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STAKEHOLDER DEMANDS AND CORPORATE ENVIRONMENTAL COPING STRATEGIES IN CHINA

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Stakeholder Demands and Corporate Environmental Coping Strategies in China

Abstract

This paper examines how stakeholder demand and compliance capacity jointly shape corporate environmental coping strategies and subsequently environmental protection practices. A four-dimensional classification of coping strategies—formalism, accommodation, referencing, and self-determination—is conceptualized. Drawing on survey and interview data collected from manufacturing enterprises in China between 2011 and 2012, the paper shows that compared with formalism and accommodation, coping strategies of referencing and self-determination are associated with stronger environmental protection practices. Enterprises adjust their coping strategies by taking into account the constraints defined by both their internal and external environments. The results also demonstrate the potential synergetic effects of state and non-state stakeholders working together in promoting better corporate environmental coping strategies and environmental practices in China.

Keywords: corporate environmental coping strategy, environmental protection practices, compliance capacity, stakeholder demand

Regulators may choose from a variety of enforcement strategies to achieve policy targets (Bardach and Kagan, 1982; Tang *et al.*, 2003). Regulated entities, on the other hand, may choose different strategies to cope with varying demands from different stakeholders (Darnall *et al.*, 2010; Rugman and Verbeke, 1998). The specific coping strategy adopted by a regulated firm not only shapes its environmental protection practices but also communicates to stakeholders its commitment to upholding corporate environmental responsibility (Lo *et al.*, 2010; Yee *et al.*, 2013). Researchers of both business strategy and environmental policy, however, usually focus on the dichotomy of “responsive versus proactive” strategies, while paying less attention to strategic responses to different types of stakeholder demands. In this study, we seek to build a conceptual framework of corporate environmental coping strategies, and examine how coping strategies are affected by compliance capacity and stakeholder demands, and how they subsequently influence environmental protection practices among enterprises.

As widely acknowledged in both the environmental regulation and corporate environmental management literatures, heavy-handed state enforcement is insufficient to ensure efficient and effective corporate environmental practices (Bardach and Kagan, 1982; Fiorino, 2001). Although both state and non-state demands jointly affect corporate environmental strategies and practices, effective environmental protection cannot be achieved by relying solely on external forces (Weidner and Jänacke, 2002). Instead, organizational factors such as firm capacity and awareness must also be considered (Kock *et al.*, 2012). Nevertheless, there have been few efforts to systematically examine how various external and internal factors interact with each other to shape corporate coping strategies and subsequent environmental practices. This is especially the case for research in developing countries, in which internal capacity of enterprises is often

limited, and demands from state and non-state stakeholders differ in form and intensity from those in Western countries (Fikru, 2014).

In this paper, we seek to fill this research gap by combining two different but closely related streams of research—one focusing on stakeholder demands and the other on internal compliance capacity—to examine the drivers of corporate environmental coping strategies. Drawing on survey and interview data collected from manufacturing enterprises in China between 2011 and 2012, we show that corporate environmental coping strategies can be characterized along four dimensions—formalism, accommodation, referencing, and self-determination. While internal compliance capacity is needed to pursue each dimension, different alignments of internal capacity and external demands affect a firm’s coping strategies. State and non-state demands also interact in complex ways to influence the adoption of varying dimensions. Particularly, an enterprise tends to score higher on the accommodation, referencing, and self-determination dimensions when it faces stronger demands from *both* state and non-state stakeholders. Yet only two of the four dimensions—referencing and self-determination—are associated with stronger environmental protection practices.

In the rest of the paper, we start with an overview of the current literature, and then propose a four-dimensional conceptual framework of corporate environmental coping strategies and develop four hypotheses. After introducing the research methods and empirical results, the paper concludes with a discussion on the theoretical contributions of our research and its managerial and policy implications.

Research Context and Theoretical Framework

With growing threats of environmental degradation, controlling industrial pollution has been an urgent regulatory task in China (Liu *et al.*, 2015; Tang *et al.*, 2010; Zhong and Mol, 2008). Yet many polluting enterprises are still at the threshold of minimum compliance or even non-compliance (Van Rooij, 2006). Given the increasing attention from both political leaders and the public to China's rapid environmental deterioration, industrial enterprises in China have been faced with mounting demands from various stakeholders—governments, the media, citizens, NGOs, industrial associations, and international buyers—to improve their environmental management practices (Francesch-Huidobro *et al.*, 2012; Lo and Tang, 2006). Demands from different stakeholders come in different forms and intensities, and these demands can change rapidly and are often inconsistent with one another. To deal with the stress associated with these fluid and complex regulatory environments, enterprise executives must develop appropriate coping strategies based on their assessment of their internal capacity as well as a wide array of stakeholder demands (Child and Tsai, 2005).

Conceptualizing Corporate Environmental Coping Strategies

Coping has been extensively studied in the psychology and management literatures (Carver *et al.*, 1989; Holahan and Moos, 1987). In general, coping strategies refer to the adaptive or constructive mechanisms that are used by individuals to reduce psychological stress. Some of these mechanisms focus on managing emotion, while others aim at problem solving (Holahan and Moos, 1987). In studying public service delivery, for instance, Tummers *et al.* (2015) identified three “families” of coping by frontline workers—moving towards, away, or against clients—to deal with pressure. Coping strategies have also been studied at the organizational

level. For instance, van Huijstee *et al.* (2011) systematically assessed four key elements of NGO coping strategies towards companies, namely action strategy, primary stakeholders, funding bases, and organizational capacity. The concept of “coping strategies” can be fruitfully used to examine how enterprises address environmental issues in fluid and complex regulatory environments. The concept is especially relevant to China because many studies have shown that regulatory compliance in this context is especially stressful for corporate executives because of the relative underdevelopment of the rule of law in China. As regulatory enforcement in China is often arbitrary (Yee *et al.*, forthcoming), it is difficult for corporate executives to know ahead of time what course of action can help them avoid trouble. The concept of “coping” helps analyze this type of situation.

