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Entrepreneurial orientation and green management in an emerging economy: The moderating effects of social legitimacy and ownership type

Xi Li [a], Jing Yang [b,*], Heng Liu [c], Xinyu Zhuang [d]

[a] Business School, University of Jinan, Jinan, 250002, China
[b] South China Institute of Environmental Sciences, Ministry of Environmental Protection of the People's Republic of China, Guangzhou, 510655, China
[c] School of Business, Sun Yat-sen University, Guangzhou, 510275, China
[d] College of Quality and Standardization, Qingdao University, Qingdao, 266071, China

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ABSTRACT

By combining major tenets developed in the entrepreneurial orientation literature and institutional theory, we investigate the relationship between entrepreneurial orientation and green management in the context of emerging markets and the moderating effects of social legitimacy and ownership type. Using survey data from 239 firms in China, we find that entrepreneurial orientation is positively associated with emerging market firms' green management. This positive relationship is strengthened by social legitimacy and is stronger for state-owned enterprises than for non-state-owned enterprises. Furthermore, our empirical results partly support the idea that the configuration of high entrepreneurial orientation, high social legitimacy and state ownership is more effective in facilitating emerging market firms' green management than other configurations. This study explores a new perspective (i.e., the integration of an entrepreneurial approach and institutional theory) to explain why firms make differentiated green decisions in emerging markets. Additionally, the three-way configuration effects provide a more complete picture and thereby facilitate a deeper understanding of emerging market firms' entrepreneurial spirit with regard to environmental issues.

1. Introduction

The commitment to being green and pursuing environmentally friendly practices has become an important issue within current competitive scenarios (González-Benito and González-Benito, 2006; Hofer et al., 2012; Kang and He, 2018). There is an increasing amount of evidence that green management, i.e., "the organization-wide process and practice of applying innovation to achieve sustainability, waste reduction, social responsibility, and a competitive advantage via continuous learning and development and by embracing environmental goals and strategies that are fully integrated with the goals and strategies of the organization" (Haden et al., 2009, p.1052), is often positively associated with firms' financial performance (Berchicci and King, 2007; Orlitzky et al., 2003), firm value (Flammer, 2013; Li et al., 2020), corporate financing (Liao, 2020), and product innovation (Shu et al., 2014).

As such, identifying the factors that drive green management has become a popular topic of multidisciplinary studies. For instance, grounded in institutional theory or stakeholder theory, several studies have acknowledged that firms' green management practices are shaped by coercive, normative, and mimetic pressures from various stakeholders (e.g., Chen et al., 2018; Murovec et al., 2012; Shah, 2011). The resource-based view (RBV) also provides a compelling reason to examine the internal resources and capabilities of the organizations driving green management such as financial resources (Li et al., 2017), technical resources (Jiang et al., 2020), social capital (Liao, 2018), and dynamic capabilities (Zhou et al., 2018).

However, the extant understanding may be insufficient to explain why firms choose to be greener in the context of emerging markets. Environmental issues are of paramount importance and are characterized by different features in emerging markets than those of developed countries (Fan et al., 2020; Zhou et al., 2018; Zhang et al., 2020). For instance, although the stringency of policy regulations and public participation with regard to environmentalism in emerging markets has increased in recent years, they are still significantly lower than in developed countries (Kang and He, 2018; Zou et al., 2019). Meanwhile, firms in emerging markets usually have limited resources and underdeveloped capabilities to gain environmental competitive advantages.

* Corresponding author. No.7, Yuancun West Street, Tianhe District, Guangzhou, 510655, China.
E-mail addresses: sm_lix@ujn.edu.cn (X. Li), 4914722@qq.com (J. Yang), liuheng8@mail.sysu.edu.cn (H. Liu), xinyukwi@hotmail.com (X. Zhuang).

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Therefore, it is quite meaningful to ask the following question: What unique factors drive firms to engage in green management in emerging markets, which are characterized by abundant "institutional voids" and limited internal resources?

In this study, combining major tenets developed in the entrepreneurial orientation (EO) literature and institutional theory, we seek to explore how EO, together with social legitimacy and firm ownership type, motivate firms to adopt green management in emerging markets. EO is proposed as a potential driver of green management (Menguc et al., 2010); however, it has attracted only very limited attention. EO represents the presence of a prospector-type strategic posture or entrepreneurial spirit in an organization (Miller, 1983; Varadarajan, 1992), "capturing specific entrepreneurial aspects of decision-making styles, methods, and practices" (Wiklund and Shepherd, 2005, p.74). Firms with an entrepreneurial spirit are more likely to proactively explore new routines and processes to cope with environmental changes (e.g., concerns about pollution issues, evolving regulations, changing social expectations, and new green technologies), which are risky and uncertain yet potentially highly rewarding (Sharma et al., 2007). Thus, we aim to elucidate the critical, yet less examined, role of EO in the adoption of green management in the context of emerging markets.

Specifically, we adopt institutional theory to examine the boundary conditions of the relationship between EO and green management. For emerging market firms without sufficient internal resources or an external stable resource market (Peng, 2003; Rettab et al., 2009), social legitimacy is a potential complement for EO in pursuit of opportunities as it can attract crucial resources (Wiklund and Shepherd, 2005; Zimmerman and Zeitz, 2002). In addition, we identify firms' ownership type as another potential institutional contextual moderator that is especially important in emerging markets. Ownership is a valid and widely considered predictor of organizational outcomes in emerging markets (Peng et al., 2004; Tan, 2002). That is, state-owned enterprises (SOEs) and non-SOEs demonstrate quite different strategic decisions, behaviors and performance due to their distinctive institutional identities (Peng and Luo, 2000; Hua et al., 2006). Thus, we compare how the impact of EO on green management differs between SOEs and non-SOEs in China.

Furthermore, in contrast to the extant studies, which predominantly focus on the main-effect approach or the two-way interaction effect on green management (e.g., Ortiz-de-Mandojana et al., 2019; Huang et al., 2021), we adopt a configurational approach to examine a three-way interaction (i.e., EO, social legitimacy, and ownership type) to explore how these factors cluster together to better explain green management. As a firm is configured on multiple dimensions rather than only two, the configurational approach is more conducive to deeply understanding corporate outcomes (Liu et al., 2017) such as how EO affects firm performance (Stam and Elfring, 2008; Wiklund and Shepherd, 2005). This study represents one of the earliest efforts applying a configurational approach in the research field of green management.

In summary, based on the EO literature and institutional theory as well as the configurational approach, this study addresses three research questions: first, what is the relationship between EO and green management for emerging market firms? Second, what are the boundary conditions of the relationship between EO and green management in the specific context of an emerging economy? Our model explores the moderating roles of both social legitimacy and firm ownership type. Third, what is the configurational effect of EO, social legitimacy, and ownership type on the adoption of emerging market firms' green management? Empirically, we construct a 7-point Likert scale and adopt a face-to-face interview-assisted on-site survey method to collect first-hand data from 239 Chinese firms in 21 provinces. Hierarchical moderated regression analysis and subgroup analysis are used to test our hypotheses.

The remainder of the paper is structured as follows. Section 2 presents the theoretical background and develops our theoretical hypotheses, and section 3 provides the empirical tests. The implications and limitations of this study are discussed in the final section.

2. Theory and hypotheses development

2.1. Entrepreneurial orientation and green management in emerging economies

With the current, increasingly severe environmental problems, green management is inevitably becoming one of the most important strategic decisions for firms in both developed countries and emerging markets. The core idea of green management is to protect natural resources as well as the natural environment and to enhance operational effectiveness in resource and energy consumption (Chabowski et al., 2011). Green management practices often include green manufacturing, green design, green marketing, and the integration of green factors into firms' strategic goals (Lee, 2009). Green management generally involves socially complicated processes, long-term investment, and outcome uncertainty, which make it quite different from traditional management. For example, implementing environmental standards requires a substantial investment in relevant environmental technologies and processes, especially in the initial stage (Aguilera-Caracuel et al., 2012). Nevertheless, firms continue to pursue green management for various reasons.

