced and compulsory labour	0.17	3%	5. Forced and compulsory labour	7%
6. Security practices	0.22	4%	6.Security practices	9%
7. Indigenous rights	0.68	11%	7.Indigenous rights	21%
8. Assessment	0.23	4%	8.Assessment	8%
9. Remediation	0.19	3%	9.Remediation	7%
Social– Society				
1. Local communities	1.80	30%	1. Local communities	50%
2. Corruption	0.32	5%	2. Corruption	12%
3. Public policy	0.12	2%	3. Public policy	4%
4. Anti-competitive behaviour	0.10	2%	4. Anti-competitive behaviour	4%
5. Compliance	0.35	6%	5. Compliance	9%
Social– Product Responsibility				
1. Customer health and safety	0.56	9%	1. Customer health and safety	14%
2. Product and service labelling	1.91	32%	2. Product and service labelling	42%
3. Marketing communications	0.49	8%	3. Marketing communications	11%
4. Customer privacy	0.10	2%	4. Customer privacy	3%
5. Compliance	0.48	8%	5. Compliance	11%

7.4.3.1 Economic aspect

Among the three disclosure items, A7-EC1 has the highest disclosure of 98%. This item relates to the inclusion of information in financial implications, risks and opportunities related to climate change. It also comprises disclosure on a company's benefit plan and its obligations. While some companies provided information concerning the impact of unfavourable weather on the extractive activities at the project sites, the high percentage of disclosure is largely attributed to most companies provided disclosure about their plans and obligations to employees' benefit.

38% of the companies contributed to public benefits through non-monetary commercial, in-kind and pro bono engagement. Many of them included disclosures about employees volunteering through community services. Data reported in this area include the volunteered hours and the types of services volunteered.

In contrast, the market presence (A7-ECP2) comprised only 20% of disclosure. Companies disclosed very minimal information about whether the companies' sustainability policies, knowledge and practices were passed down to their suppliers in their logistic chain.

7.4.3.2 Environmental aspect

There are a total of nine items in the environmental aspect. A7-EN7, compliance, had the highest disclosure with 98% of the companies providing information in this item. This result confirms the stakeholders and legitimacy theory posited by many prior research that companies disclose sustainability information to satisfy legal requirements (Cho et al., 2015; Cowan & Deegan, 2011; Frost, 2007).

This result is anticipated since the compliance to environmental legislation is one of the crucial criteria for companies in the resources industry to obtain an approval or a renewal for their operating license (Wood & Ross, 2008). Hence, it would be important for companies to disclose their compliance to inform stakeholders about this. This importance is also evident in the high mean of 3.28 (65%) in category A3 relating to compliance. This high mean is the second highest among the disclosure items in category A3 as displayed in Table 7.12. On average, the sample companies were reporting on approximately 3.28 indicators out of the six indicators.

Items that have less than 20% of disclosure based on the results of category A7 include A7-EN1 (11%), A7-EN2 (16%) and A7-EN6 (8%). As discussed earlier, the outcomes of these low disclosures are likely attributed to the nature of the resources industry. These resources companies, which are mainly raw materials extractive operators, may find it irrelevant to report on A7-EN1 (materials used and recycled) as

most of them would not have materials used or recycled in their business operations. Similarly, A7-EN2, which relates to the consumption or reduction in energy usage, also had the low disclosure as most sample companies were energy producers instead of users. The reasons posited for the low disclosure in both the A7-EN1 and A7-EN2 are supported by the much higher percentage of 38% in A7-EN5 that also relates to energy but is in the specific area on waste emission of energy.

7.4.3.3 Social- Labour aspect

There is extensive diversity among the various percentages of disclosure under this category, the highest being A7-LA5, Diversity and equal opportunity, at 87% and the lowest being A7-LA2, Labour and management relations, at 8%. The high percentage of disclosure in A7-LA5 is most likely due to this item being one of the recommended practices under the ASX guidelines for quality corporate governance (Australian Security Exchange, 2015). Companies are encouraged to observe gender diversity and to ensure both women and men are given an equal opportunity in their career and remuneration packages. Many companies have adopted these practices and have included details about the gender diversity at different levels of the current workforce such as the management level and the board of directors. Plans and targets to increase gender diversity are also included in these reports, together with results on the progress made towards proposed target.

This study found that only 8% of the companies were reporting in the item A7-LA2. This item had the lowest mean of 0.29 in this aspect of category A3. Very few companies were reporting on the details of their employees covered by collective bargaining agreements. This could be interpreted as an area where companies are reluctant to reveal detailed information, especially in publicly available media such as the annual reports as this could pose a potential disadvantage for companies in future collective agreements negotiations.

7.4.3.4 Social- Human rights aspect

As anticipated, there is generally a low percentage of disclosure among the items in the Social-Human Rights aspect as this was found to have the lowest rank in earlier statistical test described in section 7.2.6. The highest among the nine items was only 21% in item A7-HR7 while less than 10% of the sample companies reported on the other six items (A7-HR3, A7-HP4, A7-HR5, A7-HR6, A7-HP8, A7-HP9).

A7-HR7, the highest reported item, relates to indigenous rights. This is attributable to the fact that most of the companies are engaging in project sites that are subject to indigenous land rights. In their report, most of the companies have described how they are cooperating with the indigenous group in developing the projects. Many of the companies have commenced work among the group by offering education, training and job opportunities as part of their sustainability program.

As described in earlier sections, this study has found that there is a lack of reporting in this aspect of sustainability. This is most likely due to the recent inclusion of this area into sustainability. Prior to the development, this area was broadly known as the social aspects that included other areas such as society and labour, where most effort is focused. This may explain the lack of knowledge and guidelines for companies' inclusion in their reporting.

7.4.3.5 Social- Society aspect

The social-society aspect is also one of the less reported areas by the sample companies. Only 50% of the companies reported on A7-SOP1, with less than 12% of companies reporting on other items in this aspect. Companies who did report in this aspect mainly focused on the community item, A7-SOP1, which includes information about companies' local community engagement, impact assessment and development programs. This item is considered to be of close relevance to companies in the resources industry as most of them engage in exploration and extractive activities. For the purposes of this study, information provided in mandated environmental feasibility reports prepared for the Environmental Protection Authority (EPA), which companies have to produce to obtain or renew their operating license,

is considered as information relating to pre-activated plans that would have been included in the soft disclosure of category A5. Therefore, this information does not fit the scoring criteria for hard disclosure as it does not represent performance that has been performed and hence is excluded from the scoring in this aspect. This may explain the low disclosure in this item.

The minimal disclosure in the remaining items under this aspect is likely due to the difficulty for companies to set adequate and specific target for items in this aspect, such as corruption and anti-competitive behaviour. The lack of industry benchmark for these items also poses difficulty for disclosures in this aspect.

7.4.3.6 Social- Product responsibility aspect

There are five items in this aspect covering issues relating to customer health and safety and product and market responsibility. 42% of companies reported on item A7-PR2 that relates to customer satisfaction and providing information about their product. As discussed earlier, this aspect may be of less relevance to the sample companies as most of them do not have direct customer relationships; hence, product and customer safety issues are more remote in their operations. Companies in the energy and utilities area produce more information in this area than those in the mining industry as the former are likely to have more retail customers where gas and other utilities are provided directly to consumers, engaging them in a customer-related service.

7.4.4 A4: Spending on sustainability related expenditures

There are two items in category A4 and they relate to financial information on sustainability expenditure. While A4-1 indicates the presence of information disclosed on savings from sustainability initiatives, A4-2 indicates the presence of disclosure on expense items for sustainability initiatives. 44% of the companies included information in A4-2 and only 16% reported on item A4-1. This result was anticipated as it is easier to measure the actual spending for item A4-2, and more difficult to quantify savings from the sustainability initiatives. Besides, most sustainability efforts normally require

a longer period for the realisation of actual monetary benefits, making it less likely to be included in companies' report.

Table 7.13 Descriptive statistics for disclosure items in category A4

(A4) Spending on sustainability related expenditures (max score is 2) Each item has a maximum score of 1.	**Percentage of disclosures= Mean of disclosure item**
1. Summary of dollar savings arising from sustainability initiatives to the company	16%
2. Amount spent on donations, community investments, technologies, R&D and/or innovations to enhance sustainability	44%

7.4.5 A5: Vision and strategy claims

Table 7.14 below shows the mean of the individual items under the A5 category that relates to companies' vision and strategy claims. The high mean in all the individual items helps to explain the reason for A5 being ranked the category with the second highest disclosure. Further analysis of the median and mode shows '1' in all seven disclosure items under this category. This indicates that the majority of the companies have included most, if not all, of the disclosure items in this category. Some of the probable reasons for the high level of disclosure in category A5 have been discussed earlier in section 7.3.1. Another possible reason is that the soft disclosure items in this category relates to elementary disclosure items that are relatively easy for a company to include in their annual reports, especially if it is new to sustainability disclosures.

Table 7.14 Descriptive statistics for disclosure items in category A5

(A5) Vision and strategy claims (max score is 7) Each item has a maximum score of 1.	Percentage of disclosures= Mean of disclosure item
1. CEO statement on sustainability performance in letter to shareholders and/or stakeholders	73%
2. A statement of corporate sustainability policy, values and principles, codes of conduct	88%
3. A statement about formal management systems regarding risk and performance in sustainability	82%
4. A statement that the firm undertakes periodic reviews and evaluations of its sustainable performances	76%
5. A statement of measurable goals in terms of future sustainability performance (if not awarded under A3)	68%
6. A statement about specific sustainability innovations and/or new technologies	66%
7. Explanation of whether and how the precautionary approach or principle on sustainability issues is addressed by the organization.	80%

7.4.6 A6: Sustainability initiatives

This category consists of three disclosure items with a generally low percentage of disclosure. Only 6% of the companies disclosed information related to their internal sustainability awards. 20% of the companies conducted an internal sustainability performance audit and 11% of the companies had internal certification for their sustainability program.

Table 7.15 Descriptive statistics for disclosure items in category A6

(A6) Sustainability Initiatives (max score is 3) Each item has a maximum score of 1.	Percentage of disclosures= Mean of disclosure item
1. Internal sustainability awards	6%
2. Internal sustainability performance audits	20%
3. Internal certification of sustainability programs	11%

The disclosure items in category A6 are classified as soft disclosure items as they relate to internal awards, audit and programs within a company that are difficult to be verified. The low disclosure in these soft disclosure items reflect that it is likely that many companies do not have these sustainability initiatives in place. It is expected

that companies that practice these initiatives are likely to include these information as it is difficult for any external party to verify the validity of these soft disclosures.

7.5 Summary

This study has applied the newly developed GRI-based scoring index to measure the quality of sustainability disclosure of companies in the Australian resources industry. This study found that companies generally produced minimal sustainability information and there was vast diversity in the disclosure items. Significant positive correlations were found between sustainability disclosures and various variables, such as company size, proportion of independent directors, multiple directorships and women directors on the board. Companies without CEO duality and those with a sustainability committee were more likely to disclose a greater extent of sustainability information. The study found no significant differences in the extent of sustainability disclosures between companies operating in the metals and mining sector and those in the energy and utilities sector. Companies also disclosed more soft than hard disclosure items and significantly more information on the economic aspect than the environmental and social aspects. Implications from the empirical results of this study are discussed in the next chapter.

CHAPTER 8

CONCLUSION

This final chapter summarises the results and discussions presented in prior chapters and concludes by providing answers to the research questions and insights into the quality of sustainability reporting of companies in the Australian resources industry. The implications of this study are presented followed by a discussion of the limitations and suggestions for future research.

8.1 General Review

This study has addressed the problem of the lack of a standardised sustainability reporting framework to guide companies in sustainability reporting that is both comparable to peers and industry as well as reflective of companies' actual sustainability performance. Through the integration of the fundamental hard and soft principles in Clarkson et al's (2008) environmental index and the Global Reporting Initiatives (GRI) G3.1 framework, this study has developed a new scoring index that has the capacity to evaluate the quality of companies' sustainability reporting and differentiate the nature of their disclosure items to provide insights into companies' sustainability performance. This improved measuring instrument identifies companies that demonstrate good sustainability performance that effectively contributes towards sustainability improvements and provides a benchmark for high quality sustainability reporting practices.

This study has provided empirical results that answer the research questions to evaluate the quality of sustainability information disclosed by Australian listed companies in the resources industry and identify significant relationships between the extent of sustainability disclosures (economic, environmental and social) and company characteristics (company size, financial performance, composition of BOD and type of resources extracted). A theoretical framework based on the stakeholder theory and the legitimacy theory has been adopted to develop the hypotheses for this study.

Initially, a pilot study was conducted using the newly developed scoring index to ensure its reliability and validity before its implementation in the main study. The scoring criteria were enhanced with detailed scoring guidelines developed through the pilot study. Content analysis has been used as the main technique to complement the scoring index in order to yield the results for this study. Non-parametric statistical tests such as Kendell's tau-b, Mann-Whitney U and Friedman two way ANOVA tests have been conducted to analyse the developed hypotheses. The results obtained in the main study were generally supportive of the outcomes of prior studies on sustainability. This study has achieved its objectives and provided empirical evidence that has major implications related to sustainability disclosures, practices and performance of companies in the Australian resources industry.

8.2 Conclusion and Implications of Results

This section summarises the general results to answer the research questions. Corresponding implications relating to and deriving from the results are presented accordingly.

8.2.1 Sustainability reporting practices in the Australian resources industry

The results of this study indicate that companies in the Australian resources industry generally disclose very minimal sustainability disclosures. The reported items were mostly soft generic disclosures that are difficult to verify, suggesting that companies may make tokenistic gestures towards mandatory requirements for sustainability reporting due to the lack of standarised reporting guidelines to assist companies. This has also resulted in companies producing vastly different disclosure items that hinder comparability.

To exacerbate the problem, this study found that all the sample companies reported more soft than hard disclosure items. This low level of sustainability disclosure consisted mainly of soft disclosure items that relate to generic non-verifiable

information. This points to a low quality of sustainability disclosure that is not helpful to assist users of this sustainability information.

It is evident from the results of this study that many improvements are required in the sustainability reporting practices of companies in the Australian resources industry. Despite the mandatory environmental disclosures from these companies, there is a general low quality of sustainability reporting in this environmentally sensitive industry. This is concerning as it appears that little improvement has been made in this industry as similar results were obtained in Dong and Burritt's (2010) on companies in the Australian oil and gas industry in 2006. Dong and Burritt found that companies were reporting very broad social and environmental disclosures that lacked quantity and quality. Hence, the need for more detailed and structured guidance in sustainability reporting is necessary to achieve an improvement in the quality of sustainability reporting in Australia.

8.2.2 Disclosure items

The newly developed GRI-based scoring index has provided more details about the nature of companies' disclosures by classifying them into hard verifiable items and soft non-verifiable items. The objective is to encourage companies to disclose more hard disclosure items that contain relatively more quality information as they relate closely to sustainability performance. Each of the specific performance indicators in the hard disclosure category A3 is designed to award more scores to data that are presented relative to peers or industry; relative to previous period; relative to targets; in both aggregate and normalised form; or at a disaggregate level. Thus, a higher score in the index represents better quality sustainability reporting and is indicative of better sustainability performance.

Among a total seventeen hard and soft disclosure categories in the new scoring index, this study has found companies in the Australian resources industry provided the most information in hard disclosure item A1 that relates to governance structure and the management system of companies. Category A1 has the highest ranking and this empirical result demonstrates the successful implementation of corporate governance principles recommended by the Australian Securities Exchange (ASX). It points to the

fact that companies have embraced these good principles and practices and have produced reports with a greater level of transparency in their corporate governance structure.

Soft disclosure category A5, which relates to companies' visions and strategy claims, was found to be the second highest in ranking, making it the highest ranked item among the soft disclosure categories. This result was anticipated as it is generally simpler for companies to present soft sustainability claims and visions because these disclosures do not require quantifiable data. It is also common for companies, whether they are early or late adopters of sustainability reporting, to set visions for sustainability and to plan sustainability strategies.

A review of the results indicated that there were minimal disclosures in seven categories of disclosure items: credibility (A2), performance indicators of human rights and product responsibility (A3-HRP and A3-PRP), spending on sustainability expenditures (A4), sustainability initiatives (A6), disclosure on management approach to human rights and product responsibility (A7-HRP and A7-PRP). It is proposed that A2 and A4 are relatively more challenging for companies as they involve third party verification. Also, it is likely that companies are lacking adequate knowledge and skills to develop and implement sustainability initiatives, resulting in a low disclosure in category A6. Among the various categories relating to the social aspect of sustainability, disclosures relating to human rights (HR) and product responsibility (PR) were the lowest. This is likely due to the context of the resources industry. Companies operating in the resources industry are normally bound by very stringent labour laws and their clientele generally consist of large manufacturing companies with good product knowledge. Hence, these factors may explain the low disclosures in category A3 and A7 of HR and PR.