In the environmental management literature, there are two major research foci on firm environmental behaviors and strategies. One examines corporate environmental behaviors on a continuum from “conformance to regulation” to “voluntary actions going beyond mandatory requirements” (Henriques and Sadorsky, 1999). Another research focus is on firms’ responses to specific environmental issues, e.g. the ISO 14001 Environmental Management System (EMS) certification (Boiral, 2007), or new regulations (Levi and Egan, 2003). Notably lacking from the literature, nevertheless, is an explicit focus on corporate environmental coping strategies.

Corporate environmental coping strategies can be defined as the strategic-level approaches adopted by regulated enterprises to prioritize environmental management tactics and to set up compliance benchmarks in fluid and complex regulatory settings. Based on an overview of the regulation and corporate environmental management literature, four coping strategy dimensions can be distinguished—formalism, accommodation, referencing, and self-determination (Aragón-

Correa and Sharma, 2003; Christmann, 2004; Henriques and Sadosky, 1999; Ma and Ortolano, 2000). This multi-dimensional characterization captures the fact that firms have to face competing demands from different types of regulations and stakeholders, and to develop complex arrays of coping strategies in order to meet their business needs and avoid prosecution (Schuler *et al.*, 2002). Therefore, each firm may adopt, to varying degrees, each of the four dimensions. These four dimensions of coping strategy do not exhaust all possibilities. For example, the psychology literature suggests avoidance as a possible coping strategy for stress. In our conceptualization, we do not include avoidance strategy because we mainly look at how active and constructive approaches are adopted by regulated entities to meet environmental demands. Table 1 provides a summary of the main characteristics of these four dimensions.

Table 1 A Typology of Corporate Environmental Coping Strategy Dimensions

	Formalism	Accommodation	Referencing	Self-determination
Features	Scripted Mechanistic	Compromise Cooperative	Mimicry Learning	Discretionary Pragmatic
Defined	Adhere to formal rules and use them as sole compliance benchmarks	Actively respond to and reconcile political / bureaucratic demands	Conscious imitation of reference groups	Prioritize firms' own interests and preferences in decision making

Formalism refers to a traditional “go-by-the-book” coping strategy that strictly follows formal rules within a command-and-control regulatory context (Winter and May, 2001). Dictated by a legal orientation, enterprises comply with regulations by setting up internal procedures that adhere strictly to the letter of the law. Given widespread corruption, lax enforcement, and poor compliance in China’s environmental regulatory regime, one may suspect that formalism is yet

to be a basic strategy adopted by most firms in China. That being said, formalism may become increasingly important for some enterprises that are taking up more efforts to adhere to all relevant regulations so that they can avoid political and legal trouble when the Chinese government is moving towards a more heavy-handed approach to regulatory enforcement (Yee *et al.*, forthcoming).

Accommodation refers to a coping strategy that gives priority to meeting political or bureaucratic demands (Cho *et al.*, 2006; Levy and Egan, 2003). Firms may consider regulatory agencies, rather than legislators, as the central point of contact for regulatory compliance (Wang *et al.*, 2003). Different from formalism, accommodation emphasizes reconciliation and adaptation to informal rules and demands. Handling political demands may distract firms from achieving cost-effective compliance since many political demands are temporary instead of long-term. In the Chinese regulatory context, however, satisfying political demands is almost as important as, if not more important than, being legally in compliance.

Referencing refers to a coping strategy that imitates peers' compliance practices or follows guidelines recommended by professional associations (Greenwood *et al.*, 2002). Such behaviors may be a result of calculated judgment on who and when to follow (King and Lenox, 2000), or simply a lack of experience. Regarding calculated imitation, gaining the approval and respect of others is often a key concern (May, 2005). In China, given increasing pressure from international buyers and large numbers of ambiguous and often self-contradictory regulations, following peer practices may be a way for some enterprises to avoid getting into marketing and political troubles (Yee *et al.*, 2013).

Self-determination refers to a coping strategy that emphasizes intellectual flexibility, managerial discretion, and autonomy (Kock *et al.*, 2012). When firms find it difficult to comply with governmental requirements, they may adopt a “substitution response” by developing their own internal corporate governance codes to deal with external pressures (Okhmatovskiy and David, 2012). Some multi-national corporations, for example, use the “double standard” approach, by which their subsidiaries tailor different environmental programs to meet local conditions, instead of using a common set of practices (Diestre and Rajagopalan, 2011). Some firms follow public audit procedures in order to obtain the ISO 14001 certification, while some do not seek certification but maintain similar standards internally in order to preserve internal implementation flexibility. In China, foreign-owned firms may prefer to develop their own internal environmental management standards based on their needs, which are often driven by requirements and expectations from their home countries. For some domestic firms, self-determination as a flexible compliance approach also makes sense given China’s fluid and complex regulatory setting.

Drivers of Corporate Coping Strategies and Environmental Protection Practices

Recent empirical studies in China have generated some insights on how external institutional environments and internal organizational factors affect corporate environmental management practices (Fryxell and Lo, 2002; Liu *et al.*, 2010; Zhan *et al.*, 2014). Of particular relevance for this paper are two recent studies on enterprises in Guangdong, China. Based on a survey in 2007 of Hong Kong-owned enterprises operating in Guangdong Province, Lo *et al.* (2010) found that government pressures are associated with stronger management motivation for better environmental protection measures, but societal pressures are associated with weaker

management motivation. Drawing on the same survey, Yee *et al.* (2013) found that demands from the local environmental protection bureau and top management attitude were positively associated with better environmental management practices, but extra-legal community action had a negative association with corporate environmental management practices. Both studies offered reasonable explanations for these results by reference to the specific political and social contexts of China. A limitation of the two studies, however, was that they did not examine the interactive effect of corporate compliance capacity and external stakeholder demands, as well as the interactive effect of different types of stakeholder demands. On the one hand, to minimize compliance costs, an enterprise has to consider the constraints imposed by both compliance capacity and external demands, and only coping strategies that are compatible with these constraints will be selected (Aragón-Correa and Sharma, 2003). On the other hand, different stakeholder demands may interact with one another to produce divergent effects on corporate environmental practices. For example, a strong civil society may encourage enterprises to adopt voluntary solutions to collective-action problems among them when authority in the formal political system is fragmented (Berardo and Scholz, 2010). Nevertheless, it remains unknown as to how the two forms of interaction affect corporate coping strategies.

