

The Antecedents and Performance Consequences of Proactive Environmental Strategy: A Meta-analytic Review of National Contingency

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ABSTRACT In this article we provide a comprehensive framework to explain, in China and in Western countries, how three antecedents – regulations, stakeholder norms, and managerial mindsets – differently affect proactive environmental strategies (PES) and subsequently influence firm performance. A meta-analysis of 68 studies involving 71 samples supports our hypotheses. In Western countries, top managerial mindsets have the strongest effect and regulations have the weakest effect on PES. In China, regulations, stakeholder norms, and managerial mindsets have similar effects on PES. For Western firms, the PES has stronger effects on environmental performance than on economic performance and the effect on environmental performance is stronger than that in Chinese firms. For firms in China, the PES has equally positively affects on environmental and economic performance, but the effect on economic performance is stronger than that of Western firms. Implications for future research are discussed.

KEYWORDS China, environmental performance, environmental strategies, firm performance, meta-analysis, national contingency

INTRODUCTION

Increasing social concerns about negative effects of human activities on the environment has led firms to use environmental strategies to obtain competitive advantage and sustainable development (Aragón-Correa & Sharma, 2003; Ateş, Bloemhof, Raaij, & Wynstra, 2012; Hart, 1995). Environmental strategies can be both proactive and passive. Proactive environmental strategies (PES) are voluntary environmental protection strategies beyond compliance with regulatory requirements (Aragón-Correa & Rubio-López, 2007; Ateş et al., 2012). In contrast, passive environmental strategies are based on government regulations and strong stakeholder pressure. Firms that are focused on sustainable development are increasingly formulating and implementing PES (Aragón-Correa & Sharma, 2003; Dahmann & Brammer, 2011; Hart, 1995; Sharma & Vredenburg, 1998).

What motivates PES? In the last two decades, many scholars from strategy, economics, organizational theory, policy, organizational behavior, operations,

and other research areas have studied environmental issues based on various theories and paradigms in their respective domains (Etzion, 2007). However, the literature lacks a comprehensive theoretical framework to identify and explain the relationships between the most important antecedents and the adoption of PES.

The effectiveness of a firm's strategy depends on the specific national environment (Delmas & Montes-Sancho, 2010; Escobar & Vredenburg, 2011; Sharma, 2000). The national context is an important contingency (Maignan & Ralston, 2002; Matten & Moon, 2008): for both strategy formulation and implementation (Matten & Moon, 2008; Peng, 2002). Both historical and contemporary factors can change the effects of corporate responsibility toward the environment (Matten & Moon, 2008). Specifically, firms in China operate under lower standards of environmental protection regulations than do firms in Western countries, and thus Chinese firms lack sufficient environmental protection motivation (Wright, Filatotchev, Hoskisson, & Peng, 2005). Meanwhile, the Chinese holistic culture emphasizes balancing conflicting factors, such as economic and environmental performance, which deeply influences managers' strategic mindsets (Chen, 2002). Thus, we argue that various traditional cultural and historical factors, and current market systems are responsible for PES differences between countries (Li & Peng, 2008; Peng, 2002).

We identify, under the contrasting contexts of Western countries and China, three key factors that may have differential influence on PES: government regulations, stakeholder norms, and managers' mindsets. We conduct a meta-analysis to test our ideas.

This research will make two important contributions. First, the study delineates the important antecedents of PES and explains their different effects by synthesizing various insights and perspectives (Etzion, 2007). We develop theoretical relationships among the antecedents of government regulations, stakeholder norms, managers' mindsets on PES, and identify the effect of PES on firm's economic and environmental performance in both Western and Chinese businesses. This overarching framework explains why and how the antecedents have different influences on PES in the two contexts. We use the meta-analytic technique that allows a more comprehensive examination of the factors (Margolis, Elfenbein, & Walsh, 2007; Viswesvaran & Ones, 1995). We compare PES in China and in Western countries using both historical factors (traditional cultures) and contemporary factors (current market environments). The second contribution is to resolve the inconsistent results on three antecedents – government regulations, stakeholder norms, and managers' mindsets – with PES and firm performance in the literature (Ateş et al., 2012; Kassinis & Vafeas, 2009; Menguc, Auh, & Ozanne, 2010). One reason for these inconsistent empirical results could be due to samples from different nations (Chang, 2011; Hofer, Cantor, & Dai, 2011; Julian & Ofori-Dankwa, 2013). We integrate the naïve dialecticism perspective (Peng & Nisbett, 1999; Spencer-Rodgers, Williams, & Peng, 2010) and the national business systems approach (NBSA) (Matten & Moon, 2008) to theoretically explain how national

cultures and market institution systems have different effects on the relationships among the antecedents, PES, and firm performance in Western countries and in China. The meta-analysis allows us to account for sampling and measurement error that might affect the results of any single study and can help us detect contextual factors that explain variability across findings (Crook, Ketchen Jr., Combs, & Todd, 2008; Hunter & Schmidt, 1990).

THEORETICAL BACKGROUND AND HYPOTHESES

Scholars have offered various definitions of PES. It has been defined as intangible managerial routines and innovations that need organizational commitments to improve the natural environment, but that the laws do not require (Hart, 1995). It also has been defined as comprising environmental objectives, plans, and procedures that go beyond basic legalities (González-Benito, 2008). A third definition refers to systematic patterns of voluntary practices, such as reducing waste and preventing pollution at its source, beyond regulatory requirements (Aragón-Correa & Rubio-López, 2007).

Building on these previous works, we define PES as firms' voluntary environmentally protective strategic plans and action arrangements that go beyond regulatory requirements. In firms with a high level of PES, top managers design and implement environmental protection plans, actions, and standards beyond legislative and industry standards, in the belief that the practices will benefit both the firms and the environment. Examples of PES include ISO 14001 certification (Christmann & Taylor, 2001; Delmas, 2001; Russo & Harrison, 2005); recycling of resources or materials and using renewable sources (Chan, 2005; Cordano & Frieze, 2000; Fryxell & Lo, 2003); utilizing eco-technical innovations (Berrone & Gomez-Mejia, 2009; Chang, 2011; Christmann, 2000); establishing environmental cooperation with suppliers (Chan et al., 2012; Zhu & Sarkis, 2004); adopting environmentally friendly products and processes (Klassen, 2001; Peng & Lin, 2008; Vachon, 2007); implementing environmental policies (Darnall, Henriques & Sadorsky, 2010; González-Benito, 2008; Klassen, 2001); and training employees in pro-environmental behavior (Clemens & Douglas, 2006; Darnall et al., 2008, 2010). Proactiveness implies that the firm goes beyond government regulations and industry standards in implementing environmental strategies. However, whether environmental strategies are proactive depends on the legal environments governing the firms. Compared with firms in Western countries, China has lower environmental protection standards and incomplete government regulations (Christmann & Taylor, 2001; Li & Peng, 2008). Thus, some Chinese firms that meet international environmental standards often employ more proactive environmental strategies compared with other Chinese firms that meet only local environmental standards. For example, China does not include chronic toxicity tests and endocrine disruptors in waste water monitoring, but this is compulsory in most Western governments (Hu et al., 2011).

The purpose of PES is to create value for both shareholders and stakeholders by ensuring effective environmental protection (Darnall et al., 2010). Research has shown that PES improves firm performance (Aragón-Correa & Sharma, 2003; Chan, 2005; Darnall & Edwards, 2006; Darnall et al., 2008; Florida & Davison, 2001; King & Lenox, 2001, 2002; Klassen & Whybark, 1999; Matten & Moon, 2008; Zhu, Sarkis, & Lai, 2008).

The Antecedents of Proactive Environmental Strategies

Various disciplines have offered different theories and paradigms for identifying PES antecedents (Etzion, 2007). Most studies emphasize the role of governments (Clemens & Douglas, 2006; Russo & Harrison, 2005), mainly through regulations (Clemens & Douglas, 2006). Regulations include compulsory laws, rules, policies, and other coercive forces that administrations develop to protect the environment (López-Gamero, Claver-Cortés, & Molina-Arozin, 2009). Government-enforced laws and rules exert potential control on firms' PES (Powell & DiMaggio, 1991). On one hand, governments from China and Western countries incentivize proactive environmental protection (Liu, Liu, Shishime, Yu, Bi, & Fujitsuka, 2010) to encourage firms to adopt, for example, ISO 14001 (Johnstone & Labonne, 2009). On the other hand, firms that adhere to the laws protect themselves from legal coercion and political risks, especially when the offenses are potentially costly (Berrone et al., 2013). Thus, firms can improve their resource distribution and build their advantages by following regulations. Therefore, we posit the following hypothesis:

Hypothesis 1a: Environmental protection regulations in the focal company's home country will relate positively to the proactive environmental strategy of the focal company.

Society can influence PES through stakeholder norms (Darnall et al., 2010; Henriques & Sadosky, 1999). Stakeholder norms refer to external stakeholders' expectations regarding appropriate actions and legitimate behavior in particular organizational contexts (Scott, 2001). Firms must build their reputation and maintain legitimacy through transparency and communication that invites external stakeholder scrutinization (Hart, 1995; Suchman, 1995). The stakeholder norms may encourage firms to proactively implement PES (Sarkis, Gonzalez-Torre, & Adenso-Diaz, 2010). Proactively highlighting firms' eco-friendliness can enhance their market reputation (Lin & Ho, 2011), and win support from increasingly 'green' consumers (Huang, 2005; Peattie, 1992; Peng & Lin, 2008). Similarly, suppliers may prefer to cooperate with manufacturers that have positive corporate images regarding environmental protection (Henriques & Sadosky, 1999). In addition, stakeholders, such as environmental and community organizations, labor unions, and industry associations may actively engage in public protests, strikes, and calls for industry engagement (Darnall et al., 2010; Sharma & Henriques, 2005). Thus,

firms with PES can acquire better social reputations (Delmas & Toffel, 2004) and social legitimacy (Hoffman, 1997). Therefore, we posit:

Hypothesis 1b: Stakeholder norms in environmental protection will relate positively to the proactive environmental strategy of the focal company.

Finally, when top managers have environmentally friendly strategic mindsets, firms may be motivated toward PES (Flannery & May, 2000; Marshall, Cordano, & Silverman, 2005), and will support PES (Lin & Ho, 2011). Managers' perceptions, beliefs, expectations, and opinions determine the environmental practices firms adopt (Cordano & Frieze, 2000; Cordano, Marshall, & Silverman, 2010; Flannery & May, 2000) and are positively associated with the speed of company responses to environmental issues (Bansal, 2003). Managerial mindsets also positively affect intentions to adopt environmental management programs (Cordano et al., 2010). Therefore, we posit:

Hypothesis 1c: Environmentally friendly mindsets of top managers in the focal company will relate positively to the proactive environmental strategy of the focal company.