Grounded in institutional theory or stakeholder theory, several studies have acknowledged that firms' green management practices are shaped by coercive, normative, and mimetic pressures (e.g., Chen et al., 2018; Suk et al., 2013). For example, firms frequently engage in green innovation to avoid economic costs as well as the political costs imposed by coercive pressure (Menguc et al., 2010). Normative pressure, which includes social norms and moral standards, guides firms to take green innovative actions to meet different stakeholders' expectations (Bansal and Clelland, 2004). In addition, mimetic pressure from competitors often motivates industrial companies to take energy saving actions (Suk et al., 2013). Pressures exerted by different stakeholders, such as regulative institutions (Murovec et al., 2012), stockholders (Qi et al., 2013), suppliers (Shah, 2011), consumers (Zhang and Zhu, 2019), communities (Schaltenbrand et al., 2016), NGOs (Shah, 2011), and the public (Kang and He, 2018), have also been proposed to separately or jointly explain why firms choose to "go green".

The RBV also provides a compelling perspective to examine how internal resources and capabilities drive green management. Firms' green initiatives require the accumulation, allocation, and complex coordination of various resources (Nath and Ramanathan, 2016). Specifically, firms with abundant financial resources, technical resources, and human resources tend to invest in green projects without expectation of instant economic returns (Jabbour et al., 2013; Jiang et al., 2020; Schaltenbrand et al., 2016). Social capital promotes the implementation of green management through the search and acquisition of necessary resources (Liao, 2018). International experience and organizational learning capability help firms develop a series of best green management practices to deal with environmental regulations (Aguilera-Caracuel et al., 2012). Dynamic capability and strategic flexibility are also drivers of green management because they can allocate and reconfigure resources rapidly, flexibly and effectively to adapt to external changes (Yang et al., 2015; Zhou et al., 2018).

Despite their influences, the abovementioned leading viewpoints have limitations. The former perspective predominantly treats firms' green management as a defensive mechanism, thus failing to explain why firms respond quite heterogeneously to external pressures in terms of environmentalism (Kang and He, 2018) or why some firms pursue green practices even before stakeholders exert pressure on them (Zhou et al., 2018). The latter is based on the premise that firms lacking resources will engage less in green management initiatives. This cannot account for why firms without abundant resources have differentiated actions. Recent studies that are complementary to the institutional framework and the RBV have explored how CEOs' time perspective (Ortiz-de-Mandojana et al., 2019), managerial interpretations (Sharma, 2000), top managerial mindsets (Liu et al., 2015), and organizational

design (Sharma, 2009) impact firms' decision making on green management. Along these lines, we suggest EO as a potential driver of green management in the specific context of emerging markets.

In particular, there are two salient differences in firms' green management between developed countries and emerging markets, such as China. First, the stringency of policy regulations and public participation with regard to environmentalism in emerging markets are significantly lower than those in developed countries (Kang and He, 2018). For example, many young managers in Germany, Switzerland and Austria stated that they would leave a company if they did not feel that their employer expected them to actively engage in environmental protection activities (Einsmann, 1992), which is not often the case in emerging markets. In China, although environmental protection regulations have become more stringent than they have been, there are still plenty of unclear legal provisions, law enforcement problems, and unclear industry standards (Puffer et al., 2010; Sheng et al., 2011). Second, firms in developed countries tend to be greener after their businesses gain competitive advantages and accumulate needed resources (Sharma, 2000), yet firms in emerging markets usually have limited resources and underdeveloped capabilities. These internal and external uncertainties provide both opportunities and challenges for emerging market firms, thus obscuring the relationship between firms' green management and the antecedents that have been explored in the context of developed countries.

Here, we seek to elucidate the critical role of EO in the adoption of green management in the context of emerging markets. The EO concept stems from Danny Miller's intriguing idea that "an entrepreneurial firm is one that engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with 'proactive' innovations, beating competitors to the punch" (Miller, 1983, p. 771). As an organizational-level concept, EO focuses on gaining competitive advantage principally through innovative, proactive and risk-taking behaviors (Li et al., 2011). Specifically, innovativeness refers to "a firm's tendency to engage in and support new ideas, novelty, experimentation, and creative process that may result in new products/services" (Lumpkin and Dess, 1996, p.142). Proactiveness involves "taking the initiative in an effort to shape the environment to one's own advantages" (Lumpkin and Dess, 1996, p.147). Another distinct dimension yet closely related to proactiveness is competitive aggressiveness, referring to "how firms relate to competitors, that is, how firms respond to trends and demand that already exist in the marketplace" (Lumpkin and Dess, 1996, p.147). Risk-taking refers to "the degree to which managers are willing to make large and risky resource commitments" (Miller and Friesen, 1982, p. 923).

A large part of the EO literature focuses on the relationship between EO and firm performance (e.g., Stam and Elfring, 2008; Wang et al., 2017; Wiklund and Shepherd, 2005). An interesting but less mentioned issue is the role of EO in firm green management. One notable exception is Menguc and colleagues' (2010) research suggesting that a firm's EO may contribute to a proactive environmental strategy since "the proclivity of top management to support natural environmental issues is enhanced when an entrepreneurial orientation is pervasive in the organization" (p.285). However, their arguments and empirical tests are conducted in the context of developed countries only. In short, a detailed analysis of why and how EO affects the green management of emerging market firms is still missing.

We expect that a positive relationship exists between EO and a firm's green management in emerging markets such as China for the following reasons: first, EO emphasizes opportunity seeking given the "the scanning aspect of proactiveness" (Lumpkin and Dess, 1996, p.148), and being green has become a new trend in emerging markets. In these places, governments and the public are paying increasing attention to green products and green production. This provides both opportunities and threats to firms. When firms have high EO, managers are more inclined to perceive ongoing environmental issues as an opportunity instead of a threat (Sharma, 2000; Wang et al., 2017), leading to a high likelihood of engaging in green management activities as a strategy for pursuing opportunities. Moreover, firms undertaking proactive green practices have a higher chance of obtaining first-mover advantages because green management in emerging markets is still in an exploratory stage (He et al., 2019; Wiklund and Shepherd, 2005).

Second, EO is often characterized by more risk taking, which is also important when engaging in green management. Some of the leading green technologies (e.g., photovoltaic energy and hydrogen fuel cells) are far from mature, and the formulation of green regulations and standards is still evolving and undergoing constant changes, especially in emerging markets such as China. As such, firms making early attempts to adopt green practices must bear considerable long-term investment and high levels of outcome- and process uncertainty (Aragón-Correa, 1998; Etzion, 2007; Yu et al., 2009). Hence, firms with high EO may have a higher intention to engage in risky green practices.

Third, firms with high EO are more adaptable to new competitive strategies because they have developed the abilities required for changing and adapting. These abilities include continuous learning, innovation and experimentation (Jennings and Zandbergen, 1995; Wang, 2008). The skillful application of these capabilities helps firms overcome path dependence, redefine their existing strategies and practices, and reconfigure their structures and routines to implement new green management practices (Zhou and Wu, 2010). In addition, the innovative allocation of resources by such high-EO firms can promote the integration of green practices into their daily operation (Lee, 2009; Lin and Ho, 2011). Collectively, the proactiveness, risk-taking, and innovativeness dimensions of EO help emerging market firms adopt green management practices. Therefore, we first propose the following as our baseline hypothesis:

Hypothesis 1. EO is positively related to the green management practices of emerging market firms.

2.2. The moderating role of social legitimacy

Social legitimacy refers to the "generalized perception or assumption that the actions of an entity are desirable, proper or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (Suchman, 1995, p.574). Social legitimacy is rooted in many theories, among which institutional theory is widely acknowledged as the most important (Suchman, 1995). Institutional theory focuses on the interplay between organizations and institutions (Scott, 1995). Organizations must conform to various institutional requirements and gain social legitimacy. In the domain of entrepreneurship, legitimacy is usually considered with the integration of opportunities (Wang et al., 2017) because it helps firms obtain the resources and capabilities that are necessary to identify and realize new opportunities (Covin and Slevin, 1989; Wiklund and Shepherd, 2005).

The importance of social legitimacy is especially notable in emerging markets such as China. On the one hand, firms in emerging markets usually have neither enough resource bases internally nor a stable resource market externally (Peng, 2003; Rettab et al., 2009). Social legitimacy is an important conduit for the acquisition of resources. On the other hand, after years of economic growth based on resource consumption and environmental destruction, stakeholders in emerging markets increasingly emphasize firms' noneconomic responsibilities (Yang et al., 2015). This has created both pressures and opportunities for firms with high levels of social legitimacy. Thus, it is meaningful to investigate how social legitimacy influences emerging market firms in adopting and implementing green management. Based on three institutional pillars (regulative, normative and cultural-cognitive) identified by Scott (1995), we suggest that social legitimacy may positively moderate the relationship between EO and green management for the following reasons.