In this paper, we seek to fill this gap by examining how stakeholder demand and compliance capacity co-shape corporate coping strategies and subsequently environmental protection practices, using data from a more recent survey on enterprises in the same province. Compliance capacity refers to an enterprise's endowment such as technical knowledge, financial and human resources, and inter-department coordination to comply with environmental regulations. Stakeholder demand is the degree of compliance demand from a wide variety of external

stakeholders. Two groups of stakeholders are relevant—one involving various state entities and the other involving various non-state (societal and market) actors that may exert environmental demands on enterprises.¹

Hypotheses

The positive impact of compliance capacity on corporate environmental strategy and performance has been well established in the literature (Qi *et al.*, 2014; Tung *et al.*, 2014; Winter and May, 2001). To employ any of the four dimensions of coping, considerable organizational inputs and efforts are needed. However, different stakeholders may exert different demands on how firms allocate their limited resources. Demands from state stakeholders usually aim at mandating enterprises to follow strictly formal regulatory requirements and government orders. When formal state demands are clear and enforcement is strict, enterprise executives are more likely to apply existing resources in following formal rules and matching the expectations of political and bureaucratic stakeholders. For instance, human resources could be utilized to develop informal ties (e.g. the so-called “*guanxi*” in the Chinese context) with those who have political influence.

H1. Corporations facing a higher level of demand from state stakeholders are more likely to translate compliance capacity into formalism and accommodation.

Demands from non-state stakeholders often go beyond simply meeting government-mandated pollution-reduction targets. For example, a local community may require the neighboring factory to reduce noise beyond the legal mandate, which is not an issue for a similar factory located in a suburban district. Meanwhile, firms also face different types of societal and market demands (Zhan and Tang, 2013). Since the way to deal with these types of demands

varies from case to case, applying resources into following others' practices and experiences is not the appropriate way to satisfy these needs. Moreover, such extra requirements and constraints give firms less freedom and latitude in developing means of compliance and applying resources in independent decision-making. Therefore, firms are less likely to apply their resources to referencing and self-determination when they are subject to strong societal and market demands.

H2. Corporations facing a higher level of demand from non-state stakeholders are less likely to translate compliance capacity into referencing and self-determination.

In addition to the dyadic relationship between the focal organization and external stakeholders, different stakeholder groups may interact, cooperate, and form alliances with each other (Lubell, 2004). For example, non-state stakeholders may strengthen their influence on enterprises' compliance by partnering with the more powerful state stakeholders (Gunningham *et al.*, 2003). Therefore, demands coming from state stakeholders may strengthen the impact of non-state stakeholder demand on corporate compliance strategies. Since these interacting effects may differ in relation to different dimensions of coping strategy, and it is difficult to specify *a priori* all the likely scenarios.

H3. State and non-state stakeholder demands have a joint effect on formalism, accommodation, referencing, and self-determination.

Different coping strategies vary in their effect on environmental protection practices. Compared with formalism and accommodation, referencing and self-determination are likely to lead to stronger environmental protection practices because (1) the former create less opportunities to acquire new information and less flexibility to address organizational

shortcomings (Short and Toffel, 2010), and (2) the latter help enterprises to ascertain the benefit of stronger environmental protection practices through learning from peer enterprises and self-audits (Majumdar and Marcus, 2001).

H4. Compared with formalism and accommodation, referencing and self-determination are associated with stronger environmental protection practices.

Research Design and Methodology

In this study, we collected data on manufacturing firms operating in the Pearl River Delta (PRD), Guangdong Province. Widely known as the “World’s Factory” for almost three decades, the PRD is home to tens of thousands of manufacturing plants, which differ widely in their environmental performance (Yee *et al.*, 2013). These enterprises have been under more legalistic regulation and stricter enforcement from local environmental protection bureaus (EPBs), as well as greater societal and market demands for industrial pollution reduction from an increasingly affluent society (Lo *et al.*, 2010). Given the vastness and geographical diversity of China, experiences in Guangdong are not necessarily representative of the whole country; yet they provide useful clues for understanding corporate environmental management in China and other emerging economies.

Data Collection

We collected data from firm-level surveys and semi-structured interviews with executives and managers. The former provide data on a broad spectrum of enterprises in different sizes, industries, as well as internal and external circumstances. The latter help to identify varied patterns in specific situations and to contextualize statistical findings from the surveys.

The questionnaire survey was administered in two stages. The first stage was a pilot one performed in late 2010 in a business environmental seminar with the objectives of pre-testing the reliability of key variables and helping troubleshoot the questionnaire for the main survey. The survey questionnaire was given to the most senior executive of each participating company or top manager who is most knowledgeable about corporate environmental management issues. Out of 110 questionnaires distributed, 71 of them responded, with a response rate of 64.5%.

