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Does voluntary carbon disclosure reflect underlying carbon performance?

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ABSTRACT

Carbon information is becoming more and more important in the decision making of stakeholders, but there is growing concern regarding the reliability of corporate carbon disclosure and a lack of empirical studies addressing this issue. The purpose of this paper is to examine whether voluntary carbon disclosure reflects firms' true carbon performance. Level of carbon disclosure was measured based on content analysis of Carbon Disclosure Project (CDP) reports, and our carbon performance index focused on both carbon intensity of emissions and carbon mitigation. Based on a sample of 474 U.S., U.K., and Australian firms, our findings show a significant positive association between carbon disclosure and performance, suggesting that firms' voluntary carbon disclosure in the CDP is indicative of their underlying actual carbon performance. This result is consistent with signalling theory. Our findings are useful for corporate stakeholders and governmental policymakers who are concerned about the quality of voluntary greenhouse gas disclosure.

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1. Introduction

Globally, average temperatures have already risen by approximately 0.85 °C since 1880 (Intergovernmental Panel on Climate Change IPCC, 2013). We will experience significant increases in surface temperatures and atmospheric CO₂ concentrations, and sea levels are projected to rise between 26 and 81 centimetres by 2100 (IPCC, 2013). It is extremely likely (95% certainty) that humans are the dominant cause of warming, and without aggressive cuts to emissions, the world is on track for more than 2 °C or possibly 4 °C of warming by the end of this century (IPCC, 2013).

Corporations are expected to play an important role in stabilising climate change, and the control of greenhouse gas (GHG)¹ emissions is essential for sustainable corporate development²; thus, there is a growing demand for carbon-related information (Organisation for Economic Co-operation and Development [OECD], 2010; Rankin et al., 2011). Although researchers recognise the importance of voluntary carbon disclosure, concern has been expressed regarding the credibility of this information. Because there is inherent uncertainty associated with emissions measurement and carbon reduction activities, some

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¹ This paper uses the terms *carbon*, *carbon equivalent*, and *GHG emissions* interchangeably.

² Sustainability can be defined in the sense of deep-rooted social justice and fair and responsible allocation and use of ecological resources (Tinker and Gray, 2003). Another definition is found in the (International Union for the Conservation of Nature, 1980): "the maintenance of essential ecological processes and life-support systems, the preservation of genetic diversity, and the sustainable utilisation of species and ecosystems, with the overall aim of achieving 'sustainable development' through the conservation of living resources."

49 authors claim that firms may take advantage of disclosure to alter the perceptions of stakeholders rather than make true efforts
50 to reduce harm to the environment (Aerts and Cormier, 2009; Gray et al., 1995; Neu et al., 1998). As a result, such disclosures
51 could be merely cosmetic or represent an attempt to deceptively promote a firm's image or reputation, a phenomenon known as
52 "green-washing" (Andrew and Cortese, 2010; Frost et al., 2005; Kolk et al., 2008). However, some studies present evidence that
53 firms' disclosures tend to reflect their commitment to ecological improvement and are thus relevant in decision making (Al-
54 Tuwaijri et al., 2004; Clarkson et al., 2008; Deegan and Gordon, 1996; Deegan and Rankin, 1996; Mitchell et al., 2006; Tilt, 2001).

55 This debate motivated us to investigate whether disclosed carbon information reflects actual underlying carbon perfor-
56 mance. A higher degree of correspondence between the two would suggest that the information is potentially useful for
57 stakeholders. In the present study, we examined how carbon information *voluntarily* disclosed in the Carbon Disclosure Pro-
58 ject (CDP)³ by large firms in the United States, United Kingdom, and Australia relates to their objectively measured carbon per-
59 formance. Based on signalling theory, we predicted that good performers would provide more voluntary carbon disclosure as a
60 signal to highlight their true carbon performance, which cannot be imitated by their poor counterparts. Thus, an observed posi-
61 tive association would mean that such disclosed information is indeed indicative of a firm's true carbon position and relevant for
62 assessing the risk of carbon exposure, commitment to climate change, and achievement in reducing GHG emissions of the
63 reporting firm.

64 Our sample consisted of 474 large companies that were listed as Australian Securities Exchange 200 (ASX 200), Standard
65 & Poor's 500 (S&P 500), and Financial Times UK Top 350 (FTSE 350) companies. These firms showed their commitment to
66 carbon transparency by participating in the CDP, 2010 annual survey. The extent of carbon disclosure was measured using
67 an index, based on each firm's responses to the well-designed and uniform CDP questionnaire, which is standardised to a
68 0–100 scale (CDP Rating Methodology, 2010). Our carbon performance measure focused on objective, observable, and quan-
69 tifiable carbon emissions and reduction outcomes achieved by each company. Our results consistently indicate that firms
70 with better performance disclose a greater amount of overall carbon information, supporting signalling theory.

