Political Commitment, Policy Ambiguity, and Corporate Environmental Practices

Nicole Ning Liu (ning.liu@cityu.edu.hk)*

Shui-Yan Tang (stang@price.usc.edu) **

Xueyong Zhan (xueyong.zhan@polyu.edu.hk) ***

Carlos Wing-Hung Lo (carlos.lo@polyu.edu.hk) ****

*Department of Public Policy, City University of Hong Kong, Tat Chee Avenue, Kowloon, Hong Kong

**Sol Price School of Public Policy, University of Southern California, USA

***Department of Management and Marketing, The Hong Kong Polytechnic University, Hong Kong

****Department of Government and Public Administration, The Chinese University of Hong Kong, Hong Kong

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Abstract

A lack of clear political commitment together with confusing rules and enforcement often characterize the institutional context of policy implementation and regulatory compliance in developing countries. By connecting such contextual features to existing models of policy implementation and regulatory compliance, we examine how regulatory factors are related to basic and proactive corporate environmental management practices in the Pearl River Delta (PRD) region in China. Drawing on data derived from both a survey and in-depth interviews, we show that a perception of clear political commitment to environmental protection across multiple government levels and units is positively associated with business efforts in basic environmental practices, regardless of the specific enforcement intensity. Nevertheless, a perception of clear political commitment is not related to proactive environmental practices. On the other hand, a perception of policy ambiguity, in the form of confusing regulatory standards and enforcement, is negatively associated with corporate efforts in both basic and proactive environmental practices; yet intensive inspections mitigate the negative association with policy ambiguity.

Keywords: political commitment, policy ambiguity, corporate environmental practices

Implementation failures are pervasive in both developed and developing countries; yet many of the existing theories and models of policy implementation have been developed from experiences in Western countries like the U.S. and European countries (Saetren 2005). Given the significant differences in political, economic, and social contexts across different countries, the application of these theories and models to the developing world requires contextual adaptation (Rivera 2004). Along with the globalization of the field of public policy and administration, more contextualized studies are needed to validate or extend existing theories and models of public policy and administration (Blackman *et al.* 2013; Zhan, Lo and Tang 2014). For example, the current literatures on environmental policy implementation and corporate regulatory compliance are based primarily on experiences in developed countries, often characterized by relatively clear political commitment to environmental protection and well-developed administrative capacity for enforcement. Environmental enforcement in developing countries, however, is often constrained by a lack of both political will and administrative capacity (Auer 2001; Ma and Ortolano 2000; Xue, Simonis, and Dudek 2007). When regulations are widely perceived as not only unreasonable on paper but also arbitrary in enforcement, corporate managers are unlikely to comply with regulations out of a sense of duty. Furthermore, many of the main conclusions in the current literature about the potential benefits of a more flexible, cooperative, and voluntary regulatory approach become invalid in the institutional context of the developing world, in which democratic control of bureaucracies and the rule of law are weak (Blackman 2008). For example, when official corruption is widespread, corporate managers may easily perceive flexible and cooperative approaches to enforcement as signs of arbitrariness and favoritism. Given these contextual differences, in what ways and to what extent can existing theories and models inform efforts to improve regulatory enforcement and compliance in

developing societies? This is a critical question for China, which suffers from regulatory failures in many policy fields and similar institutional constraints as those of other developing countries.

Recent literature on China has highlighted how policy conflicts across levels of government and inadequate rule of law may shape corporate environmental management behavior. Although national government leaders have expressed heightened concern and ambition for environmental protection, local officials in many regions have demonstratively cared more about GDP growth than environmental protection (Chan *et al.* 1995; Kostka and Hobbs 2012; Zhan *et al.* 2014). As a result, when there is a lack of overall political commitment to environmental protection and particularly a gap between central ambition and local implementation, regulatees may feel less compelled to invest in environmental management (Mol and Carter 2006). Moreover, when corporate executives lack confidence that regulators enforce laws impartially, they may choose to simply meet often-time arbitrary demands from government officials who happen to show up at their door instead of focusing on developing long-term management strategies for meeting regulatory standards (Yee, Tang, and Lo Forthcoming). The key research question becomes how the lack of political commitment and the existence of policy ambiguity as two major institutional realities, as perceived by regulated businesses in emerging economies, are related to corporate environmental practices. This paper attempts to connect these special features of China's regulatory context to concepts in the policy implementation literature, which were initially developed for understanding the dynamics of policy implementation in the U.S. but can be adapted for use in understanding corporate environmental practices in China. Borrowing insights from the policy implementation and regulatory compliance literatures, we examine how two key dimensions of policy context—political commitment and policy ambiguity—manifest in the Chinese context, and how these contextual variables, when combined with patterns of interaction

between regulators and enterprises, affect corporate environmental management practices in China. Using a regulatee's perspective, we define political commitment as an indication from government authorities about their willingness to support environmental protection policies, and policy ambiguity as confusing standards and enforcement in environmental regulation.

Based on data obtained from a survey of enterprises in Guangdong Province, we found that a perception of clear political commitment across multiple government levels and units is positively related to business efforts in taking up basic environmental practices, regardless of the specific enforcement intensity. Nevertheless, a perception of clear political commitment appears to be unrelated to beyond-compliance practices. On the other hand, a perception of policy ambiguity, in the form of confusing standards and enforcement, is negatively associated with firm efforts in both basic and proactive environmental practices. Yet intensive inspections weaken these negative relationships. These results help connect the experiences in China to long-standing arguments on how political commitment and policy ambiguity affect policy implementation and regulatory compliance, and they also highlight the need to adapt relevant concepts to the specific institutional context of developing countries.

This paper begins with an overview of the literature on policy implementation and regulatory compliance, focusing on the role of "clear political commitment" and "confusing standards and enforcement". Next, we develop hypotheses on the main effects of these two key variables, and how their effects are moderated by regulatory inspection frequency. After introducing the methodology, we present our data analyses and results. The final section concludes with discussions on theoretical contributions and practical implications.

Corporate Environmental Compliance in an Evolving Regulatory Context

Much of the existing literature on environmental regulation and compliance in China focuses on the impact of specific enforcement activities (e.g. pollution fee collection, inspection, etc.) on the environmental performance of enterprises. In addition to these conventional perspectives, some recent publications have begun to provide empirical evidence about how the unique institutional features in China affect environmental policy implementation and corporate environmental practices. Some suggested that ambiguous responsibilities among government agencies due to bureaucratic fragmentation hamper comprehensive enforcement of environmental regulations (Kostka 2013). Others focused on informal rules and institutions, suggesting that the problem of incomplete environmental enforcement in China partly stems from the uneven bargaining powers between regulators and regulatees (Ma and Ortolano 2000; Wang *et al.* 2003). For example, a survey of industrial plants found an insignificant effect of government officials' visits on polluting plants, because such visits could be interpreted as either intense government effort in environmental policy implementation, or an exhibition of close informal relationships (Wang and Jin 2007).

Among the many studies in the current literature, several studies are especially relevant for our research focus on the role of political commitment and policy ambiguity. Van Rooij (2006) argues that the legal system at the local level usually had low legitimacy because of conflicting interests of stakeholders and the need to balance these conflicts. Most of the effective policy programs are instead initiated and supported by explicit political effort rather than stemming from the law (Eaton and Kostka 2014; Mol and Carter 2006). Existing studies suggest that campaign-style enforcement, "a type of policy implementation involving extraordinary

mobilization of administrative resources under political sponsorship to achieve a specific policy target within a defined period of time" (Liu *et al.* 2015, p. 85), can help mobilize political support for stricter enforcement and temporarily override entrenched local interests that are against stricter enforcement. For example, Zhu and Moser (2014) found that substantial reductions of industrial lead pollution in China after years of enforcement failures were mainly driven by the tool of "restriction of approvals"[1], which relied on strong political push rather than clear legislative support. Nonetheless, as noted by Van Rooij (2006), a shortcoming of enforcement campaigns is that they are difficult to sustain in the long run. Yet their importance in China shows the significance of demonstrated political commitment to local regulatory enforcement and compliance. Following a similar approach to linking contextual factors to policy implementation, Zhan *et al.* (2014) have examined the relationship between changing political context and environmental policy implementation in China. Based on a longitudinal study with street-level bureaucrats in the City of Guangzhou during the years of 2000 and 2006, they found that in the year 2000 political support from the central government was a key driving force of enforcement effectiveness on the ground; yet later on once central government support had been firmly in place, support from local stakeholders became more important in the eyes of enforcement officials.