The main survey was implemented in early 2011, with logistic support from the management offices of four industrial parks in the PRD region. Before the survey, we organized a briefing session for personnel assigned for administering the survey within their respective industrial parks. We contacted them three weeks later to follow up on progress. Among the 300 enterprises selected, 121 usable questionnaires were returned, representing a response rate of 40.3%. Since samples in the pilot study and the main survey are not significantly different in firm features, we combined these two datasets in the statistical analysis (with a total of 192 firms).²

To appreciate the value of the survey data, one needs to understand the general difficulties of administering policy and management questionnaire surveys in China (Roy *et al.*, 2001), and particularly when the survey involves sensitive environmental issues (Lo *et al.*, 2010). Enterprise executives, for example, are often concerned about information on their companies' environmental practices being passed on to the mass media and business competitors, causing them political, legal, or economic problems. Such information disclosure could put firms in the spotlight of regulatory enforcement. In the context of China, enterprise executives are especially sensitive to drawing attention from government authorities as their enforcement actions are often arbitrary and unpredictable (Yee *et al.*, forthcoming). Response rates in this study were higher

than those in recent environmental studies in the U.S. (20%, Christmann, 2004, 24.7%, Darnall *et al.*, 2010, 11.2%, Delmas and Keller, 2005) and China (10.2%, Liu *et al.*, 2010). This is partly due to the assistance we obtained from the business seminar organizer (for the pilot survey) and the industrial park management offices (for the main survey). Meanwhile, to ensure that all participants are voluntary and free to express their opinions, strict confidentiality was promised, and no identification information of respondents was requested.

In-depth interviews were conducted after the completion of the survey and data analysis in the first half of 2012. From the same population above, a total of 10 firms were chosen for interview. As indicated by their enrollment in a local voluntary environmental program, this group of exemplary firms can be considered as the pioneers in corporate environmental management in the PRD region. While these firms are from multiple industrial sectors (ranging from pharmaceutical and chemical to food processing and waste recycling) and vary in ownership status (six state-owned, three privately owned, and one joint venture), they are not meant to be representative of all the firms in the region. Nonetheless as pioneers in environmental management practices, these firms help to highlight key compliance challenges faced by most firms in the region. In the majority of the cases, we interviewed the senior executives because they are likely to be involved in their company's overall strategic decision-making. Each interview lasted around 1.5 hours with questions focused on five aspects of corporate environmental compliance: strategies and experiences, internal capacities, sources of pressure, possible improvement, and stakeholder expectations. All interviews were conducted in Chinese. We prepared an interview summary after each visit, including interview results, field

observations, and other information collected. Information provided by interviewees was cross-checked with archival data, whenever feasible.

Measurement

All components of the independent variables were measured by a seven-point Likert scale (1 = Strongly disagree; 7 = Strongly agree). The measurements for corporate compliance capacity are adapted from Russo and Fouts (1997), which capture managers' perceptions of a firm's resource endowment for environmental management. A total of 4 items were used: (1) the enterprise is equipped with appropriate pollution control technologies; (2) the enterprise is equipped with human resources on environmental issues; (3) financial support on environmental issues is sufficient, and (4) inter-departmental coordination on environmental issues is guaranteed. The Cronbach's alpha is 0.72.

Following the extant literature (Henriques and Sadorsky, 1999; Liu *et al.*, 2010; Yee *et al.*, forthcoming), we identified a total of 12 stakeholder entities that may exert pressure for industrial clean-up. Four items were used to measure state stakeholder demand, by asking respondents' agreement on whether there are explicit environmental demands from the central government, the local government, the local EPB, and other government agencies (1 = Strongly disagree; 7 = Strongly agree). The Cronbach's alpha is 0.80. Similarly, non-state stakeholder demand was measured by asking respondents' agreement on 8 items that is, whether there are explicit environmental demands from the following non-state stakeholders: (1) financial organizations such as banks, (2) the local community, (3) the mass media, (4) environmental interest groups, (5) investors and shareholders, (6) major competitors (i.e., through fear of losing

business to them), (7) industrial associations, and (8) customers (e.g., via purchasing requirements or other means). The Cronbach's alpha is 0.88.

We adopted a total of 11 items to measure four coping strategy dimensions (1 = Strongly disagree; 7 = Strongly agree). One item measuring formalism and one item measuring self-determination were removed after the pilot study to achieve better reliability. Items were first reviewed by a group of academics, industry experts, and local EPB officials to ensure that the measures are relevant and easy to understand. Revisions to the questionnaire were made based on these inputs. In order to confirm the dimensionality of these items, we conducted exploratory factor analysis using varimax rotation. Table 2 shows that four components emerge with eigenvalues larger than 1, accounting for 61.4% of the total variance. We then formed a scale for each dimension by averaging items under each heading. The Cronbach's alphas are: formalism (3 items, $\alpha = 0.70$), accommodation (2 items, $\alpha = 0.75$), referencing (3 items, $\alpha = 0.71$), self-determination (3 items, $\alpha = 0.73$). We further conducted a confirmatory factor analysis to evaluate the validity of the four-dimensional construct. The results (CFI = 0.961, TLI = 0.940, RMSEA = 0.055; SRMR = 0.052) showed that the hypothesized four-factor model yields a good fit (Hair *et al.*, 2010).

Table 2 Principal Component Analysis of Corporate Environmental Coping Strategy Items

	Loadings			
	Self-determination $\alpha = 0.73$	Referencing ($\alpha = 0.71$)	Formalism $\alpha = 0.70$	Accommodation $\alpha = 0.75$
We attach great importance to central political leaders' environmental opinions	0.032	0.088	0.235	0.851
We attach great importance to local political leaders' environmental opinions	0.132	0.087	0.065	0.854
We try to be consistent with competitors' environmental behaviors	0.145	0.631	0.028	0.266
We communicate with peers on environmental issues	0.229	0.811	0.114	0.020
We adopt industrial associations' environmental recommendations	0.046	0.858	0.123	-0.033
We have our own plan in environmental protection	0.706	0.235	-0.024	0.188
We have our own understanding of greening the company	0.880	0.066	0.136	-0.013
We have our own environmental performance evaluation system	0.747	0.113	0.137	0.040
We emphasize whether we meet the formal environmental standards	-0.006	0.006	0.628	0.300
Our most important duty is to strictly follow environmental laws	0.138	0.245	0.833	0.015
Formal regulation is our compliance benchmark and guideline	0.130	0.040	0.795	0.060
Model Statistics				
Eigenvalue	3.315	1.590	1.273	1.228
Variance explained	30.14%	14.46%	11.57%	11.16%
Kaiser–Meyer–Olkin index = 0.67; Bartlett's test of Sphericity is significant at 0.001 level.				