National Context as a Contingency

The national business systems approach (NBSA) explains that political, financial, education, labor, and cultural systems formulate the historical national institutional framework (Matten & Moon, 2008; Whitley, 1999). Generally, political, financial, education, and labor systems are included in Western environmental protection regulations (Darnall et al., 2010; Klassen & Vachon, 2003; Zhou, Su, & Bao, 2002). These systems follow efficient regulations and strengthen stakeholder norms. In contrast, China's systems are less developed (Chan, 2005; Li & Peng, 2008; Wright et al., 2005; Zhu & Sarkis, 2004). Between the two contexts, top managers will have different cognitions regarding environmental protection strategies because of the different regulation effects (Cordano, Marshall, & Silverman, 2010; Fryxell & Lo, 2003). In Western countries, complete political, financial, education, and labor system regulations keep top managers from acting opportunistically. Thus, they will leverage PES to create new business and enhance competitiveness (Cordano et al., 2010). On the contrary, managers in Chinese firms, operating under incomplete national business systems, mainly focus on grasping political opportunities (Fryxell & Lo, 2003).

Western countries and China have different cultural systems that may affect the relationships among the antecedents, PES, and firm performance. The naive dialecticism perspective (Peng & Nisbett, 1999; Spencer-Rodgers, Williams, & Peng, 2010) suggests that Western dialectical thinking tends to be more synthetic, emphasizing the law of identity (everything must be identical to itself), the law of non-contradiction (the same thing cannot be both true and false), and the law of the excluded middle (everything is either true or false). Chinese dialectical

thinking has three key principles: change (the universe is dynamic and constantly changing), contradiction (two ostensibly contradictory propositions may both be true), and holism (everything in the universe is connected) (Peng & Nisbett, 1999). Thus, Western dialectical thinking is quite different from that of Chinese dialectical thinking.

By integrating the national business systems approach and the naive dialecticism perspective, we can explain how the key differences cause the antecedents to exert different influences on PES in firms from China and firms from Western countries.

Different influences of national contingencies on antecedents–proactive environmental strategy linkage. Western thinking is characteristically analytical, primarily focusing on objects and their categories, relying on formal logic to understand objects' behaviors (Chen, 2002; Nisbett et al., 2001; Nisbett & Masuda, 2003), and regarding objects as separate and distinct (Nisbett & Masuda, 2003; Shafer, Fukukawa, & Lee, 2007). Western dialectical thinking means that Western firms may regard regulations, stakeholder norms, and top managers' mindsets as three independent antecedents of PES. Thus they may analyze the attributes and the consequences of attention to the three factors separately and subsequently implement distinct efforts to achieve their strategies.

Western governments, as compared with China's government, have more complete environmental regulations (Escobar & Vredenburg, 2011). Most Western firms adhere to strict and well-developed environmental legal systems that strongly control their environmental behaviors (Christmann & Taylor, 2001). They face more pressure from political systems (Matten & Moon, 2008), so in the Western context, high-level regulations have weaker marginal effects on PES.

Stakeholder norms affect PES mainly through external stakeholders such as customers, suppliers, and the public (Darnall, Henriques, & Sadorsky, 2010). In Western countries, many stakeholders are different from legislation that constrains all firms equally, and different stakeholders may have different influences on firms' environmental protection behaviors, so that firms can be either reactive or proactive depending on different stakeholder expectations and demands (Clarkson, 1995; Darnall, Henriques, & Sadorsky, 2010; González-Benito & González-Benito, 2006). As the public becomes increasingly knowledgeable about environmental protection, stakeholder norms exert increasing demands (Darnall, Henriques, & Sadorsky, 2010) so that stakeholders' evaluations provide opportunities for firms to improve firm reputations by leveraging PES. Unlike pressure from regulations, stakeholder norms offer more incentives to leverage PES (Huang, 2005; Peng & Lin, 2008).

Finally, under Western political, education, and labor systems, firms are likely to strengthen PES, depending on managers' beliefs, expectations, and perceptions (Banerjee, 2001). The Western emphasis on independence leads them to focus primarily on personal achievements (Nisbett & Masuda, 2003; Shafer, Fukukawa, & Lee, 2007). In an individualist culture focused on personal achievements, managers strongly devoted to environmental protection may emphasize PES as a personal

accomplishment that wins market advantage (Shafer, Fukukawa, & Lee, 2007). For instance, firms whose managers have strong environmentally friendly mindsets can implement higher PES standards to win competitive advantage over rival firms whose managers are less devoted to environmental protection (Hart, 1995). Meanwhile, a more efficient financial system ensures that top managers can obtain resources for implementing PES, which may strengthen the effect of the top manager's mindset. Therefore, we posit:

Hypothesis 2a: In Western firms, top managers' mindsets will have the strongest effect and regulations will have the weakest effect on the proactive environmental strategy of the focal company.

In contrast, Chinese naive dialecticism thinking embraces a holistic world view (Chen, 2002), which holds that everything is connected. According to this view, regarding anything in isolation is misleading (Chen, 2002; Peng & Nisbett, 1999); rather, the whole is more than the sum of its parts (Peng & Nisbett, 1999) and the parts cannot be understood except in relation to the whole. Thus, Chinese firms prefer to leverage the effects of regulations, stakeholder norms, and the mindsets of top managers on PES. Furthermore, most Chinese firms have collectivist culture stressing social harmony and protection of group interests (Shafer, Fukukawa, & Lee, 2007; Su, Sirgy, & Littlefield, 2003), so they are more likely to be affected by informal professional, industrial, and organizational norms (Li, Lee, Li, & Liu, 2010; Shafer, Fukukawa, & Lee, 2007).

Furthermore, with poorly developed environmental regulations and relatively low environmental standards, the space for regulation improvement significantly affects PES in China. With rapid economic growth, people are increasingly paying attention to firms' CSR (corporate social responsibility) and environmental protection activities (Aguinis & Galvas, 2012; Lee, 2011), which provides new opportunities for firms to leverage PES and enhance their reputation by meeting stakeholder demands (Chan et al., 2012; González-Benito & González-Benito, 2006). Moreover, top managers in China are influenced by the collectivist culture to comply with regulations and stakeholder norms. They prefer to comprehensively leverage the antecedents to educate their employees, enhance their reputations, and display their social responsibility to society (Shafer, Fukukawa, & Lee, 2007). Therefore, we posit:

Hypothesis 2b: For firms in China, regulations, stakeholder norms, and the mindsets of top managers will have similar effects on the proactive environmental strategy of the focal company.

Different influences of national contingencies on proactive environmental strategy–performance linkage. The gold standard for evaluating any effective strategy is whether the strategy improves firm performance. Because firms have multiple objectives, they pursue multiple performance goals that include environmental performance based on environmental protection results and economic performance based

on financial outcomes (Kassinis & Vafeas, 2009; Schaefer, 2007; Zhu & Sarkis, 2004). Environmental performance has been defined as the ecological results based on the impact that pollutants, such as plant emissions, have on the environment (Freedman & Jaggi, 1988; Klassen & Whybark, 1999). That measure of environmental performance consists of objective measures, such as total emissions (Kassinis & Vafeas, 2009; King & Lenox, 2002; Klassen, 2001), toxic releases or toxic release inventory (TRI) (Klassen & Whybark, 1999; Russo & Harrison, 2005), pollution emissions (Berrone et al., 2010; Lo, Fryxell, & Tang, 2010), record of environmental protection activities (Branzei, Ursacki-Bryant, Vertinsky, & Zhang, 2004), environmental regulatory compliance records (Chan, 2005; Judge & Douglas, 1998), the number of cases or administrative actions against the firm for violating an environmental law, environmental accidents reports (Bansal & Clelland, 2004; Kassinis & Vafeas, 2009), frequency of environmental accidents (Zhu & Sarkis, 2004), and other environmental outcomes. Accordingly, environmental performance is a tangible output related to firm-level environmental management (Klassen, 2001).

Alarmed by deteriorating environmental conditions, scholars who hold the natural resource-based view argue that firms can enhance their environmental performance through effective PES activities and PES implementation (Aragón-Correa & Sharma, 2003; Chan, 2005; Darnall & Edwards, 2006; Matten & Moon, 2008). Thus, firms with PES are associated with higher environmental performance (Chan, 2005; Florida & Davison, 2001).

National cultures and market institution systems also influence PES effects on performance (Li, Li, Liu, & Yang, 2010; Matten & Moon, 2008; Su, Peng, Shen, & Xiao, 2013). First, Westerners emphasize relative independence and value autonomy and individualism over collectivism. They are inclined to attend to one focal object and focus exclusively on one objective, using an either/or mindset (Chen, 2002; Nisbett & Masuda, 2003). Western firms are more likely to stress a strategy's direct purpose (Nisbett & Masuda, 2003) and pay considerable attention to PES effects on environmental performance alone (King & Lenox, 2001; Walls, Berrone, & Phan, 2012). Second, Western firms have accumulated more resources and technologies relating to environmental protection than have firms in China (Aragón-Correa et al., 2008; Darnall & Edwards, 2006; Klassen & Whybark, 1999) and can improve their environmental performance more easily. Third, Western governments have implemented comprehensive environmental policies, thereby incentivizing firms to pursue efficient PES via tax deductions (Villiers, Naiker, & Staden, 2011). Some recent evidence also shows that US firms have strong incentives to adopt ISO 14001, an action leading to external legitimacy and stronger environmental performance (Bansal & Hunter, 2003). Therefore, we posit:

Hypothesis 3a: The proactive environmental strategy of the firms in Western countries will have stronger effect on environmental performance than on economic performance, compared with firms in China.

In contrast, Chinese culture and the current market environment cause Chinese firms to emphasize the effect of PES on both firms' economic and environmental performance. First, incomplete financial and market systems provide insufficient resources to ensure continuous environmental protection (Zhu & Sarkis, 2004). The lack of complete systems forces Chinese firms to regard both environmental performance and economic performance as an inherent contradiction. Thus, they must balance their environmental and economic performance because of great pressure toward environmental protection practices and substantial investments (Zhu & Sarkis, 2004). Second, they emphasize balancing conflicting sides (Chen, 2002; Fang, 2010, 2011), so that they pursue both environmental and economic performance simultaneously. The idea of paradoxical integration rooted in Chinese 'middle way' philosophy stresses that two opposites are interdependent and constitute a whole (Chen, 2002). Chinese philosophy encourages a coherent business/environment relationship. The concept of *tian ren he yi*, a Chinese expression, captures a famous Chinese holism perspective for handling the dilemma between nature and mankind (Peng, Spencer-Rodgers, & Nian, 2006). The expression means that nature and mankind are an interdependent organic whole (Fang, 2010, 2011; Li, Liu, Duan, & Li, 2008; Peng, Spencer-Rodgers, & Nian, 2006), which means that firms should improve economic performance so they will have resources remaining to sustain the natural environment. Meanwhile, firms recognize that destroying nature equals ruining oneself. Therefore,

Hypothesis 3b: Among Chinese firms, proactive environmental strategy will have similar effect on both environmental and economic performance.