In addition to examining the effect of contextual changes, Yee *et al.* (Forthcoming) further examine how regulatory compliance in China is shaped by an institutional setting in which the rule of law is relatively weak. Based on data obtained from a survey of Hong-Kong based companies operating in the Pearl River Delta (PRD) region, they show that corporate environmental management practices in China are less driven by a concern for legality as one would expect to be the case for companies in Western settings. Like their Western counterparts,

enterprises in China adopt environmental management practices to avoid potential punishments. Enterprises in China, however, differ from their Western counterparts in that they face an institutional setting in which there is greater uncertainty in regard to what regulations mean, and how and when they are actually enforced. Furthermore, they are also more likely to be subject to random and arbitrary targeting by local enforcement officials, which in some cases may have little to do with whether they comply with all the regulations.

As these recent findings highlight the effects of conflicting political signals and an uncertain regulatory environment, they can be put into perspective using models of policy implementation developed by scholars in Western countries. One relevant model is the policy regime perspective (May Forthcoming; May and Jochim 2013), which highlights the way in which governing arrangements may undermine or strengthen political commitment to fulfilling policy goals. From this perspective, political context affects policy implementation by shaping the legitimacy, coherence, and durability of a policy (May and Jochim 2013). The policy regime perspective offers valuable insights for examining policy implementation successes and failures in developing countries. In China, for example, as a result of incompatible interests and priorities across multiple levels of government, policy conflicts may arise during implementation (Tang 2012; Zhou *et al.* 2014). Given China's size and its regional disparity, local governments often have policy preferences and priorities that differ considerably from those of the central government, and act very differently from the expressed instructions from the central government (Zhou *et al.* 2014). O'Brien and Li (1999), for example, found that "selective policy implementation" is a common practice among government officials in rural areas, who are likely to evade central government mandates, by selectively implementing unpopular policies that may benefit officials while refusing to implement policies that may benefit local people only. The

central government often tolerates these local deviations unless emerging social conflicts catch its attention or when these deviations threaten its key policy priorities.

Another relevant model of policy implementation is the ambiguity-conflict model developed by Matland (1995), which examines how the dynamics of policy implementation are shaped by two major contextual factors—policy conflict and policy ambiguity. Although this framework was developed mainly for understanding policy implementation in the United States, it can be adapted for use in the Chinese context. In recent years, several scholars have borrowed insights from the ambiguity-conflict framework to examine environmental policy implementation in China, focusing on issues such as sustained environmental policy implementation gaps (Zhan *et al.* 2014), campaign-style enforcement of emission reduction policy (Liu *et al.* 2015), and energy efficiency policy implementation (Kostka and Hobbs 2012). As argued by Matland (1995), a key to overcoming implementation problems is that enforcers have adequate authority to force their will on those who may act against policy goals, or have sufficient resources to bargain with regulated firms. In China, both local opposition and business resistance to strict environmental enforcement may diminish when higher-level governments show a stronger commitment to environmental protection (Liu *et al.* 2015; Lo and Tang 2006). The extent to which an enterprise perceives "clear political commitment" from all levels of government affects its motivation for regulatory compliance.

In terms of regulatory compliance, ambiguous and conflicting signals from government authorities may create difficulty for the regulated enterprise in understanding what constitutes acceptable compliance. Ambiguity in environmental policy arises from unclear problem definition and policy responses (Arentsen, Bressers, and O'Toole 2000). When applied to regulatory enforcement and compliance in China, policy ambiguity exists in the form of

confusing regulatory standards and inconsistent enforcement (Marcus, Aragón-Correa, and Pinkse 2011; Marquis, Zhang, and Zhou 2011). Although policy ambiguity may allow regulators more flexibility in policy making and enforcement (Ma and Ortolano 2000), it amplifies compliance costs by creating uncertainty for the regulatees. As indicated repeatedly in the literature, enterprise executives in China often complain about regulatory standards being vague and self-contradictory, and about inconsistent and often corrupt practices among local regulation enforcers (Zhang *et al.* 2015). On the one hand, different government agencies may issue inconsistent messages to regulatees. On the other hand, enforcers have a lot of discretionary power in enforcement, oftentimes making it arbitrary or inconsistent. Thus depending on how it perceives the extent of "confusing standards and enforcement", an enterprise may behave differently in its environmental management practices.

In this paper, we draw on a recent survey of enterprises in Guangdong Province, China to explore how enterprise executives' perceptions of the regulatory regime and their interactions with the local regulators are related to their environmental practices. Specifically we examine how enterprises' perceptions of (1) clear political commitment to environmental protection and (2) confusing regulatory standards and enforcement may impact their environmental management practices. In line with the regulatory enforcement literature (Dasgupta, Hettige, and Wheeler 2000; May and Winter 1999), we also look at the moderating effect of actual regulatory inspection frequency on the former two relationships. By doing so, we link the specific experiences of individual enterprises to their respective contextual environments.

Clear Political Commitment

Political commitment is an important factor contributing to the effectiveness of policy implementation (May and Jochim 2013; Royo, Yetano, and Acerete 2014; Travis, Morris, and Morris 2004). Bertelli and Whitford (2009), for example, show that a country's demonstrated commitment to protecting market mechanisms, through the establishment of independent regulatory agencies, increases business elites' perception of regulatory quality. In this research, we define clear political commitment as a clear indication from government authorities about their willingness to support environmental protection policies. Similar to the conceptualization of organizational commitment, political commitment also consists of attitudinal and behavioral aspects (Robertson and Tang 1995). For example, clear political commitment towards environmental protection can be demonstrated in multiple ways: a government leader's public speech to convey his/her environmental ideas, a specific local plan to encourage societal participation in resource recycling, a joint-effort of multiple government agencies to inspect local polluting plants, and others.

Political commitment is important in China given that the central and local governments often have divergent interests in environmental protection and other policy priorities (Eaton and Kostka 2014). Since the Chinese central government has placed economic growth as one of its most important policy targets, central leaders have shown credible political commitment to market-oriented economic reform. The central government has been able to align the goal of local governments by setting growth targets for local officials' performance evaluation, an incentive structure that has effectively motivated local officials to promote economic development in recent decades (Qian and Weingast 1997; Xu 2011). Yet such strong political

commitment to economic development may weaken the overall commitment of the Chinese government to environmental protection. In the past decade, the central government has signaled its interest in environmental protection through formal pronouncements as well as by adopting various environmental programs and regulations (Mol and Carter 2006). Although environmental protection record has in recent years been included as one of the many performance indicators for annual evaluation of local government leaders, it has remained a minor factor in most evaluation metrics (Heilmann and Melton 2013; Lo and Tang 2006; Wang 2013). When faced with other competing priorities especially those related to economic development, local government leaders are likely to be less committed to enforcing environmental regulations. In this situation, the central government may initiate enforcement campaigns that set up definite targets, timelines, and incentives for local government leaders. When an enforcement campaign is underway, corporate executives can easily perceive clear political commitment from all public authorities, and they are likely to work to meet basic regulatory requirements and avoid getting into any trouble with the authorities.

During non-campaign periods, corporate executives may perceive different degrees of commitment from the authorities depending on their respective circumstances. Such perceptions may affect corporate engagement in environmental practices in general. Nevertheless, top-down, politically driven implementation often aims at correcting non-compliance, but not necessarily attempts at thoughtful and systematic solutions to the underlying problem (Liu *et al.* 2015). Thus, when they perceive clear political commitment, firms are more likely to improve their basic environmental practices, rather than proactive practices.

H1: A perception of clear political commitment to environmental protection is positively related to enterprises' basic environmental practices.