We measure environmental protection practices following the scales used in the corporate environmental management literature, particularly those in the Chinese regulatory context (e.g. Liu *et al.*, 2010; Lo *et al.*, 2010; Yee *et al.*, 2013). We asked respondents to describe the integration level of 8 environmental practices: (1) clean production assessment, (2) EMS certifications, such as ISO 14001, (3) reduction in resources consumption (e.g. clean water, electricity, material), (4) substitution by renewable materials or energy sources, (5) periodical evaluation of firms' environmental performance, (6) setting environmental objectives as part of the annual business plans, (7) including environmental performance measures in management

evaluations, and (8) preparation and release of environmental reports. The following seven-point scale is adopted: “not being considered” (coded as “1”), “considered with no further implementation” (coded as “2”), “piloted it without official implementation” (coded as “3”), “implemented but not the focus” (coded as “4”), “currently implementing as a focus” (coded as “5”), “implementation and closely connected to other departments” (coded as “6”), and “successfully implemented as an integral part of business operation” (coded as “7”). These intermediate choices aim to obtain a more nuanced measure instead of a simple dichotomous response on whether an environmental protection practice was adopted or not. We then summed the 8 items together to measure the enterprise’s environmental protection practices (Cronbach’s alpha: 0.90).

We included several control variables in the analysis. First, “headquarter” was coded as “1” for firms headquartered overseas, and “0” otherwise. In the combined dataset, about 85% were headquartered in Mainland China. Second, “export ratio” was measured in terms of the proportion of a firm’s annual sales in export. Ten percent of the companies had fewer than 10 percent of export sales, 16% had over 50 percent of exports, while around three thirds had an export ratio between 10-50%. Third, “firm size” was measured by the number of employees. Three groups of firms are identified: “1” including firms with fewer than 100 employees (38%), “2” 100-499 employees (32%), and “3” more than 500 employees (30%). Fourth, regarding “ownership”, about two thirds of the surveyed companies were private-owned enterprises (67%), followed by foreign-controlled businesses (17%) and state-controlled joint ventures (13%). State-owned enterprises (SOEs) only accounted for 3% of the sample. Therefore we introduced a dummy variable “non-private firms” to differentiate private-owned enterprises from all others.

Analysis and Results

We conducted several preliminary analyses before hypothesis testing. In the main survey, Armstrong and Overton's (1977) non-bias check was conducted by dividing the respondents into two groups by response time. As late respondents to mail surveys tend to be more similar to non-respondents than early respondents, significant differences could have indicated a response bias (Fowler, 1993). T-test results revealed no significant differences in mean scores of firm features between early respondents (first 25%) and late respondents (last 25%). To test the potential risk of common method biases, we conducted a Harman one-factor test (Harman, 1976). The first factor accounted for 25% of the variance, indicating no serious common method biases.³

Table 3 presents means, standard deviations, and correlations. The correlation between state stakeholder demand and non-state stakeholder demand is relatively high (0.68), indicating potential multicollinearity. Exploratory factor analysis results show that the two components accounting for 59% of the variance among the 12 items—each with an eigenvalue greater than 1.0. We further checked the Variance Inflation Factor (VIF) measures of these two variables, and the VIF for both is around 2.0 and below the threshold (5.0).

Table 3 Descriptive Statistics and Correlations (N = 192)

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Headquarter overseas	0.16	0.37											
2. Export ratio	3.62	1.57	0.26*										
3. Firm size	2.19	1.48	0.37*	0.02									
4. Non-private firms	0.32	0.47	0.45*	0.22*	0.32*								
5. Compliance capacity	5.34	0.99	-0.11	-0.08	-0.06	-0.13							
6. State stakeholder demand	5.15	1.21	-0.27*	-0.07	-0.14*	-0.25*	0.41*						
7. Non-state stakeholder demand	5.10	1.22	-0.24*	-0.07	-0.11	-0.35*	0.33*	0.68*					
8. Formalism	5.74	0.99	-0.18*	-0.16*	-0.06	-0.05	0.43*	0.17*	0.06				
9. Accommodation	5.34	1.15	-0.02	-0.13	-0.01	-0.01	0.30*	0.20*	0.20*	0.33*			
10. Referencing	5.30	1.16	-0.16*	-0.06	-0.01	-0.26*	0.53*	0.36*	0.33*	0.26*	0.22*		
11. Self-determination	5.25	1.09	0.08	-0.18*	0.16*	-0.01	0.39*	0.19*	0.13	0.25*	0.20*	0.36*	
12. Environmental management practices	5.02	1.37	-0.11	-0.11	-0.03	-0.25*	0.64*	0.41*	0.33*	0.27*	0.22*	0.51*	0.39*

* $p < 0.05$

On average, the surveyed firms score higher on the coping strategy dimensions of formalism ($\bar{x} = 5.73$) and accommodation ($\bar{x} = 5.34$) than those of referencing ($\bar{x} = 5.29$) and self-determination ($\bar{x} = 5.25$). Our interview findings also suggest that the four coping strategy dimensions do co-exist. First, the conventional formalism dimension was the most commonly adopted, with all firms shown to be sticking to formal regulations as the compliance benchmark. Second, half of the interviewed firms exhibited strong evidence of accommodating political interests. For instance, one respondent indicated “developing a close relationship with the local government and obtain their supports are critical to the development of a new-industrial enterprise like our firm. Being cooperative in environmental protection will make the government feel our business and products are contributing to society rather than polluting the local environment, and thus help us gain additional support from the government for development in the long-run (Firm 6).” Third, in regard to the referencing dimension, many firms were used to conducting field trips to industrial green pioneers to learn from their

experiences (Firms 1, 3, 4, 6, 7, 8, & 10). Such learning practices were claimed to be common in the early stages of environmental management as well as adopting advanced environmental practices (Firms 3 & 10). Lastly, more than half of the interviewed firms emphasized independent decision-making and pragmatism. For instance, it was explicitly indicated by Firm 2 that only environmental programs with economic benefits would be implemented. Firm 3 emphasized internal adjustments in order to satisfy vague regulatory demand: “What we receive from EPB and local government (who just care about the outcome) is simply a guideline, and we need to work out the specific enforcement plans.”