By conforming to the regulative aspects of institutions, firms can gain regulative legitimacy. Firms with high regulative legitimacy can benefit

from endorsements and approval from governments and other authorities (Wang et al., 2017), which are very beneficial in the identification and implementation of green opportunities in emerging markets. On the one hand, regulative legitimacy supplies firms with useful information ahead of other competitors and thus helps those firms realize the value of proactiveness in grasping green opportunities. The availability of information can also reduce the uncertainty of engaging in green management initiatives. On the other hand, regulative legitimacy can also leave firms with disproportionately scarce resources with which to exploit green opportunities such as government subsidies (Hung et al., 2015), tax benefits (Chen et al., 2011), bank loans (Dinç, 2005), new entry certification, and standard-setting rights.

By conforming to the normative aspects of institutions, firms can gain normative legitimacy. Firms with high normative legitimacy must consider the social norms arising from various social constituencies by presenting an image emphasizing social welfare, interests, and values (Wang and Bansal, 2012). Normative legitimacy signals a good public image and social trustworthiness, which helps firms build good relationships with key stakeholders (Fombrun et al., 2000). In this way, normative legitimacy can serve as a tool to acquire resources and specific knowledge (Wiklund and Shepherd, 2005). As the markets of green products are often far from mature, firms not only need plenty of resources to conduct research and experimentation but also require key stakeholders' acceptance of their green attempts and products. Meanwhile, environmental improvement often requires several parties, or even a whole industry, to work collaboratively (Einsmann, 1992). Good relationships with key stakeholders are essential to mobilize other organizations in combined green efforts with the focal company. Overall, normative legitimacy can defend firms with high EO from a high risk of failure in pursuit of green opportunities (Lumpkin and Lichtenstein, 2005).

By conforming to the cultural-cognitive aspects of institutions, firms can gain cognitive legitimacy. Cognitive legitimacy involves the adoption of culturally supported and assumed symbols, signs, words, habits, values, and rules (DiMaggio and Powell, 1983), usually in an unconscious way (Grewal and Dharwadkar, 2002). One mechanism through which cognitive legitimacy functions in the pursuit of green opportunities is a shared organizational culture and conceptual basis in the development of green management. By communicating an environmentally friendly culture with employees and other stakeholders, firms with high EO can attract talented employment-seekers devoted to green careers (Wang et al., 2017) and thus improve their capability to identify and exploit green opportunities. Such efforts may also signal firms' commitment and good performance prospects in terms of their green practices, thereby attracting potential investors and other necessary resources. Thus, our second hypothesis is as follows:

Hypothesis 2. Social legitimacy will strengthen the positive relationship between EO and green management practices for emerging market firms.

2.3. The moderating role of ownership type

In addition to the use of social legitimacy-building tactics to address the challenges of engaging in green management, the coexistence of SOEs and non-SOEs is another significant institutional feature of emerging markets such as China. SOEs are characterized as being highly controlled by governments and enjoying various political privileges (Bruton et al., 2000). Non-SOEs receive less support from the government than SOEs, which means that non-SOEs are less able to acquire institutional resources and often face much fiercer market competition without specific institutional protection (Tang and Tang, 2010). Due to these differences, previous studies have revealed that EO is more positively associated with performance for SOEs than for non-SOEs (Tang et al., 2007). Thus, ownership type has the potential to influence the effectiveness of EO in facilitating green management.

Specifically, we suggest that with high EO, SOEs may prefer engaging in green initiatives more than non-SOEs do. On the one hand, SOEs have a stronger motivation to choose green opportunities. Such firms are not directly affected by the discipline of the market, and the decisions of whether to shut down the firm or replace managers are determined mainly by politicians rather than the market (Li et al., 2013; Megginson and Netter, 2001). Due to their institutional identity, SOEs often have multiple objectives and are expected to realize both economic and noneconomic goals such as raising the level of social welfare (Liao et al., 2018). Thus, pursuing green opportunities helps SOEs improve their image from the perspective of politicians regardless of whether their efforts achieve positive or negative economic returns. In addition, the soft budgets enjoyed by SOEs make environmental issues more like opportunities than threats and facilitate related research and experimentation. Unlike SOEs, non-SOEs constantly face both market competition and capital market inspection. They must employ their resources as efficiently as possible; otherwise, their capital may be withdrawn or reallocated (internally or externally), and their company may be taken over or shut down (Stiglitz, 1988). Therefore, green opportunities that are far from mature and still remain in the gray zone of laws and legislation are not actively considered by non-SOEs.

On the other hand, SOEs have greater capabilities to choose green opportunities. SOEs' natural political connections can bring them the latest information and the needed resources for exploring and exploiting green opportunities (Liao et al., 2018). For example, EO is shown to be more effective for SOEs due to their easy access to human and financial resources (Tang et al., 2007). In contrast, despite the ongoing reform, non-SOEs still suffer a certain level of discrimination in obtaining access to political information, financing, government subsidies, and other resources (Ding et al., 2007; Guo et al., 2018). The resource-constrained environment makes green opportunities a lower priority for non-SOEs. Similarly, Liao et al. (2018) empirically found that the relationship between female directors and environmental innovation is stronger for SOEs than for non-SOEs because SOEs can acquire the needed resources more easily to support female directors' environmental innovation decisions. Therefore, we propose the third hypothesis as follows:

Hypothesis 3. The positive relationship between EO and the green management practices of emerging market firms is stronger for SOEs than for non-SOEs.

2.4. The configuration of entrepreneurial orientation, social legitimacy, and ownership type

Hypothesis 2 proposes a moderating role of social legitimacy while Hypothesis 3 suggests a moderating role of ownership type. Furthermore, we will investigate the relationship among all these constructs from a configurational perspective. Configurational studies can be used to examine a set of firms sharing common key variables (Geiger et al., 2019) and are more conducive to deeply understanding corporate outcomes (Liu et al., 2017).

In particular, we suggest that the link between EO and green management is stronger for SOEs with high social legitimacy than for firms with other configurations for the following reasons. The identity of SOEs enhances their social legitimacy value. SOEs can verify the information received from other stakeholders with information received from the government, thereby obtaining access to cutting-edge and high-quality information that benefits the pursuit of green opportunities (Gao et al., 2008). Additionally, with similar levels of social legitimacy, SOEs appear to be more trustworthy than non-SOEs to resource providers (for instance, banks and other financial institutions) due to the endorsement of the government. Thus, for SOEs with high social legitimacy, EO can be more easily translated into green attempts through the acquisition of resources and information from governments and other stakeholders (Li et al., 2019; Tan and Peng, 2003).

In turn, social legitimacy enhances the pressure on SOEs to take part

in green management practices. With high social legitimacy, SOEs must not only meet the requirements of politicians but also demonstrate their congruence with social norms and the expectations of other social constituencies. Therefore, these firms are more likely to engage in green efforts while introducing entrepreneurial activities. In summary, the configuration of high EO, high social legitimacy, and status as an SOE appears to be related to a high level of green management.

Other configurations of EO, social legitimacy and ownership type are less effective. SOEs with low social legitimacy may treat being green as an option rather than an obligation. Their managers may be concerned about only the demands of local governments and serving politicians with their entrepreneurial activities, which does not necessarily lead to green management. Non-SOEs with high social legitimacy may prefer other market opportunities to green ones. These firms can acquire information and resources more easily than non-SOEs with low legitimacy, yet such acquisition is still more difficult for them than for SOEs. Without actual support from governments, they lack the source of precise policy messages and soft budgets to arbitrarily conduct green research and experiments. They are more likely to endeavor to allocate their precious resources, time and energy as rewardingly as possible. For non-SOEs with low social legitimacy, without the resources and pressure brought by ownership and legitimacy, the potential value of green opportunities is often ignored. Such firms treat survival as their primary goal (Carr et al., 2010) and may change or respond to marginal market opportunities (Wiklund and Shepherd, 2005) instead of being environmentally responsible. Thus, we propose the fourth hypothesis as follows:

Hypothesis 4. The link between EO and green management is stronger for SOEs with high social legitimacy than for other configurations.

