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Determinants of the Quality of Corporate Carbon Management Systems: An International Study☆

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Abstract

Firms' carbon management systems play a key role in controlling greenhouse gas emissions, but very little research has focused on determinants of carbon management systems quality. This study uses the holistic approach used by Tang and Luo (2014) and data from large companies that participated in the Carbon Disclosure Project to measure the quality of carbon management systems. Our results show that the overall quality of carbon management systems improved in 2012 relative to 2011, and the quality of carbon management systems is associated with the presence of an emission trading scheme, competitor pressure, the nature of the legal system, and carbon exposure. In addition, these country-level and firm-level factors also impact the types of carbon management systems adopted by the firms in our sample. Our findings suggest that institutional theory explains our results well. Other theoretical perspectives such as a shareholder/stakeholder orientation provide additional elucidation. Given that the quality of carbon management systems is not directly observable, our results are potentially useful to outside stakeholders who are concerned about risks associated with GHG emissions of a firm.

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1. Introduction

Businesses are exposed to various risks related to climate change including direct physical risks, regulatory risks, and other risks.¹ National governments and nongovernmental organizations have adopted various carbon² initiatives, and companies worldwide are implementing carbon management systems as a response (Tang & Luo, 2014). A carbon management system is defined by Tang and Luo (2014) as “a way to implement a firm’s carbon strategy or policy to enhance the efficiency of input-use, mitigate emissions and risks and avoid compliance costs or to gain a competitive advantage”³ (p. 84). A large body of literature is devoted to environmental accounting (Anton, Deltas, & Khanna, 2004; Henri & Journeault, 2010; Jasch, 2003; Levy, 1997; Morrow & Rondinelli, 2002; Zhang et al., 2008; Zutshi & Sohal, 2004), and there has been a growing amount of research on carbon accounting in recent years (e.g., Liao, Luo, & Tang, 2015; Luo, Lan, & Tang, 2012; Luo, Tang, & Lan, 2013). However, few studies have been conducted on carbon management systems with the exception of Tang and Luo (2014). Tang and Luo (2014) made two important contributions: first, they presented a theoretical carbon management systems model that consists of ten key elements from four perspectives (see Appendix A); and second, they provided initial evidence that carbon mitigation performance is significantly related to the quality of carbon management systems. However, an essential question remains unanswered: why do some companies adopt high-quality carbon management systems but others do not? To investigate this important issue, we use a sample of 1805 observations from large firms in different countries in 2011 and 2012, and we quantify the quality of carbon management systems by scoring the ten elements of carbon management systems and standardizing the scores to create an index for each firm (Tang & Luo, 2014). We analyze the data using univariate and regression models; by doing so, we find that carbon management systems’ quality varies noticeably across firms and is a function of external pressure and internal conditions. Specifically, companies tend to implement

¹ Direct physical risks affect a company’s tangible assets and operation, including damage to production facilities or the availability of raw materials due to extreme weather, storms, floods, droughts, a rise in sea level, as well as increased risk to human health (e.g., the potential spreading of tropical disease). Regulatory risk arises when a government changes its climate policy, and other risks include risk to a business’s reputation, changes in consumption patterns, and short-term adjustments to contract conditions. Examples include when consumers switch to products with a lower effect on climate change or when insurance carriers request higher risk premiums due to high exposure to climate change.

² The term *carbon* as used here is interchangeable with *CO₂*, *carbon equivalent (CO₂-e)*, *emissions*, and *greenhouse gas*.

³ Our definition of CMS excludes CMSs that exist purely for the purposes of greenwashing (*greenwashing* is the overstatement of carbon performance and understatement of climate change damages). However, in practice CMS may be designed for greenwashing and to avoid damage to a business’s reputation. If this is the case, the company likely has no emission reduction target, takes no actions to reduce carbon emissions, has poor carbon governance, and so on; therefore, it will score low on our quality measure for CMS. Thus, our measurement mechanism should reflect to some degree opportunistic greenwashing behavior.

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