We conducted multiple regressions to test Hypothesis 1-4. The estimates for the regression models are reported in Table 4. To reduce potential multicollinearity associated with the use of interaction terms, we centered all the variables that were used for constructing those terms. Some control variables suggest interesting relationships. First, firms headquartered overseas are likely to score lower on formalism. Meanwhile, export-oriented firms are likely to score lower on accommodation and self-determination. Perhaps, this is because, compared with those of local firms, the business operations of foreign firms are less influenced by the local government. Foreign firms are thus less motivated to accommodate extra political demands. Meanwhile, environmental standards in both domestic and export countries combine to leave limited room for organizational autonomy in environmental management in export-oriented firms. Second, larger firms (measured by the number of employees) are more likely to score higher on self-determination. This is consistent with the economy-of-scale perspective that larger firms are more capable in managing environmental issues. Lastly, private firms are likely to score higher

on referencing than non-private firms. This might indicate that private firms in China are usually subject to higher market competition than firms of other ownership types.

In Table 4, Column 2, 3, 4, 5 report results of interaction effects on four coping strategy dimensions, respectively. The statistical results do not show any significant effects of interactions between compliance capacity and state stakeholder demand on formalism and accommodation. Therefore, H1 is not supported. In other words, state demands play a limited role in either strengthening or weakening the positive association between compliance capacity and coping strategy. A firm's confusion over formal regulatory requirements may explain this finding. In our interviews, only one respondent clearly suggested that there is no problem in understanding and following legal mandates (Firm 7). Others described them in the following terms: "*confusing* (Firms 1, 2 & 6)", "*infeasible* (Firms 6, 8 & 9)", "*conflicting* (Firms 4, 8 & 10)", "*update too slowly* (Firm 10)", and "*change too often* (Firms 3, 5 & 8)". The latter two might seem contradictory to each other, but they actually are consistent in suggesting that the one-size-fits-all regulations do create much confusion for the enterprises.

Meanwhile, although state regulators have become clearer in recent years about their expectations of corporate environmental performance, many enterprises have remained unsure about the technical means for meeting those expectations. Some interviewees expressed the following: "Some requests are too general to follow (Firm 4). For instance, the EPB often requires us to fix a problem without providing any help on feasible solutions. We have no idea what techniques should be adopted or are available in the market (Firm 5)."

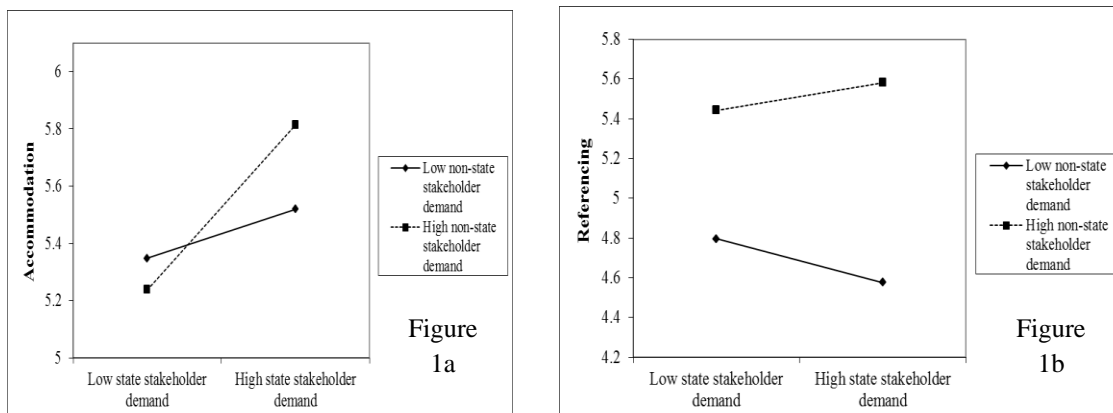
Table 4 Regression Coefficients of Model Predicting Coping Strategy Dimensions and Environmental Protection Practices (N = 192)