3. Method

3.1. Data collection

We use a unique first-hand collected data set (the sample size is 239) in China in 2012 to test our hypotheses. In the Chinese context, a series of environment-related laws and policies have been carried out since the 1990s, and not until 2014 did the level of policy regulation and implementation for environmental protection become more stringent. In fact, China amended the Environmental Protection Law in 2014 to further enhance the awareness of local governments and firms of the importance of environmental issues and to encourage them to improve their green conditions by adopting various green management practices (Liu and Ye, 2012; Shu et al., 2016). Thus, green data collected before 2014 can better show the central role of EO in the process of making green management decisions.

To collect high-quality data, we conducted a face-to-face interview-assisted on-site survey. While this type of survey is much more costly than traditional surveys conducted by mail, email or telephone, it can obtain a higher response rate and ensure that the survey is more understandable to respondents. The questionnaire was originally designed in English based on the existing literature and was then translated into Chinese with the assistance of PhD students who are competent in both languages. A pilot test with managers of 10 local firms was conducted to ensure that each item could be accurately understood. To reduce social desirability bias, we ensured that our item descriptions were phrased to be neutral, and we assured the respondents of the confidentiality of their responses and that their responses would be used only in the aggregated analysis.

A three-stage process was performed to collect the final data. First, 21 out of 34 Chinese provinces were chosen, and a list of 1000 firms was randomly chosen from the local yellow pages of these provinces. Second, our research team contacted the managers of the chosen firms to determine their willingness to participate in the research; among those firms, 530 agreed to participate. Third, well-trained research assistants were sent to the firms to conduct the on-site survey. Finally, 308 questionnaires were returned. After omitting questionnaires with excessive missing data, we obtained 239 firms as our final sample size (response rate = 23.9%). You may see the profiles of the survey sample in Table 1.

We ensured that our respondents were sufficiently knowledgeable about their firms' decision making as all of our on-site respondents were high-ranked managers such as CEOs, COOs, and divisional managers. We also used a *t*-test to compare the firms that participated and the firms that did not participate and found that there was no significant nonresponse bias. Additionally, Harman's (1976) single-factor test was performed. No single factor accounted for most of the variance; thus, common method variance bias was not a major issue in this study.

3.2. Questionnaire description

A 7-point Likert-scale format was used to measure each of our constructs where "1" indicated strongly disagree and "7" indicated strongly agree. The key measures included in our study were grounded in the extant literature and adopted from prior studies that have been validated by scholars in both Western countries and the Chinese context. The details of the item descriptions are presented in Table 2.

Entrepreneurial orientation (EO). We adopted Wang's (2008) 11-item scale for measuring EO. While the scale most commonly used to measure EO is the Miller/Covin and Slevin scale (Brown et al., 2001; Covin and Slevin, 1989; Miller, 1983), Lumpkin and Dess (1996) found that this approach focused exclusively on the product market and on the technological aspects of EO. We therefore adopted Wang's (2008) 11-item scale, which also adapted two items from Miller and Friesen (1983) and one item from Hurt et al. (1977) to reflect a firm's overall innovativeness. The details of the items are shown in Table 2. Following Wang (2008), we treated EO as a higher-order latent construct that consists of four first-order indicators.

Social legitimacy. To measure the level of firm social legitimacy, we combined Shu et al.'s (2016) scale and Yang et al.'s (2015) scale to capture recognition and acceptance by various types of stakeholders. Shu et al.'s (2016) scale was developed based on Scott (1995) and Suchman (1995) and has only 4 items covering key stakeholders such as the community and the public. Yang et al.'s (2015) scale was developed based on Elsbach (1994) and has 7 items covering critical stakeholders such as peer firms, customers, and various levels of governments. As a more comprehensive measurement, the scale we formed had 9 items, which are shown in Table 2.

Ownership type. The sample was classified into two categories: SOEs and non-SOEs. Non-SOEs include privately owned enterprises, collectively owned enterprises, Sino-foreign joint ventures, foreign-owned

Table 1
Profiles of the survey sample.

Firm Age	Frequency	Firm Size	Frequency
0–3 years	5.86	0-20 people	3.77
3–8 years	19.66	20-300 people	37.65
More than 8 years	74.48	300-1000 people	20.09
		More than 1000 people	38.49
Public-Listed Company	**Frequency**	**Development Stage**	**Frequency**
Yes	25.94	Introduction	1.26
No	74.06	Growth	38.07
		Maturity	57.74
		Recession	2.93
Ownership	**Frequency**	**Industrial Sector**	**Frequency**
State-owned	42.68	Heavy manufacturing	52.72
Privately owned	33.47	Light manufacturing	14.64
Collectively owned	4.18	Construction	1.68
Sino-foreign JV	11.30	Service	30.96
Others	8.37		

Note: Numbers are presented as percentages (%).

Table 2
Key construct measurements.

Construct/Item	α	Loading	CR	AVE
Entrepreneurship Orientation	0.844		0.848	0.584
Market Proactiveness		0.66		
EO1: In general, the top managers of our organization favor a strong emphasis on research & development, technological leadership, and innovations.		0.60		
EO2: In the past 5 years, our organization has marketed a large variety of new lines of products or services.		0.63		
EO3: In the past 5 years, changes in our products or service lines have been mostly of a minor nature. (Reverse coded)		0.66		
Competitive Aggressiveness		0.82		
EO4: In dealing with competitors, our organization often leads the competition, initiating actions to which our competitors have to respond.		0.71		
EO5: In dealing with competitors, our organization typically adopts a very competitive posture aiming at overtaking the competitors.		0.77		
Firm Risk Taking		0.75		
EO6: In general, the top managers of my organization have a strong propensity for high-risk projects (with chances of very high return).		0.61		
EO7: The top managers believe, owing to the nature of the environment, that bold, wide-ranging acts are necessary to achieve our organization objectives.		0.74		
EO8: When there is uncertainty, our organization typically adopts a "wait-and-see" posture in order to minimize the probability of making costly decisions. (Reverse coded)		0.73		
Firm Innovativeness		0.82		
EO9: Management actively responds to the adoption of "new ways of doing things" by main competitors.		0.79		
EO10: We are willing to try new ways of doing things and seek unusual, novel solutions.		0.69		
EO11: We encourage people to think and behave in original and novel ways.		0.69		
(Acquisition of) Social Legitimacy	0.926		0.920	0.563
SL1: What our company has done has been accepted by our peer companies.		0.63		
SL2: What our company has done has been accepted by our customers.		0.60		
SL3: What our company has done has been accepted by the public/community.		0.64		
SL4: What our company has done has been accepted by the local government.		0.84		
SL5: What our company has done has been accepted by the provincial government departments.		0.80		
SL6: What our company has done has been accepted by the market supervision departments, such as industrial and commercial bureaus, tax bureaus, and quality inspection departments.		0.86		
SL7: What our company has done has been accepted by the state-owned financial agencies, such as the state-owned banks.		0.77		
SL8: What our company has done has been accepted by official industry associations.		0.77		
SL9: What our company has done has been accepted by the public stakeholders, such as the consumer association.		0.79		
Green Management	0.893		0.894	0.587
GM1: In the past three years, our company has protected the environment.		0.78		
GM2: In the past three years, our company has respected the natural laws.		0.81		
GM3: In the past three years, our company has maintained an ethical working environment.		0.87		
GM4: In the past three years, our company has utilized resources wisely and responsibly.		0.79		
GM5: In the past three years, our company has economized the usage of raw materials.		0.61		
GM6: In the past three years, our company has recycled our products.		0.71		

Note: α, Cronbach's alpha; CR, composite reliability; AVE, average variance extracted.

enterprises, and others.

Dependent variable: Green management. The level of green management was measured by asking the respondents to assess how well their firms have protected the environment, maintained an ethical working environment, obeyed the laws of nature, recycled their products, economized raw material usage, and utilized resources responsibly. This method of measurement has also been used and validated in studies such as Shu et al. (2016) in the context of China.

Control variables. We also controlled for several variables in the analysis. *Firm size* was measured by the logarithm of the number of employees. Firms were also classified as *public companies* or *not public companies*. *Industrial development stage* was coded as the introduction stage, growth stage, maturity stage or recession stage. *Industry sector* was classified as the heavy manufacturing industry, light manufacturing industry, construction industry, and service industry.

We report the correlations, means, and standard deviations of the constructs in Table 3. There was no correlation coefficient greater than 0.60, showing no potential serious multicollinearity problem. The relationship between EO and green management is significantly positive, providing preliminary evidence to support our hypotheses.

