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Exploring Environmental Disclosure in Selected Australian Multinationals under the GRI Guidelines

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Abstract

This paper explores changes in environmental reporting among Australian MNEs between 2004 and 2007, using the GRI guidelines, and explains how GRI transformation (from G2 to G3) leads to changes in environmental disclosure aspects along with their association with company size, profitability, industry sector. Applying Wilcoxon matched pair signed ranked and Spearman rank correlation tests, twenty companies from the Australian SAM Sustainability Index (AuSSI) are examined to identify the extent of changes on specific aspects of environmental disclosure. The findings of the paper document a significant increase in environmental reporting in Australian companies. In particular, reporting has increased for energy, emissions and environmental management followed by water, overall, materials, transport and product/ services aspects. However, a shift in emphasis from compliance and biodiversity aspects associated with climate changes and resource preservation is also evident. Again, the majority of changes occurred in companies operating in environmentally sensitive industries with industry sector having significant relationship with a few environmental disclosure aspects, the study shows no significant effect of company size and profitability on different environmental disclosure aspects. These evidences indicate that external forces (such as, legislation, industry sensitiveness to environment, and stakeholder awareness and pressure) rather than internal factors are more effective to influence and determine environmental disclosure in Australian companies.

Keywords: *Australian MNEs; environmental reporting; GRI guidelines; legislation and economic benefits, sustainability*

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Introduction

Corporate disclosure is generally focused on corporate financials aimed at satisfying one set of stakeholders' (shareholders and prospective investors) quest for information to assess the financial health of companies. Such mandatory reporting is influenced by the capital market pursuit of shareholder wealth maximization and compliance with accounting standards and corporate governance codes/guidelines as well as regulatory requirements to protect the interest of primary capital providers. Reporting is therefore either a legal requirement of corporate firms backed by 'shareholder primacy' argument (Friedman, 1970; Fisch, 2006) or the 'nexus of contracts' (Jensen & Meckling, 1976), under Anglo-US system of corporate governance with shareholders increasingly calling for transparency and accountability. However, it is also increasingly recognised that companies operate in a broad stakeholder society, with obligations beyond financial performance (Frederick, 2006). Stakeholder consideration is primarily driven by non-Anglo-US style of corporate governance, in particular Continental system of governance in Europe. This endorses the view that any solution to the moral hazard problem should be considered a legal responsibility of corporate firms. Therefore, in addition to financial performance, governments, communities, and society in general expect companies to report on their performance in areas of social equity and quality, as well as ecological resource preservation (Dunphy, Griffiths & Benn, 2003). Thus, it is argued that while corporate governance is aimed more towards a firm's internal affairs, whereas corporate social responsibility focuses more on issues outside the firm and towards the concerns of its stakeholders, constituents and the environment in general (Fassin & van Rossem, 2009).

In recent years, there has been increasing corporate response from the business world paying more attention to both corporate governance and corporate social responsibility (CSR). It is also observed that there are some complementary aspect of corporate governance and corporate social responsibility and that good corporate governance provides the foundation for corporate social responsibility leading to improved value of the firm (Beltratti, 2005; Aguilera, Rupp, & Ganapathi, 2007). Similarly, Luo (2006) considers corporate social responsibility as an important part of corporate governance and Sacconi (2006) as a model of extended corporate governance. However, the question is whether shareholder-wealth- maximisation driven corporate firms are being accepted broadly in the Anglo-US style of corporate governance. It is observed that some Anglo-US corporate firms address this issue by making a case for stakeholder, CSR and environmental considerations that enhance wealth maximisation. In addition, the progressive view also argues that firms are organised for the benefit of society at large, and that corporate boards have a fiduciary duty that extends to a wide variety of stakeholders (Sheehy, 2005). In a broader sense, corporate governance thus covers both corporate financial and non-financial disclosure (i.e. environmental and social), as it considers the interests and benefits of shareholders as well as other stakeholders. Reinhardt, Stavis & Vietor (2008) contend that corporate social responsibility or level of environmental protection should be seen as complementary to increasingly effective government regulation and not as a substitute for it.