Variables	Formalism	Accommodation	Referencing	Self-determination	Environmental protection practices				
Headquarter overseas	-0.46* (-2.02)	-0.45* (-2.12)	0.03 (0.10)	0.15 (0.57)	-0.27 (-1.04)	-0.22 (-1.03)	0.31 (1.25)	0.305 (1.36)	0.09 (0.33)
Export ratio	-0.08† (-1.72)	-0.07 (-1.53)	-0.10† (-1.75)	-0.09 (-1.61)	0.01 (0.26)	0.04 (0.92)	-0.14** (-2.68)	-0.12* (-2.58)	-0.00 (-0.00)
Firm size	-0.01 (-0.22)	-0.02 (-0.35)	-0.02 (-0.28)	-0.02 (-0.28)	0.08 (1.39)	0.07 (1.40)	0.11† (1.92)	0.09† (1.81)	-0.02 (-0.23)
Non-private firms	0.14 (0.81)	0.21 (1.19)	0.06 (0.30)	0.22 (1.04)	-0.65** (-3.26)	-0.20 (-1.13)	-0.14 (-0.72)	0.04 (0.20)	-0.46* (-2.18)
Compliance capacity		0.40*** (5.18)		0.27** (2.78)		0.36*** (4.55)		0.25** (2.94)	
State stakeholder demand		0.034 (0.42)		0.19† (1.77)		-0.02 (-0.25)		0.17† (1.89)	
Non-state stakeholder demand		-0.04 (-0.39)		0.05 (0.38)		0.41*** (4.29)		0.04 (0.42)	
Compliance capacity × state stakeholder demand		-0.07 (-1.24)		0.05 (0.66)					
Compliance capacity × Non-state stakeholder demand						-0.19** (-3.23)		-0.22*** (-3.50)	
State stakeholder demand × Non-state stakeholder demand		0.03 (0.74)		0.10* (2.32)		0.09* (2.47)		0.10* (2.60)	
Formalism									0.14 (1.47)
Accommodation									0.08 (1.05)
Referencing									0.42*** (5.11)
Self-determination									0.28*** (3.29)
Constant	6.08*** (28.78)	6.02*** (29.75)	5.72*** (22.87)	5.48*** (22.01)	5.31*** (21.87)	5.10*** (25.34)	5.51*** (23.95)	5.42*** (25.31)	0.26 (0.37)
Total R ²	0.05*	0.23***	0.02	0.15***	0.08**	0.44***	0.07**	0.29***	0.35***
ΔR ²		0.18***		0.13***		0.36***		0.22***	

t statistics in parentheses; † p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

In support of H2, which predicts interaction between compliance capacity and non-state stakeholder demand, we found that the interaction term is negative and statistically significant on both referencing ($b = -0.19, p < 0.01$) and self-determination ($b = -0.22, p < 0.001$). As we expected, resources will not be applied to learning from others or making environmental decisions based on one's own preference when demands from non-state stakeholders are high. In support of H3, which predicts interaction between two groups of stakeholders, we found significant interactive effects on three coping strategy dimensions: accommodation ($b = 0.10, p < 0.05$), referencing ($b = 0.09, p < 0.05$), and self-determination ($b = 0.10, p < 0.05$). Following the procedures outlined by Aiken and West (1991), the interaction plots shown in Figure 1 further indicate that the joint effects differ among coping strategies.

Figure 1 Plots of the Interactions between State and Non-state Stakeholder Demand in Predicting Accommodation (1a), Referencing (1b), and Self-determination (1c)



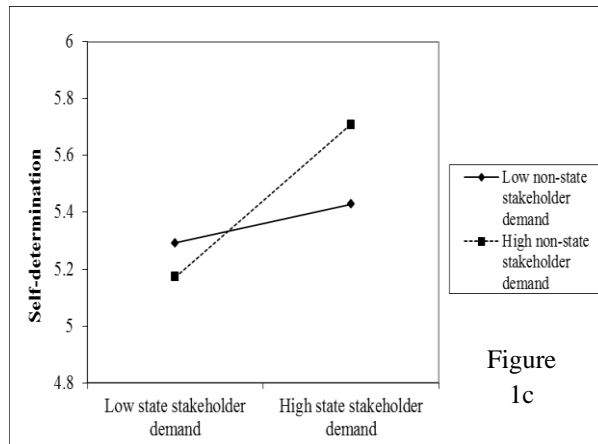


Figure 1c

The positive effect of state stakeholder demand on accommodation only exists when demand from non-state stakeholders is high (see Figure 1a, simple slope test: $b = 0.29, p < 0.05$). This positive effect fades away when there is a low degree of demand from non-state stakeholders (simple slope test: $b = 0.08, n.s.$). Similar interaction effects can also be observed on self-determination (see Figure 1c). Therefore, a firm's adoption of these two coping strategies is highest when it is under high demand from both state and non-state stakeholders. Referencing appears to be mainly driven by non-state stakeholder demand, which also alters the impact direction of state stakeholder demand. State stakeholder demand increases referencing behavior when non-state stakeholder demand is present, but reduce it if there is limited demand from non-state stakeholders (though such impact is not significant).

The last column of Table 4 reports results of the influence of four coping strategy dimensions on environmental protection practices. In support of H4, referencing and self-determination are positively related to environmental protection practices (referencing: $b = 0.42, p < 0.001$; self-determination: $b = 0.28, p < 0.01$). The positive association between the other two dimensions—formalism ($b = 0.14, n.s.$) and accommodation ($b = 0.08, n.s.$)—and environmental protection practices are insignificant. H4 is thus fully supported.

Discussion and Conclusion

Our research has examined the extent to which manufacturing enterprises in China have adopted each of the four dimensions of corporate environmental coping strategies—formalism, accommodation, referencing, and self-determination. On average, enterprises score higher on formalism and accommodation, and lower on referencing and self-determination. The conventional formalistic dimension is important for Chinese enterprises, probably due to China’s authoritarian setting, in which enterprises can be subject to closure for non-compliance without much legal recourse. Yet simply following the written rules is often insufficient, as enterprise executives can hardly ignore informal demands from political entities, pointing to the importance of accommodation. There may be differences between SOEs and non-SOEs with respect to accommodation. SOEs, in particular larger ones, have closer relationships with government agencies than their non-SOE counterparts; these informal ties provide SOEs with more convenient access to governmental support, and therefore accommodation is a cost-effective approach to achieving regulatory compliance. Nevertheless, SOEs are sometimes under greater pressure when bureaucratic demands are presented to them (Liu *et al.*, 2015).

The lower adoption rate for self-determination probably reflects the resource constraints faced by the regulated enterprises. Business firms in emerging economies like China are less familiar with environmental management as compared to their industrial counterparts in developed economies. Many enterprises were established at a time when environmental issues were not major business concerns, and resource scarcity had prevented them from pursuing superior environmental performance (Liu *et al.*, 2010). Our follow-up interviews with ten environmentally progressive firms supported such explanations as most of them have reported

some degree of self-determination, more so than is evident from the broader survey. In other words, firms tend to practice self-determination when the regulatory environment leaves room for autonomy, and the firm is highly capable of dealing with environmental issues.