Comparing Western countries and China, one notices that different national business systems produce different effects of PES for both environmental and economic performance. Under a more complete political system, Western firms have formulated higher environmental protection standards (Christmann & Taylor, 2001; Li & Peng, 2008), and have developed more advanced environmental management systems and environmental technologies in response to more stringent regulations (Christmann & Taylor, 2001). Thus, Western firms can place more effort into improving environmental performance. Furthermore, their complete financial system ensures that they will obtain more resources for improving environmental performance. Meanwhile, China's weak financial system cannot provide sufficient resources for firms to pursue environmental performance (Darnall & Edwards, 2006; Klassen & Whybark, 1999). They focus on higher economic performance because they operate in a culture of incomplete education and lower social environmental awareness. Therefore, we posit:

Hypothesis 3c: Proactive environmental strategy will have stronger effect on environmental performance in Western firms than it will have in Chinese firms.

Hypothesis 3d: Proactive environmental strategy will have stronger effect on economic performance in Chinese firms than it will have in Western firms.

METHOD

Sample – Selection of Relevant Studies

To ensure that our data-base was complete, we employed multiple search techniques. First, we searched five computerized databases (i.e., ABI/Inform, ISI Web of Science, Science Direct, Wiley, and JSTOR) that include most business journals. We used the following search terms: *environmental strategies*, *environmental management*, *green strategies*, *ecological*, and *pollution prevention* to find studies published prior to 2013. Second, we manually searched several major management and international business journals: *Academy of Management Journal*, *Strategic Management Journal*, *Administrative Science Quarterly*, *Organization Science*, *Journal of International Business Studies*, *Production and Operations Management*, *Journal of Management Studies*, *Management and Organization Review*, and other journals highly cited in the field of environmental management, such as *Journal of Business Ethics*, *Journal of Environmental Economics and Management*, and *Journal of Business Research*. Third, we studied the reference sections in all identified articles and in the citations of several key environmental articles, to identify relevant studies. Finally, we e-mailed researchers in the domain for their unpublished correlation tables and studies.

We used the following set of criteria (Kirca et al., 2011; Lipsey & Wilson, 2001) to select the studies: (1) the items in the meta-analysis must include only those empirical studies that reported sample sizes as well as correlations, (2) the empirical settings must be in China or western countries; (3) the articles must contain at least one relationship between PES and other variables in our model; (4) the studies must measure the constructs at the firm level; and (5) the studies must report correlation coefficients from different samples to qualify as independent. These criteria resulted in 68 studies (with 71 separate samples) and the number of effect sizes integrated is 126, including 19 for regulations, 31 for stakeholder norms, 22 for mindsets of top managers, 18 for environmental performance, and 36 for economic performance. Table 1 lists the studies, the key attributes of each study, and correlation r for the associations between PES, its antecedents, and its performance.

Coding Procedure

We used a coding form to record the most important study characteristics, such as author(s), date of study, study sample size N , the correlation (r) between two variables with the relationship specified in our hypotheses. In addition, we included effect size, reliability, and research contexts (Chang, Rosen, & Levy, 2009). To minimize the risk of coding errors, we developed a coding protocol (Kirca et al., 2011; Lipsey & Wilson, 2001) that specifies all relevant variables we planned to extract from each study. Two authors read all the selected articles, coded each study independently, and resolved any differences through discussion.

Table 1. Attributes of 126 effects from 68 studies (71 separate samples) included in meta-analyses

#	Study	N	Country	PES	Measure and correlation with PES in the parentheses				
					R	N	M	En.P	Ec.P
1	Aguilera-Caracuel, Hurtado-Torres and Aragón-Correa (2012)	106	EU	Recycling, eco-technical innovation					ROE (-0.140)
2	Avella, Vazquez-Bustelo and Fernandez (2011)	274	Spain	Environmental products and processes					Cost efficiency (0.347)
3	Bagur-Femenias, Llach and Alonso-Almeida (2013)	448	Spain	Environmental products and processes, reduce resources or materials		Customers, suppliers and other stakeholders (0.304)			Profits, sales (0.180)
4	Bansal and Clelland (2004)	100	US	Disclosure of environmental information				Media reports accounts (0.050)	ROA (-0.035)
5	Berrone, Fosfuri, Gelabert and Gomez-Mejia (2013)	326	US	Eco-technical innovation	Regulatory pressures (0.050)	Environmental NGOs number (0.040)			
6	Berrone and Gomez-Mejia (2009)	469	US	Eco-technical innovation	Regulatory stringency (-0.180)				Tobin's Q (0.060)
7	Branzei, Ursacki-Bryant, Vertinsky and Zhang (2004)	360	China	Environmental policy	Government standards and environmental regulation (0.246)		Ecological values (0.131)	Environmental protection record (0.279)	

Table 1. continued

#	Study	N	Country	<i>Measure and correlation with PES in the parentheses</i>					
				PES	R	N	M	En.P	Ec.P
8	Chan (2005)	561	China	Recycling, reduce resources or materials				Compliance with environmental regulations (0.260)	Earnings growth, sales growth (0.240)
9	Chan, He, Chan and Wang (2012)	194	China	Environmental cooperation with suppliers		Various external stakeholders (0.560)	Internal environmental orientation (0.560)		Earnings growth, sales growth (0.560)
10	Chang (2011)	106	China (Taiwan)	Eco-technical innovation			Managers' environmental vision (0.509)		Profitability (0.429)
11	Chen, Chang and Wu (2012)	178	China (Taiwan)	Eco-technical innovation	Environmental regulations pressure (0.212)	Investors and clients' environmental pressure (0.208)	Environmental leadership (0.392)		
12	Christmann (2000)	88	US	Eco-technical innovation					Cost (0.100)
13	Christmann and Taylor (2001)	101	China	ISO 14001 certification	Environmental government regulations (0.280)	Multinational customers (0.140)			Self-reported firm performance (0.150)
14	Clemens and Douglas (2006)	107	US	Environmental audits, environmental training	Coercive green forces form government (0.310)				
15	Cordano and Frieze (2000)	230	US	Reduce resources or materials			Pollution prevention attitudes (0.140)		

Table 1. continued

#	Study	N	Country	Measure and correlation with PES in the parentheses					
				PES	R	N	M	En.P	Ec.P
16	Cordano, Marshall and Silverman (2010)	369	US	Environmental policy	Pollution regulation (0.220)	Local community groups, environmental organizations (0.210)	Manager's attitudes (0.267)		
17	Darnall, Henriques and Sadorsky (2008)	1355	Canada, Germany, Hungary, US	Environmental policy, environmental training, environmental accounting	Regulatory pressures (0.240)	Market pressures and social pressures (0.185)		Profitability (0.100)	
18	Darnall, Henriques and Sadorsky (2010)	907	US, Canada, France, Germany, Hungary, Norway	Environmental policy, environmental accounting and audits, environmental training		Value chain stakeholders, societal stakeholders (0.217)			
19	Delgado-Ceballos, Aragón-Correa, Ortiz-de-Mandojana and Rueda-Manzanares (2012)	73	Spain	Recycling, reduce resources or materials		Stakeholder integration (0.350)			
20	Delmas (2001)	152	US	ISO 14001 certification		External stakeholders (0.218)			
21	Demirel and Kesidou (2011)	289	UK	Eco-technical innovation, ISO 14001 certification	Environmental regulations (0.106)				

Table 1. continued

#	Study	N	Country	<i>Measure and correlation with PES in the parentheses</i>					
				PES	R	N	M	En.P	Ec.P
22	Flannery and May (2000)	130	US	Recycling			Attitude toward the environmental behavior (0.150)		
23	Fryxell and Lo (2003)	151	China (Guangzhou)	Recycling, reduce resources or materials			Environmental values (0.320)		
24	Fryxell and Lo (2003)	154	China (Beijing)	Recycling, reduce resources or materials			Environmental values (0.180)		
25	Fryxell, Lo and Chung (2004)	128	China	ISO 14001 certification		Stakeholder pressures (0.230)			
26	Gadenne, Kennedy and McKeiver (2009)	166	Australia (Queensland)	Environmental audits, environmental training, environmental policy		External influences: suppliers and customers (0.540)	Environmental awareness and attitudes (0.240)		
27	González-Benito (2008)	184	Spain	Environment training, environmental policy, eco-technical innovation		Environmental suppliers (0.280)			
28	González-Benito and González-Benito (2006)	186	Spain	Recycling	Governmental pressure (0.043)		Managerial environmental awareness (0.282)		
29	Hajmohammad, Vachon, Klassen and Gavronski (2013)	94	Canada	ISO 14001 certification, eco-technical innovation, recycling				Air emissions, waste water generation (0.490)	
30	Hofer, Cantor and Dai (2011)	96	US	Recycling, eco-technical innovation					ROE (0.080)

Table 1. continued

#	Study	N	Country	<i>Measure and correlation with PES in the parentheses</i>					
				PES	R	N	M	En.P	Ec.P
31	Huang (2005)	152	China (Taiwan)	Environmental products and processes, eco-technical innovation, environmental audit		Community stakeholders, the media (0.567)			
32	Huang, Ding and Kao (2009)	235	China (Taiwan)	Eco-technical innovation		External stakeholders (0.353)			
33	Huang and Kung (2010)	759	China (Taiwan)	Disclosure of environmental information					ROA (0.020)
34	Judge and Douglas (1998)	170	US	Environmental products and processes				Compliance with regulations (0.286)	Earnings growth, sales growth (0.260)
35	Kassinis and Soteriou (2003)	104	European Union	Reduce resources or materials, recycling		Customer satisfaction and loyalty (0.229)			Profit growth, revenues growth (0.072)