Confusing Standards and Enforcement

Confusing regulatory standards and enforcement may hamper corporate executives' willingness to engage in both basic and proactive environmental practices. On the one hand, ambiguous standards and arbitrary enforcement undermine the legitimacy of the regulatory regime and may lead corporate executives to believe that there are no compelling legal and moral reasons to comply (Van Rooij 2006). For example, Engau and Hoffmann (2011) noted that regulatees could adopt four different strategies in response to post-Kyoto regulatory uncertainty: avoiding decision making, directly targeting uncertainty to reduce it, adapting internal capacity, and disregarding uncertainty. Rivera and Oh (2013) found that confusing and frequently revised environmental regulations in a country reduce the investment likelihood of multinational corporations, which usually favor more stringent environmental regulations and are more likely to adopt proactive environmental practices. In Colombia's discharge fee system, incentives from the program were found less attractive to polluters because of confusing relationships between discharge fees and emissions standards (Blackman 2009). If clear guidelines for compliance are absent, enterprise executives can hardly develop coherent plans, whether short term or long term, to ensure compliance (Aragón-Correa and Sharma 2003; Hoffmann, Trautmann and Hamprecht 2009). Recent studies further indicate that an uncertain regulatory environment encourages business greenwashing behaviors, and discourages genuine efforts in sound environmental practices (Delmas and Burbano 2011). Thus a perception of confusing standards and enforcement may lead enterprises away from both basic and proactive environmental practices.

H2a: A perception of confusing standards and enforcement is negatively related to enterprises' basic environmental practices.

H2b: A perception of confusing standards and enforcement is negatively related to enterprises' proactive environmental practices.

The Moderating Effect of Inspection Frequency

While perceptions on clear political commitment to environmental protection and confusing standards and enforcement may shape enterprise executives' environmental behaviors, a more proximate factor that influences their role is the frequency of inspections enterprises experience. A perception of political commitment may initially induce firms' attitudinal changes towards environmental issues. Yet it is through direct interactions with enforcement officials during inspections that corporate managers will be further convinced that expressed political commitment is more than a symbolic gesture, and enforcement officials are motivated to translate political leaders' commitment into rigorous enforcement. Thus higher inspection frequency is likely to reinforce the positive association between clear political commitment and basic environmental practices.

H3a: Higher inspection frequency strengthens the positive association between a perception of clear political commitment and an enterprise' basic environmental practices.

The responsive regulation literature emphasizes the importance of communication between regulators and regulatees for building trust and providing information and assistance (Ayres and Braithwaite 1992; May and Winter 1999). Such interactions may not necessarily improve regulatees' environmental practices when rules and standards are already clear and straightforward, but could be particularly helpful when regulatees have difficulties in understanding and following environmental regulations. By interacting with firms during field

inspections, enforcement officials may communicate directly with corporate managers about what specific measures are needed to stay out of legal troubles. Meanwhile, enforcement officials may provide guidance during field visits and compensate for the inconsistencies among formal laws and rules. Thus frequent inspection may lessen the negative effect of confusing standards and enforcement.

H3b: Higher inspection frequency weakens the negative association between a perception of confusing standards and enforcement and an enterprise's basic and proactive environmental practices.

Empirical Setting

We collected empirical data in China's PRD region, which has witnessed heightened political awareness of the importance of environmental protection in the past decade, resulting in adjustments in economic development and environmental policies. We conducted a content analysis of *Milestones of Environmental Governance in Guangdong Province* from 2004-2013, and found that there has been a great increase in local political leaders' engagement in environmental protection. The number of major public environmental events and policy initiatives with direct involvement of political leaders (e.g. provincial governor, party secretary, Political Consultative Committee) increased from 4 in 2003 to 22 in 2013.[2] Such government gestures appeared not to just target pollution per se, but also to seek to balance between economic development and environmental protection. For example, the former Provincial Secretary initiated the "Vacate the Cage and Change Birds (*Teng Long Huan Niao*)" policy to restructure local industries by seeking to attract high-end investments and to gradually replace old ones that were no longer environmentally sustainable. One of the entry/exit criteria, for

example, is that highly polluting and energy-consuming industries will no longer be allowed to operate in the region. This initiative's implementation continued despite the economic crisis in 2008-2009, and gained support by the new Provincial Party Secretary in 2013 and by President Xi in 2014. Another example of increased political commitment concerns the annual "Swimathon" in Pearl River by provincial governors and city mayors to showcase improvements in water quality, and more importantly, to pledge continuing efforts in cleaning up the environment. After nine consecutive years of "Swimathon" since 2006, the river's water quality had been upgraded from grade V to grade IV[3], reaching the standard of industrial water use but not clean enough for swimming.

Despite an increase in political commitment, confusing environmental standards and enforcement have remained a problem in the region, as in many other jurisdictions in China. A typical example is the recent implementation of a local environmental voluntary program—Cleaner Production. This program was first initiated by the local government in 2002 to complement mandatory environmental regulations. Nevertheless, the program guidebook that clarifies the auditing process, participants' responsibilities, as well as policy incentives and monitoring schemes did not come out until early 2009. Such policy ambiguities, though inevitable during administrative reform, have affected enterprises' environmental decision-making and behavior. In recent years, in order to reduce policy ambiguities, the Ministry of Environmental Protection (MEP) has released the manual "A Collection of Legal Interpretations on Chinese Environmental Laws" to help both regulators and regulatees understand environmental regulations more precisely. Meanwhile, regulatees can now access detailed interpretations by MEP on a variety of rules and enforcement cases at the websites of local EPBs or MEP.

Data Collection

We conducted two rounds of questionnaire survey in the PRD region. The survey questionnaire was given to the most senior corporate executive of each company or top manager who was most knowledgeable about corporate environmental management. Given the general difficulty in conducting firm-level environmental surveys in China (Liu *et al.* 2010) as well as the likely low response rate of mailed surveys, we adopted a convenience sampling method[4] and face-to-face data collection strategy. A pilot survey was first performed in late 2010 in a business environmental seminar, followed by the main survey implemented in four industrial parks in early 2011. Surveyed enterprises were from a wide variety of industries: hardware and electronics, food manufacturing, textile, paper manufacturing, packaging, chemical, power generation, metal and machinery manufacturing, among others. Before the main survey, we organized a briefing session for personnel assigned for administering the survey; the session explained in detail the standard procedure for distributing and collecting the questionnaires among individual enterprises within their respective industrial parks.

Among the 410 enterprises selected in two rounds of survey, 192 usable questionnaires were returned, representing an overall response rate of 40.3%. We examined the likelihood of non-response bias in the main survey by dividing respondents into two groups by response time. As late respondents tend to be more similar to non-respondents than do 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%). A Harman one-factor test (Harman 1976) suggests

that the first factor accounted for 25% of the variance. The results indicated no serious problem associated with common method biases.

After the completion of the survey and data analysis, in-depth interviews with 10 surveyed firms were conducted to complement survey findings. Instead of random selection, we chose firms that varied in their location (four in the downtown area, and the other six in the suburbs), ownership (six state-owned, three private-owned, and one joint venture), and listing status (six listed in the mainland China stock market, one in Singapore, one in initial public offering (IPO), and the remaining two without any IPO plans at the time of the interviews). In the majority of cases, we interviewed senior executives who were knowledgeable about or directly in charge of the company's environmental management. Each interview lasted around 1.5 hours, with questions focusing on corporate environmental activities (both basic and proactive) and perceived changes in political commitment and the legal framework.

Measurement

Detailed wording for measurements is provided in Appendix. To encourage truthful responses, the survey items were presented in a nonthreatening, neutral tone.

Clear political commitment. Using a seven-point, agree-disagree Likert scale, we measured clear political commitment to environmental protection by asking respondents if they perceived a clear commitment from three key government entities besides environmental protection agencies: the central government, the local government, and non-environmental government agencies. The construct is mostly about whether the entire government system is in sync in being committed to environmental protection. The Cronbach's alpha is 0.77.

Confusing standards and enforcement. The existing literature indicates that policy ambiguity could stem from two sources: ambiguity of goals and ambiguity of means (Matland 1995). We captured both by developing four items regarding regulatees' perceptions of confusing standards and enforcement: unclear environmental standards, conflicting policies, ambiguous sanctioning criteria, and inconsistent enforcement actions.[5] A seven-point, agree-disagree Likert scale was used. The Cronbach's alpha is 0.83.