This standardised scoring framework that comprises hard and soft disclosure items has enhanced comparability among companies' sustainability disclosures and provided more specific guidelines to assist companies in sustainability reporting. The new scoring index also identifies and highlights potential areas of improvement for both companies' sustainability reporting and their sustainability performance.

8.2.3 Company characteristics affecting sustainability reporting

Non-parametric statistical tests were applied to investigate the correlations between the total sustainability disclosures and the different company characteristics such as company size, company financial performance and board composition. Statistical tests were also applied to examine each of the three aspects – economic, environmental and social – and the selected company characteristics.

Significant positive correlations were found between total sustainability disclosures, including all the three aspects of sustainability, and company size and company financial performance. These results support the legitimacy theory that suggests that larger and more profitable companies generally attract greater publicity and tighter scrutiny; hence, they tend to provide more sustainability disclosures to legitimise their business activities to reduce potential political costs.

Various attributes of company board composition – independent directors, directors with multiple directorships, CEO duality, women directors and sustainability committee – were examined in this study. Significant positive correlations were found to exist between sustainability disclosures and the attributes of company board composition that support a better corporate governance structure. 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 study, however, found no significant differences in the extent of sustainability disclosures between companies operating in the Metals and Mining sector and those in the Energy and Utilities sector. This implies that similar benchmarking and reporting guidelines are applicable for these companies in the resources industry.

8.3 Implications for Sustainability Reporting Practices and Policies

This research has developed a newly GRI-based reporting index that has multiple advantages. 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 for future research projects and promotes comparability of company sustainability disclosures and performances.

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 overall low scores of the total sustainability disclosure suggest a need to improve companies' current sustainability practice and performance. 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.

The new scoring index 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. It is evident that the social aspect of sustainability has the least disclosure among the three aspects of sustainability. The minimal disclosure in this aspect is likely due to the difficulty experienced by companies in setting adequate and specific targets for items in the social aspect. It is commonly more difficult for companies to obtain relevant industry benchmarks for issues covered in this aspect such as corruption, anti-competitive behavior and human rights, and this may explain the low disclosures in this area. Hence, there is a need for more precise industry benchmarking of social issues to be made available to companies.

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.

8.4 Limitations of the Current Study

This research 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. This study has examined only a limited number of variables relating to company characteristics. These limitations have resulted in making the findings from this study to be less generalisable to conditions that differ from this study.

This study has not expanded on further statistical testing, which includes interactions of the independent variables, sensitivity testing and multiple regression, that may enhance the results of the study.

8.5 Recommendations for Future Research Works

With the increased use of internet and technology, companies have diverted from the traditional means of sustainability reporting through annual financial reports. Companies in the recent years have provided sustainability disclosures through their corporate websites. It is suggested that future research may include the companies' corporate websites as an additional data source.

This study has focused on the Australian resources industry. It would be interesting to apply the newly developed GRI-based index to companies in other industry types and across different countries for further examination. The new index provides an improved measurement instrument and enhances comparability among companies' sustainability reports and sustainability performance.

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 variables relating to company characteristics. Further investigations using different proxies for other company characteristics and more in-depth analysis, together with other robust statistical testing such as multiple regression and sensitivity testing, would enhance future research works.

8.6 Summary

This study has developed an improved measuring instrument for sustainability reporting that enhances the current GRI framework by classifying companies' disclosures into hard and soft disclosure items. By applying this newly developed GRI-based scoring index to evaluate companies' sustainability disclosures, this study has provided empirical findings that support most of the hypotheses developed. Furthermore, the findings generally support the theoretical framework of the stakeholder theory and the legitimacy theory and are in line with those from prior

studies. The findings in this study should be reviewed together with its limitations. The empirical results of this industry-focused study have contributed to a better understanding of the sustainability reporting practices and performance of companies in the Australian resources industry and have provided practical implications for future studies and policy making.

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APPENDICES

Appendix 4-1 List of sample companies for pilot study

Metals and mining

S/N	ASX Code	Company Name	Market Capitalisation (Australian Dollars) as at 30 June 2012
1	NCM	Newcrest Mining Limited	17,286,734,995
2	AGO	Atlas Iron Limited	1,827,251,600
3	RRL	Regis Resources Limited	1,771,339,480
4	LYC	Lynas Corporation Limited	1,449,199,505
5	ARI	Arrium Limited	1,164,000,766
6	PRU	Perseus Mining Limited	1,135,745,978
7	SFR	Sandfire Resources NL	1,082,861,467
8	EVN	Evolution Mining Limited	1,042,980,927
9	SDL	Sundance Resources Limited	1,006,360,421
10	BSL	BlueScope Steel Limited	1,004,755,574
11	MGX	Mount Gibson Iron Limited	933,544,321
12	RSG	Resolute Mining Limited	858,503,641
13	IGO	Independence Group NL	803,444,746
14	KCN	Kingsgate Consolidated Limited	733,629,377
15	WSA	Western Areas NL	729,727,750
16	SLR	Silver Lake Resources Limited	618,942,020
17	CDU	CuDeco Limited	596,670,236
18	SBM	St Barbara Limited	574,578,089
19	GBG	Gindalbie Metals Ltd	548,894,480
20	TRY	Troy Resources Limited	348,709,331
21	SMM	Summit Resources Limited	326,972,654
22	SYR	Syrah Resources Limited	291,726,534
23	IRN	Indophil Resources NL	288,755,087

Energy and utilities

S/N	ASX Code	Company Name	Market Capitalisation (Australian Dollars) as at 30 June 2012
1	ORG	Origin Energy Limited	13,292,688,584
2	AGL	AGL Energy Limited	8,062,368,196
3	WOR	WorleyParsons Limited	6,167,956,181
4	WHC	Whitehaven Coal Limited	4,204,740,106
5	DUE	DUET Group	2,042,089,040
6	ENV	Envestra Limited	1,234,327,807
7	BPT	Beach Energy Limited	1,180,136,308
8	KAR	Karoon Gas Australia Ltd	892,325,699
9	BRU	Buru Energy Limited	788,162,432
10	SXY	Senex Energy Limited	732,786,876
11	AWE	AWE Limited	699,308,401
12	ENE	Energy Developments Limited	403,778,018
13	CZA	Coal Of Africa Limited	373,141,344
14	LNC	Linc Energy Ltd	351,867,353
15	DLS	Drillsearch Energy Limited	337,449,196
16	EPW	ERM Power Limited	336,590,078
17	HZN	Horizon Oil Limited	322,281,282
18	RRS	Range Resources Limited	235,747,761
19	PCL	Pancontinental Oil & Gas NL	196,602,716
20	COK	Cockatoo Coal Limited	193,181,913
21	NCR	Nucoal Resources Limited	184,466,965
22	BND	Bandanna Energy Limited	179,683,608
23	PEA	Pacific Energy Limited	174,222,440

Appendix 4-2 List of sample companies for main study

Taken from list of top 50 stocks as at 30 June 2012 and top 100 stocks as at 30 Sept 2012)

Metals and mining

S/N	ASX Code	Company Name	Market Capitalisation (Australian Dollars) as at 30 June 2012
1	BHP	BHP Billiton Limited	167,399,636,840
2	NCM	Newcrest Mining Limited	17,286,734,995
3	FMG	Fortescue Metals Group Ltd	15,257,610,940
4	SGM	Sims Metal Management Limited	1,968,289,390
5	AGO	Atlas Iron Limited	1,827,251,600
6	RRL	Regis Resources Limited	1,771,339,480
7	LYC	Lynas Corporation Limited	1,449,199,505
8	ARI	Arrium Limited	1,164,000,766
9	PRU	Perseus Mining Limited	1,135,745,978
10	SFR	Sandfire Resources NL	1,082,861,467
11	EVN	Evolution Mining Limited	1,042,980,927
12	SDL	Sundance Resources Limited	1,006,360,421
13	BSL	BlueScope Steel Limited	1,004,755,574
14	MGX	Mount Gibson Iron Limited	933,544,321
15	MML	Medusa Mining Ltd	912,405,890
16	RSG	Resolute Mining Limited	858,503,641
17	IGO	Independence Group NL	803,444,746
18	KCN	Kingsgate Consolidated Limited	733,629,377
19	WSA	Western Areas Limited	729,727,750
20	DML	Discovery Metals Limited	621,190,165
21	SLR	Silver Lake Resources Limited	618,942,020
22	CDU	CuDeco Limited	596,670,236
23	SBM	St Barbara Limited	574,578,089
24	TGZ	Teranga Gold Corporation	550,184,320
25	GBG	Gindalbie Metals Ltd	548,894,480
26	IMD	Imdex Limited	366,494,350
27	TRY	Troy Resources Limited	348,709,331
28	KRM	Kingsrose Mining Limited	332,592,472
29	SAR	Saracen Mineral Holdings Limited	330,122,680
30	AQP	Aquarius Platinum Limited	329,218,805
31	SMM	Summit Resources Limited	326,972,654
32	NST	Northern Star Resources Ltd	309,816,239

S/N	ASX Code	Company Name	Market Capitalisation (Australian Dollars) As at 30 June 2012
33	SYR	Syrah Resources Limited	291,726,534
34	JMS	Jupiter Mines Limited	289,093,447
35	BCI	BC Iron Limited	270,038,600
36	BRL	Bathurst Resources Limited	264,384,239
37	PIR	Papillon Resources Limited	237,549,137
38	GRY	Gryphon Minerals Limited	236,820,188
39	FMS	Flinders Mines Limited	236,769,053
40	EQX	Equatorial Resources Limited	227,436,585
41	SWA	Swan Gold Mining Limited	219,132,193
42	CFE	Cape Lambert Resources Limited	217,069,269
43	NGF	Norton Gold Fields Limited	199,651,362
44	RED	Red 5 Limited	197,135,052
45	MLX	Metals X Limited	190,916,172
46	TAM	Tanami Gold NL	190,626,854
47	ORE	Orocobre Limited	190,394,829
48	BSE	Base Resources Limited	186,478,212
49	WDR	Western Desert Resources Limited	177,288,498
50	RMS	Ramelius Resources Limited	162,945,285
51	FML	Focus Minerals Limited	159,868,627
52	ATR	Astron Corporation Limited	154,324,528
53	BTR	Blackthorn Resources Limited	148,907,970
54	PAN	Panoramic Resources Limited	147,425,529
55	IOH	Iron Ore Holdings Limited	143,583,784
56	AOH	Altona Mining Limited	125,301,849
57	ABU	ABM Resources NL	123,164,674
58	MCR	Mincor Resources NL	121,394,337
59	CCU	Cobar Consolidated Resources Limited	112,404,135
60	SIR	Sirius Resources NL	7,697,664

Energy and utilities

S/N	ASX Code	Company Name	Market Capitalisation ($ million) as at 30 June 2012
1	ORG	Origin Energy Limited	13,292,688,584
2	AGL	AGL Energy Limited	8,062,368,196
3	WOR	WorleyParsons Limited	6,167,956,181
4	WHC	Whitehaven Coal Limited	4,204,740,106
5	APA	APA Group	3,215,983,059
6	DUE	DUET Group	2,042,089,040
7	ENV	Envestra Limited	1,234,327,807
8	AQA	Aquila Resources Limited	1,231,295,282
9	BPT	Beach Energy Limited	1,180,136,308
10	PDN	Paladin Energy Ltd	1,044,556,613
11	KAR	Karoon Gas Australia Ltd	892,325,699
12	BRU	Buru Energy Limited	788,162,432
13	SXY	Senex Energy Limited	732,786,876
14	AWE	AWE Limited	699,308,401
15	EWC	Energy World Corporation Ltd	641,641,669
16	MIO	Miclyn Express Offshore Limited	565,387,480
17	MAD	Maverick Drilling and Exploration Limited	490,504,179
18	CIF	Challenger Infrastructure Fund	414,253,440
19	CPL	Coalspur Mines Limited	412,785,383
20	ENE	Energy Developments Limited	403,778,018
21	CZA	Coal Of Africa Limited	373,141,344
22	LNC	Linc Energy Ltd	351,867,353
23	DLS	Drillsearch Energy Limited	337,449,196
24	EPW	ERM Power Limited	336,590,078
25	HZN	Horizon Oil Limited	322,281,282
26	GUF	Guildford Coal Limited	259,892,804
27	NZO	New Zealand Oil & Gas Limited	257,477,120
28	RRS	Range Resources Limited	235,747,761
29	RFE	Red Fork Energy Limited	228,018,942
30	PCL	Pancontinental Oil & Gas NL	196,602,716
31	COK	Cockatoo Coal Limited	193,181,913
32	NCR	Nucoal Resources Limited	184,466,965
33	BND	Bandanna Energy Limited	179,683,608
34	PEA	Pacific Energy Limited	174,222,440
35	IFN	Infigen Energy	171,509,850
36	MCE	Matrix Composites & Engineering Limited	166,890,330
37	NSE	New Standard Energy Limited	164,712,286
38	NXS	Nexus Energy Limited	146,280,327

S/N	ASX Code	Company Name	Market Capitalisation ($ million) as at 30 June 2012
39	COE	Cooper Energy Limited	145,661,405
40	APY	Azonto Petroleum Ltd	139,813,586
41	NEN	Neon Energy Limited	137,486,323
42	MPO	Molopo Energy Limited	133,840,996
43	MEO	MEO Australia Limited	132,278,749
44	CTP	Central Petroleum Limited	128,653,993
45	CUE	Cue Energy Resources Limited	125,661,550
46	WCL	Westside Corporation Limited	119,215,743
47	OEL	Otto Energy Limited	105,860,977
48	WEC	White Energy Company Limited	101,736,966
49	STX	Strike Energy Limited	92,177,850
50	SSN	Samson Oil & Gas Limited	92,167,755
51	LNG	Liquefied Natural Gas Limited	87,002,180
52	ICN	Icon Energy Limited	84,474,251
53	AJQ	Armour Energy Limited	82,500,000
54	PPP	Pan Pacific Petroleum NL	82,405,695
55	RES	Resource Generation Limited	76,079,025
56	CVN	Carnarvon Petroleum Limited	72,803,917
57	BKY	Berkeley Resources Limited	71,719,309
58	EGO	Empire Oil & Gas NL	71,184,874
59	MEL	Metgasco Limited	70,856,969
60	TOE	Toro Energy Limited	70,851,694
61	MGN	Magellan Petroleum Corporation	69,986,272
62	SUR	Sun Resources NL	67,275,464
63	AFR	African Energy Resources Limited	57,772,179
64	IEC	Intra Energy Corporation Limited	55,811,273
65	NTU	Northern Minerals Limited	53,089,330
66	DYL	Deep Yellow Limited	51,921,875
67	BCC	Buccaneer Energy Limited	48,616,652
68	JPR	Jupiter Energy Limited	48,194,014
69	HOG	Hawkley Oil and Gas Limited	47,112,685
70	GDY	Geodynamics Limited	44,709,787
71	NWE	Norwest Energy NL	44,591,720
72	EAX	Energy Action Limited	44,239,628
73	ESY	Enhanced Systems Technologies Limited	41,705,642

Appendix 5-1 The new scoring index

Hard Disclosure Items: A1 – A4
(A1) Governance structure and management systems (max score is 9)
1. Existence of a sustainability committee and/or management position for sustainability management
2. Stakeholder involvement (include setting sustainability policies, existence of mechanisms for stakeholders to provide recommendations and management responses to key topics and concerns raised by stakeholders)
3. Implementation of externally developed economic, environmental and social charters/ principles/ initiatives which organisation subscribes/ endorses
4. Executive compensation is linked to sustainability performance
5. Existence of explanation for data measurement techniques and the bases of calculations, including assumptions adopted in the compilation of sustainability information in the report.
6. Indicate whether the Chair of the highest governance body is also an executive officer
7. State the number, gender, expertise of members of the highest governance body such as the board of directors that are independent and/or non-executive members
8. Processes in place for the highest governance body to ensure conflicts of interest are avoided
9. Processes for evaluating the highest governance body's own performance, particularly with respect to economic, environmental, and social performance
(A2) Credibility (max score is 5)
1. Adoption of GRI sustainability reporting guidelines or provision of a CERES report
2. Independent verification/ assurance about environmental information disclosed in the environmental performance report/web, including external awards for providing quality sustainability information
3. Independent verifications/ audits on sustainability systems/ performances, including external awards/certifications for good sustainability practices
4. Participation in industry specific associations/initiatives to improve sustainability practices
5. Participation in other organisations/association which promotes sustainability to improve sustainability practices
(A3) Economic Performance Indicators, ECP (max score is 18)
1. Economic performance
2. Market presence
3. Indirect economic impacts
(A3) Environmental Performance Indicators, ENP (max score is 66)
4. Materials