Table 1. continued

#	Study	N	Country	<i>Measure and correlation with PES in the parentheses</i>					
				PES	R	N	M	En.P	Ec.P
36	Kassinis and Vafeas (2009)	117	US	Recycling		Community stakeholders (0.014)		The total amount of toxic releases, the number of environmental accidents report (-0.018)	Sales (0.067)
37	King and Lenox (2002)	614	US	Eco-technical innovation, reduce resources or materials, recycling	Regulatory stringency (0.050)				Tobin's Q, ROA (0.035)
38	Klassen (2001)	53	US	Environmental policy, environmental products and processes, environmental audit			Manager's personal opinion on environment (0.290)	Toxics Release Inventory (TRI) releases (0.110)	
39	Klassen and Vachon (2003)	157	Canada	Eco-technical innovation		Evaluation of suppliers, evaluation by customers (0.010)			
40	Klassen and Whybark (1999)	83	US	Eco-technical innovation				Toxics Release Inventory (TRI) releases (0.130)	Cost (-0.260)

Table 1. continued

#	Study	N	Country	<i>Measure and correlation with PES in the parentheses</i>					
				PES	R	N	M	En.P	Ec.P
41	Lin and Ho (2011)	322	China	Reduce resources or materials, recycling	Regulatory pressure (0.610)	The environmental pressure exerted by customers (0.150)	Leaders' attitudes toward environment issues (0.720)		Economic benefits (0.650)
42	Link and Naveh (2006)	40	Israel	ISO 14001 certification				Emission of pollutions (0.180)	Sales (-0.040)
43	Liu, Liu, Shishime, Yu, Bi and Fujitsuka (2010)	117	China	ISO14001 certification, eco-technical innovation, disclosure of environmental information	Environmental regulation (0.001)	Frequency of the public complaints (0.162)	Awareness on environmental problems (0.242)		
44	Llach, Perramon, Alonso-Almeida and Bagur-Femenías (2013)	374	Spain	Environmental training, environmental policy					Profitability (0.167)

Table 1. continued

#	Study	N	Country	<i>Measure and correlation with PES in the parentheses</i>					
				PES	R	N	M	En.P	Ec.P
45	Lo, Fryxell and Tang (2010)	369	China	Environmental training, environmental audits, recycling, ISO 14001 certification					Amounts of different kind of pollutants (0.046)
46	López- Gamero, Claver- Cortés and Molina- Azorín (2009)	239	Spain (Hotels)	Eco-technical innovation	Compulsory laws and regulations of protecting the environment (0.401)		Managerial perception (0.465)		
47	López- Gamero, Claver- Cortés and Molina- Azorín (2009)	208	Spain (Firms)	Eco-technical innovation	Compulsory laws and regulations of protecting the environment (-0.153)		Managerial perception (0.381)		

Table 1. continued

#	Study	N	Country	<i>Measure and correlation with PES in the parentheses</i>					
				PES	R	N	M	En.P	Ec.P
48	López- Gamero, Claver-Cortés and Molina-Azorín (2011)	239	Spain	Environmental policy, recycling, reduce resources or materials	Environmental regulation (−0.200)	Stakeholders (−0.023)	Managerial perceptions (0.293)		
49	López- Gamero, Molina-Azorín and Claver-Cortés (2011)	240	Spain	Environmental policy, recycling, reduce resources or materials	Environmental regulation (−0.186)	Stakeholders (−0.030)	Managerial interpretation (0.357)	Reduction of emissions, residues and acoustic pollution (0.663)	Profitability (0.247)
50	López-Gamero, Molina-Azorín and Claver-Cortés (2009)	240	Spain (Hotels)	Environmental policy, recycling, reduce resources or materials, disclosure of environmental information				Reduction of emissions, residues and acoustic pollution (0.667)	Profitability (0.244)
51	López-Gamero, Molina-Azorín and Claver-Cortés (2009)	208	Spain (Firms)	Environmental policy, recycling, reduce resources or materials, disclosure of environmental information				Reduction of emissions, residues and acoustic pollution (0.536)	Profitability (0.506)

Table 1. continued

#	Study	N	Country	<i>Measure and correlation with PES in the parentheses</i>					
				PES	R	N	M	En.P	Ec.P
52	Marshall, Akoorie, Hamann and Sinha (2010)	486	US, New Zealand	Reduce resources or materials		External stakeholder pressures: customers, community groups, regulators (0.064)	Managers' attitudes toward environmental initiatives and practices (0.087)		
53	Martínez-del-Río, Céspedes-Lorente and Carmona-Moreno (2012)	233	Spain	Environmental training, recycling					ROA, economic profits (0.235)
54	Menguc, Auh and Ozanne (2010)	150	New Zealand	Eco-technical innovation, recycling	Government regulations (0.260)	Customers' environmental sensitivity (0.310)	Top management support (0.440)		Sales growth and profit growth (0.195)
55	Ortiz-de-Mandojana, Aragón-Correa, Delgado-Ceballos and Ferrón-Vilchez (2012)	90	US	Use renewable sources				Toxic emissions (0.170)	Profitability (0.100)
56	Peng and Lin (2008)	101	China (Taiwan)	Environmental products and processes, eco-technical innovation		Local pressure groups, the expectation of major customers (0.393)			Marketing and product benefits (0.453)
57	Philippe and Durand (2011)	282	US	Disclosure of environmental information		The media (0.200)			ROA (0.040)

Table 1. continued

#	Study	N	Country	<i>Measure and correlation with PES in the parentheses</i>					
				PES	R	N	M	En.P	Ec.P
58	Qj, Zeng, Li and Tam (2012)	246	China	ISO 14001 certification				The reduced waste, dust, and noise pollution (0.450)	
59	Qj, Zeng, Tam, Yin, Wu and Dai (2011)	155	China	ISO 14001 certification		Community stakeholders, foreign customers, foreign investors (0.423)			
60	Ramus and Steger (2000)	353	Europe	Environmental policy, environmental training			Management understands/addresses issue of sustainable development (0.340)	Environmental report (0.450)	
61	Russo and Harrison (2005)	169	US	ISO 14001 certification	States' environmental regulations (-0.025)			Toxic emissions index (0.030)	
62	Sharfman and Fernando (2008)	267	US	Recycling					Cost (0.140)
63	Sharma (2000)	99	Canada	Reduce resources or materials			Managerial interpretations of environmental issues (0.387)		
64	Sharma and Henriques (2005)	49	Canada	Eco-technical innovation, reduce resources or materials, recycling		Stakeholder influences: customer, local community, environmental group (0.081)			

Table 1. continued

#	Study	N	Country	PES	Measure and correlation with PES in the parentheses				
					R	N	M	En.P	Ec.P
65	Thoumy and Vachon (2012)	79	Canada	Eco-technical innovation					Profitability (-0.400)
66	Torugsa, O'Donohue and Hecker (2013)	171	Australia	Environmental training, environmental audit, eco-technical innovation, recycling		Stakeholder management (0.370)			ROA, net profits (0.440)
67	Vachon (2007)	84	Canadian, US	Eco-technical innovation, environmental products and processes		Environmental suppliers and customers (0.115)			
68	Wagner (2007)	1631	European countries	ISO 14001 certification					Profitability (-0.010)
69	Wong, Lai, Cheng and Lun (2012)	128	China	Environmental products and processes		Stakeholder support (0.550)			Revenues growth (0.210)
70	Yang, Lin, Chan and Sheu (2010)	107	China (Taiwan)	Environmental policy					Cost (-0.336)
71	Zhu and Sarkis (2004)	162	China	ISO14000 certification, eco-technical innovation, environmental cooperation with suppliers				Reduction of air emission, waste water, and solid wastes, and frequency for environmental accidents (0.456)	Cost (0.291)

Notes: PES = proactive environmental strategy; R = regulation; N = stakeholder norm; M = mindsets of top managers; En. P = environmental performance; Ec. P = economic performance.

Measures

Proactive environmental strategy. We examined nine types of proactive environmental practices: whether the firm had (1) ISO 14001 certification; (2) environmental audit/accounting; (3) practices of recycling, reducing resources or materials, using renewable sources; (4) eco-technical innovation; (5) disclosure of environmental information; (6) environmental cooperation with suppliers; (7) environmental products and processes; (8) environmental policy; and (9) environmental training. We identified the measures of relevant studies, and if a study used one or more practices above, we considered these practices as PES, and recorded their correlations with other constructs we examined in our study. For instance, if a study used two PES measures and reported a correlation with environmental performance for each separately, we averaged the two correlations to yield a single estimate (Hunter & Schmidt, 2004; Lux, Crook, & Woehr, 2011). On the other hand, if effect sizes of a study were reported from two independent samples, then each sample was regarded as an independent observation.

Regulations. We define this variable as the set of compulsory laws, rules, policies, and other coercive forces that the government developed to protect the environment. The regulations variable includes measures of government, state, or industry environmental protection laws, along with other coercive forces, such as environmental regulations, government regulations, states' environmental regulations, and pollution regulations. If a study used one or more variables above, we identified them as regulations, and recorded their correlations with PES. Similar with the measure of PES, if a study used multiple measures of regulations and reported effect sizes separately, we averaged the effect sizes.

Stakeholder norms. The measure of this variable is stakeholder pressure from consumers, suppliers, community members, the media, environmental organizations, and industry associates concerning the firms' environmental practices. A study with one or more measures above were identified as stakeholder norms, and their correlations with PES were recorded. Also, effect sizes of multiple measures were averaged.

Mindsets of top managers. We coded this variable based on the managers' pollution prevention attitudes, environmental values, environmental awareness, managerial perceptions and awareness, and the managers' attitudes toward their firms' environmental behaviors. One or more of the above measures included in a selected study were regarded as mindsets of top managers, and their correlations with PES were recorded. We averaged the effect sizes of a study with multiple measures of mindsets of top managers.

Environmental performance. We used objective measures about the outcomes of environmental activities, such as pollution emissions and environmental accidents reports. These measures include the total firm emissions, the toxic release inventory,

the number of environmental accidents reports, the level of compliance with environmental regulations, and other environmental outcomes.

Economic performance. This is measured by sales growth and profits growth, earnings growth, return on equity (ROE), return on assets (ROA), Tobin's Q, profitability, costs, and other measures that reflect financial performance or competitive advantages.

Meta-analytic Procedures

We conducted this meta-analysis following Hunter and Schmidt's (1990) guidelines. First, we calculated effect size estimates as the mean of the sample weighted correlations. Then, we corrected the correlations from each study for measurement errors by dividing the correlation coefficient by the product of the square root of the reliabilities of the two constructs (Hunter & Schmidt, 1990). This step was done to correct for imperfections of the research methods scholars used in the studies. Third, we transformed the reliability-corrected correlations into Fisher coefficients to account for skewness in the distribution of the sample correlation coefficients (Rosenthal, 1994). We then averaged and weighted the Fisher coefficients by estimating the inverse of their variance ($N-3$), to give greater weight to more precise estimates (Hedges & Olkin, 1985). Finally, we computed the standard error of sample weighted and reliability corrected correlation, the corresponding 95 percent confidence interval, and file drawer analysis. We used Q-statistics to test the variables' heterogeneity.