Inspection frequency. Instead of adopting a Likert-scale, we used "the number of inspections the firm received in the past year" as a more objective measurement to capture inspection frequency. Among all sampled firms, the average number of annual inspections is 2.71 (min = 0; max = 20; standard deviation = 2.71).[6] Being inspected more often does not necessarily mean that the firm is being "arbitrarily" targeted; some types of enterprises just produce larger amounts of pollutants, and thus are subject to more inspections.

Basic environmental practices. We examine basic environmental practices by focusing on the basic operations needed to meet minimum regulatory requirements. When measuring this variable, we did not specify what kinds of pollution these basic practices aim to address because the sampled firms cover a wide variety of industries, which differ in their respective pollution types (e.g. water, air, solid waste, etc.). Instead, we asked respondents to evaluate to what extent end-of-pipe equipment was established in the company to reduce pollution emission in general[7], with a seven-point scale: "not being considered" (coded as "1"), "considered with no further implementation" (coded as "2"), "piloted 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"). This

measurement captures not only whether basic environmental facilities were installed but also to what extent they were integrated into daily operations. The mean value of this variable is 5.51.

Proactive environmental practices. We look at eight types of proactive environmental practices, following the scales used in the corporate environmental management literature, particularly those in the Chinese regulatory context (e.g. Liu *et al.* 2010; Yee *et al.* Forthcoming). Instead of using the same set of questions as in prior studies, we adjusted some of the measurement items to fit better into the selected context. Different from basic practices that are usually mandatory requirements, these eight practices go beyond the command-and-control regime to further reduce the enterprise's negative environmental impact. Examples include substitution by renewable materials or energy sources, releasing environmental reports, and participating in voluntary environmental programs (see Appendix). We asked respondents to describe the integration level of these practices along the same seven-point scale for basic environmental practices. We then averaged the 8 items to measure the enterprise's proactive environmental practices (Cronbach's alpha: 0.90). To check the unidimensionality of this construct, we conducted an exploratory factor analysis (EFA). A single dimension was extracted, with the lowest loading item (substitution by renewable materials or energy sources) of 0.72. The confirmatory factor analysis (CFA) show that all the indices have adequate fit (CFI = 0.99, TLI = 0.98; RMSEA = 0.039; SRMR = 0.026). The standardized loadings for all items are higher than 0.50.

Controls. We included dummy and other proxy variables in the analysis: (1) Headquarter abroad, (2) Export ratio, (3) Firm size, (4) Ownership, and 5) Access to environmental information. "Headquarter abroad" was coded as "1" for firms headquartered overseas (around 15% of the surveyed firms), and "0" in Mainland China. The effect of export proportion in the

firm's annual sales was also controlled mainly because export-oriented firms usually face greater pressure from international markets and export countries for better environmental practices (Gunningham *et al.* 2003). In our sample, ten percent of the companies had fewer than 10% of export sales, 16% had over 50% of exports, while around three thirds had an export ratio between 10 to 50 percent. Regarding the role of firm size, larger firms normally have higher productivity and also produce more pollution emissions due to economies of scale. They are also more visible and more likely to be targets of social pressure. Thus firm size as measured by the number of employees was controlled. Three groups of firms were identified: "1" including firms with fewer than 100 employees (38%), "2" for 100-499 employees (32%), and "3" for more than 500 employees (30%). Firm ownership is another key determinant of firm environmental performance in China as indicated in the literature (Steger, Lu, and Fang 2003; Wang and Jin 2007). We controlled for it by introducing a dummy variable "Non-private firms" (coded as "1" for non-private owned firms, which include those that are state-owned, foreign-owned, and joint-ventures; coded as "0" for private-owned firms). In addition to firm demographics, firms' access to environmental information is also likely to affect both basic and proactive environmental practices. Therefore, we measure "Access to environmental information" by the extent of agreement to two items: (1) the firm has sufficient access to environmental policy information, and (2) the firm has sufficient access to environmental technical information. The Cronbach's alpha is 0.81.

Analysis and Results

Table 1 includes means, standard deviations, and correlations for all variables. Correlations among the explanatory variables are within the range of acceptability, except that the correlation between "confusing standards and enforcement" and "clear political commitment" is relatively

high (0.78) and may lead to multicollinearity concerns. For this reason, we evaluated the variance inflation factors (VIFs) of these two variables, and the VIF for both is around 2.8 and below the maximum acceptable threshold of 10.0 (Kennedy 1997).

Table 1 here

We conducted hierarchical multiple regressions to test the main effect of two independent variables (H1 and H2), as well as the moderating effect of inspection frequency on these relationships (H3a and H3b). Two interaction terms were created: Confusing standards and enforcement × Inspection frequency, and Clear political commitment × Inspection frequency. To mitigate problems associated with multicollinearity, variables included in interaction terms were centered before entering into the regression. Estimates for the regression models are reported in Table 2. Consistent with the general regulatory compliance literature, the results show that stringent regulatory enforcement is positively associated with corporate environmental practices. We found that frequent inspection is positively associated with not only the adoption of basic environmental practices (b = 0.073, $p < 0.05$), but also corporate efforts in proactive practices (b = 0.055, $p < 0.05$).

Table 2 here

Columns 3 and 6 report results related to H1 and H2, respectively. The statistical results suggest that a perception of clear political commitment is positively linked to basic (b = 0.262, $p < 0.05$), but not proactive practices (b = 0.079, *n.s.*), meaning that H1regarding clear political commitment is supported. Apparently, a major limitation of clear political commitment is that, by itself, a declaration of political commitment to environmental protection may lead enterprises to focus their effort on curbing end-of-pipe pollution, but not necessarily long-term proactive

practices. Specifically, our interviewees indicated that far less technical and financial assistance was leveraged to reduce resource consumption and to encourage environmental innovation, than that used to promote basic emission reduction practices. For example, the vice president of a renewable energy company (Firm 10) said:

> It is widely acknowledged that in recent years, both the central and local government have been strongly advocating for business innovation in renewable energy and resource recycling. Following this signal, our firm decided to expand our business by establishing new forms of community-based resource re-utilization centers these years. However, we found that absent (or lags far behind) from such political signals is detailed standards and supporting mechanisms. This thus increases the difficulty for early entrant firms to gain a first mover advantage.

This comment suggests that demonstrated government commitment to promoting environmental protection may not motivate enterprises to develop beyond-compliance practices if such commitment is perceived as superficial gestures without solid and clear supporting measures.

We also found that a perception of confusing standards and enforcement is negatively associated with business efforts in taking up both basic and proactive practices ($b = -0.235$, $p < 0.1$; $b = -0.430$, $p < 0.001$), supporting both H2a and H2b. Among our interviewees, only one suggested that there was no problem in understanding and following legal mandates (Firm 7). Others used terms such as "*sometimes confusing* (Firms 1, 2 & 6)", "*infeasible* (Firms 6, 8 & 9)", "*conflicting* (Firms 4, 8 & 10)", "*updated too slowly* (Firm 10)", and "*change too often* (Firms 3, 5 & 8)" to describe environmental regulations and enforcement. Such confusion is caused not

just by ambiguous language in laws and regulations, but also by inconsistent rules and standards set by different governmental agencies. In the words of the environmental manager of Firm 2:

> It is not hard for us to understand environmental laws and regulations. One problem we have is about the conflicting standards and responsibilities between the environmental protection bureau (EPB) and other government agencies. For instance, previously we needed to follow EPB standards when discharging wastewater into Pearl River. Since the Asian Game in 2010, all industrial sewage has to be discharged into local wastewater treatment plants, which are under the jurisdiction of the water bureau (whose standards are different from that of the EPB). Maybe there are some coordination and communication problems between the two departments, and we are not very clear about whether we are regulated by the environmental protection or water bureau.