A substantive body of literature has shown that company responses to stakeholder expectations through voluntary environmental disclosures increased significantly during the 1990s (Gamble, Hsu, & Radke, 1995; Deegan, Rankin, & Tobin, 2002; Kolk, 2003) and has since continued its upward trend (Gray, 2006). The increase in environ-

mental reporting has been traced to factors, such as legislation, rising public concern for the environment, improved reporting guidelines and reputation management. In addition to mandatory specific and general purpose environmental reports, Australian companies produce voluntary reports as part of, or separately from, their annual reports. These voluntary reports provide opportunity for companies to showcase their environmental initiatives and defend their actions and/or breaches of legislation in a way that is not possible through mandatory reporting. Various frameworks, such as the Public Environmental Reporting (PER) framework in Australia and the Global Reporting Initiative (GRI), provide guidance on how and what environmental aspects to report. Nonetheless, the GRI has become the global standard for environmental reporting from which other more localised guidelines are drawn (Burritt, 2002). The GRI guidelines (i.e. G3 released in 2006 from its previous version of G2 in 2002) are reviewed and revised periodically to simplify their use and enhance their orientation to the underlying principles of comparability, reliability, timeliness and clarity. However, not many companies in Australia have been using GRI guidelines (i.e. G3) for environmental reporting.

This paper examines specifically, the disclosure of corporate social performance of companies on ecological/environmental resource preservation in consonance with recent emphasis on the environment through government regulations and industry support programs. The first motivation of this paper derives from the lack of using GRI guidelines by vast majority of Australian multinational companies. The objective of the paper is to examine advances in disclosures during the release of G2 and G3 by few Australian companies. We investigate changes to environmental reporting among Australian MNEs using the GRI guidelines, following the release of a more simplified version, the G3, in 2006. Our aim is to ascertain increases in the number of companies disclosing information on each aspect of the environment, and to examine specific aspects of these increases. We then discuss other factors that may account for the increase or decrease in reporting, within the different aspects. The reason of choosing 2004 and 2007 time periods is that GRI adopting companies in Australia have began substantive disclosure in environmental aspects in 2004 after the release of the G2 guidelines in 2002. While G3 guidelines released in 2006, companies have started reporting in accordance with the G3 guideline from 2007. Therefore, it is of interest to examine changes in disclosure that occurred between the periods 2004 and 2007, as it would provide a better comparison between disclosure before the release of the G3 guidelines and afterwards. Again, the second motivation is drawn from introducing legislation on environmental disclosure requirements for companies listed on their stock exchanges, such as the National Greenhouse Energy Reporting Act 2007. In addition, various Acts have been enacted, and frameworks and schemes developed by Federal and State governments to reduce energy usage and greenhouse gas emissions. It is argued that disclosures in environmental reports can prepare companies for the management of future challenges and to take advantage of current and future opportunities (Environment Australia 2003). However, until 2005 the level of reporting by companies in Australia continues to be low as compared to that of other countries. Therefore, it is of interest to observe whether environmental reporting has improved over time from 2004 to 2007 as a consequence of legislative efforts.

The study contributes by providing insights on environmental reporting in Australian companies. First, unveiling the trend in environmental disclosure where a shift in emphasis associated with climate changes and resource preservation is evident to meet

challenges of the time and grab future opportunities. Secondly, it highlights that while industry sector is important to get enhanced environmental disclosure particularly from environmentally sensitive industries, but surprisingly company internal factors, such as firm size and profitability are not contributing towards increased reporting of companies. It is rather external forces, such as legislation and stakeholder awareness and pressure that matter for increased environmental disclosure. These findings are important for policy makers to develop appropriate strategies that will encourage companies to disclose information in accordance with corporate legitimacy and stakeholders' expectations.

The remainder of this paper is organised as follows. Section two presents the literature review, GRI guidelines and relevant theory of the study. Section three explains our hypotheses and section four research designs and data. The results of the analyses and discussion are reported in section five. Finally, section six provides implication of findings and conclusion to the study.