3.3. Reliability and validity test

To test our conceptual model, the collected data were analyzed following a two-stage procedure (Anderson and Gerbing, 1988). We first assessed the reliability and validity of our measurement and then tested the proposed hypotheses using regression techniques.

Regarding the reliability scores for the inter-item consistencies within each construct, all the Cronbach's alphas in this study are above 0.7, as shown in Table 2, thus indicating that the measures are reliable. Alternatively, the composite reliability (CR) values are all greater than 0.7, which further verifies the construct reliability (Bagozzi and Yi, 1988).

We use confirmative factor analysis (CFA) to demonstrate convergent validity and discriminant validity (Anderson and Gerbing, 1988). In particular, following Wang (2008), we show EO's first-order loadings and second-order loadings. As Table 2 shows, all factor loadings on their corresponding items are above 0.6 (Fornell and Larcker, 1981). The measurement model of CFA (fit indexes: $\chi^2/df = 2.50$, RMSEA = 0.079, CFI = 0.932, TLI = 0.918, SRMR = 0.061) indicates acceptable levels of fitness between each construct and its related items. The coefficients and related *t*-values for each path show that all the items are significantly related to their theoretical construct, indicating sufficient convergent validity.

Convergent validity can also be illustrated by the average variance extracted (AVE) from the latent variables. Table 2 shows that the AVE values are all greater than 0.5, showing that each latent variable has good convergent validity. Moreover, Table 3 shows that none of the correlations between each pair of constructs is higher than the square

Table 3
Correlations and discriminant validity.

Variable	Mean	SD	1	2	3	4	5	6	7
1. Green management	5.30	0.938	0.766						
2. EO	4.74	0.932	0.446**	**0.765**					
3. Social legitimacy	5.11	0.893	0.559**	0.595**	**0.751**				
4. Ownership	1.43	0.496	−0.069	−0.088	−0.017				
5. Firm size	2.74	0.815	0.061	0.091	0.213**	0.263**			
6. Public company	1.74	0.439	−0.056	−0.083	−0.084	−0.146*	−0.360**		
7. Development stage	2.62	0.565	−0.111	−0.082	−0.119	0.171**	0.167**	−0.091	
8. Industrial sector	2.11	1.333	−0.008	0.106	−0.001	−0.077	−0.246**	−0.009	−0.129*

Note: **$p < 0.01$, *$p < 0.05$; N = 239; the data on the diagonal line in bold are the square root of AVE.

root of AVE corresponding to the focal construct, indicating sufficient discriminant validity. Overall, all these results suggest that the constructs exhibit appropriate psychometric properties, and our measurement model fits well with the data.

3.4. Regression results

We used hierarchical moderated regression analysis to test our hypotheses (Stam and Elfring, 2008). First, we examined the variance inflation factor (VIF) for all the regression models. The maximum VIF is 1.77. Since the VIF values are all below 10, multicollinearity was not a problem in this study. Then, we used hierarchical multiple regression analysis to examine the above hypotheses. Table 4 shows the results of the regressions with green management as the dependent variable.

In model 2, the coefficient of EO is 0.238 ($p < 0.001$), showing that EO has a positive and significant influence on emerging market firms' green management. Hypothesis 1 is thus supported. In model 3, the coefficient of the interaction between EO and social legitimacy is 0.170 ($p < 0.01$). The coefficient of the interaction between EO and ownership type is 0.215 ($p < 0.001$). The coefficient of the configuration among EO, social legitimacy and ownership type is −0.118 ($p > 0.10$). These results provide empirical support for the two-way interactions (Hypotheses 2 and 3) but not for the three-way configuration model (Hypothesis 4).

We also perform a subgroup analysis, separating our sample into SOEs and non-SOEs. Table 5 shows the results. Model 5 and model 8 indicate that EO ($\beta = 0.261$, $p < 0.05$; $\beta = 0.233$, $p > 0.10$) facilitates only SOEs in taking green actions. This is consistent with the argument of Hypothesis 2. Model 6 and model 9 suggest that with high EO and high social legitimacy, both SOEs and non-SOEs are willing to adopt green management. A *t*-test shows that the three-way configuration effect is more significant in the group of SOEs. Hypothesis 4 is thus partly supported.

Table 4
Regression results.

Variable	Model 1	Model 2	Model 3
Firm size	0.246***(0.071)	0.178***(0.051)	0.191***(0.054)
Public company	0.001(0.058)	0.002(0.037)	0.011(0.040)
Development stage	−0.188**(0.101)	−0.040(0.091)	−0.021(0.103)
Industrial sector	−0.087(0.180)	−0.036(0.081)	−0.026(0.088)
EO		0.238***(0.081)	0.266***(0.099)
Social legitimacy (SL)		0.475***(0.074)	0.458***(0.097)
Ownership		0.022(0.038)	0.003(0.051)
EO × SL			0.170**(0.098)
EO × Ownership			0.215***(0.092)
SL × Ownership			0.050(0.128)
EO × SL × Ownership			−0.118(0.151)
R^2	0.102	0.441	0.469
Adjusted R^2	0.050	0.389	0.378
F value	1.966*	8.589***	5.124***

Note: N = 239; ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$, $^{\dagger}p < 0.10$; Standard errors in parentheses.

3.5. Robustness test

We further examine how each dimension of EO affects green management in emerging markets. In the main analyses above, we use the aggregated index of four dimensions for measuring EO. Testing the relationship between each dimension of EO and emerging market firms' green initiatives is useful to validate the robustness of our findings. As indicated in Table 6, the results using each dimension of EO appear similar to the original results shown in Table 4, with proactiveness and innovativeness showing significantly positive relationship with emerging market firms' green management ($\beta = 0.196$, $p < 0.001$; $\beta = 0.225$, $p < 0.001$).

4. Discussion

4.1. Theoretical contributions

Our study contributes to the green management literature in the following ways. First, we explore a new perspective (i.e., the integration of an entrepreneurial approach and institutional theory) to explain why firms make differentiated green decisions in emerging markets. The driving forces of green practices in emerging markets can be different from those in developed countries since emerging market firms usually have insufficient resources and operate in a turbulent and complex environment with institutional deficiencies (Yang et al., 2015). In the current study, we highlight that the integrated logics of an entrepreneurial approach and institutional theory are suitable to further advance our understanding of the ongoing transformation towards environmentally friendly practices in emerging markets. More concretely, emerging market firms with an entrepreneurial spirit are more likely to interpret ongoing external changes as opportunities instead of threats and to take risks to pursue green opportunities and be more adaptable to new changes. These firms could also leverage their legitimacy and/or ownership type to overcome institutional defects and resource constraints to proactively pursue green opportunities in emerging markets. These findings are complementary to the prior research emphasizing a defensive mechanism (i.e., institutional theory and stakeholder theory) or the resource and capability bases (i.e., RBV) undertaken in developed countries.

Second, based on Wiklund and Shepherd (2005) and other configurational works, the current study is an early effort to incorporate social legitimacy and ownership type into a configuration of how EO influences emerging market firms' green management. The prior research adopts a main-effect or a two-way interaction approach to examine the driving factors of environmental behaviors (e.g., Jiang et al., 2020; Ortiz-de-Mandojana et al., 2019). We propose that the configuration of high legitimacy and state-owned ownership maximizes the contribution of EO to emerging market firms' green management. The multivariate configuration of EO and other important constructs in this study provide a more complete understanding of why firms choose to be greener than that obtained using bivariate contingency models (Stam, 2008).

Our study also enriches the current EO literature by revealing the role of EO in firms' environmental-based CSR. The previous studies have

Table 5
Subgroup analysis (SOEs vs. non-SOEs).

	SOEs ($N = 102$)			Non-SOEs ($N = 137$)		
Variable	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Firm size	0.399***(0.095)	0.111(0.090)	0.150**(0.084)	0.244***(0.106)	0.213***(0.091)	0.219***(0.093)
Public company	0.163(0.115)	0.040(0.067)	0.011(0.068)	0.112(0.085)	0.025(0.060)	0.005(0.062)
Development stage	−0.370*(0.178)	−0.258*(0.138)	−0.254*(0.132)	−0.268(0.245)	0.077(0.136)	0.091(0.145)
Industrial sector	0.160(0.235)	−0.121(0.124)	−0.095(0.111)	−0.165(0.213)	−0.048(0.139)	−0.045(0.136)
EO		0.261*(0.137)	0.247(0.171)		0.233(0.169)	0.228(0.183)
Social legitimacy (SL)		0.538***(0.123)	0.533***(0.170)		0.500***(0.125)	0.474***(0.139)
EO × SL			0.329***(0.113)			0.224**(0.113)
R^2	0.266	0.600	0.669	0.179	0.439	0.468
Adjusted R^2	0.177	0.519	0.560	0.100	0.353	0.370
F value	2.972**	7.401***	6.132***	2.253**	5.123***	4.809***

Note: ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$, $^{\dagger}p < 0.10$; Standard errors in parentheses.