Results on interaction effects are presented in columns 4 and 7. In contrast to H3a, an insignificant moderating effect in our results (interaction term: b = 0.087, n.s.) suggests that the positive association between clear political commitment and basic environmental practices is not moderated by the inspection frequency received by enterprise managers. In other words, a perception of clearer political commitment is always associated with better engagement in basic practices, regardless of the level of inspection frequency.

Consistent with H3b, we found that more frequent inspections could relieve (even reverse) the negative association between "confusing standards and enforcement" and "basic practices" (interaction term: b = 0.085, $p < 0.05$) and "proactive practices" (interaction term: b = 0.056, $p < 0.1$). Following the procedures outlined by Aiken and West (1991), the forms of these joint effects were shown in Figure 1 and Figure 2. As can be noted, the negative association between

"confusing standards and enforcement" and "basic practices" only exists when inspection frequency is low (simple slope test: b = -0.27, $p < 0.05$). This negative association fades away when there is a high degree of inspection frequency (simple slope test: b = 0.07, n.s.). Therefore, confusing standards and enforcement is a problem towards adopting basic environmental practices only when inspection frequency is low. Similarly, the interaction plot in Figure 2 suggests that the negative association between "confusing standards and enforcement" and "proactive practices" is stronger when the level of inspection frequency is low (simple slope test: b = -0.459, $p < 0.001$) than when it is high (see simple slope test: b = -0.259, $p < 0.05$). In other words, the negative association between the two is only partially relieved by inspection frequency. Overall, this result supports H3b that if firms have experienced frequent inspections, confusing standards and enforcement become less harmful for their engagement in both basic and proactive practices.

Figure 1 here

Figure 2 here

Discussion and Conclusion

As widely reported, policy implementation failures are pervasive in China. When such failures create increasing pubic outcry, the Chinese government would highlight its commitment to addressing these failures by announcing more regulations and launching enforcement campaigns aiming at fixing the most visible problems. These increased regulatory efforts have been applied not just to environmental protection, but also food safety, workplace safety, public safety, and public heath. However, introducing more regulations and launching enforcement campaigns may work only to a limited extent. As China has been confronting increasing challenges in

environmental protection, the number and complexity of environmental regulations in China will continue to grow. Yet it has remained unclear as to how much these regulations impact corporate environmental practices given the current levels of political commitment and policy ambiguity.

By relating China's contextual features to existing models of policy implementation, we examined factors affecting corporate environmental management practices in the PRD region in China. Our findings highlight three mechanisms by which regulatory enforcement, in combination with different contextual factors, may affect enterprises' environmental practices. The first mechanism corroborates arguments in the existing literature that intensive regulatory enforcement in terms of frequent inspections encourages both basic and proactive behavior.[8] But given the scarcity of administrative resources, there is a limit to the extent by which increases in inspection frequency can be used as a tool for improving regulatory effectiveness. In Donguan city (also known as the "World Factory") of the PRD region, with an average 7.7% annual GDP growth rate during 2009-2014, for example, the number of established staff positions of the local EPB has remained unchanged (around 200).[9]

The other two mechanisms involve an increase in political commitment to environmental protection and a reduction in confusing standards and enforcement. Regarding clear political commitment, our findings suggest that it is associated with basic, but not proactive behaviors, highlighting the limitation of a top-down approach to policy implementation. The result also underscores the inherent limitation of using governmental authority to ensure that enterprises do more than just minimally complying with formal regulatory standards. It is also likely that most government-driven campaigns in China, both in terms of intention by higher-level governments and on-the-ground implementation by local governments, aim no more than meeting modest pollution reduction targets in an effort to accommodate competing economic-development

priorities. However, recent local government efforts to incorporate voluntary environmental programs within the regulatory system may complement political campaigns in inducing firms to adopt beyond-compliance initiatives (Geng *et al.* 2010).

Our findings also suggest that the association between perceived clear political commitment and environmental practices is not affected by the inspection frequency received by regulatees. Perhaps this has to do with the fact that in China, in order to avoid getting into trouble, individuals or firms have developed a habit of heeding the prospect of strong governmental impositions. Such a habit is different from a "culture of compliance" in many Western countries, which is premised on a general respect for the rule of law (Gunningham *et al.* 2005). In China, once enterprise executives perceive a strong "political wind" toward heavy-handed enforcement, they understand the importance of "taking cover" for the moment regardless of their individual circumstances (Yee *et al.* Forthcoming). Such political winds can also be translated into more rigorous enforcement by local agencies. Recent studies, for example, suggested that central political effort to impose "performance management" on local government leaders had effectively reduced air pollution (Liang and Langbein Forthcoming). Future research needs to study further the varying effects of different political processes on local environmental performance.

Regarding "confusing standards and enforcement", conventional wisdom suggests that an ambiguous legal environment may undermine an enterprise's environmental efforts, and clear policy information can facilitate the process and outcomes of environmental policy implementation (Lubell 2004). In this research, we found that confusion over regulatory standards and enforcement undermines basic compliance only when inspection frequency is low. Stated differently, increased inspection frequency may overcome the negative effect of policy

ambiguity through explicit deterrence or direct interaction with enforcement officials who may clarify directly to them specific regulatory requirements. Although intensive inspection doesn't reverse the negative association between "confusing standards and enforcement" and "proactive practices", it makes it less negative. This is probably because proactive practices are voluntary actions that go beyond one's understanding of basic regulatory requirements. On-site instructions during inspections (if such communication exists) may be enough to clarify ambiguous rules for basic compliance, but are not informative and convincing enough to encourage enterprises to take bigger steps towards proactive practices. These findings add to the literature on regulatory enforcement by exploring the possible interplays between policy ambiguity and enforcement actions as well as their distinct connections to different policy targets.

This research has several limitations. First, we relied on self-reported data on corporate environmental practices, which are subject to potential social desirability biases. Business managers may attempt to project a positive image to stakeholders (Flannery and May 2000; Liu *et al.* 2010). Future research may seek to combine both survey and third-party data. For example, public speeches by political leaders and joint initiatives by government agencies at different levels can be used to assess political commitment of government entities. As more local governments have begun to implement public disclosure programs, more objective measurements on corporate environmental performance will become more available in the future. Second, several constructs may need further refinement. For instance, while there are multiple environmental policies/programs in China, we chose to measure "basic environmental practices" by asking each firm whether it has "installed end-of-pipe equipment to reduce pollution emission". Future research can refine the construct of basic environmental practices by employing more types of basic environmental practices as mandated by China's Environmental

Protection Law. Policy ambiguity may exist in the form of ambiguity in either goals or means (Arentsen *et al.* 2000; Matland 1995; Pandey and Wright 2006). In this study we mainly focus on "confusing standards and enforcement". Future studies may further differentiate among other aspects of policy ambiguity and explore their impacts on regulatory outcomes. Lastly, our data have a relatively limited geographical focus by collecting data from only one province in China; thus one must be cautious in generalizing results of the research to other parts of China. That being said, this research has moved the literature of policy implementation in China one step forward by examining the complex relationships between environmental policy implementation and corporate environmental compliance. Results of this search also validate the important role of political commitment and policy ambiguity in shaping policy implementation and compliance. They also demonstrate the utility of adapting some well-established models of policy implementation derived from Western to developmental contexts (Matland 1995; May forthcoming; May and Jochim 2013).

This research contributes to a better understanding of the contingent nature of policy implementation. Regulatory compliance is driven by a number of contextual factors that are situational in nature. Different forces drive basic and proactive practices. In environmental governance, attention from the top leaders may induce compliance up to a certain point (e.g. basic compliance in this study). A more meaningful way to further improve regulatory compliance is to enhance the quality of rules and enforcement, and to make the process more transparent, reasonable, and fair. In the context of China, this is easier said than done as governments are not used to working with diverse sets of stakeholders—societal groups, business associations, NGOs, etc.—in regulatory processes. These alternative options may take

some time for China to develop, but are needed if governments in China are serious about enhancing the effectiveness of policy implementation and regulatory compliance.