5. Energy
6. Water
4. Biodiversity
5. Greenhouse emissions
6. Air emissions
7. Water effluents
8. Waste
9. Products and services
10. Compliance
11. Transport
(A3) Social Performance Indicators – Labour Practice and Decent Work, LAP (max score is 36)
7. Employment
8. Labour/ Management relations
9. Occupational health and safety
10.Training and education
11.Diversity and equal opportunity
12.Equal remuneration for women and men
(A3) Social Performance Indicators – Human Rights, HRP (max score is 54)
5. Investment and procurement practices
6. Non-discrimination
7. Freedom of association
8. Child labour
9. Forced and compulsory labour
10.Security practices
11.Indigenous rights
12.Assessment
13.Remediation
(A3) Social Performance Indicators – Society, SOP (max score is 25)
2. Local communities
3. Corruption
4. Public policy
5. Anti-competitive behaviour
6. Compliance
(A3) Social Performance Indicators – Product, PRP (max score is 25)
3. Customer health and safety
4. Product and service labelling
5. Marketing communications

6. Customer privacy
7. Compliance
(A4) Spending on sustainability related expenditures (max score is 2)
1. Summary of dollar savings arising from sustainability initiatives to the company
2. Amount spent on donations, community investments, technologies, R&D and/or innovations to enhance sustainability
Soft Disclosure Items: A5 – A7
(A5) Vision and strategy claims (max score is 7)
1. CEO statement on sustainability performance in letter to shareholders and/or stakeholders
2. A statement of corporate sustainability policy, values and principles, codes of conduct
3. A statement about formal management systems regarding risk and performance in sustainability
7. A statement that the firm undertakes periodic reviews and evaluations of its sustainable performances
5. A statement of measurable goals in terms of future sustainability performance (if not awarded under A3)
8. A statement about specific sustainability innovations and/or new technologies
9. Explanation of whether and how the precautionary approach or principle on sustainability issues is addressed by the organization.
(A6) Sustainability Initiatives (max score is 3)
4. Internal sustainability awards
5. Internal sustainability performance audits
6. Internal certification of sustainability programs
(A7) Disclosure on Management Approach – Economic (max score is 3)
1. Economic performance
2. Market presence
3. Indirect economic impacts
(A7) Disclosure on Management Approach – Environmental (max score is 9)
1. Materials
2. Energy
3. Water
4. Biodiversity
5. Emissions, effluents and waste
6. Products and services
7. Compliance
8. Transport
9. Overall
(A7) Disclosure on Management Approach –Labour Practice and Decent Work (max score is 6)
1. Employment

2. Labour/management relations
3. Occupational health and safety
4. Training and education
5. Diversity and equal opportunity
6. Equal remuneration for women and men
(A7) Disclosure on Management Approach – Human Rights (max score is 9)
1. Investment and procurement practices
2. Non-discrimination
3. Freedom of association and collective bargaining
4. Child labour
5. Prevention of forced and compulsory labour
6. Security practices
7. Indigenous rights
8. Assessment
9. Remediation
(A7) Disclosure on Management Approach – Society (max score is 5)
1. Local communities
2. Corruption
3. Public policy
4. Anti-competitive behaviour
5. Compliance
(A7) Disclosure on Management Approach - Products Responsibility (max score is 5)
1. Customer health and safety
2. Product and service labelling
3. Marketing communications
4. Customer privacy
5. Compliance

Appendix 6-1 Recording worksheet

Hard Disclosure Items (Category A1 - A4)			
(A1)Governance structure and management systems (max score is 9)	**Map to GRI G3.1**	**Min-Max Score (0-1)**	**Reference**
1. Existence of a sustainability committee and/or management position for sustainability management	4.1		
2. Stakeholder involvement (include setting sustainability policies, existence of mechanisms for stakeholders to provide recommendations and management responses to key topics and concerns raised by stakeholders)	4.4 (Presence of mechanism), 4.16 (Freq), 4.17 (Org addressed key concerns)		
3. Implementation of externally developed economic, environmental and social charters/ principles/ initiatives which organisation subscribes/ endorses	4.12		
4. Executive compensation is linked to sustainability performance	4.5		
5. Existence of explanation for data measurement techniques and the bases of calculations, including assumptions adopted in the compilation of sustainability information in the report.	3.9		
6. Indicate whether the Chair of the highest governance body is also an executive officer.	4.2		
7. State the number, gender, expertise of members of the highest governance body such as the board of directors that are independent and/or non-executive members.	4.3 (No of directors & Gender), 4.7 (Expertise)		
8. Processes in place for the highest governance body to ensure conflicts of interest are avoided.	4.6		
9. Processes for evaluating the highest governance body's own performance, particularly with respect to economic, environmental, and social performance.	4.10		
	TOTAL A1 SCORE		

(A2) Credibility (max score is 5)	Map to GRI G3.1	Min-Max Score (0-1)	Reference
1. Adoption of GRI sustainability reporting guidelines or provision of a CERES report	4.12		
2. Independent verification/ assurance about sustainability information disclosed in the environmental performance report/web, including external awards for providing quality sustainability information	3.13 (External assurance on		
3. Independent verifications/ audits on sustainability systems/ performances, including external awards/ certifications for good sustainability practices	2.10 (Award for practices)		
4. Participation in industry specific associations/initiatives to improve sustainability practices	4.13 (Industry typed association)		
5. Participation in other organisations/assoc which promotes sustainability to improve sustainability practices	4.13 (Association other than by industry)		
	TOTAL A2 SCORE		

(A4) Spending on sustainability related expenditures (max score is 2)	Map to GRI G3.1	Min-Max Score (0-1)	Reference
1. Summary of dollar savings arising from sustainability initiatives to the company	-		
2. Amount spent on technologies, R&D and/or innovations to enhance sustainability	EN 30, EC1, EC4		
	TOTAL A4 SCORE		

New Index Code	(A3) Economic Performance (ECP) Indicators (Max score is 18)	Map to GRI G3.1	Data Present	Relative to Peers/ Industry	Relative to Previous Period	Relative to Targets	Absolute and Normalised form	At Disaggregate level	Min-Max Score (0 -6)	Ref
A3 ECP1	**Economic Performance**	EC2 & EC3								
	Financial implications and other risks and opportunities for the organization's activities due to climate change.									
	Coverage of the organization's defined benefit plan obligations.									
A3 ECP2	**Market Presence**	EC5, EC6 & EC7								
	Range of ratios of standard entry level wage by gender compared to local minimum wage at significant locations of operation.									
	Policy, practices, and proportion of spending on locally-based suppliers at significant locations of operation.									
	Procedures for local hiring and proportion of senior management hired from the local community at significant locations of operation.									
A3 ECP3	**Indirect Economic Impacts**	EC8 & EC9								
	Development and impact of infrastructure investments and services provided primarily for public benefit through commercial, in-kind, or pro bono engagement.									
	Understanding and describing significant indirect economic impacts, including the extent of impacts.									
	TOTAL									

New Index Code	(A3) Environmental Performance (ENP) Indicators (Max score is 66)	Map to GRI G3.1	Data Present	Relative to Peers/ Industry	Relative to Previous Period	Relative to Targets	Absolute and Normalised form	At Disaggregate level	Min-Max Score (0 -6)	Ref
A3 ENP1	**Materials**	EN1 & EN2								
	Materials used by weight or volume.									
	Percentage of materials used that are recycled input materials.									
A3 ENP2	**Energy**	EN3, EN4, EN5, EN6 & EN7								
	Direct energy consumption by primary energy source.									
	Indirect energy consumption by primary source.									
	Energy saved due to conservation and efficiency improvements.									
	Initiatives to provide energy-efficient or renewable energy based products and services, and reductions in energy requirements as a result of these initiatives.									
	Initiatives to reduce indirect energy consumption and reductions achieved.									
A3 ENP3	**Water**	EN8, EN9 & EN10								
	Total water withdrawal by source.									
	Water sources significantly affected by withdrawal of water.									
	Percentage and total volume of water recycled and reused.									

New Index Code	(A3) Environmental Performance (ENP) Indicators (Max score is 66)	Map to GRI G3.1	Data Present	Relative to Peers/ Industry	Relative to Previous	Relative to Targets	Absolute and Normalised	At Disaggregate level	Min-Max Score (0 -6)	Ref
A3 ENP4	**Biodiversity**	EN11, EN12, EN13, EN14 & EN15								
	Location and size of land owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas.									
	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas.									
	Habitats protected or restored.									
	Strategies, current actions, and future plans for managing impacts on biodiversity.									
	Number of IUCN Red List species and national conservation list species with habitats in areas affected by operations, by level of extinction risk.									
A3 ENP5	**Emissions, effluents and waste**	EN16, EN17 & EN18								
	Total direct and indirect greenhouse gas emissions by weight.									
	Other relevant indirect greenhouse gas emissions by weight.									
	Initiatives to reduce greenhouse gas emissions and reductions achieved.									
A3 ENP6	Emissions of ozone-depleting substances by weight.	EN19 & EN20								
	NOx, SOx, and other significant air emissions by type and weight.									

New Index Code	(A3) Environmental Performance (ENP) Indicators (Max score is 66)	Map to GRI G3.1	Data Present	Relative to Peers/ Industry	Relative to Previous Period	Relative to Targets	Absolute and Normalised form	At Disaggregate level	Min-Max Score (0 -6)	Ref
A3 ENP7	Total water discharge by quality and destination. Total number and volume of significant spills. Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the reporting organization's discharges of water and runoff.	EN21, EN23 & EN25								
A3 ENP8	Total weight of waste by type and disposal method. Weight of transported, imported, exported, or treated waste deemed hazardous under the terms of the Basel Convention Annex I, II, III, and VIII, and percentage of transported waste shipped internationally.	EN22 & EN24								
A3 ENP9	**Products and services** Initiatives to mitigate environmental impacts of products and services, and extent of impact mitigation. Percentage of products sold and their packaging materials that are reclaimed by category.	EN26 & EN27								
A3 ENP10	**Compliance** Total number of non-monetary sanctions for non-compliance with environmental laws and regulations.	EN28								
A3 ENP11	**Transport** Significant environmental impacts of transporting products and other goods and materials used for the organization's operations, and transporting members of the workforce.	EN29								
	TOTAL									

New Index Code	(A3) Labour Performance (LAP) Indicators (Max score is 36)	Map to GRI G3.1	Data Present	Relative to Peers/ Industry	Relative to Previous Period	Relative to Targets	Absolute and Normalised form	At Disaggregate level	Min-Max Score (0 -6)	Ref
A3 LAP1	**Employment**	LA1, LA2, LA3 & LA15								
	Total workforce by employment type, employment contract, and region, broken down by gender.									
	Total number and rate of new employee hires and employee turnover by age group, gender, and region.									
	Benefits provided to full-time employees that are not provided to temporary or part-time employees, by									
	Return to work and retention rates after parental leave, by gender.									
A3 LAP2	**Labour/ Management relations**	LA4 & LA5								
	Percentage of employees covered by collective bargaining agreements.									
	Minimum notice period(s) regarding significant operational changes, including whether it is specified in collective agreements.									
A3 LAP3	**Occupational health and safety**	LA6, LA7, LA8 & LA9								
	Percentage of total workforce represented in formal joint management-worker health and safety committees that help monitor and advise on									
	Rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities by region and by gender.									
	Education, training, counselling, prevention, and risk-control programs in place to assist workforce members, their families, or community members regarding serious diseases.									
	Health and safety topics covered in formal agreements with trade unions.									

New Index Code	(A3) Labour Performance (LAP) Indicators (Max score is 36)	Map to GRI G3.1	Data Present	Relative to Peers/ Industry	Relative to Previous Period	Relative to Targets	Absolute and Normalised form	At Disaggregate level	Min-Max Score (0 -6)	Ref
A3 LAP4	**Training and education**	LA10, LA11, LA12								
	Average hours of training per year per employee by gender, and by employee category.									
	Programs for skills management and lifelong learning that support the continued employability of employees and assist them in managing career endings.									
	Percentage of employees receiving regular performance and career development reviews, by gender.									
A3 LAP5	**Diversity and equal opportunity**	LA13								
	Composition of governance bodies and breakdown of employees per employee category according to gender, age group, minority group membership, and other indicators of diversity.									
A3 LAP6	**Equal remuneration for women and men**	LA14								
	Ratio of basic salary and remuneration of women to men by employee category, by significant locations of operation.									
	TOTAL									

New Index Code	(A3) Human Rights Performance (HRP) Indicators (Max score is 54)	Map to GRI G3.1	Data Present	Relative to Peers/ Industry	Relative to Previous Period	Relative to Targets	Absolute and Normalised form	At Disaggregate level	Min-Max Score (0 -6)	Ref
A3 HRP1	**Investment and procurement practices** Percentage and total number of significant investment agreements and contracts that include clauses incorporating human rights concerns, or that have undergone human rights screening. Percentage of significant suppliers, contractors and other business partners that have undergone human rights screening, and actions taken. Total hours of employee training on policies and procedures concerning aspects of human rights that are relevant to operations, including the percentage of employees trained.	**HR1, HR2 & HR3**								
A3 HRP2	**Non-discrimination** Total number of incidents of discrimination and corrective actions taken.	**HR4**								
A3 HRP3	**Freedom of association and collective bargaining** Operations and significant suppliers identified in which the right to exercise freedom of association and collective bargaining may be violated or at significant risk, and actions taken to support these rights.	**HR5**								
A3 HRP4	**Child Labour** Operations and significant suppliers identified as having significant risk for incidents of child labor, and measures taken to contribute to the effective abolition of child labor.	**HR6**								

New Index Code	(A3) Human Rights Performance (HRP) Indicators (Max score is 54)	Map to GRI G3.1	Data Present	Relative to Peers/ Industry	Relative to Previous Period	Relative to Targets	Absolute and Normalised form	At Disaggregate level	Min-Max Score (0 -6)	Ref
A3 HRP5	**Forced and compulsory labour** Operations and significant suppliers identified as having significant risk for incidents of forced or compulsory labour, and measures to contribute to the elimination of all forms of forced or compulsory labour.	HR7								
A3 HRP6	**Security practices** Percentage of security personnel trained in the organization's policies or procedures concerning aspects of human rights that are relevant to operations.	HR8								
A3 HRP7	**Indigenous rights** Total number of incidents of violations involving rights of indigenous people and actions taken.	HR9								
A3 HRP8	**Assessment** Percentage and total number of operations that have been subject to human rights reviews and/or impact assessments.	HR10								
A3 HRP9	**Remediation** Number of grievances related to human rights filed, addressed and resolved through formal grievance mechanisms.	HR11								
	TOTAL									

New Index Code	(A3) Society Performance (SOP) Indicators (Max score is 30)	Map to GRI G3.1	Data Present	Relative to Peers/ Industry	Relative to Previous Period	Relative to Targets	Absolute and Normalised form	At Disaggregate level	Min-Max Score (0 -6)	Ref
A3 SOP1	**Local communities**	SO1, SO9 & SO10								
	Percentage of operations with implemented local community engagement, impact assessments, and development programs.									
	Operations with significant potential or actual negative impacts on local communities.									
	Prevention and mitigation measures implemented in operations with significant potential or actual									
A3 SOP2	**Corruption**	SO2, SO3 & SO4								
	Percentage and total number of business units analysed for risks related to corruption.									
	Percentage of employees trained in organization's anti-corruption policies and procedures.									
	Actions taken in response to incidents of corruption.									
A3 SOP3	**Public Policy**	SO5 & SO6								
	Public policy positions and participation in public policy development and lobbying.									
	Total value of financial and in-kind contributions to political parties, politicians, and related institutions by country.									
A3 SOP4	**Anti-competitive behaviour**	SO7								
	Total number of legal actions for anti-competitive behaviour, anti-trust, and monopoly practices and their outcomes.									
A3 SOP5	**Compliance**	SO8								
	Total number of non-monetary sanctions for non-compliance with laws and regulations.									
	TOTAL									

New Index Code	(A3) Product Responsibility Performance (PRP) Indicators (Max score is 30)	Map to GRI G3.1	Data Present	Relative to Peers/ Industry	Relative to Previous Period	Relative to Targets	Absolute and Normalised form	At Disaggregate level	Min-Max Score (0 -6)	Ref
A3 PRP1	**Customer health and safety**	PR1 & PR2								
	Life cycle stages in which health and safety impacts of products and services are assessed for improvement, and percentage of significant products and services categories subject to such procedures.									
	Total number of incidents of non-compliance with regulations and voluntary codes concerning health and safety impacts of products and services during their life cycle, by type of outcomes.									
A3 PRP2	**Product and service labelling**	PR3, PR4 & PR5								
	Type of product and service information required by procedures, and percentage of significant products and services subject to such information requirements.									
	Total number of incidents of non-compliance with regulations and voluntary codes concerning product									
	Practices related to customer satisfaction, including results of surveys measuring customer satisfaction.									
A3 PRP3	**Marketing communications**	PR6 & PR7								
	Programs for adherence to laws, standards, and voluntary codes related to marketing communications, including advertising, promotion, and sponsorship.									
	Total number of incidents of non-compliance with regulations and voluntary codes concerning marketing communications, including advertising, promotion, and sponsorship by type of outcomes.									