Table 6
Robustness test.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Firm size	0.246***	0.169***	0.186***	0.172***	0.170***
	(0.071)	(0.052)	(0.052)	(0.052)	(0.052)
Public company	0.001	0.011	0.012	0.020	0.011
	(0.058)	(0.036)	(0.038)	(0.037)	(0.035)
Development stage	−0.188**	−0.037	−0.075	−0.056	−0.068
	(0.101)	(0.093)	(0.093)	(0.097)	(0.098)
Industrial sector	−0.087	−0.001	−0.002	−0.026	−0.030
	(0.180)	(0.085)	(0.083)	(0.081)	(0.078)
Social legitimacy		0.513***	0.517***	0.552***	0.475***
		(0.061)	(0.076)	(0.079)	(0.072)
Ownership		0.034	0.017	0.039	0.022
		(0.041)	(0.041)	(0.043)	(0.037)
Proactiveness		0.196***			
		(0.072)			
Aggressiveness			0.183		
			(0.137)		
Risk Taking				0.110	
				(0.153)	
Innovativeness					0.225***
					(0.076)
R^2	0.102	0.434	0.430	0.416	0.439
Adjusted R^2	0.050	0.380	0.380	0.336	0.385
F value	1.966*	7.933***	8.692***	8.218***	8.083***

Note: N = 239; ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$, $^{\dagger}p < 0.10$; Standard errors in parentheses.

predominantly examined how EO affects corporate performance (e.g., Covin and Miller, 2014; see Rauch et al., 2009 as a summary). Few researchers have given adequate attention to the link between EO and other corporate economic outcomes such as information acquisition (Keh et al., 2007), knowledge creation (Li et al., 2009), and exploratory innovation (Kollman and Stockmann, 2014). In contrast, our findings suggest that EO is useful to both business ethics and economic outcomes. In addition, the complementary role of legitimacy (e.g., Guo et al., 2014; Wang et al., 2017) or ownership type (e.g., Tang et al., 2017) to EO, which is emphasized in the growth of new ventures, is extended to the research field of green management.

Finally, our study contributes to institutional theory by demonstrating a new value-creation mechanism of social legitimacy. It is widely acknowledged that legitimacy has a positive impact on organizational survival (Delmar and Shane, 2004), yet whether and how legitimacy influences other performance aspects is relatively less known (e.g., Wang et al., 2017). We argue that social legitimacy can act as a conduit of resource acquisition and capability development to assist green opportunity identification and exploitation for emerging market firms. This not only explicates a new mechanism through which social legitimacy can generate returns but also represents a "manipulative" strategic response to institutional processes with regard to environmental improvement (Oliver, 1991).

4.2. Practical implications

Our findings have several management implications. First, firms in emerging markets, such as China, need to realize that EO may enable them to pursue green opportunities and gain potential first-mover advantages. They should develop a certain level of EO to proactively deal with fast-changing environmental conditions that moves toward environmental protection (Wiklund and Shepherd, 2005).

Second, top management teams, especially in non-SOEs, need to learn how to leverage the synergistic effect between EO and legitimacy-building strategies to support their green practices. In the process of pursuing green opportunities, critical resources can be acquired through the flexible use of social legitimacy. For SOEs that already enjoy institutional benefits rooted in their ownership structures, appropriate social legitimacy tactics should be skillfully adopted to further facilitate the process of becoming greener.

Moreover, this study has implications for policy makers in emerging countries such as China. Policy makers should design specific mechanisms to identify enterprises that can take the lead in adopting green measures in their industries and launch appropriate policies encouraging those proactive firms to take green actions and realize green knowledge spillovers. This will support the development of a good ecological-sustainability culture to a greater extent (Blundel et al., 2013; Parry, 2012), which can be beneficial for both firms and society.

4.3. Limitations and future directions

There are several limitations to be noted that also provide directions for future studies. First, caution is needed in generalizing our study to other countries because of contextual specificity. There are reasons to believe that firms in other emerging markets may experience similar circumstances, such as institutional constraints, yet Chinese policies, social expectations, and culture-based norms do have some uniqueness. Thus, the future extension of the research setting to the multicountry context would further enhance the understanding of the issue at a broader level.

Second, a cross-sectional research design cannot establish the causality argument or avoid endogeneity problems. We suggest that future research use panel data or longitudinal designs to better capture causal relationships and address potential endogeneity problems. Specifically, a DID analysis could be conducted to explore possible differences before and after the amendment of the Environmental Protection Law in 2014. It would be very interesting to examine how the interaction of EO and its complementary factors evolves over time to create a more effective and dynamic condition to drive a firm's green transformation.

Third, we did not examine the heterogeneous effects brought by different kinds of social legitimacy (Aldrich and Fiol, 1994; Nowacki and Monk, 2020). Firms need to obtain recognition from various stakeholders, such as governments, customers, and financial agencies, which can help them access different types of resources. A direction that

deserves more attention would be to examine whether and how different types of legitimacy differ in driving firms' green efforts directly and indirectly.

5. Conclusion

Based on the theoretical development and empirical tests, several revealing conclusions can be drawn from this study. First, firms in emerging economies are more likely to take green actions with a higher entrepreneurial spirit. These high EO firms are more inclined to perceive ongoing environmental issues as opportunities instead of threats, take risks to pursue green opportunities and be more adaptable to change. Second, entrepreneurial firms in an emerging economy with a high level of social legitimacy can acquire various types of resources from external stakeholders to explore and exploit green opportunities; thus, social legitimacy positively moderates the relationship between EO and green management. Third, with high EO, emerging market SOEs are more likely to take green initiatives than non-SOEs because they are expected to realize more noneconomic goals and enjoy a soft budget to engage in green R&D without serious concerns about instant economic returns. Fourth, the configuration of high EO, high social legitimacy, and SOE status is more effective in facilitating green management than other configurations. This kind of firm can most easily translate its EO into green attempts by acquiring resources and information from both the government and other stakeholders and bearing the highest social expectation to undertake environmental responsibility.

CRediT authorship contribution statement

Xi Li: Writing – original draft, preparation, Software. **Jing Yang:** Conceptualization, Data collection. **Heng Liu:** Methodology, Writing – review & editing. **Xinyu Zhuang:** Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