As noted by Matland (1995), some policy arenas are inevitably characterized by high levels of policy conflict and policy ambiguity, or what he termed cases of "symbolic implementation". This is likely to be true in the foreseeable future in many regions in China as far as environmental policy implementation is concerned. In these cases, strategies for improving regulatory enforcement and compliance must be developed with a firm understanding of the interactive dynamics among local actors (Tang and Tang 2014). Nevertheless, higher-level governments may still play an active role in providing resources and incentives for local actors, and in focusing their attention on high-priority goals. In our empirical context (the PRD region) where both conflict and ambiguity of environmental policy are lessened gradually, a pragmatic approach moving closer toward what Matland called "administrative implementation" (characterized by both low conflict and low ambiguity) may be a good option to pursue.

This research also sheds light on some future research directions. First, future studies may seek to identify the divergent impacts of different forms of political commitment on policy implementation. Instead of measuring an overall perception of political commitment, researchers may seek to identify specific government commitment measures and their respective perceptions of credibility. Second, to better capture the causal relationships between different contextual factors and corporate environmental practices, longitudinal research design may be employed to capture the dynamic changes in political commitment and legal frameworks, and how regulatees' perception of these changes will affect their environmental compliance behavior. Third, our findings were contextualized in a region in which the divergence in political commitment to environmental protection between the central and local governments is narrower than that in

many other regions in China. It remains to be seen if the same results will be obtained in regions where the divergence is much greater. Lastly, future research may explore whether and how the theoretical framework used in this study applies to varying regulatory, political, and cultural contexts.

Notes

1. This tool seeks to withhold environmental impact assessments (EIA) approval for all future construction projects in regions/industries/companies where environmental noncompliance is detected (Zhu and Moser 2014).

2. The annual number of milestone events in environmental governance fluctuated between 33-45 from 2004-2013, with an exception of 75 cases in 2008. Data source: Annual Report of Environmental Quality in Guangdong Province, 2003-2014.

3. The national standard for water quality in China is based on a five-grade (I-V) classification system. Only water with a grade lower than III is potable, and a grade V is the worst.

4. The potential bias due to convenience sampling should not be a great concern in this study because our sample included manufacturing enterprises from a wide variety of industrial sectors, with different firm sizes and ownership types.

5. We conducted an exploratory factor analysis to test if political commitment and policy ambiguity are two independent constructs. The analysis isolated two factors that correspond to political commitment (eigenvalue 3.678) and policy ambiguity (eigenvalue 1.623).

6. For firms participating in the pilot study and the main survey, this variable measures the inspection frequency in 2009 and 2010, respectively. We assume that there are no significant differences in terms of regulatory enforcement effort between the two time spans.

7. Although other measures can potentially be considered as basic within the broader regulatory framework (e.g., paying pollution fees and conducting environmental impact assessment), our singular measurement is probably the most straightforward assessment of basic corporate environmental efforts. We also ran an ordered logit model, which treated the dependent variable as ordinal, with imperfectly scaled intervals (Long 1997). Results are largely the same as those in our current analysis, where "basic practice" was measured with a scaled item. Overall, our single-item measurement of "basic practice" should be acceptable.

8. Enforcement intensity could be measured in various ways. Within the same institutional context, some enforcement tools may be effective while others are not. For example, Liu *et al.* (2010) found that the amount of effluent fee that a firm pays has no effect on its environmental practices. Our findings corroborate with the result of Dasgupta *et al.* (2001) that in China, inspection is a more salient factor in improving environmental compliance.

9. Source: Dongguan Statistical Bureau http://tjj.dg.gov.cn/website/web2/index.jsp, accessed on July 13, 2015.

References

Aiken, Leona S., and Stephen G. West.1991. *Multiple regression: Testing and interpreting interaction*. Newbury Park, Calif.: Sage Publications.

Aragón-Correa, J. Alberto, and Sanjay Sharma. 2003. "A contingent resource-based view of proactive corporate environmental strategy." *Academy of Management Review* 28: 71–88.

Arentsen, Maarten J., Hans Th.A. Bressers, and Jr. Laurence J. O'Toole. 2000. "Institutional and policy responses to uncertainty in environmental policy: A comparison of Dutch and US styles." *Policy Studies Journal* 28 (3): 597-611.

Auer, Matthew. 2001. "Energy and environmental politics in post-corporatist Mexico." *Policy Studies Journal* 29 (3): 437–455.

Ayres, Ian, and John Braithwaite. 1992. "*Responsive regulation: Transcending the deregulation debate*." Oxford University Press.

Bertelli, Anthony M., and Andrew B. Whitford. 2009. "Perceiving credible commitments: How independent regulators shape elite perceptions of regulatory quality." *British Journal of Political Science* 39 (3): 517–537.

Blackman, Allen. 2008. "Can voluntary environmental regulation work in developing countries? Lessons from case studies." *Policy Studies Journal* 36 (1): 119–141.

Blackman, Allen. 2009. "Colombia's discharge fee program: Incentives for polluters or regulators?" *Journal of Environmental Management* 90 (1): 101–119.

Blackman, Allen, Eduardo Uribe, Bart van Hoof, and Thomas P. Lyon. 2013. "Voluntary environmental agreements in developing countries: the Colombian experience." *Policy Sciences* 46 (4): 335–385.

Chan, Hon S., Koon-kwai Wong, K. C. Cheung, and Jack Man-keung Lo. 1995. "The implementation gap in environmental management in China, the case of Guangzhou, Zhengzhou, and Nanjing." *Public Administration Review* 55 (4): 333–340.

Dasgupta, Susmita, Hemamala Hettige, and David Wheeler. 2000. "What improves environmental compliance? Evidence from Mexican industry." *Journal of Environmental Economics and Management* 39 (1): 39–66.

Dasgupta, Susmita, Benoit Laplante, Nlandu Mamingi, and Hua Wang. 2001. "Inspections, pollution prices, and environmental performance: evidence from China." *Ecological Economics* 36 (3): 487–498.

Delmas, Magali A., and Vanessa C. Burbano. 2011. "The drivers of greenwashing." *California Management Review* 54 (1): 64–87.

Eaton, Sarah, and Genia Kostka. 2014. "Authoritarian environmentalism undermined? Local leaders' time horizons and environmental policy implementation in China." *The China Quarterly* 218: 359–380.

Engau, Christian, and Volker H. Hoffmann. 2011. "Corporate response strategies to regulatory uncertainty: evidence from uncertainty about post-Kyoto regulation." *Policy Sciences* 44 (1): 53–80.

Flannery, Brenda L., and Douglas R. May. 2000. "Environmental ethical decision making in the US metal-finishing industry." *Academy of Management Journal* 43 (4): 642–662.

Fowler, Floyd J. 1993. *Survey Research Methods*. Newbury Park, CA: Sage.

Geng, Yong, Xinbei Wang, Qinghua Zhu, and Hengxin Zhao. 2010. "Regional initiatives on promoting cleaner production in China: a case of Liaoning." *Journal of Cleaner Production* 18 (15): 1502–1508.

Gunningham, Neil A., Robert A. Kagan, and Dorothy Thornton. 2003. *Shades of Green: Business,*