New Index Code	(A3) Product Responsibility Performance (PRP) Indicators (Max score is 30)	Map to GRI G3.1	Data Present	Relative to Peers/ Industry	Relative to Previous Period	Relative to Targets	Absolute and Normalised form	At Disaggregate level	Min-Max Score (0 -6)	Ref
A3 PRP4	**Customer privacy** Total number of substantiated complaints regarding breaches of customer privacy and losses of customer data.	PR8								
A3 PRP5	**Compliance** Non-compliance with laws and regulations concerning the provision and use of products and services.	PR9								
	TOTAL									

Soft Disclosure Items (Category A5 - A6)			
(A5) Vision and strategy claims (max score is 7)	**Map to GRI G3.1**	**Min-Max Score (0-1)**	**Reference**
1. CEO statement on sustainability performance in letter to shareholders and/or stakeholders	1.1 (CEO statement) , 1.2 (Key risks and impacts)		
2. A statement of corporate sustainability policy, values and principles, codes of conduct	1.1 (CEO statement) , 1.2 (Key risks and impacts), 4.8 (Other internal developed statements/policies)		
3. A statement about formal management systems regarding risk and performance in sustainability	4.9 (Focus on management system)		
4. A statement that the firm undertakes periodic reviews and evaluations of its sustainable performances	4.9 (Focus on undertaking reviews)		
5. A statement of measurable goals in terms of future sustainability performance (if not awarded under A3)	1.1 (CEO statement) , 1.2 (Key risks and impacts)		
6. A statement about specific sustainability innovations and/or new technologies	1.1 (CEO statement) , 1.2 (Key risks and impacts)		
7. Explanation of whether and how the precautionary approach or principle on sustainability issues is addressed by the organization.	4.11		
	TOTAL A5 SCORE		

(A6) Sustainability Initiatives (max score is 3)	Map to GRI G3.1	Min-Max Score (0-1)	Reference
1. Internal sustainability awards			
2. Internal sustainability performance audits			
3. Internal certification of sustainability programs			
	TOTAL A6 SCORE		

(A7) DMA EC - Disclosure on Management Approach Economic	Score : (0-1)	Total DMA EC	Reference
Economic performance			
Market presence			
Indirect economic impacts			
(A7) DMA EN - Disclosure on Management Approach Environmental	**Score : (0-1)**	**Total DMA EN**	**Reference**
Materials			
Energy			
Water			
Biodiversity			
Emissions, effluents and waste			
Products and services			
Compliance			
Transport			
Overall			
(A7) Disclosure on Management Approach Labour	**Score : (0-1)**	**Total DMA LA**	**Reference**
Employment			
Labour/management relations			
Occupational health and safety			
Training and education			
Diversity and equal opportunity			
Equal remuneration for women and men			
	TOTAL DMA (1)		

(A7) Disclosure on Management Approach Human Rights	Score : (0-1)	Total DMA HR	Reference
Investment and procurement practices			
Non-discrimination			
Freedom of association and collective bargaining			
Child labour			
Prevention of forced and compulsory labour			
Security practices			
Indigenous rights			
Assessment			
Remediation			
(A7) Disclosure on Management Approach Society	**Score : (0-1)**	**Total DMA SO**	**Reference**
Local communities			
Corruption			
Public policy			
Anti-competitive behaviour			
Compliance			
(A7) Disclosure on Management Approach Products	**Score : (0-1)**	**Total DMA PR**	**Reference**
Customer health and safety			
Product and service labelling			
Marketing communications			
Customer privacy			
Compliance			
	TOTAL DMA (2)		

Appendix 6-2 Summary score sheet

Hard Disclosure Items (A1-A4)

Category		Items	Max Scores	Scores
A1	Governance structure and management systems	9	9	
A2	Credibility	5	5	
A3	Economic Performance Indicators (ECP)	3	18	
	Environmental Performance Indicators (ENP)	11	66	
	Social Performance Indicators			
	Labour Practices and Decent Work (LAP)	6	36	
	Human Rights (HRP)	9	54	
	Society (SOP)	5	30	
	Product Responsibility (PRP)	5	30	
A4	Spending related to sustainability	2	2	
		Total	**250**	

Soft Disclosure Items (A5-A7)

Category		Items	Max Scores	Scores
A5	Vision and strategy claims	7	7	
A6	Sustainability Initiatives	3	3	
A7	Disclosures of Management Approach (DMA)			
	Economic	3	3	
	Environmental	9	9	
	Social - Labour	6	6	
	Social - Human Rights	9	9	
	Social - Society	5	5	
	Social - Product Responsibility	5	5	
		Total	**47**	

Total = 250 + 47 = 297

Appendix 6-3 Tests of normality for dependent and independent variables

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
TotalDis	.177	46	.001	.856	46	.000
TotalHard	.206	46	.000	.825	46	.000
TotalSoft	.118	46	.118	.938	46	.017
Total_A1	.191	46	.000	.914	46	.002
Total_A2	.274	46	.000	.829	46	.000
Total_A3_ECP	.190	46	.000	.871	46	.000
Total_A3_ENP	.191	46	.000	.774	46	.000
Total_A3_LAP	.075	46	.200*	.965	46	.177
Total_A3_HRP	.291	46	.000	.610	46	.000
Total_A3_SOP	.251	46	.000	.731	46	.000
Total_A3_PRP	.240	46	.000	.745	46	.000
Total_A4	.235	46	.000	.802	46	.000
Total_A5	.374	46	.000	.666	46	.000
Total_A6	.410	46	.000	.616	46	.000
Total_DMA_EC	.327	46	.000	.738	46	.000
Total_DMA_EN	.185	46	.000	.901	46	.001
Total_DMA_LA	.190	46	.000	.898	46	.001
Total_DMA_HR	.311	46	.000	.707	46	.000
Total_DMA_SO	.269	46	.000	.771	46	.000
Total_DMA_PR	.254	46	.000	.751	46	.000
Market_Cap	.363	46	.000	.462	46	.000
TotalRevenue	.396	46	.000	.492	46	.000
TotalAssets	.338	46	.000	.502	46	.000
OpRevenue	.413	46	.000	.491	46	.000
EBIT	.314	46	.000	.538	46	.000
ROA	.440	46	.000	.238	46	.000
ROE	.407	46	.000	.238	46	.000
SharePrice	.305	46	.000	.568	46	.000
SharePrice_BV	.267	46	.000	.639	46	.000
TotalDir	.156	46	.007	.943	46	.024
IndepentDir	.143	46	.020	.939	46	.018
MultipleDir	.187	46	.000	.924	46	.005
CEODuality	.510	46	.000	.431	46	.000
WomenDir	.374	46	.000	.698	46	.000
SusComm	.395	46	.000	.620	46	.000

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Appendix 6-4 Mean scores of each item for the pilot study

Hard Disclosure Items: A1 – A4	Mean Scores
(A1) Governance structure and management systems (max score is 9) Each item has a maximum score of 1.	**6.41**
1. Existence of a sustainability committee and/or management position for sustainability management	0.46
2. Stakeholder involvement (include setting sustainability policies, existence of mechanisms for stakeholders to provide recommendations and management responses to key topics and concerns raised by stakeholders)	0.72
3. Implementation of externally developed economic, environmental and social charters/ principles/ initiatives which organisation subscribes/ endorses	0.63
4. Executive compensation is linked to sustainability performance	0.61
5. Existence of explanation for data measurement techniques and the bases of calculations, including assumptions adopted in the compilation of sustainability information in the report.	0.41
6. Indicate whether the Chair of the highest governance body is also an executive officer	1.00
7. State the number, gender, expertise of members of the highest governance body such as the board of directors that are independent and/or non-executive members	1.00
8. Processes in place for the highest governance body to ensure conflicts of interest are avoided	0.96
9. Processes for evaluating the highest governance body's own performance, particularly with respect to economic, environmental, and social performance	0.63
(A2) Credibility (max score is 5) Each item has a maximum score of 1.	**1.74**
1. Adoption of GRI sustainability reporting guidelines or provision of a CERES report	0.13
2. Independent verification/ assurance about environmental information disclosed in the environmental performance report/web, including external awards for providing quality sustainability information	0.15
3. Independent verifications/ audits on sustainability systems/ performances, including external awards/certifications for good sustainability practices	0.43
4. Participation in industry specific associations/initiatives to improve sustainability practices	0.57
5. Participation in other organisations/association which promotes sustainability to improve sustainability practices	0.46
(A3) Economic Performance Indicators, ECP (max score is 18) Each item has a maximum score of 6.	**7.09**
1. Economic performance	4.41
2. Market presence	0.89
3. Indirect economic impacts	1.78
(A3) Environmental Performance Indicators, ENP (max score is 66) Each item has a maximum score of 6.	**13.78**
1.Materials	0.74

2. Energy	0.80
3. Water	1.30
4. Biodiversity	2.00
5. Greenhouse emissions	1.76
6. Air emissions	0.59
7. Water effluents	0.87
8. Waste	0.70
9. Products and services	0.33
10. Compliance	3.39
11. Transport	1.30
(A3) Social Performance Indicators – Labour Practice and Decent Work, LAP (max score is 36) Each item has a maximum score of 6.	**13.65**
1. Employment	2.78
2. Labour/ Management relations	0.41
3. Occupational health and safety	3.48
4. Training and education	1.70
5. Diversity and equal opportunity	3.70
6. Equal remuneration for women and men	1.59
(A3) Social Performance Indicators – Human Rights, HRP (max score is 54) Each item has a maximum score of 6.	**4.09**
1. Investment and procurement practices	0.74
2. Non-discrimination	0.57
3. Freedom of association	0.35
4. Child labour	0.33
5. Forced and compulsory labour	0.35
6. Security practices	0.43
7. Indigenous rights	0.85
8. Assessment	0.33
9. Remediation	0.15
(A3) Social Performance Indicators – Society, SOP (max score is 25) Each item has a maximum score of 6.	**3.63**
1. Local communities	2.30
2. Corruption	0.43
3. Public policy	0.13
4. Anti-competitive behaviour	0.22
5. Compliance	0.54
(A3) Social Performance Indicators – Product, PRP (max score is 25) Each item has a maximum score of 6.	**4.74**
1. Customer health and safety	0.63
2. Product and service labelling	2.39

3. Marketing communications	0.74
4. Customer privacy	0.26
5. Compliance	0.72
(A4) Spending on sustainability related expenditures (max score is 2) Each item has a maximum score of 1.	**0.85**
1. Summary of dollar savings arising from sustainability initiatives to the company	0.20
2. Amount spent on donations, community investments, technologies, R&D and/or innovations to enhance sustainability	0.65
Soft Disclosure Items: A5 – A7	
(A5) Vision and strategy claims (max score is 7) Each item has a maximum score of 1.	**5.28**
1. CEO statement on sustainability performance in letter to shareholders and/or stakeholders	0.80
2. A statement of corporate sustainability policy, values and principles, codes of conduct	0.80
3. A statement about formal management systems regarding risk and performance in sustainability	0.78
6. A statement that the firm undertakes periodic reviews and evaluations of its sustainable performances	0.74
5. A statement of measurable goals in terms of future sustainability performance (if not awarded under A3)	0.70
7. A statement about specific sustainability innovations and/or new technologies	0.72
8. Explanation of whether and how the precautionary approach or principle on sustainability issues is addressed by the organization.	0.74
(A6) Sustainability Initiatives (max score is 3) Each item has a maximum score of 1.	**0.54**
1. Internal sustainability awards	0.11
2. Internal sustainability performance audits	0.28
3. Internal certification of sustainability programs	0.15
(A7) Disclosure on Management Approach – Economic (max score is 3) Each item has a maximum score of 1.	**1.72**
1. Economic performance	0.98
2. Market presence	0.24
3. Indirect economic impacts	0.50
(A7) Disclosure on Management Approach – Environmental (max score is 9) Each item has a maximum score of 1.	**3.54**
1. Materials	0.17
2. Energy	0.15
3. Water	0.30
4. Biodiversity	0.46
5. Emissions, effluents and waste	0.46
6. Products and services	0.09
7. Compliance	0.93
8. Transport	0.33

9. Overall	0.65
(A7) Disclosure on Management Approach – Labour Practice and Decent Work (max score is 6) Each item has a maximum score of 1.	**3.33**
1. Employment	0.67
2. Labour/management relations	0.13
3. Occupational health and safety	0.78
4. Training and education	0.39
5. Diversity and equal opportunity	0.91
6. Equal remuneration for women and men	0.43
(A7) Disclosure on Management Approach – Human Rights (max score is 9) Each item has a maximum score of 1.	**1.54**
1. Investment and procurement practices	0.22
2. Non-discrimination	0.26
3. Freedom of association and collective bargaining	0.11
4. Child labour	0.11
5. Prevention of forced and compulsory labour	0.13
6. Security practices	0.20
7. Indigenous rights	0.33
8. Assessment	0.13
9. Remediation	0.07
(A7) Disclosure on Management Approach – Society (max score is 5) Each item has a maximum score of 1.	**1.09**
1. Local communities	0.63
2. Corruption	0.20
3. Public policy	0.04
4. Anti-competitive behaviour	0.07
5. Compliance	0.15
(A7) Disclosure on Management Approach – Products Responsibility (max score is 5) Each item has a maximum score of 1.	**1.11**
1. Customer health and safety	0.17
2. Product and service labelling	0.52
3. Marketing communications	0.17
4. Customer privacy	0.07
5. Compliance	0.17

Appendix 7-1 Mean scores of each item for the main study

	Total scores in various categories																		
Sector ASX Code	A1	A2	A3 ECP	A3 ENP	A3 LAP	A3 HRP	A3 SOP	A3 PRP	A4	A5	A6	A7 ECP	A7 ENP	A7 LAP	A7 HRP	A7 SOP	A7 PRP	Total Hard (A1 to A4)	Total Soft (A5 to A7)	TOTAL Scores
MM_ABU	5	0	5	14	10	0	0	0	0	4	0	1	3	3	0	0	0	34	11	45
MM_AGO	8	2	15	11	21	1	5	0	1	7	1	3	4	5	1	2	0	64	23	87
MM_AOH	3	0	8	10	9	0	3	4	1	4	0	2	4	2	0	1	1	38	14	52
MM_AQP	6	5	16	19	20	13	8	5	1	7	1	3	6	4	4	2	1	93	28	121
MM_ARI	9	5	5	48	29	25	5	15	2	7	3	1	9	6	6	1	4	143	37	180
MM_ATR	4	1	4	5	5	0	2	3	0	7	0	1	1	1	0	1	1	24	12	36
MM_BCI	5	0	7	15	14	4	3	9	0	6	0	2	4	4	1	1	2	57	20	77
MM_BHP	9	5	18	45	23	27	17	12	2	7	3	3	9	6	9	5	5	158	47	205
MM_BSE	8	2	15	6	16	0	3	0	0	7	0	3	2	3	0	1	0	50	16	66
MM_BSL	7	0	6	0	14	0	0	0	0	3	0	1	0	3	0	0	0	27	7	34
MM_BTR	4	0	12	5	9	0	3	6	0	7	0	3	1	3	0	1	1	39	16	55
MM_BTU	7	5	10	12	5	0	2	0	1	7	1	3	4	2	0	1	0	42	18	60
MM_CCU	3	0	5	2	0	0	0	0	0	0	0	1	2	0	0	0	0	10	3	13
MM_CDU	5	0	3	2	3	2	8	0	1	7	0	1	2	1	1	2	0	24	14	38
MM_CFE	4	0	3	2	9	2	0	0	0	1	0	1	1	3	1	0	0	20	7	27