Aguilera-Caracuel, J., Hurtado-Torres, N.E., Aragon-Correa, J.A., 2012. Does international experience help firms to be green? A knowledge-based view of how international experience and organisational learning influence proactive environmental strategies. Int. Bus. Rev. 21 (5), 847–861.
Aldrich, H.E., Fiol, C.M., 1994. Fools rush in? The institutional context of industry creation. Acad. Manag. Rev. 19 (4), 645–670.
Anderson, J.C., Gerbing, D.W., 1988. Structural equation modeling in practice: a review and recommended two-step approach. Psychol. Bull. 103 (3), 411–423.
Aragón-Correa, J.A., 1998. Strategic proactivity and firm approach to the natural environment. Acad. Manag. J. 41 (5), 556–567.
Bagozzi, R.P., Yi, Y., 1988. On the evaluation of structural equation models. J. Acad. Market. Sci. 16 (1), 74–94.
Berchicci, L., King, A., 2007. Postcards from the edge: a review of the business and environment literature. Acad. Manag. Ann. 1 (1), 513–547.
Blundel, R., Monaghan, A., Thomas, C., 2013. SMEs and environmental responsibility: a policy perspective. Bus. Ethics Eur. Rev. 22 (3), 246–262.
Brown, T.E., Davidsson, P., Wiklund, J., 2001. An operationalization of Stevenson's conceptualization of entrepreneurship as opportunity-based firm behavior. Strat. Manag. J. 22 (10), 953–968.
Bruton, G.D., Lan, H., Lu, Y., 2000. China's township and village enterprises: kelon's competitive edge. Acad. Manag. Perspect. 14 (1), 19–27.
Carr, J.C., Haggard, K.S., Hmieleski, K.M., Zahra, S.A., 2010. A study of the moderating effects of firm age at internationalization on firm survival and short-term growth. Strat. Entrepren. J. 4 (2), 183–192.
Chabowski, B.R., Mena, J.A., Gonzalez-Padron, T.L., 2011. The structure of sustainability research in marketing, 1958-2008. J. Acad. Market. Sci. 39 (1), 55–70.
Chen, X., Yi, N., Zhang, L., Li, D., 2018. Does institutional pressure foster corporate green innovation? evidence from China's top 100 companies. J. Clean. Prod. 188, 304–311.
Covin, J.G., Miller, D., 2014. International entrepreneurial orientation: conceptual considerations, research themes, measurement issues, and future research directions. Enterpren. Theor. Pract. 38 (1), 11–44.
Covin, J.G., Slevin, D.P., 1989. Strategic management of small firms in hostile and benign environments. Strat. Manag. J. 10 (1), 75–87.
Delmar, F., Shane, S., 2004. Legitimating first: organizing activities and the survival of new ventures. J. Bus. Ventur. 19 (3), 385–410.
Ding, Y., Zhang, H., Zhang, J., 2007. Private vs state ownership and earnings management: evidence from Chinese listed companies. Corp. Govern. Int. Rev. 15 (2), 223–238.
Elsbach, K.D., 1994. Managing organizational legitimacy in the California cattle industry: the construction and effectiveness of verbal accounts. Adm. Sci. Q. 39 (1), 57–88.
Einsmann, H., 1992. The environment: an entrepreneurial approach. Long. Range Plan. 25 (4), 22–24.
Etzion, D., 2007. Research on organizations and the natural environment, 1992-present: a review. J. Manag. 33 (4), 637–664.
Fan, F., Lian, H., Liu, X., Wang, X., 2020. Can environmental regulation promote urban green innovation Efficiency? J. Clean. Prod. https://doi.org/10.1016/j.jclepro.2020.125060.
Flammer, C., 2013. Corporate social responsibility and shareholder reaction: the environmental awareness of investors. Acad. Manag. J. 56 (3), 758–781.
Fombrun, C.J., Gardberg, N.A., Barnett, M.L., 2000. Opportunity platforms and safety nets: corporate citizenship and reputational risk. Bus. Soc. Rev. 105 (1), 85–106.
Fornell, C., Larcker, D.F., 1981. Evaluating structural equation models with unobservable variables and measurement error. J. Market. Res. 18 (1), 39–50.
Gao, H., Darroch, J., Mather, D., MacGregor, A., 2008. Signaling corporate strategy in IPO communication: a study of biotechnology IPOs on the NASDAQ. J. Bus. Commun. 45 (1), 3–30.
Geiger, S.W., Marlin, D., Segrest, S.L., 2019. Slack and performance in the hospital industry: a configurational approach. Manag. Decis. 57 (11), 2978–2996.
González-Benito, J., González-Benito, Ó., 2006. A review of determinant factors of environmental proactivity. Bus. Strat. Environ. 15 (2), 87–102.
Guo, H., Tang, J., Su, Z., 2014. To be different, or to be the same? The interactive effect of organizational regulatory legitimacy and entrepreneurial orientation on new venture performance. Asia Pac. J. Manag. 31 (3), 665–685.
Guo, S., Jiang, Z., Shi, H., 2018. The business cycle implications of bank discrimination in China. Econ. Modell. 73, 264–278.
Haden, S.S., Oyler, J.D., Humphreys, J.H., 2009. Historical, practical, and theoretical perspectives on green management: an exploratory analysis. Manag. Decis. 47 (7), 1041–1055.
He, Z., Xu, S., Shen, W., Wang, M., Li, C., 2019. Exploring external and internal pressures on the environmental behavior of paper enterprises in China: a qualitative study. Bus. Strat. Environ. 28, 951–969.
Hofer, C., Cantor, D.E., Dai, J., 2012. The competitive determinants of a firm's environmental management activities. J. Oper. Manag. 30 (1–2), 69–84.
Hua, J., Miesing, P., Li, M., 2006. An empirical taxonomy of SOE governance in transitional China. J. Manag. Govern. 10 (4), 401–433.
Huang, M., Li, M., Liao, Z., 2021. Do politically connected CEOs promote Chinese listed industrial firms' green innovation? the mediating role of external governance environments. J. Clean. Prod. 278 (1) (online).
Hurt, H.T., Joseph, K., Cook, C.D., 1977. Scales for the measurement of innovativeness. Hum. Commun. Res. 4 (1), 58–65.
Jennings, P.D., Zandbergen, P.A., 1995. Ecologically sustainable organizations: an institutional approach. Acad. Manag. Rev. 20 (4), 1015–1052.
Jiang, Y., Asanteb, D., Zhang, J., Cao, M., 2020. The effects of environmental factors on low-carbon innovation strategy: a study of the executive environmental leadership in China. J. Clean. Prod. 266 (online).
Kang, Y., He, X., 2018. Institutional forces and environmental management strategy: moderating effects of environmental orientation and innovation capability. Manag. Organ. Rev. 14 (3), 577–605.
Keh, H.T., Nguyen, T.T.M., Ng, H.P., 2007. The effects of entrepreneurial orientation and marketing information on the performance of SMEs. J. Bus. Ventur. 22 (4), 592–611.
Lee, K.H., 2009. Why and how to adopt green management into business organizations? The case study of Korean SMEs in manufacturing industry. Manag. Decis. 47 (7), 1101–1121.
Li, D., Zheng, M., Cao, C., Chen, X., Ren, S., Huang, M., 2017. The impact of legitimacy pressure and corporate profitability on green innovation. J. Clean. Prod. 141, 41–49.
Li, Q., Li, T., Chen, H., Xiang, E., Ruan, W., 2019. Executives' excess compensation, legitimacy, and environmental information disclosure in Chinese heavily polluting companies: the moderating role of media pressure. *Corp. Soc. Responsib. Environ. Manag.* 26 (1), 248–256.
Li, Q., Luo, W., Wang, Y., Wu, L., 2013. Firm performance, corporate ownership, and corporate social responsibility disclosure in China. Bus. Ethics Eur. Rev. 22 (2), 159–173.
Li, Y.H., Huang, J.W., Tsai, M.T., 2009. Entrepreneurial orientation and firm performance: the role of knowledge creation process. Ind. Market. Manag. 38 (4), 440–449.