Literature Review, Guidelines and Theory

Environmental Reporting by Australian Companies

Environmental reporting by Australian companies takes two forms: (1) mandatory reporting in response to regulatory obligations, and (2) voluntary reporting of environmental performance to stakeholders. Depending on the industry sectors in which they operate and the volume of their emissions, Australian companies are obliged to report certain aspects of their environmental performance to specific regulatory organisations in compliance with various legislative requirements, such as the National Pollutant Inventory (NPI), the National Packaging Convention (NPC) and more recently the National Greenhouse and Energy Reporting (NGER) Act of 2007. In addition to these specific reports, Australia companies are also obliged to disclose their environmental performance in their annual reports as part of general reporting to stakeholders. Section 299(1)(f) of the Corporations Act 2001 requires publicly owned companies whose operations are subject to a particular environmental regulation under a law of the Commonwealth or a State or Territory in Australia to provide details of their performance in relation to the regulation. Companies are also required to report their exposure to environmental and climate change risks and the associated mitigating strategies under section 299A of the Corporations Act 2001. The Act enables more balanced disclosure of environmental performance than existed under the voluntary regime by requiring companies to disclose the extent of compliance as well as any breaches of legislation. For the public sector, s516 Division 1 of the Environmental Protection and Biodiversity Conservation (EPBC) Act sets out environmental reporting obligations for Commonwealth departments and authorities as well as companies and agencies established by or under a law of the Commonwealth (Burritt, 2002). Apart from mandatory specific and general purpose reporting, Australian companies also disclose voluntary information on their environmental performance with or separately from their annual reports. The government encourages such disclosure through the Public Environmental Reporting (PER) framework, which provides guidelines for reporting. Nonetheless, some Australian companies use various other guidelines, especially the GRI, to report their environmental performance and in fact both the EPBC Act and PER draw from the GRI guidelines (Burritt, 2002).

The GRI Guidelines

The GRI guideline is adopted in this study because it targets a broad array of stakeholders, adopting a multi-stakeholder and 'all inclusive' approach to developing the guidelines. It represents best practice in environmental reporting (Enquist, Jonson, & Skalen, 2006) and has achieved general acceptance in the commercial world (Weber, Koellner, Habegger, Steffensen, & Ohnemus, 2008). According to Savitz & Weber (2006, p. 211–212), the GRI is the "leading benchmark for measuring, monitoring, and reporting sustainability information". It is exhaustive in coverage, requiring descriptive disclosures backed by quantitative measurements. The GRI encourages companies to report not only historic performance, but also future performance targets (Global Reporting Initiative, 2002). The guidelines are continuously reviewed and revised for the purpose of tightening the link between information disclosed and the underlying principles of comparability, clarity, timeliness, flexibility, auditability and global acceptance (Global Reporting Initiative, 2002). These principles are the basis upon which investors and stakeholders measure consistency and conformity of environmental reports before using them (Van Staden, 2007). The third generation of GRI guidelines (G3), a comprehensive set of reporting guidelines, is released in October 2006 (Ballou, Heitger, & Landes, 2006). The G3 is about half the length of 2002 GRI, which makes it a streamlined version of the 2002 GRI, because G3 involves changes to the number of indicators representing certain aspects but it is simpler, more concise and requires less details and metrics (Etzion & Ferraro, 2007). The environmental category has nine (9) aspects: (i) material, (ii) energy, (iii) water, (iv) biodiversity, (v) emissions, effluents and waste, (vi) products and services, (iv) compliance, (viii) transport and (ix) overall. These aspects are represented by seventeen (17) core and thirteen (13) additional indicators (Global Reporting Initiative, 2002). These are provided to help reporting entities to think creatively about their environmental reports.

The current study has adopted the GRI (G3), because it is a guideline widely used by companies in the disclosure of their environmental activities. This widespread usage also enables comparability of information amongst various companies and meets the needs of a wider audience, such as civil society while maintaining information relevant to the reporting organisation and its investors. Since our study is more related to environmental reporting than social or economic reporting, we focus on only the environmental category of the G3 guidelines. Our focus is therefore upon several specific corporate factors and how these factors affect the corporate legitimacy process in environmental reporting.

Legitimacy Theory

This study adopts legitimacy theory as the appropriate basis, because this theory has been widely used in the literature for environmental reporting. Suchman (1995 p.574) contend that 'the impression created by businesses through disclosure to show that their operations are in accordance with the standards, cultures and beliefs (values) of the society'. This implies that communication is an importance aspect of corporate legitimacy (Parker, 2005). Suchman (1995) considers legitimacy using two perspectives: moral/ethical legitimacy and pragmatic legitimacy. The moral/ethical perspective indicates that corporations 'do the right thing' while the pragmatic perspective views legitimacy as an essential resource beneficial to both corporations and primary stakeholders (Suchman, 1995). Furthermore, different typologies are suggested to af-

fect the corporate legitimacy process, which include media legitimacy, managerial legitimacy, normative legitimacy, structural legitimacy and internal legitimacy. Consistent with the legitimacy theory, the literature reveals significant links between strong environmental disclosures and both poor environmental performance (Deegan & Gordon, 1996; O'Donovan, 2002) and high media exposure (Patten, 2002). In effect, companies engage in environmental reporting to value add, repair or build reputation, enhance competitive positions, manage environmental risks, attract equity and debt capital, achieve employee satisfaction, and expand globally (Psaros, 2009). These follow a growing belief that environmental reporting will ultimately improve operating and financial performance (Brammer & Pavelin, 2006). The positive effects of legitimacy theory on CSR reporting as shown in prior studies (Suchman, 1995; Parker, 2005; Ho & Taylor, 2007; Gamerschlag, Möller, & Verbeeten, 2011) has prompted us to further examine its (legitimacy theory) effect on CSR reporting.