	Total scores in various categories																			
Sector ASX Code	A1	A2	A3 ECP	A3 ENP	A3 LAP	A3 HRP	A3 SOP	A3 PRP	A4	A5	A6	A7 ECP	A7 ENP	A7 LAP	A7 HRP	A7 SOP	A7 PRP	Total Hard (A1 to A4)	Total Soft (A5 to A7)	TOTAL Scores
MM_DML	9	5	7	22	14	6	5	0	1	7	1	2	6	4	3	2	0	69	25	94
MM_EQX	4	0	8	9	2	0	0	3	0	4	0	2	2	2	0	0	1	26	11	37
MM_EVN	6	0	6	7	11	3	4	4	0	7	1	1	2	3	1	2	1	41	18	59
MM_FMG	8	5	18	51	27	12	8	3	1	7	2	3	8	5	2	2	1	133	30	163
MM_FML	4	1	5	9	5	0	0	0	1	6	0	1	3	1	0	0	0	25	11	36
MM_FMS	3	0	5	8	12	8	0	0	0	5	0	1	2	3	2	0	0	36	13	49
MM_GBG	7	3	18	42	18	4	4	0	2	7	3	3	7	3	1	1	0	98	25	123
MM_GRY	6	2	10	5	11	0	4	0	1	7	0	2	2	3	0	1	0	39	15	54
MM_IGO	8	4	8	10	16	1	1	0	1	7	1	2	4	4	1	1	0	49	20	69
MM_IOH	4	0	5	4	6	0	0	5	0	5	0	1	1	2	0	0	1	24	10	34
MM_IRN	6	2	4	3	12	0	0	0	0	6	0	1	1	3	0	0	0	27	11	38
MM_JMS	3	0	5	9	4	0	0	0	0	3	0	1	2	1	0	0	0	21	7	28
MM_KCN	4	2	3	21	12	0	3	7	2	6	0	1	6	4	0	1	2	54	20	74
MM_KRM	4	0	5	6	5	0	4	5	1	7	0	1	3	2	0	1	1	30	15	45

	Total scores in various categories																			
Sector ASX Code	A1	A2	A3 ECP	A3 ENP	A3 LAP	A3 HRP	A3 SOP	A3 PRP	A4	A5	A6	A7 ECP	A7 ENP	A7 LAP	A7 HRP	A7 SOP	A7 PRP	Total Hard (A1 to A4)	Total Soft (A5 to A7)	TOTAL Scores
MM_LYC	9	3	6	13	17	1	10	16	0	7	0	1	3	4	1	2	4	75	22	97
MM_MCR	6	2	6	18	18	0	0	6	1	7	0	1	4	4	0	0	1	57	17	74
MM_MGX	9	4	6	15	18	5	5	0	1	7	3	2	4	4	1	1	0	63	22	85
MM_MLX	3	0	4	10	19	4	2	0	0	6	0	1	2	5	1	1	0	42	16	58
MM_MML	9	3	11	20	13	5	3	6	1	7	1	2	5	4	2	1	1	71	23	94
MM_NCM	9	5	16	40	31	28	17	16	1	7	3	3	7	6	8	5	5	163	44	207
MM_NGF	4	0	8	14	16	3	1	0	1	7	0	2	3	4	1	1	0	47	18	65
MM_NST	8	0	5	5	14	0	2	6	0	7	0	1	1	4	0	1	1	40	15	55
MM_ORE	4	0	10	4	1	0	0	0	0	5	0	3	1	1	0	0	0	19	10	29
MM_PAN	8	5	14	28	29	15	5	0	2	7	2	3	6	6	3	1	0	106	28	134
MM_PIR	5	0	10	5	6	0	0	0	0	7	0	3	1	3	0	0	0	26	14	40
MM_PRU	7	0	6	6	13	9	5	0	1	7	1	3	5	4	3	2	0	47	25	72
MM_RED	8	0	9	15	10	0	3	3	1	7	0	2	3	2	0	1	1	49	16	65
MM_RMS	6	0	5	5	15	3	0	3	0	5	1	1	1	3	1	0	1	37	13	50

	Total scores in various categories																			
Sector ASX Code	A1	A2	A3 ECP	A3 ENP	A3 LAP	A3 HRP	A3 SOP	A3 PRP	A4	A5	A6	A7 ECP	A7 ENP	A7 LAP	A7 HRP	A7 SOP	A7 PRP	Total Hard (A1 to A4)	Total Soft (A5 to A7)	TOTAL Scores
MM_RRL	4	0	5	2	9	0	0	6	0	4	0	1	1	3	0	0	1	26	10	36
MM_RSG	9	2	8	19	11	0	4	0	1	7	2	2	5	3	0	2	0	54	21	75
MM_SAR	5	0	6	5	9	0	0	0	1	0	0	2	2	4	0	0	0	26	8	34
MM_SBM	6	4	9	15	19	2	2	0	1	7	1	2	4	4	2	1	0	58	21	79
MM_SDL	7	4	7	39	20	12	7	6	1	7	1	3	7	4	3	2	1	103	28	131
MM_SFR	8	0	6	6	4	0	0	0	0	6	0	1	2	1	0	0	0	24	10	34
MM_SGM	9	4	7	25	15	7	3	0	2	7	3	2	6	4	5	1	0	72	28	100
MM_SIR	3	0	4	3	2	0	0	0	0	1	0	1	1	1	0	0	0	12	4	16
MM_SLR	3	0	3	2	9	0	0	6	0	0	0	1	1	2	0	0	1	23	5	28
MM_SMM	3	0	4	4	3	0	0	0	0	1	0	1	1	1	0	0	0	14	4	18
MM_SWA	3	0	0	3	6	0	0	0	0	0	0	0	1	2	0	0	0	12	3	15
MM_SYR	2	0	4	2	3	0	0	3	0	0	0	1	1	1	0	0	1	14	4	18
MM_TAM	5	0	4	7	3	0	2	0	0	6	1	1	2	1	0	1	0	21	12	33
MM_TGZ	7	4	10	20	18	9	8	5	1	7	1	2	7	4	4	2	1	82	28	110
MM_TRY	5	1	7	8	7	0	3	0	1	7	0	2	3	2	0	1	0	32	15	47

	Total scores in various categories																			
Sector ASX Code	A1	A2	A3 ECP	A3 ENP	A3 LAP	A3 HRP	A3 SOP	A3 PRP	A4	A5	A6	A7 ECP	A7 ENP	A7 LAP	A7 HRP	A7 SOP	A7 PRP	Total Hard (A1 to A4)	Total Soft (A5 to A7)	TOTAL Scores
MM_WDR	4	0	5	10	8	0	0	6	0	2	0	1	2	2	0	0	1	33	8	41
MM_WSA	5	0	6	6	16	0	1	5	1	7	0	2	4	4	0	1	1	40	19	59
EU_AFR	3	0	4	8	5	0	0	0	0	2	0	1	3	1	0	0	0	20	7	27
EU_AGK	9	5	15	59	30	32	22	29	2	7	2	3	9	6	8	5	5	203	45	248
EU_AJQ	4	0	5	3	5	0	0	0	0	1	0	1	1	2	0	0	0	17	5	22
EU_APA	9	2	17	34	25	0	3	16	2	7	0	3	7	5	0	1	4	108	27	135
EU_AQA	7	2	6	14	10	3	3	4	0	6	0	2	4	3	1	1	1	49	18	67
EU_AWE	9	4	11	18	23	8	4	0	1	7	0	2	3	4	3	1	0	78	20	98
EU_BCC	4	0	11	4	0	0	0	0	1	1	0	2	2	0	0	0	0	20	5	25
EU_BKY	6	3	6	6	12	0	2	0	0	7	0	2	2	4	0	1	0	35	16	51
EU_BND	5	2	13	16	14	4	4	4	1	7	0	3	4	5	4	1	1	63	25	88
EU_BPT	6	3	7	15	22	3	3	0	1	7	0	2	6	5	1	1	0	60	22	82
EU_BRU	6	2	8	7	19	3	5	6	1	7	0	3	4	4	1	1	2	57	22	79
EU_CIF	6	3	9	16	17	0	2	0	1	6	0	2	3	4	0	1	0	54	16	70
EU_COE	7	1	6	6	5	0	0	0	1	7	1	1	2	1	0	0	0	26	12	38

	Total scores in various categories																			
Sector ASX Code	A1	A2	A3 ECP	A3 ENP	A3 LAP	A3 HRP	A3 SOP	A3 PRP	A4	A5	A6	A7 ECP	A7 ENP	A7 LAP	A7 HRP	A7 SOP	A7 PRP	Total Hard (A1 to A4)	Total Soft (A5 to A7)	TOTAL Scores
EU_COK	4	0	3	8	1	0	1	7	0	1	0	1	2	1	0	1	2	24	8	32
EU_CPL	3	0	4	8	4	0	0	0	0	1	0	1	2	1	0	0	0	19	5	24
EU_CTP	5	0	6	4	7	0	0	0	0	3	0	1	1	2	0	0	0	22	7	29
EU_CUE	6	0	4	6	6	0	0	0	0	7	0	1	1	2	0	0	0	22	11	33
EU_CVN	3	0	5	4	0	0	0	0	0	1	0	1	1	0	0	0	0	12	3	15
EU_CZA	8	4	10	30	27	10	4	4	2	7	0	3	8	6	7	2	2	99	35	134
EU_DLS	9	0	7	3	16	4	4	0	1	7	0	2	2	4	3	1	0	44	19	63
EU_DUE	8	2	2	10	9	0	0	2	1	7	0	1	4	3	0	0	1	34	16	50
EU_DYL	5	2	5	4	12	2	5	0	1	7	0	1	2	3	1	1	0	36	15	51
EU_EAX	5	2	5	12	7	0	0	15	2	7	0	1	4	2	0	0	4	48	18	66
EU_EGO	3	0	4	3	0	0	0	0	0	0	0	1	1	0	0	0	0	10	2	12
EU_ENE	8	3	9	18	14	0	0	8	2	7	0	2	4	3	0	0	2	62	18	80
EU_ENV	8	3	6	12	8	0	4	21	1	7	0	1	3	3	0	1	4	63	19	82
EU_EPW	8	0	8	7	15	5	4	12	2	7	0	2	3	4	3	1	2	61	22	83
EU_EWC	4	3	12	16	6	4	8	0	0	6	1	3	2	2	1	2	0	53	17	70

	Total scores in various categories																			
Sector ASX Code	A1	A2	A3 ECP	A3 ENP	A3 LAP	A3 HRP	A3 SOP	A3 PRP	A4	A5	A6	A7 ECP	A7 ENP	A7 LAP	A7 HRP	A7 SOP	A7 PRP	Total Hard (A1 to A4)	Total Soft (A5 to A7)	TOTAL Scores
EU_GDY	8	3	5	13	17	0	4	3	1	7	0	1	4	4	0	1	1	54	18	72
EU_GUF	6	0	6	6	11	14	4	5	1	7	0	1	3	3	3	1	1	53	19	72
EU_HOG	3	0	5	3	2	0	0	0	0	0	0	1	1	1	0	0	0	13	3	16
EU_HZN	5	0	6	4	2	0	0	0	0	2	0	1	1	1	0	0	0	17	5	22
EU_ICN	8	2	4	6	10	0	4	0	0	7	0	1	1	3	0	1	0	34	13	47
EU_IEC	6	0	10	7	4	0	4	0	2	7	0	2	3	1	0	1	0	33	14	47
EU_IFN	8	3	13	31	16	0	5	24	2	7	0	3	7	3	0	1	4	102	25	127
EU_JPR	5	0	5	6	7	0	0	0	0	5	0	1	1	3	0	0	0	23	10	33
EU_KAR	5	0	6	5	5	0	0	0	0	3	0	1	1	1	0	0	0	21	6	27
EU_LNC	5	2	2	5	14	0	4	1	2	3	0	1	3	4	0	1	1	35	13	48
EU_LNG	6	2	5	16	15	0	0	12	2	7	0	1	4	4	0	0	2	58	18	76
EU_MAD	3	0	4	3	10	0	0	0	0	4	0	1	1	2	0	0	0	20	8	28
EU_MCE	7	2	4	4	11	0	0	3	0	7	0	1	1	3	0	0	1	31	13	44
EU_MEL	6	2	5	3	8	0	0	10	0	7	0	1	1	2	0	0	2	34	13	47
EU_MEO	4	2	5	4	11	0	0	0	0	7	0	1	1	4	0	0	0	26	13	39

	Total scores in various categories																			
Sector ASX Code	A1	A2	A3 ECP	A3 ENP	A3 LAP	A3 HRP	A3 SOP	A3 PRP	A4	A5	A6	A7 ECP	A7 ENP	A7 LAP	A7 HRP	A7 SOP	A7 PRP	Total Hard (A1 to A4)	Total Soft (A5 to A7)	TOTAL Scores
EU_MGN	2	0	6	36	6	0	0	4	0	6	0	1	5	2	0	0	1	54	15	69
EU_MIO	5	0	6	4	10	0	0	4	0	5	1	1	2	3	0	0	2	29	14	43
EU_MPO	8	0	6	15	15	0	0	0	0	7	0	1	2	3	0	0	0	44	13	57
EU_NCR	4	2	2	6	3	0	3	0	1	1	0	1	3	1	0	1	0	21	7	28
EU_NEN	5	0	5	3	15	0	0	0	0	6	0	1	1	5	0	0	0	28	13	41
EU_NSE	6	0	6	9	16	0	1	0	0	7	0	1	2	3	0	1	0	38	14	52
EU_NTU	5	0	5	9	3	11	6	0	0	7	0	1	2	1	2	1	0	39	14	53
EU_NWE	4	0	6	6	13	0	0	4	0	7	0	1	1	4	0	0	1	33	14	47
EU_NXS	7	1	5	4	16	0	0	0	0	7	0	1	1	3	0	0	0	33	12	45
EU_NZO	4	0	4	2	8	0	1	6	0	4	0	1	1	3	0	1	1	25	11	36
EU_OEL	8	0	6	3	3	0	0	0	0	5	0	1	1	1	0	0	0	20	8	28
EU_ORG	9	4	18	49	26	13	14	16	2	7	2	3	9	5	5	3	4	151	38	189
EU_PCL	3	0	3	2	5	0	0	0	1	0	0	1	2	1	0	0	0	14	4	18
EU_PDN	9	4	16	36	29	31	26	24	1	7	2	3	6	6	9	5	4	176	42	218

	Total scores in various categories																			
Sector ASX Code	A1	A2	A3 ECP	A3 ENP	A3 LAP	A3 HRP	A3 SOP	A3 PRP	A4	A5	A6	A7 ECP	A7 ENP	A7 LAP	A7 HRP	A7 SOP	A7 PRP	Total Hard (A1 to A4)	Total Soft (A5 to A7)	TOTAL Scores
EU_PEA	5	0	3	3	6	2	0	12	0	0	0	1	1	3	1	0	2	31	8	39
EU_PPP	4	0	5	4	5	0	0	0	0	1	0	1	1	2	0	0	0	18	5	23
EU_RES	5	1	4	9	6	0	3	0	1	7	0	1	4	2	0	1	0	29	15	44
EU_RFE	3	0	5	9	5	0	0	0	0	1	0	1	3	2	0	0	0	22	7	29
EU_RIA	4	0	11	11	11	0	3	0	0	7	0	2	2	3	0	1	0	40	15	55
EU_RRS	3	0	3	3	1	0	0	0	0	0	0	1	1	1	0	0	0	10	3	13
EU_SSN	3	0	6	9	4	0	0	4	0	4	0	1	2	1	0	0	1	26	9	35
EU_STX	3	0	5	4	16	0	3	0	0	7	0	1	1	3	0	1	0	31	13	44
EU_SUR	6	0	5	6	8	0	0	0	0	6	0	1	1	2	0	0	0	25	10	35
EU_SXY	8	0	6	9	20	0	2	6	0	7	0	1	2	4	0	1	1	51	16	67
EU_TOE	6	3	5	6	12	3	8	18	0	7	0	1	2	3	1	2	3	61	19	80
EU_WAS	3	1	4	4	6	0	0	0	0	7	0	1	1	2	0	0	0	18	11	29
EU_WCL	8	2	4	10	15	3	3	4	2	7	1	1	4	4	1	1	1	51	20	71
EU_WEC	4	2	4	3	8	0	0	3	0	7	0	1	1	2	0	0	1	24	12	36
EU_WHC	6	0	6	6	15	0	0	6	0	4	0	1	1	4	0	0	1	39	11	50
EU_WOR	8	3	11	18	17	11	5	0	1	7	1	3	4	5	6	2	0	74	28	102

Appendix 7-2 Proxies for company size and company financial performance of sample companies

