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Relationships between isomorphic pressures and carbon management imitation behavior of firms

Yong Liu[a,b], Nan Wang[b], Juanjuan Zhao[c,*]

[a] School of Economics, Sichuan University, Chengdu, China
[b] College of Management and Economics, Tianjin University, Tianjin, China
[c] College of Horticulture and Landscape Architecture, Southwest University, Chongqing, China

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ABSTRACT

Isomorphism describes the phenomenon where environmental behaviors and processes are similar across different organizations. Thus, firms may model their strategy on the carbon management behavior of other firms. The pressures that drive institutional isomorphism are described as mimetic, coercive, and normative pressures. In this study, based on a questionnaire survey in China, we found that isomorphic pressures to copy the carbon management methods of competitors (mimetic pressures) were the strongest, followed by the pressures from government (coercive pressures). Pressures from standards (normative pressures) were weakest. However, the firms imitated the carbon management behaviors with the lowest costs. Coercive and mimetic isomorphic pressures were positively associated with imitation behavior. Multiple regression analysis was used to evaluate the degrees of association between isomorphic pressures and imitation behavior, where we controlled for firm size, ownership, culture, and the awareness of managers. The results indicated that coercive and mimetic pressures were positively related to the carbon management imitation behavior of firms. Firm size and a control orientation culture were also significantly related to the carbon management imitation behavior of firms. Normative pressures, firm ownership, and awareness by managers were not significantly related to imitation behavior. Thus, our findings suggest that policymakers might benefit from increasing coercive and mimetic isomorphic pressures when seeking to encourage firms to adopt carbon management behavior.

1. Introduction

Scientific evidence indicates that climate change related to carbon emissions is a global problem and 43% of the CO_2 emissions due to fuel combustion are related to coal combustion. However, coal is used to meet most of the growing energy demands of developing countries where energy-intensive industrial production is expanding. The challenges of adapting to climate change are particularly acute for China. In 2008, the China Meteorological Administration stated that over the past century, the average temperature of the earth's surface in China has risen by 1.1 °C. Between 1986 and 2007, China experienced 21 warm winters[1]. Carbon management by industrial firms plays an important role in the adaptation process but management is challenged by many carbon management-related pressures (Cadez and Czerny, 2015). Studies have shown that firms within a specific field will respond to isomorphic pressures (Dimaggio and Powell, 2000), which can be described as three types comprising coercive, mimetic, and normative isomorphic processes (Dimaggio and Powell, 1983). These multi-faceted isomorphic pressures include those derived from regulatory and market competition (Huang et al., 2016; Hazen et al., 2017), communities, and non-governmental organizations (Zhu et al., 2007). Furthermore, the associations between mimetic pressures and coercive and normative pressures have been explored previously (Liu, 2009).

Firms may model themselves on other firms. For example, they may emulate the low carbon activities or carbon management systems of other firms. Previous researchers have grounded discussions of this phenomenon mainly in institutional theory. However, some criticisms of this theory have been discussed. For example, Greenwood and Hinings (1996) indicated that the theory says nothing about why some organizations adopt radical change whereas others do not when facing the same institutional pressures. Integrating the internal dynamics within organizations could partly avoid this deficiency. Recent studies (Colwell and Joshi, 2013; Dubey et al., 2017) have attempted to integrate institutional theory with factors such as top management

* Corresponding author.
E-mail address: juanjuanzhao@swu.edu.cn (J. Zhao).

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commitment and organizational culture. Another criticism is that institutional theory does not focus on organizational performance and competitive advantage (Jonsson and Regnér, 2009), but Oliver integrated it with a resource-based view (Oliver, 1997a) and contingency theory (Oliver, 1997b). Firms may react by exhibiting a variety of behaviors when faced with isomorphic pressures and other factors. The difficulty of assessing these pressures involves determining whether they are effective at inducing predictable firm responses. Thus, it is important to explore the relationships between isomorphic pressures and the carbon management behavior of firms, as well as the key factors involved, such as firm size and ownership, which can lead more firms to improve their carbon management behavior.

However, until recently, few studies have empirically explored the relationships between isomorphic pressures and the carbon management imitation behavior of firms. Thus, in the present study, we explored the relationships between isomorphic pressures and the carbon management imitation behavior of firms. In particular, what are the strongest or weakest isomorphic pressures in China? What is the relationship among these different types of pressure? What are the different carbon management imitation behaviors exhibited by firms? Answering these questions may facilitate decision making to promote carbon management by firms.

The remainder of this paper is organized as follows. In Section 2, we review previous research in this area. In Section 3, we describe the theoretical framework. In Section 4, we explain the empirical study. The results and discussion are presented in Section 5. We give our conclusions and policy analysis in Section 6.