Based on legitimacy theory, this study seeks to examine how several corporate internal financial and specific demographic factors affect the level of reporting on each aspect of its environmental disclosure. In case of non-existence of such effect, it would be plausible to conclude that these disclosures are more aligned to external factors, such as legislation, industry sensitivity to environment, stakeholder's awareness and pressure. This study is more skewed towards the evaluation of the effect that various organisational structures have on the corporate legitimacy process. In particular, this study adopts pragmatic legitimacy in promoting advanced accountability and transparency in the environmental disclosure. Moreover, corporate effort to effectively connect stakeholders with the achievement of corporate objectives is of importance for continuous operations of corporate entities and meeting stakeholders' expectations. In addition to pragmatic legitimacy, this study also advocates for the structural dimension of legitimacy theory to communicate with stakeholders in an effective way of explaining the variability of corporate environmental disclosures and fulfil societal interest. Accordingly, examining the role of internal financial and specific demographic factors in environmental disclosure will be linked to the typology of structural legitimacy.

Hypotheses Development

Hypotheses Development

Firm resources and profitability are company-specific factors that influence the quality as well as the volume of environmental reporting (Cullen & Christopher, 2002; Brammer, Brooks, & Pavelin, 2006; Brammer & Pavelin, 2008). It would therefore be unreasonable to attribute any increase in environmental disclosure solely to changes in the GRI guidelines, especially a company cannot disclose information without an existing system for environmental management and reporting - an investment that is not likely to arise solely from changes in the GRI guidelines. This means several other internal and/or external factors will also account for increases in reporting between 2004 and 2007.

The time period appears important reflecting the overall economic activities and performance of the economy. During 2004 to 2007 periods and before, Australia has experienced economic boom until the global financial crisis of 2008, which encourages companies across the industries to involve more in environmental activities and accordingly disclosure more. Therefore, we propose the following alternative hypothesis:

H_1: All aspects of environmental disclosures are likely to increase from 2004 to 2007, particularly in energy, emissions and environmental management than biodiversity and compliance.

Prior studies have reported a positive relationship between CSR, particularly environmental, and financial performance (Key and Popkin, 1998). Corporations that increase their CSR activities and disclosure in a socially responsible manner are able to attract debt capital at low cost, such as loans from the banks. Increase in the ability of these corporations to attract debt capital can reduce cost of capital and result in better long-term financial performance (Scholtens, 2006). Orlitzky, Schmidt & Rynes (2003) also posit a positive relationship between strong CSR reporting and investment return across industries. They argue that corporate social and financial performance mutually affects each other through a 'virtuous cycle'. This is possible through the use of effective strategies that will result in competitive advantage (Albareda and Lozano, 2008). Value is therefore created when investors are able to assess corporate non-financial information through sustainability reports and make informed decisions (Rikhardsson and Holm, 2008). However, Surroca & Tribo (2008) present international evidence that the combination of socially responsible actions with corporate entrenchment strategies have negative effects on financial performance and subsequently disclosure. Thus, the financial reward associated with environmental reporting remains unclear. The current study revisits the relationship between investment returns and corporate disclosure and improves upon prior literature by examining the effect of profitability on specific aspects of corporate voluntary disclosure. Profitability has been measured by the ratio of pre-tax profit to assets in previous studies (Brammer, Brooks & Pavelin, 2006); however, the current study measures profitability by after-tax profit to assets. It is envisaged that after-tax profit is a more realistic figure for corporate profits than pre-tax profit, as argued and used by Meek, Roberts & Gray (1995). Therefore, we propose the following alternative hypothesis:

H_2: All aspects of environmental disclosure are significantly associated with Profitability.