To test the differences of the antecedents' effects and the outcomes' effects on proactive environmental strategies (PES), we divided the database into two parts, filtering by location, (i.e., China, and Western areas which included both the United States and European countries). We performed all the meta-analytic steps on both the total sample and the two sub-samples, China and Western, separately.

For H1a through H1c, we constructed confidence intervals around the average corrected correlations and tested whether the confidence interval included zero. In addition, results are significant when confidence intervals do not overlap. Thus, for H2a and H2b, we compared the confidence intervals for the three antecedents (i.e., regulations, stakeholder norms, and mindsets of top managers) in each context, respectively. Similarly, for H3a and H3b, we compared the confidence intervals for environmental performance and economic performance in each context, respectively. For H3c and H3d, we compared the confidence intervals for environmental performance in China and Western countries, as well as economic performance in the two contexts.

RESULTS

Table 2 summarizes the results of our analyses, including the number of effect sizes (K), total sample size (N), sample weighted correlation (\bar{r}), sample weighted and reliability corrected correlation (\bar{r}_c), standard error of sample weighted and

Table 2. Meta-analytic results of proactive environmental strategy

<i>Relationships</i>	<i>K^a</i>	<i>Total Sample Size (N)</i>	<i>Sample Weighted Mean r (\bar{r})</i>	<i>Corrected Mean r (\bar{r}_c)^b</i>	<i>Standard Error^c</i>	<i>95% Confidence Interval (95%CI)</i>	<i>File Drawer Analysis^d</i>	<i>Q statistic test for heterogeneity</i>
Total Sample								
a. Regulations→PES	19	6038	0.132	0.187	0.013	0.162–0.212	49	539.40
b. Stakeholder norms→PES	31	7870	0.216	0.289	0.011	0.266–0.311	1111	371.63
c. Mindsets of top managers→PES	22	4730	0.314	0.432	0.015	0.403–0.460	787	302.38
Sample in Western countries								
a. Regulations→PES	14	4960	0.090	0.133	0.014	0.105–0.161	NA	356.01
b. Stakeholder norms→PES	20	6059	0.181	0.243	0.013	0.217–0.268	157	198.59
c. Mindsets of top managers→PES	14	3148	0.276	0.380	0.018	0.345–0.415	156	118.66
d. PES→ Environ. performance	13	1957	0.376	0.480	0.023	0.435–0.524	96	225.72
e. PES→ Economic performance	26	7837	0.107	0.137	0.011	0.115–0.159	91	246.96
Sample in China								
a. Regulations→PES	5	1078	0.326	0.437	0.031	0.377–0.497	1	102.67
b. Stakeholder norms→PES	11	1811	0.332	0.444	0.024	0.397–0.490	94	117.53
c. Mindsets of top managers→PES	8	1582	0.389	0.535	0.025	0.486–0.585	45	158.64
d. PES→ Environ. performance	5	1698	0.263	0.308	0.024	0.260–0.356	1	46.63
e. PES→ Economic performance	10	2525	0.240	0.312	0.020	0.273–0.351	39	293.07

Notes: ^a K: number of correlation coefficients meta-analysed. ^b The sample weighted and reliability corrected correlation. ^c Standard error of sample weighted and reliability corrected correlation. ^d The number of studies reporting null results needed to reduce the correlation to non-significance.

reliability-corrected correlation (Standard Error), and the corresponding 95 percent confidence interval (95% CI), file drawer analysis, as well as Q statistic test of heterogeneity for each relationship.

We first examined the overall antecedents–PES relationships. As shown in the first line of the total sample in [Table 2](#), the sample weighted correlation (\bar{r}) for the total set of 19 correlations and a total sample size N of 6038 observations is 0.132. After correcting for measurement errors, the sample weighted and reliability corrected correlation (\bar{r}_c) is 0.187, with a standard error of 0.013. The corresponding 95 percent confidence interval (95% CI) is 0.162–0.212, which is positive and excludes zero, indicating that the correlation between regulations and PES is distinguished from zero. Thus, the results support H1a, which predicts a positive relationship between regulations and PES. As shown in the second line of [Table 2](#), the sample weighted correlation (\bar{r}) for the total sample size of 7870 is 0.216, the sample weighted and reliability corrected correlation (\bar{r}_c) is 0.289, and the 95 percent confidence interval (95% CI) is 0.266–0.311. Therefore the relationship between stakeholder norms and PES is positive and H1b is supported. Likewise, the results provide support for H1c, which posits a positive relationship between top managers' mindsets and PES ($\bar{r} = 0.314$, $\bar{r}_c = 0.432$, $K = 22$, 95% CI = 0.403–0.460).

The subgroup meta-analysis results in [Table 2](#) suggest that, in Western countries, the three antecedents all have positive effects on PES respectively. Specifically, for the relationship between regulations and PES, the sample weighted correlation (\bar{r}) is 0.090, the sample weighted and reliability corrected correlation (\bar{r}_c) is 0.133, and the 95 percent confidence interval (95% CI) is 0.105–0.161. For the relationship between stakeholder norms and PES, the sample weighted correlation (\bar{r}) is 0.181, the sample weighted and reliability corrected correlation (\bar{r}_c) is 0.243, and the 95 percent confidence interval (95% CI) is 0.217–0.268. For the relationship between top managers' mindsets and PES, the sample weighted correlation (\bar{r}) is 0.276, the sample weighted and reliability corrected correlation (\bar{r}_c) is 0.380, and the 95 percent confidence interval (95% CI) is 0.345–0.415. We compared the 95 percent confidence intervals of the three relationships and the results reveal that the lower endpoint of 95% CI of mindsets of top managers–PES relationship (0.345) is larger than the upper endpoint of 95% CI of stakeholder norms–PES relationship (0.268), and the lower endpoint of 95% CI of stakeholder norms–PES relationship (0.217) is larger than the upper endpoint of 95% CI of regulations–PES relationship (0.161). The results indicate that in Western countries, top managers' mindsets show greater impact on PES than stakeholder norms do, and stakeholder norms also show greater impact on PES than regulations do. Therefore H2a is supported. On the other hand, the data in China show positive associations between the three antecedents and PES separately. For regulations–PES relationship, $\bar{r} = 0.326$, $\bar{r}_c = 0.437$, and 95% CI is 0.377–0.497. For stakeholder norms–PES relationship, $\bar{r} = 0.332$, $\bar{r}_c = 0.444$, and 95% CI is 0.397–0.490. For mindsets of top managers–PES relationship, $\bar{r} = 0.389$, $\bar{r}_c = 0.535$, and 95% CI is 0.486–0.585. Furthermore, comparing the 95 percent confidence intervals of the three relationships, we find that they overlap,

which reveals that the regulations, stakeholder norms and mindsets of top managers have similar positive effects on PES. Thus, H2b is supported.

The meta-analysis results in Western countries also suggest that PES has positive association with environmental performance ($\bar{r} = 0.376$, $\bar{r}_c = 0.480$, $K = 13$, 95% CI = 0.435–0.524) and economic performance ($\bar{r} = 0.107$, $\bar{r}_c = 0.137$, $K = 26$, 95% CI = 0.115–0.159). In addition, PES has a stronger effect on environmental performance than it has on economic performance in Western firms, because the lower endpoint of 95% CI of PES–environmental performance relationship (0.435) is larger than the upper endpoint of 95% CI of PES–economic performance relationship (0.159). Thus, H3a is supported. By contrast, in Chinese firms, the results show that PES has similar positive effects on environmental performance ($\bar{r} = 0.263$, $\bar{r}_c = 0.308$, $K = 5$, 95% CI = 0.260–0.356) and economic performance ($\bar{r} = 0.240$, $\bar{r}_c = 0.312$, $K = 10$, 95% CI = 0.273–0.351), according to the overlap of the two 95 percent confidence intervals. Therefore, the results confirm H3b. With regard to H3c, the meta-analysis results show that PES has a greater impact on environmental performance for Western firms ($\bar{r} = 0.376$, $\bar{r}_c = 0.480$, $K = 13$, 95% CI = 0.435–0.524) than it does for Chinese firms ($\bar{r} = 0.263$, $\bar{r}_c = 0.308$, $K = 5$, 95% CI = 0.260–0.356), because the lower endpoint of 95% CI in Western countries (0.435) is larger than the upper endpoint of 95% CI in China (0.356). Therefore H3c is supported. Similarly, H3d is also confirmed by the results which suggest that PES has a greater impact on economic performance for the Chinese firms ($\bar{r} = 0.240$, $\bar{r}_c = 0.312$, $K = 10$, 95% CI = 0.273–0.351) than it does for the Western firms ($\bar{r} = 0.107$, $\bar{r}_c = 0.137$, $K = 26$, 95% CI = 0.115–0.159).

Availability bias is an important common criticism against meta-analysis, which suspects that published research reports larger effect sizes than unpublished studies. Some studies because of the ‘file drawer problem,’ are simply never published (Dalton & Dalton, 2005). To address the possibility of availability bias, we performed an effect size file drawer analysis according to Rosenthal (1979) to compute the number of additional overlooked studies needed to cause the correlation to reduce to the point of non-significance. Table 2 shows the results of the file drawer analysis. Most of the results appear to be robust with regard to a large number of null studies (mean file-drawer N is 498.20) needed to change the conclusions of this meta-analysis. However, some findings presented in Table 2 are not conclusive because a small number of additional studies could change the conclusions. In the Q-statistic test for heterogeneity, all the tests for heterogeneity are significant, demonstrating statistical heterogeneity.

Robustness Check

Our samples of Western countries include Europe and the United States. Therefore, some differences may be because of their different national contexts. To test whether the West is culturally homogenous, we differentiated the US-based studies from the European-based studies and separated the Western country data into two samples.

For samples from the US-based studies, the mindsets of top managers show a greater impact on PES ($\bar{r}_c = 0.238$, $K = 6$, 95% CI = 0.185–0.291) than do the stakeholder norms ($\bar{r}_c = 0.136$, $K = 9$, 95% CI = 0.092–0.180), and stakeholder norms also show a greater impact on PES than do the regulations ($\bar{r}_c = 0.047$, $K = 6$, 95% CI = 0.004–0.090). Meanwhile, the results also show that the effect of PES on environmental performance ($\bar{r}_c = 0.173$, $K = 8$, 95% CI = 0.106–0.240) is stronger than the effect on economic performance ($\bar{r}_c = 0.052$, $K = 12$, 95% CI = 0.011–0.094) in US firms. For the European samples, the mindsets of top managers show a greater impact on PES ($\bar{r}_c = 0.489$, $K = 8$, 95% CI = 0.442–0.536) than do the stakeholder norms ($\bar{r}_c = 0.296$, $K = 11$, 95% CI = 0.265–0.326), and stakeholder norms also show a greater impact on PES than do the regulations ($\bar{r}_c = 0.194$, $K = 8$, 95% CI = 0.157–0.230). The effect of PES on environmental performance ($\bar{r}_c = 0.725$, $K = 5$, 95% CI = 0.665–0.785) is stronger than that on economic performance ($\bar{r}_c = 0.171$, $K = 14$, 95% CI = 0.145–0.198). Therefore, the results in the two contexts are both consistent with the results in Western countries, which suggest that our results are robust.