Regulation, and Environment. Stanford University Press, Stanford, California.
Gunningham, Neil A., Dorothy Thornton, and Robert A. Kagan. 2005. "Motivating management: corporate compliance in environmental protection." *Law & Policy* 27 (2): 289–316.
Harman, Harry H. 1976. *Modern Factor Analysis* (3rd edition). Chicago: The University of Chicago Press.
Heilmann, Sebastian, and Oliver Melton. 2013. "The reinvention of development planning in China, 1993–2012." *Modern China* 39 (6): 580–628.
Hoffmann, Volker H., Thomas Trautmann, and Jens Hamprecht. 2009. "Regulatory uncertainty: a reason to postpone investments? Not necessarily." *Journal of Management Studies* 46 (7): 1227–1253.
Kennedy, P. 1997. *A Guide to Econometrics*, 3rd ed. Cambridge, MA: MIT Press.
Kostka, Genia. 2013. "Environmental protection bureau leadership at the provincial level in China: examining diverging career backgrounds and appointment patterns." *Journal of Environmental Policy and Planning* 15 (1): 41–63.
Kostka, Genia, and William Hobbs. 2012. "Local energy efficiency policy implementation in China: bridging the gap between national priorities and local interests." *The China Quarterly* 211: 765–785.
Liang, Jiaqi, and Laura Langbein. Forthcoming. "Performance management, high-powered incentives, and environmental policies in China." *International Public Management Journal*.
Liu, Xianbing, Beibei Liu, Tomohiro Shishimea, Qinqin Yu, Jun Bi, and Tetsuro Fujitsuka. 2010. "An empirical study on the driving mechanism of proactive corporate environmental management in China." *Journal of Environmental Management* 91 (8): 1707–1717.
Liu, Nicole Ning, Carlos Wing-Hung Lo, Xueyong Zhan, and Wei Wang. 2015. "Campaign-style enforcement and regulatory compliance." *Public Administration Review* 75 (1): 85–95.
Lo, Carlos Wing-Hung, and Shui-Yan Tang. 2006. "Institutional reform, economic changes, and local environmental management in China: the case of Guangdong Province." *Environmental Politics* 15:190–211.
Long, Scott J. 1997. *Regression Models for Categorical and Limited Dependent Variables*. Sage: Thousand Oaks, CA.
Lubell, Mark. 2004. "Collaborative watershed management: a view from the grassroots." *Policy Studies Journal* 32 (3): 341–361.
Ma, Xiaoying, and Leonard Ortolano. 2000. *Environmental Regulation in China: Institutions, Enforcement, and Compliance*. Lanham, MD: Rowman & Littlefield.
Marcus, Alfred, J. Alberto Aragón-Correa, and Jonatan Pinkse. 2011. "Firms, regulatory uncertainty, and the natural environment." *California Management Review* 54 (1): 5–16.
Marquis, Christopher, Jianjun Zhang, and Yanhua Zhou. 2011. "Regulatory uncertainty and corporate responses to environmental protection in China." *California Management Review* 54 (1): 39–63.
Matland, Richard. 1995. "Synthesizing the implementation literature: the ambiguity-conflict model of policy implementation." *Journal of Public Administration Research and Theory* 5 (2): 145–155.
May, Peter J. Forthcoming. "Implementation failures revisited: Policy regime perspectives." *Public Policy and Administration*.
May, Peter J., and Ashley E. Jochim. 2013. "Policy regime perspectives: Policies, politics, and governing." *Policy Studies Journal* 41 (3): 426–452.
May, Peter J., and Søren C. Winter. 1999. "Regulatory enforcement and compliance: Examining

Danish agro-environmental policy." *Journal of Policy Analysis and Management* 18: 625–651.
Mol, Arthur P. J., and Neil T. Carter. 2006. "China's environmental governance in transition." *Environmental Politics* 15 (2): 149–170.
O'Brien, Kevin J., and Lianjiang Li. 1999. "Selective policy implementation in rural China." *Comparative Politics* 31 (2): 167–186.
Pandey, Sanjay K., and Bradley E. Wright. 2006. "Connecting the dots in public management: political environment, organizational goal ambiguity, and the public manager's role ambiguity." *Journal of Public Administration Research and Theory* 16(4): 511–532.
Qian, Yingyi, and Barry R. Weingast. 1997. "Federalism as a commitment to preserving market incentives." *Journal of Economic Perspectives* 11 (4): 83–92.
Rivera, Jorge. 2004. "Institutional pressures and voluntary environmental behavior in developing countries: evidence from the Costa Rican hotel industry." *Society and Natural Resources* 17 (9): 779–797.
Rivera, Jorge, and Chang H. Oh. 2013. "Environmental regulations and multinational corporations' foreign market entry investments." *Policy Studies Journal* 41 (2): 243–272.
Robertson, Peter J., and Shui-Yan Tang. 1995. "The role of commitment in collective action: Comparing the organizational behavior and rational choice perspectives." *Public Administration Review* 55 (1): 67–80.
Royo, Sonia, Ana Yetano, and Basilio Acerete. 2014. "E-participation and environmental protection: are local governments really committed?" *Public Administration Review* 74(1): 87–98.
Saetren, Harald. 2005. "Facts and myths about research on public policy implementation: Out-of-Fashion, allegedly dead, but still very much alive and relevant." *Policy Studies Journal* 33 (4): 559–582.
Steger, Ulrich, Wei Lu, and Zhaoben Fang. 2003. *Greening Chinese Business: Barriers, Trends and Opportunities for Environmental Management*. UK: Greenleaf Publishing Limited.
Tang, Ching-Ping, and Shui-Yan Tang. 2014. "Managing incentive dynamics for collaborative governance in land and ecological conservation." *Public Administration Review* 74(2): 220–231.
Tang, Shui-Yan. 2012. *Ten Principles for a Rule-ordered Society: Enhancing China's Governing Capacity*. Beijing: China Economic Publishing House
Travis, Rick, John C. Morris, and Elizabeth D. Morris. 2004. "State implementation of federal environmental policy: Explaining leveraging in the Clean Water State Revolving Fund." *Policy Studies Journal* 32 (3): 461–480.
Van Rooij, Benjamin. 2006. *Regulating Land and Pollution in China: Lawmaking, Compliance, and Enforcement; Theory and Cases*. Leiden: Leiden Univ. Press.
Wang, Alex L. 2013. "The search for sustainable legitimacy: environmental law and bureaucracy in China." *Harvard Environmental Law Review* 37 (2): 365–440.
Wang, Hua, and Yanhong Jin. 2007. "Industrial ownership and environmental performance: evidence from China." *Environmental and Resource Economics* 36 (3): 255–273.
Wang, Hua, Nlandu Mamingi, Benoit Laplante, and Susmita Dasgupta. 2003. "Incomplete enforcement of pollution regulation: Bargaining power of Chinese factories." *Environmental and Resource Economics* 24 (3): 245–262.
Xu, Chenggang. 2011. "The fundamental institutions of China's reform and development." *Journal of Economic Literature* 49 (4): 1076–1151.
Xue, Lan, Udo E. Simonis, and Daniel J. Dudek. 2007. "Environmental governance for China: Major recommendations of a task force." *Environmental Politics* 16 (4): 669–676.

Yee, Wai Hang, Shui-Yan Tang, and Carlos Wing-Hung Lo. Forthcoming. “Regulatory compliance when the rule of law is weak: evidence from China’s environmental reform.” *Journal of Public Administration Research and Theory*.

Zhan, Xueyong, Carlos Wing-Hung Lo, and Shui-Yan Tang. 2014. “Contextual changes and environmental policy implementation: a longitudinal study of street-level bureaucrats in Guangzhou, China.” *Journal of Public Administration Research and Theory* 24 (4): 1005–1035.

Zhang, Bing, Hanxun Fei, Yongjing Zhang, and Beibei Liu. 2015. “Regulatory uncertainty and corporate pollution control strategies: an empirical study of the ‘Pay for Permit’ policy in the Tai Lake Basin.” *Environment and Planning C: Government and Policy* 33(1): 118–135.

Zhou, Xueguang, Hong Lian, Leonard Ortolano, and Yinyu Ye. 2014. “A behavioral model of “muddling through” in the Chinese bureaucracy: the case of environmental protection.” *China Journal* 70: 120–147.

Zhu, Xiao, and Adam Moser. 2014. “The laws, policies, and politics of regulating lead pollution in China.” *Frontiers of Law in China* 9 (2): 187–207.