The effects of industry sector and company size have been well examined in the prior literature, with the conclusion that these demographic factors affect disclosure. Although prior literature reports positive impacts of firm size on all aspects of disclosure, we are of a different opinion. We argue that size is likely to impact differently upon each of the aspects of environmental disclosure between 2004 and 2007. It is expected that the outcome of this further examination on the impact size to the various aspects of corporate disclosure will expand the previous knowledge acquired on the relationship between size and corporate voluntary disclosure. Using the value of total assets to measure company size as in Trotman & Bradley (1981), our alternative hypothesis is:

H_3: *All aspects of environmental disclosure are not significantly associated with company size.*

With regards to influence of industry type on different aspects of voluntary CSR disclosure, the volume and quality of disclosures may vary across companies and industries over time (Gray, Javad, Power, & Sinclair, 2001). According to Deegan & Gordon (1996), larger and environmentally sensitive companies are disclosing more information in response to rising social concern for the environment. This means that environmentally sensitive companies in the same industry are likely to implement similar

disclosure strategies. Therefore, an increase in disclosure by one environmentally sensitive company in the same industry is likely to positively affect the disclosure practices of other companies in the same industry (Ho & Taylor, 2007). This also implies that companies will do well to avoid litigation and its subsequent costs as they comply with at least the minimum requirements of the law. To further reduce the cost, we envisage that companies will implement and enforce strategies to increase their use of recycled water, subsequently reducing the cost of their production while making their goods and services more environmentally friendly. We also argue that corporate sustainability disclosures in the level of reporting within the different aspects of environmental disclosure are likely to be similar in both environmentally-sensitive and non-environmentally sensitive industry sectors. We further argue that legislation on energy conservation and encouraging climate change management strategies will encourage significant disclosure in terms of energy and emission reduction. However, we do not envisage and increases in biodiversity since legislation in that area have been on the low side. Therefore, our alternative hypothesis is:

H_4: *All aspects of environmental disclosure are not significantly associated with industry sector.*

Research Design

Sampling Process and Data Development

Non-probability sampling, specifically purposive sampling is used to select twenty companies for the study based on a number of criteria. First, the company must have produced environmental reports for both 2004 and 2007. Second, their reports must be based on the GRI sustainability reporting guidelines and indicator protocols for 2002 (G2) and 2006 (G3), respectively. The GRI indicators for 2002 are different from those of 2006 so that the specific GRI guidelines used for the 2004 and 2007 reports could be easily determined through content analysis of the reports. Third, the reports must be available on the internet for easy access. Fourth, the companies must be wholly or partly Australian owned and registered with the Australian Securities Exchange (ASX).

The Australian SAM Sustainability Index (AuSSI) with a database of 70 reporting companies as at January 2008 in 21 industry-clusters (www.aussi.net.au) is used to select the sample companies. At the time of collating the sample, not more than twenty companies out of the seventy met the above criteria. Although the use of small sample size for accounting studies is not unique (Rahman, Perera & Ganeshanandam, 1996), the sample size to this study is in line with the minimum endorsed by Milne and Adler (1999) for descriptive analyses. The 20 companies are: Amcor Ltd., AGL Energy Ltd.; BHP Billiton Ltd.; Bluescope Steel Ltd.; Brambles Ltd.; CFS Retail Property Trust; Foster's Group Ltd.; Kingsgate Consolidated Ltd.; Leighton Ltd.; Lihir Ltd., Nufarm Ltd.; Orica Ltd.; Origin Energy Ltd.; Oxiana Ltd.; Qantas Airways Ltd.; Rio Tinto Ltd.; Santos Ltd.; Telstra Corp. Ltd.; Transfield Services Ltd; and Westfarmers Ltd.

The secondary data from the environmental reports of the companies are used in this study, which comprised of 30 disclosure indicators from the G3 guidelines and 35 indi-

cators from the 2002 GRI G2 guidelines. The number of indicators addressed by each company for each aspect, in relation to the total indicators required by the relevant GRI guidelines for the aspect, is used to assess the level of emphasis. Thus, quantity of reporting rather than quality or completeness of information provided is used to assess relative emphasis on each aspect. Following Frost, Jones, Loftus & Van Der Laan (2005) and Clarkson, Richardson & Vasvari (2008), we have developed content analysis indices for each company, showing the number and percentage of indicators addressed in its 2004 and 2007 sustainability reports for each aspect of the environmental disclosure. The use of content analysis in accounting research is discussed in Guthrie, Petty, Yongvanich & Ricceri (2004). A score of 1 is assigned for any disclosure in relation to an indicator and 0 for non-disclosure. While this approach supports 'form' rather than the 'meaning' oriented content analysis, we sought, in our discussion of the results to explain the level of disclosure for each year and changes between the two periods, thus imputing some meaning to the volume of reporting for each aspect (Steenkamp & Northcott, 2007). The percentage indices are computed by the number of 1 score out of the total indicators required by the 2002 or 2006 GRI guidelines for each environmental aspect. In addition, indices for the total number and percentage of indicators addressed by each company for the environment category as a whole are compiled following the same procedure as for the aspects.