DISCUSSION

Our purpose in this study is to explore how national context influences relationships among proactive environmental strategies (PES), environmental and economic firm performance, and three antecedents – government regulations, stakeholder norms, and top managers' mindsets. Furthermore, because both Western and Chinese firms undertake PES, we examine the effects of national contexts on the relationships.

Our results support all the hypotheses with important contributions. They contribute to a comprehensive understanding of important antecedents of PES. Based on extant literature, we suggest that government regulations, stakeholder norms, and managers' mindsets are the most important key antecedents of PES. Going beyond this literature, we explain how effects of three antecedents may be different between China and Western countries. We integrate the national business systems approach and naive dialecticism perspectives to provide new insights for explaining effects of traditional cultural differences and market institution systems on the relationships among the antecedents, PES, and firm performance in China and Western countries. By comparing the relationships we find that different national contexts and market environments cause firms to react to different factors in making PES choices. They also place different focus on economic versus environmental performance. Therefore, we show why and how regulations, stakeholder norms, and the mindsets of top managers can differently affect PES and cause different economic and environment performance. Thus we enrich the extant literature regarding environmental strategies, the national business systems approach, and naive dialecticism perspective.

Our meta-analysis allows us to extend our research framework beyond a single theory and to examine relationships by comparatively investigating PES in China

and in Western countries, focusing on both the historical traditional culture and contemporary market environment effects. Most prior studies focused on only one or two antecedents (Cordano & Frieze, 2000; Darnall, Henriques, & Sadorsky, 2010; López-Gamero, Claver-Cortés, & Molina-Arozin, 2009), and few studies have compared the differences in emerging and developed economies. Our results indicate that different national environments can change the importance of the three factors in affecting PES. Western firms and Chinese firms may have varying mindsets of top managers regarding PES, and those differences may significantly influence the implementation of environmental strategies. By systematically explaining the effects of antecedents in strengthening PES and by emphasizing the contingent role of national contexts, we provide an integrated view of PES, antecedents and outcomes.

Finally, this research resolved the inconsistent views about PES influences on environmental and economic performance in the literature. We find Western firms utilize PES to achieve stronger environmental performance while China firm implement PES to improve both environmental and economic performance simultaneously. The results explain the different effects of national contexts on PES–performance relationships.

Limitations and Future Research

Despite our contributions, our study has several limitations. The first arises from issues inherent in our method. Although meta-analysis can examine a more comprehensive set of factors than those we investigated from the literature alone, the scope and nature of the original studies on which we based our meta-analysis constrained the analysis (Hunter & Schmidt, 1990). Although many studies have explored PES effects on firm performance, they may ascribe different meanings to PES. Consequently, future studies should divide PES into different types and explore their relationships with firm performance. Second, based on previous research, we focused on three main antecedents of PES—regulations, stakeholder norms, and the mindsets of top managers. However, we omitted other PES drivers such as training and investment because few primary studies show relationships involving those variables. Future studies may further explore the drivers of environmental strategies and integrate the effects of those variables on PES. Third, based on extant literature, we use nine environmental activities to measure PES, and our results suggest no significant differences among the antecedents, PES, and firm performance in both European and US samples. However, the literature has explored the differences between firms in both Europe and the United States (Matten & Moon, 2008), and future study may use other indicators to measure PES, and examine relationship differences in both Europe and the United States. Finally, we compare China and Western countries, but future studies could consider PES in other emerging economies.

Managerial Implications

Our study has important managerial implications. Our results indicate that top managers can have a better awareness of regulations, stakeholder norms, and the mindsets of their managers may influence their adoption of proactive environmental strategies, and such environmental strategy may enhance their firms' performance. Especially in Western countries, firms can improve PES by strengthening managers' mindsets about environmental protection. Meanwhile, top managers of firms in China could further enhance their environmentally protective mindsets to strengthen their environmental strategies. In fact, strong environmentally friendly mindsets can ensure that firms in China emphasize PES for sustainable development. The Chinese government, especially, has more opportunity than Western governments to help firms strengthen their PES, and should therefore strengthen regulations. Moreover, because PES helps firms in China improve both environmental and economic performance, firms lacking PES should formulate and implement it.

CONCLUSION

Using a meta-analysis, we confirm that government regulations, stakeholder norms, and the mindsets of top managers positively affect PES, and that PES positively affects both environmental and economic firm performance. We introduce national context as a contingent factor and argue that traditional cultures and market systems can cause antecedents to have different effects on PES and on performance. We find all firms in any national environment utilize all three drivers to strengthen their environmental strategies and improve their environmental and economic performance. However, we found important differences between Chinese and Western firms. Future scholars and practitioners should understand the cultural effects and their implications for environmental management.

NOTES

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REFERENCES

- Aguinis, H., & Galvas, A. 2012. What we know and don't know about corporate social responsibility: A review and research agenda. *Journal of Management*, 38(4): 932–968.
- Aragón-Correa, J. A., Hurtado-Torres, N., Sharma, S., & Garcia-Morales, V. J. 2008. Environmental strategy and performance in small firms: A resource-based perspective. *Journal of Environmental Management*, 86(1): 88–103.
- Aragón-Correa, J. A., & Rubio-López, E. A. 2007. Proactive corporate environmental strategies: Myths and misunderstandings. *Long Range Planning*, 40(3): 357–381.

- Aragón-Correa, J. A., & Sharma, S. 2003. A contingent resource-based view of proactive corporate environmental strategy. *Academy of Management Review*, 28(1): 71–88.
- Ateş, M. A., Bloemhof, J., Raaij, E. M., & Wynstra, F. 2012. Proactive environmental strategy in a supply chain context: The mediating role of investments. *International Journal of Production Research*, 50(4): 1079–1095.
- Avella, L., Vazquez-Bustelo, D., & Fernandez, E. 2011. Cumulative manufacturing capabilities: An extended model and new empirical evidence. *International Journal of Production Research*, 49(3): 707–729.
- Bagur-Femenias, L., Llach, J., & Alonso-Almeida, M. M. 2013. Is the adoption of environmental practices a strategic decision for small service companies?: An empirical approach. *Management Decision*, 51(1): 41–62.
- Banerjee, S. B. 2001. Managerial perceptions of corporate environmentalism: Interpretations from industry and strategic implications for organizations. *Journal of Management Studies*, 38(4): 489–513.
- Bansal, P. 2003. From issues to actions: The importance of individual concerns and organizational values in responding to natural environmental issues. *Organization Science*, 14(5): 510–527.
- Bansal, P., & Clelland, I. 2004. Talking trash: Legitimacy, impression management and unsystematic risk in the context of the natural environment. *Academy of Management Journal*, 47(1): 93–103.
- Bansal, P., & Hunter, T. 2003. Strategic explanations for the early adoption of ISO 14001. *Journal of Business Ethics*, 46(3): 289–299.
- Berrone, P., Cruz, C., Gomez-Mejia, L. R., & Larrazza-Kintana, M. 2010. Socioemotional wealth and corporate responses to institutional pressures: Do family-controlled firms pollute less? *Administrative Science Quarterly*, 55(1): 82–113.
- Berrone, P., Fosfuri, A., Gelabert, L., & Gomez-Mejia, L. R. 2013. Necessity as the mother of ‘green’ inventions: Institutional pressures and environmental innovations. *Strategic Management Journal*, 34(8): 891–909.
- Berrone, P., & Gomez-Mejia, L. 2009. Environmental performance and executive compensation: An integrated agency-institutional perspective. *Academy of Management Journal*, 52(1): 103–126.
- Branzei, O., Ursacki-Bryant, T. J., Vertinsky, I., & Zhang, W. 2004. The formation of green strategies in Chinese firms: Matching corporate environmental responses and individual principles. *Strategic Management Journal*, 25(11): 1075–1095.
- Chan, R. Y. K. 2005. Does the natural-resource-based view of the firm apply in an emerging economy? A survey of foreign invested enterprises in China. *Journal of Management Studies*, 42(3): 625–672.
- Chan, R. Y. K., He, H., Chan, H. K., & Wang, W. Y. C. 2012. Environmental orientation and corporate performance: The mediation mechanism of green supply chain management and moderating effect of competitive intensity. *Industrial Marketing Management*, 41(4): 621–630.
- Chang, C. H. 2011. The influence of corporate environmental ethics on competitive advantage: The mediation role of green innovation. *Journal of Business Ethics*, 104(3): 361–370.
- Chang, C., Rosen, C. C., & Levy, P. E. 2009. The relationship between perceptions of organizational politics and employee attitudes, strain, and behavior: A meta-analytic examination. *Academy of Management Journal*, 52(4): 779–801.
- Chen, M. J. 2002. Transcending paradox: The Chinese ‘middle way’ perspective. *Asia Pacific Journal of Management*, 19: 179–199.
- Chen, Y. S., Chang, C. H., & Wu, F. S. 2012. Origins of green innovations: The differences between proactive and reactive green innovations. *Management Decision*, 50(3): 368–398.
- Christmann, P. 2000. Effects of ‘best practices’ of environmental management on cost advantage: The role of complementary assets. *Academy of Management Journal*, 43(4): 663–680.
- Christmann, P., & Taylor, G. 2001. Globalization and the environment: Determinants of firm self-regulation in China. *Journal of International Business Studies*, 32(3): 439–458.
- Clarkson, M. E. 1995. A stakeholder framework for analyzing and evaluating corporate social performance. *Academy of Management Review*, 20(1): 92–117.
- Clemens, B., & Douglas, T. J. 2006. Does coercion drive firms to adopt ‘voluntary’ green initiatives? Relationships among coercion, superior firm resources, and voluntary green initiatives. *Journal of Business Research*, 59(4): 483–491.

