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Promoting firms' energy-saving behavior: The role of institutional pressures, top management support and financial slack

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ABSTRACT

As one of the major energy-consuming countries, China is under great pressure to reduce energy consumption and carbon emissions. Companies, especially those with high energy consumption, are considered as key elements to improve energy efficiency. Although the Chinese government has made many related policies, there are still a substantial number of companies that have not adopted proactive energy-saving activities. Thus, it is important to study factors influencing firms' energy-saving behavior. Drawing on institutional theory, we build a model to explore the relationship between external pressures and firms' energy-saving behavior. Importantly, we investigated the role of top management support in linking external pressures to firms' energy-saving behavior and the moderating role of financial slack. The model was empirically examined using survey data collected from firms in China. Results show that top management support positively influences firms' energy-saving behavior. Command-and-control instruments, mimetic pressure and financial slack influence firms' energy-saving behavior through top management support, whereas incentive pressure and normative pressure have direct effects on firms' energy-saving behavior. Furthermore, financial slack positively moderates the effect of top management support on firms' energy-saving behavior. Based on the empirical results, policy implications on how to promote firms' energy-saving behavior are discussed.

1. Introduction

Energy is an important factor of production and resource for subsistence. The rapid increase of energy consumption has not only caused many environmental problems, but also facilitated global climate change, which has impeded humans' sustainability. As one of the major energy-consuming countries, China has a huge amount of energy consumption. For example, the total energy consumption of China in 2015 was 4300 million tons of standard coal equivalent (NBSC, 2016), accounting for 23% of the world's total energy consumption (BP, 2016). Under this condition, improving energy efficiency has become an important issue. Companies, especially those with high energy consumption, play a key role in mitigating this severe situation (Brunke et al., 2014).

Realising the importance of firms, researchers begin to study firm's energy-saving behavior. Some papers focus on exploring barriers and driving forces and have identified factors such as financial-related factors (e.g., initial investment, low returns from investments) (Cagno et al., 2015; Chai and Yeo, 2012; Trianni et al., 2016), organizational-related factors (e.g., top managers, environmental strategies) (Thollander et al., 2013), and external factors (e.g., governmental policies, demand from customer and supplier) (Brunke et al., 2014; Thollander et al., 2013; Zhang et al., 2013b). These studies indeed enhanced our understanding. However, most of them use case studies or semi-structured interviews and ask respondents to rate the importance of these factors. Few of them have built an integrated model based on theory and then empirically tested the influence of drivers and barriers on energy-saving behavior. The theory-based empirical research on firms' energy-saving behavior is relatively sparse (Liu et al., 2012, 2014; Suk et al., 2013; Zhang et al., 2015). To enhance our understanding of this important issue, more theory-based empirical research is essential.

Besides researchers, Chinese government also value energy-saving issues, and has made many related policies to promote firms' energy-saving behavior. However, some studies found that pressures from government policies do not have a significant effect on firms' energy-

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saving behavior (Liu et al., 2012; Zhu and Geng, 2013). There are still a substantial number of firms that lack an interest in energy conservation and are unwilling to partake in energy-saving activities (Du et al., 2014). It seems that the pressure from governmental policies has not been fully converted into positive motivation driving firms' energy-saving behavior. We consider whether there are some other factors that influence the relationship between external pressures and firms' energy-saving behavior.

After a careful review of organizational research, we found that top management support is a critical factor for organizational behavior (Colwell and Joshi, 2013; Lin, 2010), including energy-saving practices (Liu et al., 2012, 2014; Suk et al., 2013). Because top managers can coordinate decisions and access resources, their support for energy saving is more likely to lead to effective practice (Blass et al., 2014). According to Liang and Saraf et al. (2007), top management plays an important role in linking external pressures with firms' proactive activities. From this view, top management should play an indispensable role, and external pressures may propel top management to support firms' energy-saving behavior (Zhang et al., 2015). However, the current energy-saving literature focuses only on the effect of either external pressures or top management support on firms' behavior (Liu et al., 2014) and neglects the relationship between these two kinds of factors. In this research, we fill this gap by exploring the mediating role of top management support between external pressures and firms' energy-saving behavior.