In this paper, companies in the metal and mining, oil and gas, energy, utilities, transportation, construction, chemicals, paper and pulp and food and kindred industries are classified as environmental-sensitive and rated 2, while companies in the trade and retail, computers and electronics, communications and media are considered non-environmentally sensitive and given a rating of 1 (see for example, Jenkins, & Yakovleva, 2006).

Analytical Technique

The Wilcoxon matched pair signed ranked test and the Spearman correlation coefficients are employed to test the alternative hypotheses of the study. Non-parametric tests are used due to the small sample size and the fact that the variables examined are not normally distributed, so that the assumptions for parametric analyses could not be met. One-tailed tests are carried out to investigate changes in reporting between 2004 and 2007 periods for the various environmental aspects and also the associations of the changes with company size, profitability and industry sector.

Results and Discussion

The sample twenty companies represent a broad array of industries including mining and metals, materials, energy, minerals, food beverage and tobacco, and transport, but the majority (75%) are in environmentally sensitive industries. The smaller standard deviations for most environmental aspects in 2007 as compared with 2004 also indicate reduced variability in the number of indicators addressed by the companies.

Table 1 provides descriptive statistics of environmental reporting for 2004 and 2007 periods. It reveals that energy, biodiversity, water and compliance are emphasised in the 2004 environmental reports followed by environment management and product and services. This pattern of emphasis has changed to some extent in 2007 where energy remained important, but is followed by transport, emissions, environment man-

agement, water and product and services aspects in that order. The overall and re-use & recycling of materials aspects have also gained more attention in 2007 than in 2004. In contrast, both biodiversity and compliance have not received similar attention in 2007. However, the mean values of the environmental aspects of the sample companies in 2007 indicate a substantial improvement in environmental reporting as compared to that in 2004. In terms of percentage change, overall, transport, material and energy show enormous improvements.

Table 1. Descriptive Statistics for Environmental Reporting in 2004 and 2007

	2004				**2007**				
Category/Aspect	Mean	SD	Min	Max	Mean	**SD**	**Min**	**Max**	**% Change**
Environment Mgt.	50.1	20.4	8.57	82.8	68.7	18.2	43.3	100	37%
Material	37.5	39.3	0	100	62.5	42.5	0	100	67%
Energy	56.0	28.0	0	100	85.0	20.4	40.0	100	52%
Water	55.0	30.0	0	100	68.3	27.5	33.3	100	24%
Emissions	47.2	27.7	0	88.9	69.0	20.5	40.0	100	46%
Product/Services	50.0	32.4	0	100	67.5	24.5	50.0	100	35%
Transport	40.0	50.3	0	100	70.0	47.0	0	100	75%
Compliance	55.0	51.1	0	100	60.0	50.3	0	100	9%
Biodiversity	56.1	39.4	0	100	57.0	39.1	0	100	2%
Overall	25.0	44.4	0	100	65.0	48.9	0	100	160%

Table 2 shows the results of Wilcoxon Matched Pair Signed Ranked Tests for the changes in environmental reporting in 2007. It documents significant increases in the disclosure of environmental aspects between 2004 and 2007 periods. As a whole, environmental disclosures have increased for all aspects from 2004 to 2007, which supports our H_1. In particular, disclosures have increased substantially for energy, emissions, and overall environmental management. Increases in disclosures for water, materials, transport, and products and services are also significant, whilst disclosures for the biodiversity and compliance aspects do not change much.

Table 2. Wilcoxon Matched Pair Signed Ranked Test: Changes in Environmental Reporting from 2004 to 2007

Aspect	**Z-value**	**P-value**
Environment Mgt.	3.57	0.000
Material	1.96	0.025
Energy	3.57	0.000
Water	2.06	0.02
Emissions	3.16	0.001
Product/Services	1.81	0.036
Transport	1.51	0.03
Compliance	0.38	0.35
Biodiversity	0.51	0.31
Overall	2.83	0.003