- Cordano, M., & Frieze, I. H. 2000. Pollution reduction preferences of US environmental managers: Applying Ajzen's theory of planned behavior. *Academy of Management Journal*, 43(4): 627–641.
- Cordano, M., Marshall, R. S., & Silverman, M. 2010. How do small and medium enterprises go 'green'? A study of environmental management programs in the US Wine Industry. *Journal of Business Ethics*, 92(3), 463–478.
- Crook, T. R., Ketchen, D. J., Combs, J. G., & Todd, S. Y. 2008. Strategic resources and performance: A meta-analysis. *Strategic Management Journal*, 29(11): 1141–1154.
- Dahlmann, F., & Brammer, S. 2011. Exploring and explaining patterns of adoption and selection in corporate environmental strategies in the USA. *Organization Studies*, 32(4): 527–553.
- Dalton, D. R., & Dalton, C. M. 2005. Strategic management studies are a special case for meta-analysis. In Ketchen, D. & Bergh, D. (Eds), *Research Methodology in Strategy and Management*: Vol. 2. San Diego, CA: Elsevier.
- Darnall, N., & Edwards, D. J. 2006. Predicting the cost of environmental management system adoption: The role of capabilities, resources and ownership structure. *Strategic Management Journal*, 27(4): 301–320.
- Darnall, N., Henriques, I., & Sadowsky, P. 2008. Do environmental management systems improve business performance in an international setting? *Journal of International Management*, 14(4): 364–376.
- Darnall, N., Henriques, I., & Sadowsky, P. 2010. Adopting proactive environmental strategy: The influence of stakeholders and firm size. *Journal of Management Studies*, 47(6): 1072–1094.
- Delgado-Ceballos, J., Aragón-Correa, J. A., Ortiz-de-Mandojana, N., & Rueda-Manzanares, A. 2012. The effect of internal barriers on the connection between stakeholder integration and proactive environmental strategies. *Journal of Business Ethics*, 107(3): 281–293.
- Delmas, M. 2001. Stakeholders and competitive advantage: The case for ISO 14001. *Production and Operations Management*, 10(3): 343–358.
- Delmas, M. A., & Montes-Sancho, M. J. 2010. Voluntary agreements to improve environmental quality: Symbolic and substantive cooperation. *Strategic Management Journal*, 31(6): 576–601.
- Delmas, M., & Toffel, M. 2004. Stakeholders and environmental management practices: An institutional framework. *Business Strategy and the Environment*, 13: 209–222.
- Demirel, P., & Kesidou, E. 2011. Stimulating different types of eco-innovation in the UK: Government policies and firm motivations. *Ecological Economics*, 70(8): 1546–1557.
- Escobar, L. F., & Vredenburg, H. 2011. Multinational oil companies and the adoption of sustainable development: A resource-based and institutional theory interpretation of adoption heterogeneity. *Journal of Business Ethics*, 98(1): 39–65.
- Etzion, D. 2007. Research on organizations and the natural environment, 1992–present: A review. *Journal of Management*, 33(4): 637–664.
- Fang, T. 2010. Asian management research needs more self-confidence: Reflections on Hofstede (2007) and beyond. *Asia Pacific Journal of Management*, 27: 155–170.
- Fang, T. 2011. Yin Yang: A new perspective on culture. *Management and Organization Review*, 8(1): 25–50.
- Flannery, B. L., & May, D. R. 2000. Environmental ethical decision making in the U.S. metal-finishing industry. *Academy of Management Journal*, 43(4): 642–662.
- Florida, R., & Davison, D. 2001. Gaining from green management: Environmental management systems inside and outside the factory. *California Management Review*, 43(3): 54–64.
- Freedman, M., & Jaggi, B. 1988. Impact of government regulations on pollution performance of pulp and paper firms. *Environmental Management*, 12(3): 391–396.
- Fryxell, G. E., & Lo, C. W. H. 2003. The Influence of Environmental Knowledge and Values on Managerial Behaviours on Behalf of the Environment: An Empirical Examination of Managers in China. *Journal of Business Ethics*, 46(1): 45–69.
- Fryxell, G. E., Lo, C. W. H., & Chung, S. S. 2004. Influence of motivations for seeking ISO 14001 certification on perceptions of EMS effectiveness in China. *Environmental Management*, 33(2): 239–251.
- Gadenne, D. L., Kennedy, J., & McKeiver, C. 2009. An empirical study of environmental awareness and practices in SMEs. *Journal of Business Ethics*, 84(1): 45–63.
- González-Benito, J. 2008. The effect of manufacturing pro-activity on environmental management: An exploratory analysis. *International Journal of Production Research*, 46(24): 7017–7038.

- González-Benito, J., & González-Benito, O. 2006. The role of stakeholder pressure and managerial values in the implementation of environmental logistics practices. *International Journal of Production Research*, 44(7): 1353–1373.
- Hajmohammad, S., Vachon, S., Klassen, R. D., & Gavronski, I. 2013. Lean management and supply management: Their role in green practices and performance. *Journal of Cleaner Production*, 39: 312–320.
- Hart, S. L. 1995. A natural-resource-based view of the firm. *Academy of Management Review*, 20(4): 986–1014.
- Hedges, L. V., & Olkin, I. 1985. *Statistical methods for meta-analysis*. Orlando, FL: Academic Press.
- Henriques, I., & Sadorsky, P. 1999. The relationship between environmental commitment and managerial perceptions of stakeholder importance. *Academy of Management Journal*, 42(1): 87–99.
- Hofer, C., Cantor, D. E., & Dai, J. 2011. The competitive determinants of a firm's environmental management activities: Evidence from US manufacturing industries. *Journal of Operations Management*, 30(1–2): 69–84.
- Hoffman, A. 1997. *From heresy to dogma: An institutional history of corporate environmentalism*. San Francisco, CA: New Lexington Press.
- Hu, H. Y., Wu, Q. Y., Yang, Y., & Wang, H. T. 2011. Evaluation and management methods for toxicity control of industrial wastewater. *Journal of Environmental Engineering Technology*, 1(1): 46–51.
- Huang, Y. C. 2005. An empirical test of the relationship of environmental management and stakeholders: A study of manufacturers at Taiwan. *Asia Pacific Management Review*, 10(1): 5–16.
- Huang, Y. C., Ding, H. B., & Kao, M. R. 2009. Salient stakeholder voices: Family business and green innovation adoption. *Journal of Management and Organization*, 15(3): 309–326.
- Huang, C. L., & Kung, F. H. 2010. Drivers of environmental disclosure and stakeholder expectation: Evidence from Taiwan. *Journal of Business Ethics*, 96(3): 435–451.
- Hunter, J. E., & Schmidt, F. L. 1990. *Methods of meta-Analysis: Correcting error and bias in research findings*. Newbury Park, CA: Sage.
- Hunter, J. E., & Schmidt, F. L. 2004. *Methods of meta-analysis: Correcting error and bias in research findings* (2nd ed.). Thousand Oaks, CA: Sage.
- Johnstone, N., & Labonne, J. 2009. Why do manufacturing facilities introduce environmental management systems? Improving and/or signaling performance. *Ecological Economics*, 68(3): 719–730.
- Judge, W. Q., & Douglas, T. J. 1998. Performance implications of incorporating natural environmental issues into the strategic planning process: An empirical assessment. *Journal of Management Studies*, 35(2): 241–262.
- Julian, S. D., & Ofori-Dankwa, J. C. 2013. Financial resource availability and corporate social responsibility expenditures in a sub-Saharan economy: The institutional difference hypothesis. *Strategic Management Journal*, 34(11): 1314–1330.
- Kassinis, G. I., & Soteriou, A. C. 2003. Greening the service profit chain: The impact of environmental management practices. *Production and Operations Management*, 12(3): 386–403.
- Kassinis, G. I., & Vafeas, N. 2009. Environmental performance and plant closure. *Journal of Business Research*, 62(4): 484–494.
- King, A. A., & Lenox, M. J. 2001. Lean and green? An empirical examination of the relationship between lean production and environmental performance. *Production and Operations Management*, 10(3): 244–256.
- King, A. A., & Lenox, M. J. 2002. Exploring the locus of profitable pollution reduction. *Management Science*, 48(2): 289–299.
- Kirca, A. H., Hult, G. T. M., Roth, K., Cavusgil, S. T., Perry, M. Z., & Akdeniz, M. B., Delinogul, S. Z., Mena, J. A., Politte, W. A., Hoppner, J. J., Miller, J. C., & White, R. C. 2011. Firm-specific assets, multinationality, and firm performance: A meta-analytic review and theoretical integration. *Academy of Management Journal*, 54(1): 47–72.
- Klassen, R. D. 2001. Plant-level environmental management orientation: The influence of management views and plant characteristics. *Production and Operations Management*, 10(3): 257–275.

- Klassen, R. D., & Vachon, S. 2003. Collaboration and evaluation in the supply chain: The impact on plant-level environmental investment. *Production and Operations Management*, 12(3): 336–352.
- Klassen, R. D., & Whybark, D. C. 1999. The impact of environmental technologies on manufacturing performance. *Academy of Management Journal*, 42(6): 599–615.
- Lee, M. D. P. 2011. Configuration of external influences: The combined effects of institutions and stakeholders on corporate social responsibility strategies. *Journal of Business Ethics*, 102(2): 281–298.
- Li, Y., Lee, S., Li, X., & Liu, Y. 2010. Knowledge codification, exploitation, and innovation: The moderating influence of organizational controls in Chinese firms. *Management and Organization Review*, 6(2): 219–241.
- Li, Y., Li, P. P., Liu, Y., & Yang, D. 2010. Learning trajectory in offshore OEM cooperation: Transaction value for local suppliers in the emerging economies. *Journal of Operations Management*, 28: 269–282.
- Li, Y., Liu, Y., Duan, Y., & Li, M. F. 2008. Entrepreneurial orientation, strategic flexibilities and indigenous firm innovation in transitional China. *International Journal of Technology Management*, 41: 223–246.
- Li, Y., & Peng, M. W. 2008. Developing theory from strategic management research in China. *Asia Pacific Journal of Management*, 25: 563–572.
- Lin, C. Y., & Ho, Y. H. 2011. Determinants of green practice adoption for logistics companies in China. *Journal of Business Ethics*, 98(1): 67–83.
- Link, S., & Naveh, E. 2006. Standardization and discretion: Does the environmental standard ISO 14001 lead to performance benefits? *IEEE Transactions on Engineering Management*, 53(4): 508–519.
- Lipsey, M. W., & Wilson, D. B. 2001. *Practical meta-Analysis*. Thousand Oaks, CA: Sage.
- Liu, X., Liu, B., Shishime, T., Yu, Q., Bi, J., & Fujitsuka, T. 2010. An empirical study on the driving mechanism of proactive corporate environmental management in China. *Journal of Environmental Management*, 91(8): 1707–1717.
- Llach, J., Perramon, J., Alonso-Almeida, M. M., & Bagur-Femenías, L. 2013. Joint impact of quality and environmental practices on firm performance in small service businesses: An empirical study of restaurants. *Journal of Cleaner Production*, 44: 96–104.
- Lo, C. W. H., Fryxell, G. E., & Tang, S. Y. 2010. Stakeholder pressures from perceived environmental impacts and the effect on corporate environmental management programmes in China. *Environmental Politics*, 19(6): 888–909.
- López-Gamero, M. D., Claver-Cortés, E., & Molina-Arozín, J. F. 2009. Evaluating environmental regulation in Spain using process control and preventive techniques. *European Journal of Operational Research*, 195(2): 497–518.
- López-Gamero, M. D., Claver-Cortés, E., & Molina-Azorín, J. F. 2011. Environmental perception, management, and competitive opportunity in Spanish hotels. *Cornell Hospitality Quarterly*, 52(4): 480–500.
- López-Gamero, M. D., Molina-Azorín, J. F., & Claver-Cortés, E. 2009. The whole relationship between environmental variables and firm performance: Competitive advantage and firm resources as mediator variables. *Journal of Environmental Management*, 90(10): 3110–3121.
- López-Gamero, M. D., Molina-Azorín, J. F., & Claver-Cortés, E. 2011. The relationship between managers' environmental perceptions, environmental management and firm performance in Spanish hotels: a whole framework. *International Journal of Tourism Research*, 13: 141–163.
- Lux, S. 2008. *Nonmarket effects on strategic fit and performance: An economic institutional change perspective*. Unpublished doctoral dissertation, Florida State University, Tallahassee.
- Maignan, I., & Ralston, D. A. 2002. Corporate social responsibility in Europe and the U.S.: Insights from businesses' self-presentations. *Journal of International Business Studies*, 33: 497–515.
- Margolis, J., Elfenbein, H. A., & Walsh, J. 2007. *Does it pay to be good? A meta-analysis and redirection of research on the relationship between corporate social and financial performance*. Working Paper. Ross School of Business, University of Michigan.
- Marshall, R. S., Akoorie, M. E. M., Hamann, R., & Sinha, P. 2010. Environmental practices in the wine industry: An empirical application of the theory of reasoned action and stakeholder