Additionally, whether top management support can convert external pressures to energy-saving practices successfully also depends on firms' own financial competence. Although energy-saving practices can reduce energy costs, other expenditures are needed, such as initial investments and the cost of production disruption (Brunke et al., 2014). Thus, an essential requirement of successful energy-saving practices is that there are enough organizational resources, especially financial slack (Danneels, 2008; Joo and Kim, 2004). Otherwise, firms cannot implement energy-saving activities smoothly regardless of how supportive top managers are. However, to the best of our knowledge, few empirical studies of energy-saving behavior include a construct that describes firms' financial competence. Thus, referring to the organizational literature (Berrone et al., 2013; Zona, 2012), our research introduces a financial construct, financial slack, which represents potentially utilizable money that can be invested in new technology or projects (Daniel et al., 2004), and then investigates its influencing mechanism.

Taken together, to enhance our understanding of firms' energy-saving behavior and fill the above-mentioned literature gaps, we build a model integrating external pressures, top management support and financial slack. Consistent with previous literature (Liu et al., 2012; Zhang et al., 2015; Zhu and Geng, 2013), we draw external pressures based on institutional theory, which is widely used to capture the effect of external pressures on firms, including firms' energy-saving behavior. In the following section, we will first formulate our research model and then describe institutional theory, two crucial constructs (top management support and financial slack) and related research hypotheses. Next, the process of data collection will be presented. After empirical testing, the results will be given, followed by the discussion, research and policy implications.

2. Theoretical background and research model

This research focuses on understanding the important issue of firms' energy-saving behavior. We propose that financial slack is an important but understudied factor in promoting firms' energy-saving behavior. We also explore top management support and institutional pressures as important components in our research model, as shown in Fig. 1.

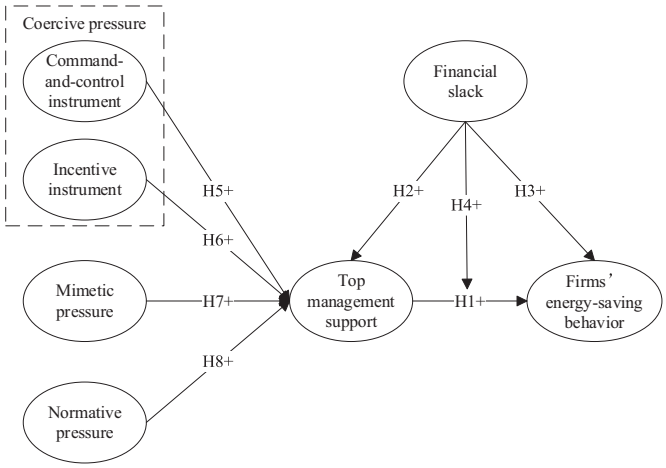

Fig. 1. Research model.

2.1. Top management support

Top managers, playing a leading role in a firm, are crucial for organizational behavior. Some researchers have explored the effect of top managers on firms' energy-saving behavior. For example, Blass et al. (2014) probed the involvement of top managers and top operation managers in energy efficiency practices. Zhang et al. (2015) explored the influence of senior managers' environmental concern on firms' energy-saving strategy and operational practice, but they found no significant relationship between environmental concern and operational practice for energy conservation. We suppose the reason might be that environmental concerns alone do not mean managers will fully support energy-saving activities. Managers' support and managers' environmental concerns are different concepts. While environmental concerns represent only a top manager's feelings and attitude towards energy-saving activities, their support means they will involve themselves and take proactive measures to conserve energy. We argue that the support from top management is more related to firms' energy-saving behavior.

Top management support has been widely used as an important factor in studying various corporate behaviors, such as technology adoption (Liang et al., 2007; Lin, 2010), managerial practice (Lee et al., 2016; Wang et al., 2006), and firms' environmental behavior (Colwell and Joshi, 2013). Liu et al. (2012), Suk et al. (2013) and Liu et al. (2014) also empirically tested the significant effect of top management support on firms' energy-saving practices. Because top managers have broader views, they are more likely to choose feasible practices, which may achieve better performance (Thong et al., 1996). In addition, implementing practices often requires investments, human resources and technical resources. With the support of top management, all of these can be provided to a great extent. Thus, we propose the following hypothesis:

Hypothesis 1:. Top management support is positively related to firms' energy-saving behavior.

2.2. Financial slack

Admittedly, top management support, as the motivation of firms' energy-saving behavior, is important, but successful practices also need enough organizational resources (Joo and Kim, 2004). Some researchers used organizational slack to represent potentially utilizable resources that can be redeployed to achieve firms' goals (Daniel et al., 2004). Bourgeois (1981) summarized the definition in the prior literature and proposed that "Organizational slack is that cushion of actual or potential resources which allows an organization to adapt successfully to internal pressures for adjustment or to external pressures for change