Table 3 presents Spearman Rank Correlation Tests to indicate significant effect of profitability, size and industry sector on different aspects of environmental reporting. In column two, the test results confirm that profitability has no significant association with any environmental aspects except water at 10% level of significance. Such finding does not support our H_2, implying that environmental disclosure is not primarily based on firm profitability, but some other factors. Again, in column three the size effect on environmental aspects is demonstrated. Of the ten aspects, six aspects show no significant association with size. Of the four aspects showing significant association with size, water and compliance aspects show positive relationship while energy and biodiversity aspects show negative relations. However, both energy and biodiversity aspects indicate a weak association at 10% level of significance. As such, our H_3 is not supported. This implies that, alike profitability, size of the firm is not the primary base for environmental disclosure. Finally, Table 3 column 4 illustrates the association between industry sector and environmental aspects. It reveals that of the ten aspects, five aspects, such as environmental management, material, emissions, overall and compliance are having significant relationship with industry sector at 5% level of significant except compliance at 10% level. The other five aspects indicate no significant association with industry sector. These results imply that our H_4 is partially supported. The reason is that environmental disclosure is generally much important for environmentally sensitive industries than non-sensitive ones. Also in sensitive industries, there remains variation in terms of importance in different environmental aspects. Given the nature of industry affiliation, we argue for an industry effect on environmental disclosure.

Table 3. Spearman Rank Correlation Test: Effect of Profitability, Size and Industry Sector on Changes in Environmental Reporting

Aspect	Profitability	Size (Assets)	Industry sector
Environment Mgt.	-0.268 (0.127)	-0.107 (0.327)	0.459** (0.021)
Material	0.139 (0.279)	0.178 (0.227)	0.372** (0.052)
Energy	-0.225 (0.170)	-0.331* (0.077)	-0.112 (0.320)
Water	0.306* (0.095)	0.469** (0.019)	0.062 (0.397)
Emissions	-0.239 (0.155)	0.039 (0.435)	0.436** (0.028)
Product/Services	-0.006 (0.489)	0.108 (0.325)	0.059 (0.402)
Transport	-0.259 (0.135)	-0.050 (0.417)	0.240 (0.154)
Compliance	-0.042 (0.431)	0.407** (0.037)	0.321*(0.084)
Biodiversity	-0.218 (0.178)	-0.335* (0.074)	0.003 (0.495)
Overall	0.230 (0.165)	0.088 (0.355)	0.417**(0.034)

*$p<0.10$, **$p<0.05$

The findings of the study mentioned above reflects the growing importance of environmental disclosure to global companies in a period of rising social concern about global warming and the ecological consequences of company activities. It documents that over the three years period from 2004 to 2007 environmental disclosure on aspects, such as energy, emissions, transport, materials, water, environment management and products and services have increased tremendously. In general, companies in both environmentally sensitive and non-environmentally sensitive industry sectors have improved their environmental disclosures for all aspects from 2004 to 2007**.** Energy aspect has the largest increase in environmental reporting in 2004 and 2007. The rise in minimum disclosures from 0% in 2004 to 40% in 2007 indicates that even smaller companies with relatively fewer resources are keen to disclose information on the energy aspect, although statistical test shows a negative association of changes in disclosure for energy with firm size (i.e. assets) and profitability. Other disclosure aspects are also not significantly associated with profitability, however, their disclosure are increasing over time, consistent with prior studies. However, disclosures on the biodiversity and compliance aspects are not expected to significantly change over the 3 years. Overall, there is a change in focus from biodiversity and compliance to aspects associated with climate change and resource preservation, as supported by recent research findings on disclosures on climate change (ACCA Australia/New Zealand & Net Balance Foundation, 2007: p4). It is because of the legislation that is likely to push disclosure of the biodiversity aspect on the low side. The opposite is appeared true for the energy aspect. This is consistent with previous research indicating that the issues emphasised in the environmental reports have changed over time (Psaros, 2009). The findings of increasing number of environmental aspects and indicators addressed in the environmental reports overtime supports the observations from previous researchers (Adams & Zutshi, 2004; Unerman & Bennett, 2004).