Li, Y., Liu, Y., Liu, H., 2011. Co-opetition, distributor's entrepreneurial orientation and manufacturer's knowledge acquisition. J. Oper. Manag. 29 (1–2), 128–142.
Li, Z., Liao, G., Albitar, K., 2020. Does corporate environmental responsibility engagement affect firm value? The mediating role of corporate innovation. Bus. Strat. Environ. 29 (3), 1045–1055.
Liao, Z., 2018. Social capital and firms' environmental innovations: the moderating role of environmental scanning. Bus. Strat. Environ. 27 (8), 1493–1501.
Liao, Z., 2020. Is environmental innovation conducive to corporate financing? The moderating role of advertising expenditures. Bus. Strat. Environ. 29 (3), 954–961.
Liao, Z., Zhang, M., Wang, X., 2018. Do female directors influence firms' environmental innovation? the moderating role of ownership type. Corp. Soc. Responsib. Environ. Manag. 26 (1), 257–263.
Lin, C.Y., Ho, Y.H., 2011. Determinants of green practice adoption for logistics companies in China. J. Bus. Ethics 98 (1), 67–83.
Liu, Y., Guo, J., Chi, N., 2015. The antecedents and performance consequences of proactive environmental strategy: a meta-analytic review of national contingency. Manag. Organ. Rev. 11 (3), 521–557.
Liu, Y., Mezei, J., Kostakos, V., Li, H., 2017. Applying configurational analysis to IS behavioural research: a methodological alternative for modelling combinatorial complexities. Inf. Syst. J. 27 (1), 59–89.
Liu, Y., Ye, H., 2012. The dynamic study on firm's environmental behavior and influencing factors: an adaptive agent-based modeling approach. J. Clean. Prod. 37, 278–287.
Lumpkin, G.T., Dess, G.G., 1996. Clarifying the entrepreneurial orientation construct and linking it to performance. Acad. Manag. Rev. 21 (1), 135–172.
Lumpkin, G.T., Lichtenstein, B.B., 2005. The role of organizational learning in the opportunity–recognition process. Enterpren. Theor. Pract. 29 (4), 451–472.
Megginson, W.L., Netter, J.M., 2001. From state to market: a survey of empirical studies on privatization. J. Econ. Lit. 39 (2), 321–389.
Menguc, B., Auh, S., Ozanne, L., 2010. The interactive effect of internal and external factors on a proactive environmental strategy and its influence on a firm's performance. J. Bus. Ethics 94 (2), 279–298.
Miller, D., 1983. The correlates of entrepreneurship in three types of firms. Manag. Sci. 29 (7), 770–791.
Miller, D., Friesen, P.H., 1982. Innovation in conservative and entrepreneurial firms: two models of strategic momentum. Strat. Manag. J. 3 (1), 1–25.
Miller, D., Friesen, P.H., 1983. Strategy-making and environment: the third link. Strat. Manag. J. 4 (3), 221–235.
Murovec, N., Erker, R.S., Prodan, I., 2012. Determinants of environmental investments: testing the structural model. J. Clean. Prod. 37, 265–277.
Nowacki, C., Monk, A., 2020. Ambidexterity in government: the influence of different types of legitimacy on innovation. Res. Pol. 49 (1) (online).
Oliver, C., 1991. Strategic responses to institutional processes. Acad. Manag. Rev. 16 (1), 145–179.
Orlitzky, M., Schmidt, F.L., Rynes, S.L., 2003. Corporate social and financial performance: a meta-analysis. Organ. Stud. 24 (3), 403–441.
Ortiz-de-Mandojana, N., Bansal, P., Aragón-Correa, J.A., 2019. Older and wiser: how CEOs' time perspective influences long-term investments in environmentally responsible technologies. Br. J. Manag. 30 (1), 134–150.
Parry, S., 2012. Going green: the evolution of micro-business environmental practices. Bus. Ethics Eur. Rev. 21 (2), 220–237.
Peng, M.W., 2003. Institutional transitions and strategic choices. Acad. Manag. Rev. 28 (2), 275–296.
Peng, M.W., Luo, Y., 2000. Managerial ties and firm performance in a transition economy: the nature of a micro-macro link. Acad. Manag. J. 43 (3), 486–501.
Peng, M.W., Tan, J., Tong, T.W., 2004. Ownership types and strategic groups in an emerging economy. J. Manag. Stud. 41 (7), 1105–1129.
Puffer, S.M., McCarthy, D.J., Boisot, M., 2010. Entrepreneurship in Russia and China: the impact of formal institutional voids. Enterpren. Theor. Pract. 34 (3), 441–467.
Qi, G., Zeng, S., Tam, C., Yin, H., Zou, H., 2013. Stakeholders' influences on corporate green innovation strategy: a case study of manufacturing firms in China. Corp. Soc. Responsib. Environ. Manag. 20 (1), 1–14.
Rauch, A., Wiklund, J., Lumpkin, G.T., Frese, M., 2009. Entrepreneurial orientation and business performance: an assessment of past research and suggestions for the future. Enterpren. Theor. Pract. 33 (3), 761–787.
Rettab, B., Brik, A.B., Mellahi, K., 2009. A study of management perceptions of the impact of corporate social responsibility on organisational performance in emerging economies: the case of Dubai. J. Bus. Ethics 89 (3), 371–390.
Schaltenbrand, B., Foerstl, K., Azadegan, A., Lindeman, K., 2016. See what we want to see? the effects of managerial experience on corporate green investments. J. Bus. Ethics 150 (4), 1129–1150.
Scott, W.R., 1995. Organizations and Institutions. Sage Publications, Thousand Oaks, CA.
Shah, K.U., 2011. Corporate environmentalism in a small emerging economy: stakeholder perceptions and the influence of firm characteristics. Corp. Soc. Responsib. Environ. Manag. 18 (2), 80–90.
Sharma, S., 2000. Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. Acad. Manag. J. 43 (4), 681–697.
Sharma, S., 2009. The mediating effect of information availability between organization design variables and environmental practices in the Canadian hotel industry. Bus. Strat. Environ. 18, 266–276.
Sharma, S., Aragón-Correa, J.A., Rueda-Manzanares, A., 2007. The contingent influence of organizational capabilities on proactive environmental strategy in the service sector: an analysis of North American and European ski resorts. Can. J. Admin. Sci. 24 (4), 268–283.
Sheng, S., Zhou, K.Z., Li, J.J., 2011. The effects of business and political ties on firm performance: evidence from China. J. Market. 75 (1), 1–15.
Shu, C., Zhou, K.Z., Xiao, Y., Gao, S., 2014. How green management influences product innovation in China: the role of institutional benefits. J. Bus. Ethics 133 (3), 471–485.
Stam, W., Elfring, T., 2008. Entrepreneurial orientation and new venture performance: the moderating role of intra-and extraindustry social capital. Acad. Manag. J. 51 (1), 97–111.
Stiglitz, J.E., 1988. Economic organization, information, and development. Handb. Dev. Econ. 93–160.
Suchman, M.C., 1995. Managing legitimacy: strategic and institutional approaches. Acad. Manag. Rev. 20 (3), 571–610.
Suk, S., Liu, X., Sudo, K., 2013. A survey study of energy saving activities of industrial companies in the Republic of Korea. J. Clean. Prod. 41, 301–311.
Tan, J., 2002. Impact of ownership type on environment–strategy linkage and performance: evidence from a transitional economy. J. Manag. Stud. 39 (3), 333–354.
Tan, J., Peng, M.W., 2003. Organizational slack and firm performance during economic transitions: two studies from an emerging economy. Strat. Manag. J. 24 (13), 1249–1263.
Tang, J., Tang, Z., Cowden, B.J., 2017. Exploring the relationship between entrepreneurial orientation, CEO dual values, and SME performance in state-owned vs. non-state-owned enterprises in China. Enterpren. Theor. Pract. 41 (6), 883–908.
Tang, J., Tang, Z., Zhang, Y., Li, Q., 2007. The impact of entrepreneurial orientation and ownership type on firm performance in the emerging region of China. J. Dev. Enterpren. 12 (4), 383–397.
Varadarajan, P.R., 1992. Marketing's contribution to strategy: the view from a different looking glass. J. Acad. Market. Sci. 20 (4), 335–343.
Wang, C.L., 2008. Entrepreneurial orientation, learning orientation, and firm performance. Enterpren. Theor. Pract. 32 (4), 635–657.
Wang, T., Thornhill, S., De Castro, J.O., 2017. Entrepreneurial orientation, legitimation, and new venture performance. Strat. Entrepren. J. 11 (4), 373–392.
Wiklund, J., Shepherd, D., 2005. Entrepreneurial orientation and small business performance: a configurational approach. J. Bus. Ventur. 20 (1), 71–91.
Yang, J., Zhang, F., Jiang, X., Sun, W., 2015. Strategic flexibility, green management, and firm competitiveness in an emerging economy. Technol. Forecast. Soc. Change 101 (1), 347–356.
Yu, V., Ting, H.I., Jim Wu, Y.C., 2009. Assessing the greenness effort for European firms: a resource efficiency perspective. Manag. Decis. 47 (7), 1065–1079.
Zhang, D., Tong, Z., Zheng, W., 2020. Does designed financial regulation policy work efficiently in pollution control? Evidence from manufacturing sector in China. J. Clean. Prod. https://doi.org/10.1016/j.jclepro.2020.125611.
Zhang, F., Zhu, L., 2019. Enhancing corporate sustainable development: stakeholder pressures, organizational learning, and green innovation. Bus. Strat. Environ. 28, 1012–1026.
Zhou, K.Z., Wu, F., 2010. Technological capability, strategic flexibility, and product innovation. Strat. Manag. J. 31 (5), 547–561.
Zhou, Y., Hong, J., Zhu, K., Yang, Y., Zhao, D., 2018. Dynamic capability matters: uncovering its fundamental role in decision making of environmental innovation. J. Clean. Prod. 177, 516–526.
Zimmerman, M.A., Zeitz, G.J., 2002. Beyond survival: achieving new venture growth by building legitimacy. Acad. Manag. Rev. 27 (3), 414–431.
Zou, H., Xie, X., Qi, G., Yang, M., 2019. The heterogeneous relationship between board social ties and corporate environmental responsibility in an emerging economy. Bus. Strat. Environ. 28 (1), 40–52.