Possible over-time changes of corporate environmental coping strategies might be considered. Apparently, formalism works well in a government-dominated mode of regulation. The other three strategies are relevant in the more recent regulatory context, which involves a wider range of private, public, and non-state interactions. Meanwhile, new industrial entrants could also bring with them new perspectives on environmental issues. While external institutional changes have an effect on environmental coping strategies, firms' internal experiences also matter. For example, referencing may work well in some circumstances, but not necessarily all situations. Firms need to learn from their past experiences to know what works and what does not. For example, one interviewee reported that the firm began to focus more on referencing and accommodation after it had hired environmental managers from SOEs. Moreover, internal structural and managerial changes may also lead a firm to adjust coping strategies.

Our finding also extends the literature on the interaction effect of state and non-state stakeholders in the local policy context. Such an interaction does not affect formalism, but it does affect accommodation, referencing, and self-determination. The latter three dimensions are favored by enterprises that face clear demands from both state and non-state stakeholders. These findings suggest that state and non-state collaboration can help transform corporate environmental practices in China. In recent years, increasing numbers of cases have indeed emerged in which community-based movements against industrial pollution have successfully

led to efforts by local governments to engage enterprises more actively in improving their environmental practices (Johnson, 2010; Zhan and Tang, 2013).

Our findings also indicate the differential effects of the four coping strategy dimensions on corporate environmental protection practices. Enterprises that score higher on referencing and self-determination also tend to score higher in environmental protection practices. But as mentioned earlier, enterprises in our survey score lower on average in these two dimensions than in formalism and accommodation. This suggests that, at least in the context of China, one way to promote stronger environmental protection practices among enterprises is to encourage inter-firm learning and corporate autonomy in environmental practices. At the same time, it is important to encourage the partnership between governments and non-state stakeholders in promoting these two coping strategies, and subsequently stronger environmental protection practices among enterprises.

Our study on corporate environmental coping strategy is situated in the developmental context of China; yet it has implications to environmental management studies in both other regulatory areas and in other countries. Overall, this research contributes to the environmental regulation and corporate environmental management literature on two fronts. First, we have added new insights to the literature by examining the coping strategies adopted by enterprises to meet regulatory requirements. Taken together, the four-dimension classification enables us to move beyond the traditional focus on formal compliance, and to adopt a more nuanced view on how businesses may address environmental issues with various coping mechanisms. An empirical study based on this classification allows us to examine in some details the strategic and behavioral orientations behind daily environmental management practices.

Second, this study adds to the growing literature on how corporate compliance capacity and stakeholder demand co-shape corporate environmental strategies. The framework highlights the need to investigate how business and public policy forces reinforce each other and the processes through which they induce corporate behavioral changes. Nevertheless, emphasizing the synergetic effect of stakeholder demands does not mean that greater stakeholder involvement always helps corporate environmental performance. Different synergetic effects may work in different circumstances and during various phases of the policy process.

To policy makers, a proper understanding of what motivates corporate coping strategies helps design better regulatory policies and implementation strategies. Collaborative efforts between state and non-state entities may encourage enterprises to adopt more innovative coping strategies and subsequently stronger environmental protection practices. These cross-sectoral collaborative efforts are especially important in China, where better corporate environmental protection practices are associated with coping strategy of referencing and self-determination rather than traditional formalism and accommodation.

This research has a few limitations. First, our survey relied on regulated enterprises' self-reported data due to the difficulties in obtaining objective pollution data. As the Chinese government has begun to implement several environmental information disclosure programs in recent years, future research may consider filling this methodological gap by integrating objective environmental statistics with survey data. A second limitation is that the survey was limited to one region in China where private and joint-venture firms account for a large proportion of ownership types (67% and 12% respectively in this study). Hence we cannot generalize our results to all ownership types as different types of firms may differ in their scores

on various coping strategy dimensions. Lastly, because the research design was cross-sectional, the current study is not able to trace corporate environmental coping strategy changes over time (though the interview findings have provided some hints). Third, we have developed a conceptual framework of corporate environmental coping strategies based on the literature and considerations of the Chinese context; yet given the diversities of regulatory settings and corporate strategies, other dimensions of coping strategy may also exist in corporate environmental practices in other settings.

Taken together, this research suggests several avenues for future work. In responding to a call for investigating organizational responses to institutional pressures as an evolving process (Tilcsik, 2010), future research may analyze overtime changes of corporate environmental coping strategy at both the firm level and industrial level. Drawn on our current framework, future research may go a step further and develop a typology of strategies that the combination of coping strategy dimensions results into. Another research direction is to explore whether regional variations in regulatory, political, and cultural contexts affect corporate coping strategies. For instance, do multi-national corporations adopt remarkably different coping strategies in different localities? In addition, the overall framework may be applicable to a wide array of domains where businesses are subject to government regulations, such as those related to taxes, workplace health and safety, and product safety. Learning from other policy settings could add theoretical insights for further developing the theoretical model in different environmental regulation contexts.

Notes

1. In this study, we did not further differentiate non-state stakeholders into societal and market groups as exploratory factor analysis identified two consistent sets of factors, one measuring state stakeholder demand, and the other non-state stakeholder demand.
2. Additional regressions were conducted using the main survey data only. The hypotheses testing results remain consistent with those using the combined dataset with the exception that the interaction of state stakeholder demand and non-state stakeholder demand on self-determination is only marginally significant. These results are available from authors upon request.
3. In the “Discussion and Conclusion” section, we identified limitations due to solely relying on self-reported data, and how future environmental research in China could potentially address this methodological gap.

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