No.	Sector	ASX Code	Company Name	Market Capitalisation	Total Revenue Exclude Interest	Total Assets	Operating Revenue	EBIT	ROE	Book Value Per share	Year-end Share Price
1	MM	ABU	ABM Resources NL	$ 123,164,673.98	$ 218,870.00	$ 44,746,664.00	$ 1,024,726.00	-$ 13,425,795.00	-0.2832	$ 0.01	$ 0.04
2	MM	AGO	Atlas Iron Limited	$ 1,827,251,600.00	$ 620,590,000.00	$ 2,261,870,000.00	$ 617,537,000.00	$ 79,038,000.00	-0.0247	$ 2.06	$ 2.02
3	MM	AOH	Altona Mining Limited	$ 125,301,849.12	$ 341,000.00	$ 114,458,000.00	$ -	-$ 23,027,000.00	-0.3067	$ 0.16	$ 0.24
4	MM	AQP	Aquarius Platinum Limited	$ 329,218,804.60	$ 469,703,660.00	$ 1,178,677,264.00	$ 467,666,568.00	-$ 156,456,677.00	-0.2301	$ 1.40	$ 0.70
5	MM	ARI	Arrium Limited	$ 1,164,000,766.49	$ 7,570,800,000.00	$ 8,931,400,000.00	$ 7,550,700,000.00	$ 525,600,000.00	0.0964	$ 3.30	$ 0.86
6	MM	ATR	Astron Corporation Limited	$ 154,324,527.84	$ 13,731,812.00	$ 206,387,152.00	$ 13,591,574.00	-$ 3,835,342.00	0.0117	$ 1.62	$ 1.26
7	MM	BCI	BC Iron Limited	$ 270,038,600.00	$ 205,995,409.00	$ 203,075,401.00	$ 204,403,170.00	$ 61,526,632.00	0.3840	$ 1.27	$ 2.60
8	MM	BHP	BHP Billiton Limited	$167,399,636,840.40	$ 71,862,427,632.00	$ 126,850,161,907.00	$ 71,170,640,761.00	$ 26,828,574,232.00	0.2605	$ 12.14	$ 31.45
9	MM	BRL	Bathurst Resources Limited	$ 264,384,238.86	$ 26,994,000.00	$ 391,202,000.00	$ 26,078,000.00	-$ 19,832,000.00	-0.0925	$ 0.25	$ 0.38
10	MM	BSE	Base Resources Limited	$ 186,478,211.74	$ 537,875.00	$ 183,676,303.00	$ -	-$ 5,201,703.00	0.0020	$ 0.37	$ 0.40
11	MM	BSL	BlueScope Steel Limited	$ 1,004,755,574.10	$ 8,582,600,000.00	$ 6,733,500,000.00	$ 8,453,600,000.00	$ 49,200,000.00	-0.0630	$ 1.10	$ 0.30
12	MM	BTR	Blackthorn Resources Limited	$ 148,907,970.00	$ -	$ 65,851,000.00	$ -	-$ 5,443,000.00	-0.0779	$ 0.50	$ 1.16
13	MM	CCU	Cobar Consolidated Resources Limited	$ 112,404,135.04	$ 23,284.00	$ 91,638,046.00	$ -	-$ 4,007,403.00	-0.0620	$ 0.30	$ 0.54
14	MM	CDU	CuDeco Limited	$ 596,670,235.59	$ 2,064,052.00	$ 271,399,287.00	$ 175,000.00	-$ 4,040,899.00	0.0029	$ 1.43	$ 3.19
15	MM	CFE	Cape Lambert Resources Limited	$ 217,069,269.48	$ 65,161,000.00	$ 397,258,213.00	$ 25,088.00	-$ 28,389,067.00	-0.0771	$ 0.54	$ 0.32
16	MM	DML	Discovery Metals Limited	$ 621,190,164.56	$ 367,971.00	$ 482,774,997.00	$ -	-$ 20,658,424.00	-0.0884	$ 0.53	$ 1.40
17	MM	EQX	Equatorial Resources Limited	$ 227,436,584.82	$ 28,213,371.00	$ 96,272,676.00	$ 3,244,794.00	-$ 9,224,565.00	-0.0823	$ 0.77	$ 1.94
18	MM	EVN	Evolution Mining Limited	$ 1,042,980,926.68	$ 472,976,000.00	$ 1,269,448,000.00	$ 469,484,000.00	$ 70,218,000.00	0.0353	$ 1.49	$ 1.48
19	MM	FMG	Fortescue Metals Group Ltd	$ 15,257,610,939.90	$ 6,604,847,414.00	$ 14,780,688,843.00	$ 6,590,128,544.00	$ 2,563,045,824.00	0.3729	$ 1.19	$ 4.90
20	MM	FML	Focus Minerals Limited	$ 159,868,626.94	$ 258,842,000.00	$ 298,238,000.00	$ 258,253,000.00	$ 9,623,000.00	0.0458	$ 0.05	$ 0.04
21	MM	FMS	Flinders Mines Limited	$ 236,769,052.52	$ 1,503,241.00	$ 78,595,314.00	$ 1,503,241.00	-$ 7,242,431.00	-0.0641	$ 0.04	$ 0.13

No.	Sector	ASX Code	Company Name	Market Capitalisation	Total Revenue Exclude Interest	Total Assets	Operating Revenue	EBIT	ROE	Book Value Per share	Year-end Share Price
22	MM	GBG	Gindalbie Metals Ltd	$ 548,894,479.76	$ 48,000.00	$ 724,128,000.00	$ -	-$ 36,384,000.00	-0.0377	$ 0.58	$ 0.44
23	MM	GRY	Gryphon Minerals Limited	$ 236,820,188.44	$ 2,000.00	$ 195,105,000.00	$ 3,043,000.00	-$ 8,920,000.00	-0.0323	$ 0.52	$ 0.68
24	MM	IGO	Independence Group NL	$ 803,444,745.75	$ 206,983,000.00	$ 812,924,000.00	$ 206,983,000.00	-$ 4,610,000.00	0.1356	$ 2.76	$ 3.45
25	MM	IMD	Imdex Limited	$ 366,494,349.76	$ 269,838,000.00	$ 274,552,000.00	$ 182,416,000.00	$ 69,242,000.00	0.2724	$ 0.81	$ 1.76
26	MM	IOH	Iron Ore Holdings Limited	$ 143,583,783.66	$ 96,062,216.00	$ 116,994,434.00	$ 100,532,932.00	-$ 27,300,680.00	-0.2770	$ 0.66	$ 0.89
27	MM	JMS	Jupiter Mines Limited	$ 289,093,447.04	$ 136,813.00	$ 528,761,517.00	$ 136,813.00	-$ 20,293,060.00	-0.0323	$ 0.23	$ 0.16
28	MM	KCN	Kingsgate Consolidated Limited	$ 733,629,376.65	$ 360,890,000.00	$ 1,048,459,000.00	$ 358,768,000.00	$ 98,875,000.00	0.0965	$ 5.13	$ 4.85
29	MM	KRM	Kingsrose Mining Limited	$ 332,592,471.75	$ 73,038,992.00	$ 94,072,454.00	$ 71,743,929.00	$ 34,836,631.00	0.2807	$ 0.22	$ 1.15
30	MM	LYC	Lynas Corporation Limited	$ 1,449,199,505.00	$ -	$ 1,023,657,000.00	$ -	-$ 90,052,000.00	-0.1558	$ 0.33	$ 0.84
31	MM	MCR	Mincor Resources NL	$ 121,394,336.73	$ 119,246,000.00	$ 179,656,000.00	$ 118,610,000.00	-$ 1,177,000.00	0.0016	$ 0.80	$ 0.64
32	MM	MGX	Mount Gibson Iron Limited	$ 933,544,320.72	$ 648,627,000.00	$ 1,789,300,000.00	$ 637,011,000.00	$ 226,466,000.00	0.1350	$ 1.18	$ 0.86
33	MM	MLX	Metals X Limited	$ 190,916,172.26	$ 49,730,622.00	$ 229,919,418.00	$ 48,915,245.00	-$ 48,213,865.00	-0.2064	$ 0.16	$ 0.14
34	MM	MML	Medusa Mining Ltd	$ 912,405,890.13	$ 79,305,269.00	$ 326,013,148.00	$ 79,287,606.00	$ 46,813,855.00	0.1558	$ 1.64	$ 4.83
35	MM	NCM	Newcrest Mining Limited	$ 17,286,734,994.97	$ 4,478,000,000.00	$ 20,509,000,000.00	$ 4,416,000,000.00	$ 1,590,000,000.00	0.0724	$ 19.59	$ 22.61
36	MM	NGF	Norton Gold Fields Limited	$ 199,651,362.28	$ 246,549,000.00	$ 276,053,000.00	$ 245,912,000.00	$ 24,925,000.00	0.0721	$ 0.19	$ 0.24
37	MM	NST	Northern Star Resources Ltd	$ 309,816,239.04	$ 99,994,000.00	$ 134,006,000.00	$ 99,994,000.00	$ 29,876,000.00	0.2324	$ 0.23	$ 0.77
38	MM	ORE	Orocobre Limited	$ 190,394,828.50	$ 153,226.00	$ 64,352,076.00	$ 143,578.00	-$ 4,444,308.00	-0.0487	$ 0.56	$ 1.84
39	MM	PAN	Panoramic Resources Limited	$ 147,425,528.95	$ 228,838,000.00	$ 431,345,000.00	$ 228,833,000.00	-$ 23,936,000.00	-0.0592	$ 1.27	$ 0.61
40	MM	PIR	Papillon Resources Limited	$ 237,549,137.48	$ 522,017.00	$ 45,337,687.00	$ 958,700.00	-$ 6,871,591.00	-0.1388	$ 0.17	$ 0.98
41	MM	PRU	Perseus Mining Limited	$ 1,135,745,978.24	$ 160,275,373.00	$ 528,970,544.00	$ 144,687,162.00	$ 54,814,360.00	0.1128	$ 0.79	$ 2.48

No.	Sector	ASX Code	Company Name	Market Capitalisation	Total Revenue Exclude Interest	Total Assets	Operating Revenue	EBIT	ROE	Book Value Per share	Year-end Share Price
42	MM	RED	Red 5 Limited	$ 197,135,051.64	$ 5,486,900.00	$ 161,051,710.00	$ 4,277,750.00	-$ 2,821,133.00	-0.0116	$ 1.11	$ 1.46
43	MM	RMS	Ramelius Resources Limited	$ 162,945,284.62	$ 84,331,000.00	$ 284,488,000.00	$ 84,331,000.00	$ 1,652,000.00	0.0115	$ 0.60	$ 0.48
44	MM	RRL	Regis Resources Limited	$ 1,771,339,480.00	$ 172,013,000.00	$ 318,480,000.00	$ 170,355,000.00	$ 76,991,000.00	0.2868	$ 0.53	$ 3.91
45	MM	RSG	Resolute Mining Limited	$ 858,503,641.05	$ 577,055,000.00	$ 664,503,000.00	$ 576,968,000.00	$ 177,832,000.00	0.2569	$ 0.91	$ 1.35
46	MM	SAR	Saracen Mineral Holdings Limited	$ 330,122,680.20	$ 188,546,000.00	$ 253,942,000.00	$ 183,828,000.00	$ 30,012,000.00	0.1176	$ 0.35	$ 0.56
47	MM	SBM	St Barbara Limited	$ 574,578,088.53	$ 537,048,000.00	$ 682,115,000.00	$ 542,044,000.00	$ 128,094,000.00	0.2320	$ 1.74	$ 1.77
48	MM	SDL	Sundance Resources Limited	$ 1,006,360,421.22	$ 16,552.00	$ 233,230,572.00	$ 16,552.00	-$ 27,831,397.00	-0.0980	$ 0.08	$ 0.33
49	MM	SFR	Sandfire Resources NL	$ 1,082,861,466.60	$ 27,839,000.00	$ 529,650,000.00	$ 20,358,000.00	-$ 33,384,000.00	-0.2037	$ 0.78	$ 7.16
50	MM	SGM	Sims Metal Management Limited	$ 1,968,289,390.34	$ 9,129,800,000.00	$ 3,620,000,000.00	$ 9,035,700,000.00	$ 75,900,000.00	0.0289	$ 11.69	$ 9.61
51	MM	SIR	Sirius Resources NL	$ 7,697,663.89	$ 12,000.00	$ 14,857,000.00	$ -	-$ 1,715,000.00	-0.1041	$ 0.10	$ 0.05
52	MM	SLR	Silver Lake Resources Limited	$ 618,942,019.84	$ 135,338,000.00	$ 278,846,000.00	$ 135,338,000.00	$ 42,559,000.00	0.1607	$ 0.88	$ 2.81
53	MM	SMM	Summit Resources Limited	$ 326,972,653.50	$ 21,000.00	$ 51,337,000.00	$ 21,000.00	-$ 1,185,000.00	-0.0186	$ 0.23	$ 1.50
54	MM	SWA	Swan Gold Mining Limited	$ 219,132,192.94	$ 239,000.00	$ 35,431,000.00	$ 124,000.00	-$ 4,462,000.00	0.8395	-$ 0.01	$ 0.30
55	MM	SYR	Syrah Resources Limited	$ 291,726,533.93	$ 72,475.00	$ 19,337,298.00	$ 72,475.00	-$ 1,898,575.00	-0.0993	$ 0.15	$ 2.33
56	MM	TAM	Tanami Gold NL	$ 190,626,854.21	$ 85,631,000.00	$ 127,415,000.00	$ 65,343,000.00	$ 3,843,000.00	-0.0546	$ 0.30	$ 0.73
57	MM	TGZ	Teranga Gold Corporation	$ 550,184,320.00	$ 339,256,678.00	$ 532,768,099.00	$ 339,256,678.00	$ 98,454,316.00	0.2203	$ 1.43	$ 2.24
58	MM	TRY	Troy Resources Limited	$ 348,709,331.10	$ 210,238,000.00	$ 185,441,000.00	$ 208,581,000.00	$ 59,217,000.00	0.2443	$ 1.48	$ 3.90
59	MM	WDR	Western Desert Resources Limited	$ 177,288,498.26	$ 14,981.00	$ 53,043,698.00	$ -	-$ 3,716,696.00	-0.0680	$ 0.21	$ 0.76
60	MM	WSA	Western Areas Limited	$ 729,727,749.94	$ 340,530,000.00	$ 774,968,000.00	$ 330,698,000.00	$ 89,896,000.00	0.1516	$ 1.61	$ 4.06
61	EU	AFR	African Energy Resources Limited	$ 57,772,178.62	$ 258,627.00	$ 29,526,965.00	$ 258,627.00	-$ 8,922,008.00	-0.4139	$ 0.07	$ 0.18
62	EU	AGL	AGL Energy Limited	$ 8,062,368,195.91	$ 7,458,500,000.00	$ 14,738,400,000.00	$ 7,454,000,000.00	$ 413,100,000.00	0.0379	$ 13.07	$ 14.77