71 The present work makes several contributions to the literature. First, the study addresses the ongoing debate on the rela-
72 tionship between environmental disclosure and environmental performance (Clarkson et al., 2008, 2011b; Cowan and
73 Gadenne, 2005; Gibson and O'Donovan, 2007; Mitchell et al., 2006) and provides new empirical evidence that has not been
74 documented previously. Second, although climate change is one dimension of the environment, carbon pollution differs from
75 other types of chemical pollution in that it causes global warming, with long-term and probably irreversible harmful effects
76 (Lash and Wellington, 2007). Carbon control requires a financial investment in firm-specific capabilities and carbon activities
77 guided by different laws and regulations (Luo et al., 2012, 2013; Tang and Luo, 2014). Because environmental protection is a
78 multidimensional construct (Chatterji et al., 2009; Strike et al., 2006; Walls et al., 2011), we examine this issue in a tightly
79 focused manner by investigating only the carbon dimension. Third, we have chosen the United States, the United Kingdom,
80 and Australia as our research setting because the three countries are heavy emitters. For example, the United States is the
81 second largest emitter after China, and the United Kingdom is one of the top 10 carbon emitters in the world. Australia is a
82 small country in terms of population but has among the world's highest per capita GHG emissions, another indicator com-
83plementary to absolute emissions of the severity of emission problems for a country. The serious consequences of climate
84 change on the Australian ecologic system (including biodiversity, tropical rainforests, etc.) are well recognised in the liter-
85 ature (Steffen et al., 2009; Williams et al., 2009). All three nations are combating global warming but have adopted some-
86 what different approaches and programs to prevent climate change from spawning social and economic problems. For
87 instance, the United Kingdom is one of the major countries within the European Union that has unveiled various climate
88 change legislation, including an international Emissions Trading Scheme (ETS). In contrast, neither the United States nor Aus-
89 tralia⁴ had a national ETS during the study period. Although both Australia and the United Kingdom signed the Kyoto Protocol,
90 the United States did not. Despite this, we find consistent evidence, after controlling for the country effect, suggesting that the
91 pattern of the association is not caused by country-specific institutions. Thus, our multinational design reflects the global nature
92 of climate change and provides a useful complement to a merely national setting. Fourth, this study relies on stand-alone CDP
93 reports, which have been considered more comprehensive sources of data than alternative data sources, such as annual reports
94 or sustainability statements (Luo et al., 2012). In the absence of internationally accepted standards, the CDP has adopted a set of
95 rules that all participating firms must follow and thus significantly reduces the opportunity for managers to manipulate carbon
96 data. Finally, the paper makes a theoretical contribution by providing new evidence that enhances the validity of the application
97 of signalling theory in carbon studies. Overall, we offer additional insight regarding corporate behaviour that should be useful in

³ The CDP in its current incarnation is a system that produces assessable reports of firms' carbon activities and emissions. The CDP encourages the development of web-based forms of corporate accountability and has successfully used institutional investors to mobilise the world's largest firms to disclose carbon information (Kolk et al., 2008). An increasing number of studies have utilised CDP information in their research (Luo et al., 2012; Peters and Romi, 2009; Reid and Toffel, 2009; Stanny, 2010; Stanny and Ely, 2008; Tang and Luo, 2011).

⁴ The implementation of a carbon price in Australia has undergone dramatic developments. In 2008, the Australian government, under Labour Party Prime Minister Kevin Rudd, proposed the Carbon Pollution Reduction Scheme (CPRS). However, on 4 May 2009, the prime minister announced a 1-year delay in the implementation of the CPRS. On 27 April 2010, the Australian government announced that the CPRS would not be reintroduced to parliament until after the Kyoto emissions commitment period ended in 2012. On 24 February 2011, the subsequent Prime Minister, the Hon. Julia Gillard MP, announced a broad architecture for a carbon-pricing mechanism; this carbon-pricing regime was finally approved by the Senate on 8 November 2011 and became effective on 1 July 2012. Nevertheless, after 1 year's implementation in 2013, this carbon-pricing mechanism now faces huge uncertainty because the subsequent administration, led by Prime Minister Tony Abbott, has sought to fulfil a pledge to repeal the carbon tax.

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