2. Literature review

Interesting research has begun to emerge recently regarding isomorphic pressures (Dubey et al., 2015). The concept of isomorphism describes the phenomenon where management behaviors and processes are similar across different organizations (Hawley, 1968). The three isomorphic pressures comprise coercive pressures, mimetic pressures, and normative pressures (Dimaggio and Powell, 2000). Organizations are susceptible to mimetic, normative, and coercive pressures. In particular, governmental organizations are more vulnerable to all three types of institutional pressures than other organizations (Frumkin and Galaskiewicz, 2004).

In addition, many studies have focused on isomorphic pressures and organizational behavior. For example, according to Benders et al. (2006), competitive and mimetic forces influenced the initial selection of the enterprise resource planning system in the Netherlands. Managers are particularly likely to mimic the behavior of organizations with which they share some type of network via boundary-spanning personnel (Galaskiewicz and Wasserman, 1989). Busch and Schwarzkopf (2013) indicated that car manufacturers tend to adopt similar strategies in terms of carbon reduction. In Europe, coercive isomorphism might be a force that drives firms to demonstrate that they are addressing climate change in order to gain legitimacy (Galbreath, 2010). In the UK, the impact of isomorphic pressures is stronger on public organizational strategies and culture than on structures and processes (Ashworth et al., 2009). However, Duysters and Hagedoorn (2001) found that in a highly competitive global industry, firms do not become isomorphic in terms of both their structure and strategy. Some factors that reflect the underlying nature of institutional pressures have also been explored as forces that might motivate strategic responsiveness to institutional pressures, such as constituents and control (Goodstein, 1994).

Several studies have demonstrated the emergence of factors that influence isomorphism, including adaptation and selection (Lawrence and Lorsch, 1967), such as the external institutional profile and the internal relational context of a firm (Kostova and Roth, 2002). Better adaptation is thought to enhance the survival chances of firms, whereas other less adapted firms will disappear, thereby indicating selection (Singh and Lurosden, 1990). The inherited properties of firms such as top management commitment (Dubey et al., 2016), clearly established and widely expressed stakeholder expectations (Busch and Schwarzkopf, 2013), culture, and technology may affect their adaptation (Hannan and Freeman, 1984). Resource dependence and political perception increase the tendency of stated-owned firms to conform to isomorphic institutional pressures (Cui and Jiang, 2012). However, companies with more intensive internal sources of motivation have better environmental management behavior (Heras-Saizarbitoria et al., 2016). Globally, multinationals are the key factors responsible for coercive isomorphism, where cohesive trade relationships between countries generate coercive and normative effects. For example, Kolk and Levy (2003) focused on the conflicting institutional pressures on multinational enterprises and the implications for their climate strategy, where the results indicated that the local context influences initial corporate reactions, but that convergent pressures predominated as the issue matures (Levy and Kolk, 2002). In addition, role-equivalent trade relationships result in competitive imitation (Guler et al., 2002). In a high-fashion company, isomorphic changes have been portrayed based on the roles played by two key actors in a company where their entrepreneurial activity stimulates institutionalization processes (Sargiacomo, 2008).

Therefore, previous studies have analyzed institutional isomorphic pressures and the management activities of firms to obtain insightful results. However, surprisingly few empirical studies have explored the relationships between institutional isomorphic pressures and carbon management by firms. Thus, based on empirical research, we aimed to address this deficiency, thereby providing a promising basis for policy-making to promote carbon management in firms.

3. Theoretical framework

Studies suggest that the behaviors of firms may be contrary to rational decision making (Kauppi, 2013). However, the use of institutional theory to explore the isomorphism within organizations can provide alternative explanations regarding the adoption of carbon management strategies. The three isomorphic pressures comprise coercive pressures, mimetic pressures, and normative pressures (Dimaggio and Powell, 2000).

Coercive isomorphic pressures are derived from the pressures exerted on firms by other organizations upon which they are dependent such as governmental regulations (Huang et al., 2016; Hazen et al., 2017). In particular, it has been determined that the following will be accomplished in China by 2030: (1) peak carbon dioxide emissions will occur in approximately 2030 and best efforts will be made to reach the peak sooner; (2) carbon dioxide emissions per unit of GDP will be reduced by 60% to 65% of the 2005 level; and (3) the share of non-fossil fuels in the overall primary energy consumption will increase to approximately 20%.[2] The most important approaches implemented for achieving these goals in China involve promoting carbon management regulations among industrial firms. Thus, the following hypothesis was tested in this study.

Hypothesis 1. Coercive isomorphic pressures are significantly associated with the carbon management imitation behavior of firms.

Mimetic isomorphic pressures are due to uncertainty or competition (Dimaggio and Powell, 1983). Low carbon production technologies are poorly understood in China and the carbon management goals are ambiguous (Liu, 2014). Furthermore, the contextual environment creates uncertainty about low carbon management (Liu, 2012), so firms might model themselves on other firms, e.g., emulating the low carbon activities or low carbon management systems of other firms (Galbreath, 2010). Inspired by the studies, the following hypothesis was tested.

[2] http://news.xinhuanet.com/world/2015-06/30/c_1115774759_3.htm.