- theory in the United States and New Zealand. *Journal of World Business*, 45(4): 405–414.
- Marshall, R. S., Cordano, M., & Silverman, M. 2005. Exploring individual and institutional drivers of proactive environmentalism in the US wine industry. *Business Strategy and the Environment*, 14: 92–109.
- Martínez-del-Río, J., Céspedes-Lorente, J., & Carmona-Moreno, E. 2012. High-involvement work practices and environmental capabilities: How HIWPS create environmentally based sustainable competitive advantages. *Human Resource Management*, 51(6): 827–850.
- Matten, D., & Moon, J. 2008. ‘Implicit’ and ‘explicit’ CSR: A conceptual framework for a comparative understanding of corporate social responsibility. *Academy of Management Review*, 33(2): 404–424.
- 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. *Journal of Business Ethics*, 94(2): 279–298.
- Nisbett, R.E., & Masuda, T. 2003. Culture and point of view. *Proceedings of the National Academy of Sciences of the United States of America*, 100(19): 11163–11170.
- Nisbett, R. E., Peng, K., Choi, I., & Norenzayan, A. 2001. Culture and systems of thought: Holistic versus analytic cognition. *Psychological Review*, 108(2): 291–310.
- Ortiz-de-Mandojana, N., Aragón-Correa, J. A., Delgado-Ceballos, J., & Ferrón-Vilchez, V. 2012. The effect of director interlocks on firms’ adoption of proactive environmental strategies. *Corporate Governance: An International Review*, 20(2): 164–178.
- Peattie, K. 1992. *Green Marketing*. London: Pitman Publishing.
- Peng, M. W. 2002. Towards an institution-based view of business strategy. *Asia Pacific Journal of Management*, 19(2–3): 251–267.
- Peng, Y. S., & Lin, S. S. 2008. Local responsiveness pressure, subsidiary resources, green management adoption and subsidiary’s performance: Evidence from Taiwanese manufactures. *Journal of Business Ethics*, 79(1–2): 199–212.
- Peng, K., & Nisbett, R. E. 1999. Culture, dialectics, and reasoning about contradiction. *American Psychologist*, 54(9): 741–754.
- Peng, K., Spencer-Rodgers, J., & Nian, Z. 2006. Naïve dialecticism and the Tao of Chinese thought. In U. Kim, K. Yang, & K. Hwang (Eds.), *Indigenous and Cultural Psychology: Understanding People in Context*. New York: Springer.
- Philippe, D., & Durand, R. 2011. The impact of norm-conforming behaviors on firm reputation. *Strategic Management Journal*, 32: 969–993.
- Powell, W. W., & DiMaggio, P. J. (Eds.) 1991. *The New Institutionalism in Organizational Analysis*. Chicago, IL: The University of Chicago Press.
- Qi, G. Y., Zeng, S. X., Li, X. D., & Tam, C. M. 2012. Role of internalization process in defining the relationship between ISO 14001 certification and corporate environmental performance. *Corporate Social Responsibility and Environmental Management*, 19(3): 129–140.
- Qi, G. Y., Zeng, S. X., Tam, C. M., Yin, H. T., Wu, J. F., & Dai, Z. H. 2011. Diffusion of ISO 14001 environmental management systems in China: Rethinking on stakeholders’ roles. *Journal of Cleaner Production*, 19(11): 1250–1256.
- Ramus, C. A., & Steger, U. 2000. The roles of supervisory support behaviors and environmental policy in employee ‘ecoinitiatives’ at leading-edge European companies. *Academy of Management Journal*, 43(4): 605–626.
- Rosenthal, R. 1994. Parametric measures of effect size. In H. Cooper & L. V. Hedges (Eds.), *The handbook of research synthesis*: 231–244. New York: Sage.
- Rosenthal, R. 1979. The file drawer problem and tolerance for null results. *Psychological Bulletin*, 86: 638–641.
- Russo, M. V., & Harrison, N. S. 2005. Organizational design and environmental performance: Clues from the electronics industry. *Academy of Management Journal*, 48(4): 582–593.
- Sarkis, J., Gonzalez-Torre, P., & Adenso-Diaz, B. 2010. Stakeholder pressure and the adoption of environmental practices: The mediating effect of training. *Journal of Operations Management*, 28(2): 163–176.
- Schaefer, A. 2007. Contrasting institutional and performance accounts of environmental management systems: Three case studies in the UK water & sewerage industry. *Journal of Management Studies*, 44(4): 506–535.
- Scott, W. R. 2001. *Institutions and Organizations*. Thousand Oaks, CA: Sage.

- Shafer, W. E., Fukukawa, K., & Lee, G. M. 2007. Values and the perceived importance of ethics and social responsibility: The US versus China. *Journal of Business Ethics*, 70(3): 265–284.
- Sharfman, M. P., & Fernando, C. S. 2008. Environmental risk management and the cost of capital. *Strategic Management Journal*, 29(6): 569–592.
- Sharma, S. 2000. Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. *Academy of Management Journal*, 43(4): 681–697.
- Sharma, S., & Henriques, I. 2005. Stakeholder influences on sustainability practices in the Canadian forest products industry. *Strategic Management Journal*, 26(2): 159–180.
- Sharma, S., & Vredenburg, H. 1998. Proactive corporate environmental strategy and the development of competitively valuable organizational capabilities. *Strategic Management Journal*, 19(8): 729–753.
- Spencer-Rodgers, J., Williams, M. J., & Peng, K. 2010. Cultural differences in expectations of change and tolerance for contradiction: A decade of empirical research. *Personality and Social Psychology Review*, 14(3): 296–312.
- Su, Z., Peng, J., Shen, H., & Xiao, T. 2013. Technological capability, marketing capability, and firm performance in turbulent conditions. *Management and Organization Review*, 9(1): 115–137.
- Su, C., Sirgy, M. J., & Littlefield, J. E. 2003. Is *guanxi* orientation bad, ethically speaking? A study of Chinese enterprises. *Journal of Business Ethics*, 44(4): 303–312.
- Suchman, M. C. 1995. Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, 20(3): 571–610.
- Thoumy, M., & Vachon, S. 2012. Environmental projects and financial performance: Exploring the impact of project characteristics. *International Journal of Production Economics*, 140(1): 28–34.
- Torugsa, N. A., & O'Donohue, W., & Hecker, R. 2013. Proactive CSR: An empirical analysis of the role of its economic, social and environmental dimensions on the association between capabilities and performance. *Journal of Business Ethics*, 115(2): 383–402.
- Vachon, S. 2007. Green supply chain practices and the selection of environmental technologies. *International Journal of Production Research*, 45(18–19): 4357–4379.
- Villiers, C. de, Naiker, V., & Staden, C. J. van. 2011. The effect of board characteristics on firm environmental performance. *Journal of Management*, 37(6): 1636–1663.
- Viswesvaran, C., & Ones, D. 1995. Theory testing: Combining psychometric meta-analysis and structural equations modeling. *Personnel Psychology*, 48(4): 865–885.
- Wagner, M. 2007. Integration of environmental management with other managerial functions of the firm: Empirical effects on drivers of economic performance. *Long Range Planning*, 40(6): 611–628.
- Walls, J. L., Berrone, P., & Phan, P. H. 2012. Corporate governance and environmental performance: Is there really a link? *Strategic Management Journal*, 33(8): 885–913.
- Whitley, R. 1999. *Divergent capitalisms: The social structuring and change of business systems*. Oxford: Oxford University Press.
- Wong, C. W. Y., Lai, K., Cheng, T. C. E., & Lun, Y. H. V. 2012. The roles of stakeholder support and procedure-oriented management on asset recovery. *International Journal of Production Economics*, 135(2): 584–594.
- Wright, M., Filatotchev, I., Hoskisson, R. E., & Peng, M. W. 2005. Strategy research in emerging economies: Challenging the conventional wisdom. *Journal of Management Studies*, 42(1): 1–33.
- Yang, C. L., Lin, S. P., Chan, Y. H., & Sheu, C. 2010. Mediated effect of environmental management on manufacturing competitiveness: An empirical study. *International Journal of Production Economics*, 123(1): 210–220.
- Zhou, K. Z., Su, C., & Bao, Y. 2002. A paradox of price–quality and market efficiency: A comparative study of the U.S. and China markets. *International Journal of Research in Marketing*, 19(4): 349–365.
- Zhu, Q., & Sarkis, J. 2004. Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises. *Journal of Operations Management*, 22(3): 265–289.
- Zhu, Q., Sarkis, J., & Lai, K. 2008. Confirmation of a measurement model for green supply chain management practices implementation. *International Journal of Production Economics*, 111(2): 261–273.

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