No.	Sector	ASX Code	Company Name	Market Capitalisation	Total Revenue Exclude Interest	Total Assets	Operating Revenue	EBIT	ROE	Book Value Per share	Year-end Share Price
63	EU	AJQ	Armour Energy Limited	$ 82,500,000.00	$ 1,030,438.00	$ 89,538,411.00	$ 1,030,438.00	-$ 3,214,564.00	-0.0372	$ 0.27	$ 0.28
64	EU	APA	APA Group	$ 3,215,983,059.17	$ 1,020,933,000.00	$ 5,496,054,000.00	$ 1,009,245,000.00	$ 419,931,000.00	0.1143	$ 1.90	$ 4.99
65	EU	APY	Azonto Petroleum Ltd	$ 139,813,585.66	$ 696,583.00	$ 224,413,612.00	$ -	-$ 10,793,617.00	-0.0493	$ 0.30	$ 0.20
66	EU	AQA	Aquila Resources Limited	$ 1,231,295,281.58	$ 200,584,000.00	$ 576,978,000.00	$ 197,454,000.00	-$ 437,000.00	0.0064	$ 1.24	$ 2.99
67	EU	AWE	AWE Limited	$ 699,308,400.94	$ 318,464,000.00	$ 1,062,008,000.00	$ 299,727,000.00	$ 71,406,000.00	0.0173	$ 1.64	$ 1.34
68	EU	BCC	Buccaneer Energy Limited	$ 48,616,651.73	$ 3,379,462.00	$ 68,554,463.00	$ 3,161,672.00	-$ 15,672,883.00	-0.7055	$ 0.02	$ 0.05
69	EU	BKY	Berkeley Resources Limited	$ 71,719,309.20	$ 162,079.00	$ 52,745,108.00	$ 2,610,300.00	-$ 15,935,756.00	-0.2614	$ 0.29	$ 0.40
70	EU	BND	Bandanna Energy Limited	$ 179,683,607.66	$ 4,631,544.00	$ 211,777,375.00	$ -	-$ 4,388,160.00	0.0303	$ 0.39	$ 0.34
71	EU	BPT	Beach Energy Limited	$ 1,180,136,307.58	$ 664,574,000.00	$ 2,148,193,000.00	$ 619,268,000.00	$ 167,001,000.00	0.0763	$ 1.28	$ 0.94
72	EU	BRU	Buru Energy Limited	$ 788,162,432.16	$ 7,234,000.00	$ 160,080,000.00	$ 2,036,000.00	-$ 10,044,000.00	-0.0503	$ 0.44	$ 3.14
73	EU	CIF	Challenger Infrastructure Fund	$ 414,253,440.00	$ 11,796,000.00	$ 2,376,861,000.00	$ 1,387,700,000.00	-$ 14,640,000.00	0.0701	$ 0.50	$ 1.31
74	EU	COE	Cooper Energy Limited	$ 145,661,405.00	$ 60,586,000.00	$ 161,023,000.00	$ 60,384,000.00	$ 17,319,000.00	0.1918	$ 0.42	$ 0.44
75	EU	COK	Cockatoo Coal Limited	$ 193,181,912.52	$ 120,647,570.00	$ 493,743,565.00	$ 84,104,866.00	$ 5,569,108.00	-0.0387	$ 0.29	$ 0.19
76	EU	CPL	Coalspur Mines Limited	$ 412,785,382.84	$ -	$ 178,109,214.00	$ -	-$ 21,826,144.00	-0.1359	$ 0.25	$ 0.66
77	EU	CTP	Central Petroleum Limited	$ 128,653,992.64	$ 1,018,958.00	$ 28,375,422.00	$ -	-$ 26,865,107.00	-1.0890	$ 0.02	$ 0.09
78	EU	CUE	Cue Energy Resources Limited	$ 125,661,549.60	$ 43,996,000.00	$ 164,036,000.00	$ 41,222,000.00	$ 13,431,000.00	0.0452	$ 0.18	$ 0.18
79	EU	CVN	Carnarvon Petroleum Limited	$ 72,803,916.57	$ 30,411,000.00	$ 105,941,000.00	$ 30,411,000.00	$ 6,824,000.00	-0.0366	$ 0.10	$ 0.10
80	EU	CZA	Coal Of Africa Limited	$ 373,141,343.68	$ 247,510,548.00	$ 543,456,971.00	$ 239,271,906.00	-$ 145,917,966.00	-0.3688	$ 0.55	$ 0.56
81	EU	DLS	Drillsearch Energy Limited	$ 337,449,196.00	$ 22,802,000.00	$ 163,517,000.00	$ 22,409,000.00	$ 1,381,000.00	0.0703	$ 0.42	$ 1.00
82	EU	DUE	DUET Group	$ 2,042,089,040.00	$ 1,212,468,000.00	$ 8,118,659,000.00	$ 1,201,861,000.00	$ 504,511,000.00	0.0422	$ 1.24	$ 1.84
83	EU	DYL	Deep Yellow Limited	$ 51,921,874.54	$ 115,608.00	$ 96,099,472.00	$ 30,605.00	-$ 48,969,727.00	-0.5228	$ 0.08	$ 0.05

No.	Sector	ASX Code	Company Name	Market Capitalisation	Total Revenue Exclude Interest	Total Assets	Operating Revenue	EBIT	ROE	Book Value Per share	Year-end Share Price
84	EU	EAX	Energy Action Limited	$ 44,239,627.92	$ 17,188,590.00	$ 12,159,870.00	$ 17,059,941.00	$ 4,957,545.00	0.3474	$ 0.41	$ 1.76
85	EU	EGO	Empire Oil & Gas NL	$ 71,184,874.44	$ 1,432,661.00	$ 32,890,230.00	$ 21,995.00	-$ 1,792,928.00	-0.0344	$ 0.01	$ 0.02
86	EU	ENE	Energy Developments Limited	$ 403,778,018.40	$ 339,507,000.00	$ 857,174,000.00	$ 311,041,000.00	$ 75,606,000.00	0.1331	$ 1.58	$ 2.40
87	EU	ENV	Envestra Limited	$ 1,234,327,807.14	$ 472,100,000.00	$ 3,058,600,000.00	$ 468,600,000.00	$ 280,100,000.00	0.1260	$ 0.37	$ 0.78
88	EU	EPW	ERM Power Limited	$ 336,590,078.00	$ 935,958,000.00	$ 782,041,000.00	$ 900,647,000.00	$ 40,954,000.00	0.0695	$ 0.96	$ 2.00
89	EU	ESY	Enhanced Systems Technologies Limited	$ 41,705,641.88	$ 8,466,006.00	$ 16,785,481.00	$ 4,661,872.00	-$ 7,558,475.00	-0.7361	$ -	$ 0.02
90	EU	EWC	Energy World Corporation Ltd	$ 641,641,668.64	$ 143,053,674.00	$ 922,532,626.00	$ 142,843,685.00	$ 35,072,122.00	0.0370	$ 0.31	$ 0.37
91	EU	GDY	Geodynamics Limited	$ 44,709,786.88	$ -	$ 179,855,000.00	$ -	-$ 13,184,000.00	-0.0762	$ 0.38	$ 0.11
92	EU	GUF	Guildford Coal Limited	$ 259,892,803.85	$ 3,411.00	$ 138,154,320.00	$ 3,411.00	-$ 23,527,558.00	-0.1779	$ 0.26	$ 0.54
93	EU	HOG	Hawkley Oil and Gas Limited	$ 47,112,685.46	$ 27,442,784.00	$ 37,793,242.00	$ 27,422,333.00	$ 8,467,735.00	0.2046	$ 0.12	$ 0.16
94	EU	HZN	Horizon Oil Limited	$ 322,281,281.78	$ 54,327,347.00	$ 344,273,378.00	$ 49,267,981.00	$ 29,044,254.00	0.0473	$ 0.14	$ 0.28
95	EU	ICN	Icon Energy Limited	$ 84,474,250.92	$ 783,581.00	$ 34,490,453.00	$ -	-$ 5,832,006.00	-0.1579	$ 0.06	$ 0.18
96	EU	IEC	Intra Energy Corporation Limited	$ 55,811,273.07	$ 2,747,000.00	$ 36,217,000.00	$ 2,231,000.00	-$ 8,261,000.00	-0.1972	$ 0.15	$ 0.23
97	EU	IFN	Infigen Energy	$ 171,509,850.00	$ 355,495,000.00	$ 2,992,030,000.00	$ 273,748,000.00	$ 84,589,000.00	-0.1050	$ 0.69	$ 0.22
98	EU	JPR	Jupiter Energy Limited	$ 48,194,013.91	$ 1,956,317.00	$ 44,297,607.00	$ 1,063,086.00	-$ 3,601,881.00	-0.1117	$ 0.33	$ 0.42
99	EU	KAR	Karoon Gas Australia Ltd	$ 892,325,699.07	$ 4,396,073.00	$ 612,081,847.00	$ 13,601,653.00	-$ 16,544,240.00	-0.0053	$ 2.71	$ 4.03
100	EU	LNC	Linc Energy Ltd	$ 351,867,352.65	$ 58,135,000.00	$ 727,779,000.00	$ 57,060,000.00	-$ 82,044,000.00	-0.1394	$ 0.87	$ 0.69
101	EU	LNG	Liquefied Natural Gas Limited	$ 87,002,179.88	$ 623,299.00	$ 16,689,083.00	$ 831,359.00	-$ 11,551,194.00	-0.6992	$ 0.06	$ 0.32
102	EU	MAD	Maverick Drilling and Exploration Limited	$ 490,504,178.74	$ 22,119,517.00	$ 75,847,316.00	$ 21,555,293.00	$ 8,889,215.00	0.1144	$ 0.14	$ 1.22
103	EU	MCE	Matrix Composites & Engineering Limited	$ 166,890,330.42	$ 144,934,358.00	$ 210,390,070.00	$ 144,811,799.00	-$ 23,598,569.00	-0.1056	$ 1.45	$ 1.76

No.	Sector	ASX Code	Company Name	Market Capitalisation	Total Revenue Exclude Interest	Total Assets	Operating Revenue	EBIT	ROE	Book Value Per share	Year-end Share Price
104	EU	MEL	Metgasco Limited	$ 70,856,969.40	$ 20,689.00	$ 87,744,641.00	$ 949,146.00	-$ 6,062,582.00	-0.0608	$ 0.25	$ 0.21
105	EU	MEO	MEO Australia Limited	$ 132,278,748.70	$ 159,081.00	$ 209,127,263.00	$ -	-$ 8,783,052.00	-0.0277	$ 0.38	$ 0.24
106	EU	MGN	Magellan Petroleum Corporation	$ 69,986,272.20	$ 13,463,840.00	$ 90,838,975.00	$ 13,508,978.00	$ 19,412,226.00	0.3634	$ 1.33	$ 1.30
107	EU	MIO	Miclyn Express Offshore Limited	$ 565,387,480.00	$ 267,623,393.00	$ 592,306,937.00	$ 264,438,229.00	$ 75,588,264.00	0.1877	$ 1.23	$ 2.03
108	EU	MPO	Molopo Energy Limited	$ 133,840,996.45	-$ 4,170,794.00	$ 194,293,216.00	$ -	-$ 33,836,099.00	-0.1436	$ 0.73	$ 0.54
109	EU	NCR	Nucoal Resources Limited	$ 184,466,964.96	$ 13,000.00	$ 72,546,000.00	$ -	-$ 5,454,000.00	-0.0605	$ 0.09	$ 0.24
110	EU	NEN	Neon Energy Limited	$ 137,486,323.17	$ 16,060,754.00	$ 80,128,711.00	$ 15,590,242.00	$ 9,503.00	-0.0314	$ 0.14	$ 0.32
111	EU	NSE	New Standard Energy Limited	$ 164,712,285.54	$ 29,541.00	$ 94,362,875.00	$ 844,077.00	-$ 4,269,036.00	0.0025	$ 0.27	$ 0.54
112	EU	NTU	Northern Minerals Limited	$ 53,089,329.50	$ 62,975.00	$ 10,525,024.00	$ 70,000.00	-$ 11,089,282.00	-1.2321	$ 0.04	$ 0.25
113	EU	NWE	Norwest Energy NL	$ 44,591,719.90	$ 955,504.00	$ 6,123,721.00	$ 561,735.00	-$ 2,725,229.00	-0.5180	$ 0.01	$ 0.05
114	EU	NXS	Nexus Energy Limited	$ 146,280,327.49	$ 83,699,129.00	$ 580,691,128.00	$ 80,904,923.00	-$ 253,188,629.00	-1.1759	$ 0.22	$ 0.11
115	EU	NZO	New Zealand Oil & Gas Limited	$ 257,477,120.00	$ 95,389,554.00	$ 379,797,196.00	$ 91,124,422.00	$ 34,884,503.00	0.0560	$ 0.69	$ 0.64
116	EU	OEL	Otto Energy Limited	$ 105,860,976.60	$ 50,179,570.00	$ 105,410,656.00	$ 30,015,700.00	-$ 7,970,758.00	-0.0655	$ 0.07	$ 0.09
117	EU	ORG	Origin Energy Limited	$ 13,292,688,583.60	$ 13,439,000,000.00	$ 27,981,000,000.00	$ 12,935,000,000.00	$ 1,675,000,000.00	0.0682	$ 12.02	$ 12.20
118	EU	PCL	Pancontinental Oil & Gas NL	$ 196,602,716.45	$ 5,500.00	$ 71,036,373.00	$ 5,500.00	-$ 2,236,176.00	-0.0255	$ 0.06	$ 0.18
119	EU	PDN	Paladin Energy Ltd	$ 1,044,556,612.50	$ 361,691,688.00	$ 2,303,699,342.00	$ 359,140,418.00	-$ 219,998,037.00	-0.1513	$ 1.34	$ 1.25
120	EU	PEA	Pacific Energy Limited	$ 174,222,440.00	$ 33,069,000.00	$ 144,198,000.00	$ 31,881,000.00	$ 10,940,000.00	0.0136	$ 0.28	$ 0.49
121	EU	PPP	Pan Pacific Petroleum NL	$ 82,405,695.40	$ 26,007,000.00	$ 122,977,000.00	$ 26,007,000.00	$ 9,813,000.00	0.0259	$ 0.18	$ 0.14
122	EU	RES	Resource Generation Limited	$ 76,079,025.00	$ 2,099,000.00	$ 140,476,000.00	$ 2,099,000.00	-$ 2,968,000.00	-0.0066	$ 0.52	$ 0.30
123	EU	RFE	Red Fork Energy Limited	$ 228,018,941.96	$ 4,337,544.00	$ 105,748,393.00	$ 4,312,291.00	-$ 6,983,408.00	-0.0632	$ 0.31	$ 0.74

No.	Sector	ASX Code	Company Name	Market Capitalisation	Total Revenue Exclude Interest	Total Assets	Operating Revenue	EBIT	ROE	Book Value Per share	Year-end Share Price
124	EU	RRS	Range Resources Limited	$ 235,747,760.60	$ 30,571,723.00	$ 319,660,191.00	$ 24,216,748.00	-$ 8,917,078.00	-0.0343	$ 0.11	$ 0.10
125	EU	SSN	Samson Oil & Gas Limited	$ 92,167,755.00	$ 8,286,131.00	$ 53,684,780.00	$ 8,228,632.00	-$ 35,426,817.00	-0.6644	$ 0.03	$ 0.05
126	EU	STX	Strike Energy Limited	$ 92,177,850.00	$ 6,524,000.00	$ 65,156,000.00	$ 4,716,000.00	-$ 14,730,000.00	-0.2367	$ 0.10	$ 0.15
127	EU	SUR	Sun Resources NL	$ 67,275,464.14	$ 110,698.00	$ 18,286,496.00	$ 40,961.00	-$ 4,437,098.00	-0.2429	$ 0.02	$ 0.06
128	EU	SXY	Senex Energy Limited	$ 732,786,875.61	$ 67,160,000.00	$ 346,361,000.00	$ 64,391,000.00	$ 7,614,000.00	0.0295	$ 0.29	$ 0.71
129	EU	TOE	Toro Energy Limited	$ 70,851,693.97	$ -	$ 99,016,864.00	$ -	-$ 11,180,216.00	-0.1077	$ 0.09	$ 0.07
130	EU	WCL	Westside Corporation Limited	$ 119,215,743.15	$ 7,712,000.00	$ 137,773,000.00	$ 5,943,000.00	-$ 11,744,000.00	-0.1029	$ 0.31	$ 0.34
131	EU	WEC	White Energy Company Limited	$ 101,736,965.61	$ 25,714,000.00	$ 384,299,000.00	$ 2,083,000.00	-$ 202,322,000.00	-0.3900	$ 0.93	$ 0.32
132	EU	WHC	Whitehaven Coal Limited	$ 4,204,740,106.05	$ 780,428,000.00	$ 4,321,617,000.00	$ 618,087,000.00	$ 34,789,000.00	0.0172	$ 3.32	$ 4.15
133	EU	WOR	WorleyParsons Limited	$ 6,167,956,180.60	$ 7,401,400,000.00	$ 4,391,300,000.00	$ 7,393,800,000.00	$ 530,300,000.00	0.1766	$ 7.97	$ 25.10

Appendix 7-3 Proxies for board composition of sample companies

No.	Sector	ASX Code	Company Name	Total Number of Directors	Independent Directors	Multiple Directorships	CEO Duality	Women Directors	Sustainbaility Committee
1	MM	ABU	ABM Resources NL	4	2	3	No	0	Yes
2	MM	AGO	Atlas Iron Limited	9	5	6	No	2	No
3	MM	AOH	Altona Mining Limited	5	2	4	No	1	No
4	MM	AQP	Aquarius Platinum Limited	9	5	6	No	0	No
5	MM	ARI	Arrium Limited	8	7	4	No	1	Yes
6	MM	ATR	Astron Corporation Limited	5	3	2	No	1	No
7	MM	BCI	BC Iron Limited	7	3	6	No	0	No
8	MM	BHP	BHP Billiton Limited	13	12	11	No	2	Yes
9	MM	BRL	Bathurst Resources Limited	5	3	4	No	0	No
10	MM	BSE	Base Resources Limited	7	5	5	No	0	No
11	MM	BSL	BlueScope Steel Limited	9	8	8	No	2	Yes
12	MM	BTR	Blackthorn Resources Limited	6	4	2	No	1	No
13	MM	CCU	Cobar Consolidated Resources Limited	5	3	1	No	0	No
14	MM	CDU	CuDeco Limited	7	4	2	Yes	0	No
15	MM	CFE	Cape Lambert Resources Limited	4	3	2	Yes	0	No
16	MM	DML	Discovery Metals Limited	7	6	5	No	0	Yes
17	MM	EQX	Equatorial Resources Limited	4	3	4	No	0	No
18	MM	EVN	Evolution Mining Limited	7	6	3	Yes	0	No
19	MM	FMG	Fortescue Metals Group Ltd	11	6	6	No	0	No
20	MM	FML	Focus Minerals Limited	4	4	2	No	0	No