While changes in GRI guidelines may have simplified disclosures for various aspects of the environment, they are by no means the only factors behind the rising disclosures. It is rather plausible to argue that irrespective of their industry sector, companies strive to be in compliance with the law by adhering to rules and regulations to reduce litigation costs. Despite having no considerable significant influence of profitability and firm size on environmental disclosure aspects, it is evident that environmental disclosures have been improved over time mainly for changes in legislation, industry sensitiveness to environment, and changes in awareness and attitudes of relevant stakeholders associated with the companies. As such, it appears that external forces are more effective than internal factors to the firms. So, it is also not surprising that energy, emissions and other disclosure aspects significantly increased over all environmental disclosure aspects in both 2004 and 2007, as companies in both environmentally sensitive and non-environmentally sensitive industry sectors made efforts to comply with the various energy laws, and to disclose their compliance through implemented strategies and outcomes. In response to stakeholder expectations, Australian governments invested in a number of programs to raise awareness of climate risks, such as the Mandatory Renewable Energy Target (MRET) and the state versions of these programs. For example, the NSW Government NRET scheme and the Victorian Government's VRET scheme, as well as the New South Wales Greenhouse Gas Abatement Scheme and Greenhouse Challenge Plus. These programs could also explain the increasing emphasis on environmental disclosure aspects associated with climate change as observed in this study. These findings are important from legitimacy point of view that companies are fostering meaningful attempts on environmental

protection as well as their reporting to discharged obligation to the stakeholders and the society at large. It also highlights the important role of government and its designated agencies in providing environmental reporting guidelines/frameworks to the companies to follow in their journey of increased disclosure on issues relating to environment, climate change and global warming.

Conclusions

Based on GRI guidelines and employing an exploratory investigation method, this paper aims at examining changes in reporting/disclosure in environmental aspects of Australian MNEs between 2004 and 2007 and the impact of company size profitability and industry sector on changing environmental disclosure. For this study, twenty companies are selected representing a broad array of industries. To test the four hypotheses, descriptive statistics, the Wilcoxon matched paired signed rank test (e, g. mean, standard deviation, % changes, Z-value and P-value) and Spearman rank correlation test are used. The result shows significant increases in the disclosure of all environmental aspects between 2004 and 2007 periods (e.g. energy, transport, emissions, environment management, water, product and services, overall and materials), except for biodiversity and compliance that have not received much attention in 2007. In particular, disclosures have increased substantially for energy, emissions, and overall environmental management. The results also confirm that profitability has no significant association with any environmental aspects. Similarly, company size shows either no significant association or weak association with most of the environmental aspects. Finally, industry sector reveals significant impact on environmental management, material, emissions, overall and compliance aspects only, but not on others.

These findings of the study contribute to unveiling the trend in environmental disclosure where a shift in emphasis associated with climate changes and resource preservation is evident to meet challenges of the time and grab future opportunities. It also highlights the irrelevance of company internal factors, such as firm size and profitability in enhanced environmental disclosure, while some relevance of industry sector (i.e. environmentally sensitive industries) in promoting disclosure. It is also observed that although the GRI guidelines (G3) have made reporting easier by being simpler, concise, and tailored to the needs of more stakeholders, the changes in disclosure requirements from the GRI 2002 for the environment category are not as large as to drive non -disclosing companies to suddenly report. Interestingly, it appears that the external forces (i.e. legislation and stakeholder awareness and pressure) are more important than internal factors to discharge corporate legitimacy and meeting stakeholders' expectations. The result that size is not related to any aspects of disclosure is an important addition to the knowledge in this area. It indicates that the previously reported notion that companies will increase their disclosure irrespective of their size requires a more in-depth assessment. It also implies that a positive relationship between company size and disclosure (specifically, certain aspects of environmental disclosure) may more likely be associated with legislative requirements and stakeholder pressure than economic benefits derived from the size of a company. Avoidance of negative effect of non-compliance to legislation may have encouraged high level disclosure in both years. We conclude that in any reporting period, companies will emphasise in their reports only for those environmental aspects of sustainability that are of concern to wider society and are likely to present economic benefits. The investment in initiatives

and systems required to report information still remains high, therefore the main drivers for environmental reporting may be legislation, response to pubic expectation, reputation building and maintaining or enhancing competitive positions.

There are a number of limitations to the study that call for caution in generalising the findings. First, consideration is not given to the content of the reports, rather the analyses are based on the number of aspects and indicators addressed by the companies. Second, disclosures are analysed for only two-year periods. Third, the sample size is also small. Future research should examine longitudinally, i.e. annual changes in reporting over a longer period of time and taking into account the content of disclosures for each aspects and indicator and indeed for a larger and more meaningful sample of firms. Given these limitations, the study still has both theoretical and practical implications. Since, legitimacy is a vital issue for companies, it is important for them to demonstrate enhanced environmental discloser to discharge their social obligation and become a corporate citizen. On the practical side, companies are keen to use their separate environmental reports to explain to their stakeholders what initiatives are in place for environmental protection and what innovations and achievements are made in this regard to ensure sustainable production of products and services.

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