No.	Sector	ASX Code	Company Name	Total Number of Directors	Independent Directors	Multiple Directorships	CEO Duality	Women Directors	Sustainbaility Committee
21	MM	FMS	Flinders Mines Limited	5	4	4	No	0	No
22	MM	GBG	Gindalbie Metals Ltd	8	4	6	No	0	No
23	MM	GRY	Gryphon Minerals Limited	5	3	5	No	1	No
24	MM	IGO	Independence Group NL	5	3	3	No	1	No
25	MM	IMD	Imdex Limited	5	4	3	No	1	Yes
26	MM	IOH	Iron Ore Holdings Limited	5	4	5	No	0	No
27	MM	JMS	Jupiter Mines Limited	5	2	3	No	0	No
28	MM	KCN	Kingsgate Consolidated Limited	5	4	3	No	0	No
29	MM	KRM	Kingsrose Mining Limited	5	2	2	No	0	No
30	MM	LYC	Lynas Corporation Limited	6	5	5	Yes	1	Yes
31	MM	MCR	Mincor Resources NL	4	3	3	No	0	No
32	MM	MGX	Mount Gibson Iron Limited	12	5	8	No	0	Yes
33	MM	MLX	Metals X Limited	5	1	3	No	0	No
34	MM	MML	Medusa Mining Ltd	5	3	2	No	0	Yes
35	MM	NCM	Newcrest Mining Limited	9	7	8	No	1	Yes
36	MM	NGF	Norton Gold Fields Limited	5	0	1	No	1	No
37	MM	NST	Northern Star Resources Ltd	5	2	3	No	0	No
38	MM	ORE	Orocobre Limited	7	4	7	No	0	No
39	MM	PAN	Panoramic Resources Limited	4	3	4	No	0	Yes
40	MM	PIR	Papillon Resources Limited	4	3	4	No	0	No

No.	Sector	ASX Code	Company Name	Total Number of Directors	Independent Directors	Multiple Directorships	CEO Duality	Women Directors	Sustainbaility Committee
41	MM	PRU	Perseus Mining Limited	7	4	7	No	0	No
42	MM	RED	Red 5 Limited	5	3	4	No	0	No
43	MM	RMS	Ramelius Resources Limited	4	3	1	No	0	No
44	MM	RRL	Regis Resources Limited	5	3	1	Yes	0	No
45	MM	RSG	Resolute Mining Limited	4	3	4	No	0	Yes
46	MM	SAR	Saracen Mineral Holdings Limited	5	4	1	Yes	0	No
47	MM	SBM	St Barbara Limited	6	5	5	No	1	Yes
48	MM	SDL	Sundance Resources Limited	6	5	5	No	1	Yes
49	MM	SFR	Sandfire Resources NL	5	2	3	No	0	No
50	MM	SGM	Sims Metal Management Limited	11	9	8	No	1	Yes
51	MM	SIR	Sirius Resources NL	4	2	2	Yes	0	No
52	MM	SLR	Silver Lake Resources Limited	6	4	3	No	0	No
53	MM	SMM	Summit Resources Limited	3	2	3	Yes	0	No
54	MM	SWA	Swan Gold Mining Limited	3	3	3	Yes	0	No
55	MM	SYR	Syrah Resources Limited	4	1	2	No	0	No
56	MM	TAM	Tanami Gold NL	5	2	5	No	0	No
57	MM	TGZ	Teranga Gold Corporation	7	5	No Information	No	0	Yes
58	MM	TRY	Troy Resources Limited	7	4	5	No	0	No
59	MM	WDR	Western Desert Resources Limited	7	5	6	No	0	No
60	MM	WSA	Western Areas Limited	7	3	6	No	0	No

No.	Sector	ASX Code	Company Name	Total Number of Directors	Independent Directors	Multiple Directorships	CEO Duality	Women Directors	Sustainbaility Committee
61	EU	AFR	African Energy Resources Limited	6	3	0	No	0	No
62	EU	AGL	AGL Energy Limited	8	7	8	No	2	Yes
63	EU	AJQ	Armour Energy Limited	6	2	5	No	0	No
64	EU	APA	APA Group	8	6	8	No	1	Yes
65	EU	APY	Azonto Petroleum Ltd	7	5	4	No	0	No
66	EU	AQA	Aquila Resources Limited	5	2	4	Yes	0	Yes
67	EU	AWE	AWE Limited	7	6	6	No	1	Yes
68	EU	BCC	Buccaneer Energy Limited	4	2	2	No	0	No
69	EU	BKY	Berkeley Resources Limited	4	3	3	No	0	No
70	EU	BND	Bandanna Energy Limited	6	2	2	No	0	No
71	EU	BPT	Beach Energy Limited	7	6	6	No	1	No
72	EU	BRU	Buru Energy Limited	3	2	2	No	0	No
73	EU	CIF	Challenger Infrastructure Fund	7	6	6	No	1	No
74	EU	COE	Cooper Energy Limited	4	2	1	No	0	No
75	EU	COK	Cockatoo Coal Limited	13	5	10	No	0	No
76	EU	CPL	Coalspur Mines Limited	7	5	4	No	1	No
77	EU	CTP	Central Petroleum Limited	6	4	3	No	0	No
78	EU	CUE	Cue Energy Resources Limited	7	5	No Information	No	0	No
79	EU	CVN	Carnarvon Petroleum Limited	5	4	3	No	0	No
80	EU	CZA	Coal Of Africa Limited	11	5	10	No	0	Yes

No.	Sector	ASX Code	Company Name	Total Number of Directors	Independent Directors	Multiple Directorships	CEO Duality	Women Directors	Sustainbaility Committee
81	EU	DLS	Drillsearch Energy Limited	5	4	3	No	1	No
82	EU	DUE	DUET Group	8	6	7	Yes	1	No
83	EU	DYL	Deep Yellow Limited	5	1	1	No	1	No
84	EU	EAX	Energy Action Limited	6	1	3	No	1	No
85	EU	EGO	Empire Oil & Gas NL	4	2	0	No	0	No
86	EU	ENE	Energy Developments Limited	6	2	2	No	0	Yes
87	EU	ENV	Envestra Limited	8	3	4	No	0	No
88	EU	EPW	ERM Power Limited	6	4	4	No	0	Yes
89	EU	ESY	Enhanced Systems Technologies Limite	5	2	1	Yes	0	No
90	EU	EWC	Energy World Corporation Ltd	6	3	2	Yes	0	No
91	EU	GDY	Geodynamics Limited	7	3	4	No	0	Yes
92	EU	GUF	Guildford Coal Limited	6	3	3	No	0	No
93	EU	HOG	Hawkley Oil and Gas Limited	5	1	2	No	0	No
94	EU	HZN	Horizon Oil Limited	5	3	1	No	0	No
95	EU	ICN	Icon Energy Limited	6	4	3	No	0	No
96	EU	IEC	Intra Energy Corporation Limited	6	1	4	Yes	0	No
97	EU	IFN	Infigen Energy	5	3	4	No	1	No
98	EU	JPR	Jupiter Energy Limited	4	0	2	Yes	0	No
99	EU	KAR	Karoon Gas Australia Ltd	6	2	3	Yes	0	No
100	EU	LNC	Linc Energy Ltd	4	2	2	No	0	No

No.	Sector	ASX Code	Company Name	Total Number of Directors	Independent Directors	Multiple Directorships	CEO Duality	Women Directors	Sustainbaility Committee
101	EU	LNG	Liquefied Natural Gas Limited	7	2	2	No	2	No
102	EU	MAD	Maverick Drilling and Exploration Limite	5	3	3	Yes	0	No
103	EU	MCE	Matrix Composites & Engineering Limit	5	3	1	No	0	No
104	EU	MEL	Metgasco Limited	4	3	2	No	0	No
105	EU	MEO	MEO Australia Limited	5	4	2	No	0	No
106	EU	MGN	Magellan Petroleum Corporation	7	5	6	No	0	No
107	EU	MIO	Miclyn Express Offshore Limited	7	5	5	No	0	Yes
108	EU	MPO	Molopo Energy Limited	6	5	2	No	0	Yes
109	EU	NCR	Nucoal Resources Limited	5	2	4	No	0	Yes
110	EU	NEN	Neon Energy Limited	3	2	2	No	0	No
111	EU	NSE	New Standard Energy Limited	5	3	3	No	0	No
112	EU	NTU	Northern Minerals Limited	5	4	2	No	0	No
113	EU	NWE	Norwest Energy NL	3	1	3	No	0	No
114	EU	NXS	Nexus Energy Limited	6	4	2	No	0	No
115	EU	NZO	New Zealand Oil & Gas Limited	7	6	5	No	0	Yes
116	EU	OEL	Otto Energy Limited	5	5	5	No	0	No
117	EU	ORG	Origin Energy Limited	9	6	9	No	2	Yes
118	EU	PCL	Pancontinental Oil & Gas NL	4	1	3	No	0	No
119	EU	PDN	Paladin Energy Ltd	6	5	4	No	0	Yes
120	EU	PEA	Pacific Energy Limited	6	2	3	No	0	No

No.	Sector	ASX Code	Company Name	Total Number of Directors	Independent Directors	Multiple Directorships	CEO Duality	Women Directors	Sustainbaility Committee
121	EU	PPP	Pan Pacific Petroleum NL	6	5	4	No	0	No
122	EU	RES	Resource Generation Limited	4	2	0	No	0	No
123	EU	RFE	Red Fork Energy Limited	5	1	3	No	0	No
124	EU	RRS	Range Resources Limited	4	2	3	No	0	No
125	EU	SSN	Samson Oil & Gas Limited	4	3	3	No	1	No
126	EU	STX	Strike Energy Limited	6	4	2	No	0	No
127	EU	SUR	Sun Resources NL	5	3	4	No	0	No
128	EU	SXY	Senex Energy Limited	6	2	4	No	1	No
129	EU	TOE	Toro Energy Limited	6	4	5	No	1	No
130	EU	WCL	Westside Corporation Limited	6	3	5	No	0	No
131	EU	WEC	White Energy Company Limited	6	3	5	No	0	No
132	EU	WHC	Whitehaven Coal Limited	8	4	6	No	1	Yes
133	EU	WOR	WorleyParsons Limited	10	8	8	No	2	Yes

Appendix 7-4 Mean scores of each item for the main study

Hard Disclosure Items: A1 – A4	Mean Scores
(A1) Governance structure and management systems (max score is 9) Each item has a maximum score of 1.	**5.69**
1. Existence of a sustainability committee and/or management position for sustainability management	0.29
2. Stakeholder involvement (include setting sustainability policies, existence of mechanisms for stakeholders to provide recommendations and management responses to key topics and concerns raised by stakeholders)	0.57
3. Implementation of externally developed economic, environmental and social charters/ principles/ initiatives which organisation subscribes/ endorses	0.65
4. Executive compensation is linked to sustainability performance	0.40
5. Existence of explanation for data measurement techniques and the bases of calculations, including assumptions adopted in the compilation of sustainability information in the report.	0.35
6. Indicate whether the Chair of the highest governance body is also an executive officer	0.99
7. State the number, gender, expertise of members of the highest governance body such as the board of directors that are independent and/or non-executive members	0.99
8. Processes in place for the highest governance body to ensure conflicts of interest are avoided	0.97
9. Processes for evaluating the highest governance body's own performance, particularly with respect to economic, environmental, and social performance	0.47
(A2) Credibility (max score is 5) Each item has a maximum score of 1.	**1.33**
1. Adoption of GRI sustainability reporting guidelines or provision of a CERES report	0.11
2. Independent verification/ assurance about environmental information disclosed in the environmental performance report/web, including external awards for providing quality sustainability information	0.12
3. Independent verifications/ audits on sustainability systems/ performances, including external awards/certifications for good sustainability practices	0.28
4. Participation in industry specific associations/initiatives to improve sustainability practices	0.44
5. Participation in other organisations/association which promotes sustainability to improve sustainability practices	0.38
(A3) Economic Performance Indicators, ECP (max score is 18) Each item has a maximum score of 6.	**6.95**
1. Economic performance	4.75
2. Market presence	0.78
3. Indirect economic impacts	1.41
(A3) Environmental Performance Indicators, ENP (max score is 66) Each item has a maximum score of 6.	**11.59**

1. Materials	0.41
2. Energy	0.73
3. Water	0.86
4. Biodiversity	1.50
5. Greenhouse emissions	1.41
6. Air emissions	0.55
7. Water effluents	0.61
8. Waste	0.51
9. Products and services	0.32
10. Compliance	3.91
11. Transport	0.78
(A3) Social Performance Indicators – Labour Practice and Decent Work, LAP (max score is 36) Each item has a maximum score of 6.	**11.35**
1. Employment	2.65
2. Labour/ Management relations	0.29
3. Occupational health and safety	3.01
4. Training and education	1.08
5. Diversity and equal opportunity	3.28
6. Equal remuneration for women and men	1.04
(A3) Social Performance Indicators – Human Rights, HRP (max score is 54) Each item has a maximum score of 6.	**2.83**
1. Investment and procurement practices	0.53
2. Non-discrimination	0.45
3. Freedom of association	0.20
4. Child labour	0.16
5. Forced and compulsory labour	0.17
6. Security practices	0.22
7. Indigenous rights	0.68
8. Assessment	0.23
9. Remediation	0.19
(A3) Social Performance Indicators – Society, SOP (max score is 25) Each item has a maximum score of 6.	**2.68**
1. Local communities	1.80
2. Corruption	0.32
3. Public policy	0.12
4. Anti-competitive behaviour	0.10
5. Compliance	0.35
(A3) Social Performance Indicators – Product, PRP (max score is 25) Each item has a maximum score of 6.	**3.54**
1. Customer health and safety	0.56

2. Product and service labelling	1.91
3. Marketing communications	0.49
4. Customer privacy	0.10
5. Compliance	0.48
(A4) Spending on sustainability related expenditures (max score is 2) Each item has a maximum score of 1.	**0.59**
1. Summary of dollar savings arising from sustainability initiatives to the company	0.16
2. Amount spent on donations, community investments, technologies, R&D and/or innovations to enhance sustainability	0.44
Soft Disclosure Items: A5 – A7	
(A5) Vision and strategy claims (max score is 7) Each item has a maximum score of 1.	**5.33**
1. CEO statement on sustainability performance in letter to shareholders and/or stakeholders	0.73
2. A statement of corporate sustainability policy, values and principles, codes of conduct	0.88
3. A statement about formal management systems regarding risk and performance in sustainability	0.82
6. A statement that the firm undertakes periodic reviews and evaluations of its sustainable performances	0.76
5. A statement of measurable goals in terms of future sustainability performance (if not awarded under A3)	0.68
6. A statement about specific sustainability innovations and/or new technologies	0.66
7. Explanation of whether and how the precautionary approach or principle on sustainability issues is addressed by the organization.	0.80
(A6) Sustainability Initiatives (max score is 3) Each item has a maximum score of 1.	**0.36**
1. Internal sustainability awards	0.06
2. Internal sustainability performance audits	0.20
3. Internal certification of sustainability programs	0.11
(A7) Disclosure on Management Approach – Economic (max score is 3) Each item has a maximum score of 1.	**1.56**
1. Economic performance	0.98
2. Market presence	0.20
3. Indirect economic impacts	0.38
(A7) Disclosure on Management Approach – Environmental (max score is 9) Each item has a maximum score of 1.	**2.92**
1. Materials	0.11
2. Energy	0.16
3. Water	0.20
4. Biodiversity	0.36
5. Emissions, effluents and waste	0.38
6. Products and services	0.08
7. Compliance	0.98

8. Transport	0.22
9. Overall	0.44
(A7) Disclosure on Management Approach – Labour Practice and Decent Work (max score is 6) Each item has a maximum score of 1.	**2.90**
1. Employment	0.68
2. Labour/management relations	0.08
3. Occupational health and safety	0.69
4. Training and education	0.28
5. Diversity and equal opportunity	0.87
6. Equal remuneration for women and men	0.29
(A7) Disclosure on Management Approach – Human Rights (max score is 9) Each item has a maximum score of 1.	**0.97**
1. Investment and procurement practices	0.14
2. Non-discrimination	0.19
3. Freedom of association and collective bargaining	0.06
4. Child labour	0.06
5. Prevention of forced and compulsory labour	0.07
6. Security practices	0.09
7. Indigenous rights	0.21
8. Assessment	0.08
9. Remediation	0.07
(A7) Disclosure on Management Approach – Society (max score is 5) Each item has a maximum score of 1.	**0.79**
1. Local communities	0.50
2. Corruption	0.12
3. Public policy	0.04
4. Anti-competitive behaviour	0.04
5. Compliance	0.09
(A7) Disclosure on Management Approach – Products Responsibility (max score is 5) Each item has a maximum score of 1.	**0.81**
1. Customer health and safety	0.14
2. Product and service labelling	0.42
3. Marketing communications	0.11
4. Customer privacy	0.03
5. Compliance	0.11