Attached Tables

Table 1 Descriptive Statistics and Correlations

	Mean	SD	1	2	3	4	5	6	7	8	9
1. Headquarter abroad	0.16	0.37									
2. Export ratio	3.62	1.57	0.26*								
3. Firm size	2.19	1.48	0.36*	0.02							
4. Non-private firm	0.32	0.47	0.45*	0.22*	0.32*						
5. Access to environmental information	5.33	1.28	-0.09	-0.11	-0.05	-0.17*					
6. Confusing standards and enforcement	2.81	1.23	0.12	0.05	0.13	0.20*	-0.46*				
7. Clear political commitment	5.21	1.31	-0.07	-0.14*	-0.07	-0.25*	0.46*	-0.78*			
8. Inspection frequency	2.51	2.71	0.01	-0.07	0.04	0.16*	0.09	-0.14	0.08		
9. Basic environmental practices	5.51	1.41	-0.12	-0.05	0.09	-0.05	0.24*	-0.41*	0.41*	0.20*	
10. Proactive environmental practices	5.02	1.37	-0.11	-0.11	-0.03	-0.25*	0.57*	-0.63*	0.56*	0.18*	0.53*

* $p < 0.05$

Table 2 Regression results

	(1) Basic environmental practices			(2) Proactive environmental practices		
Headquarter abroad	-0.593*	-0.629**	-0.683*	0.024	0.037	0.018
	(-1.86)	(-2.14)	(-2.36)	(0.09)	(0.16)	(0.08)
Export ratio	0.005	0.028	0.019	-0.016	-0.011	-0.014
	(0.08)	(0.46)	(0.31)	(-0.29)	(-0.23)	(-0.29)
Firm size	0.140*	0.163**	0.145**	0.046	0.075	0.067
	(1.90)	(2.40)	(2.17)	(0.76)	(1.43)	(1.27)
Non-private firm	0.038	0.156	0.209	-0.501***	-0.410**	-0.389**
	(0.16)	(0.67)	(0.91)	(-2.50)	(-2.27)	(-2.15)
Access to environmental information	0.254***	0.022	0.062	0.585***	0.353***	0.374***
	(3.21)	(0.27)	(0.76)	(9.06)	(5.58)	(5.86)
Confusing standards and enforcement		-0.235*	-0.101		-0.43***	-0.359***
		(-1.90)	(-0.78)		(-4.51)	(-3.54)
Clear political commitment		0.262**	0.329***		0.079	-0.115
		(2.26)	(2.83)		(0.88)	(-1.27)
Inspection frequency		0.073**	0.085**		0.055**	0.056*
		(2.11)	(2.27)		(2.06)	(1.93)
Confusing standards and enforcement × Inspection frequency			0.170**			0.096*
			(2.59)			(1.87)
Clear political commitment × Inspection frequency			0.087			0.062
			(1.39)			(1.26)
Constant	3.912***	4.077***	4.874***	2.024***	3.80***	3.075***
	(7.28)	(3.88)	(9.42)	(4.61)	(4.67)	(7.58)
Total R^2	0.08***	0.247***	0.283***	0.355***	0.527***	0.537***
ΔR^2		0.164***	0.036***		0.172***	0.010

t statistics in parenthese

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Attached Figures

Figure 1 Plots of interaction between “confusing standards and enforcement” and “inspection frequency” in predicting basic practices

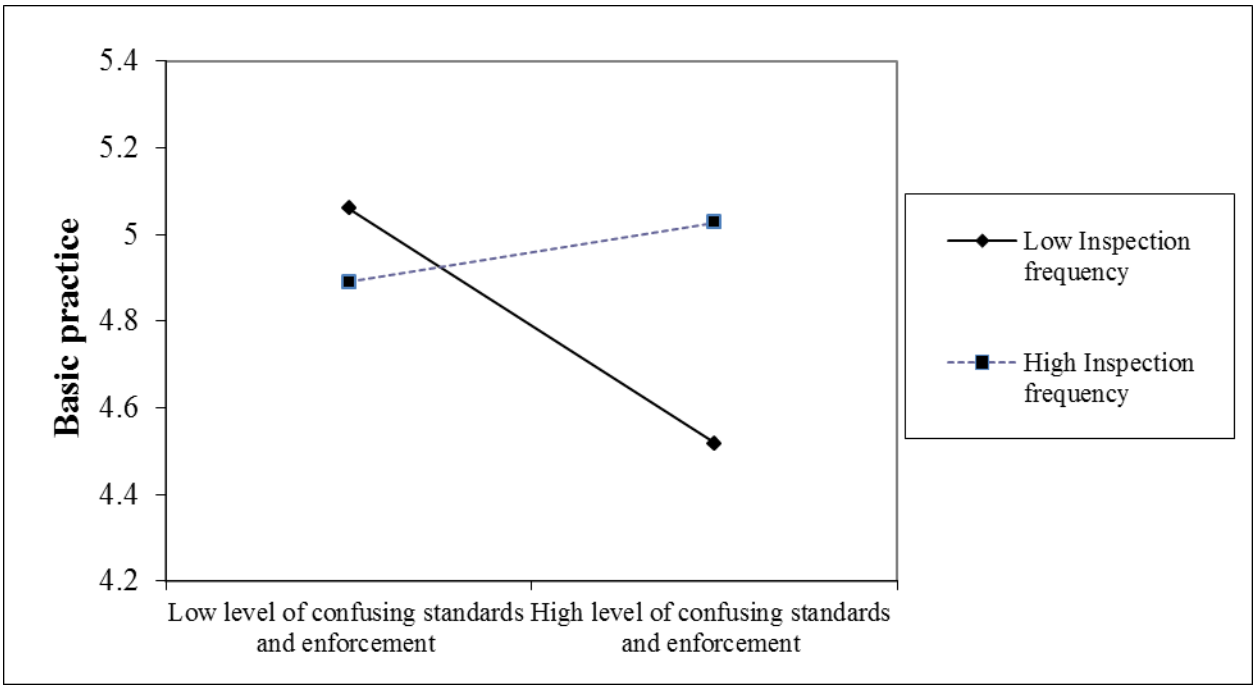
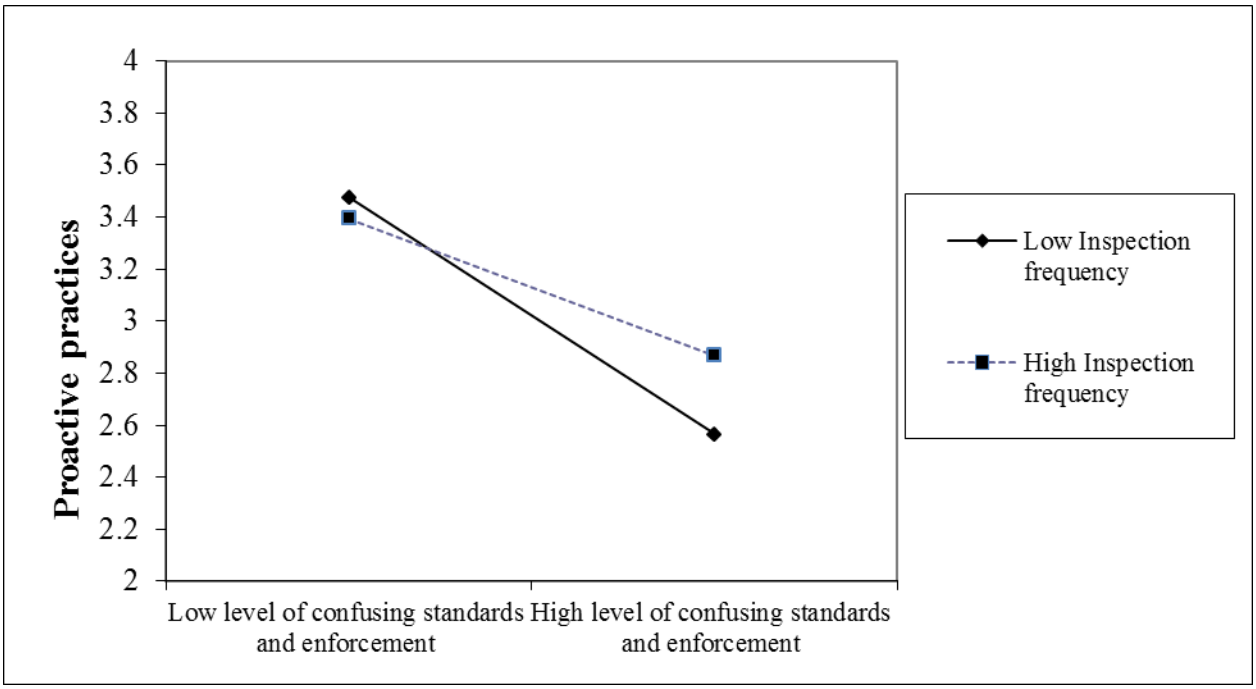


Figure 2 Plots of interaction between “confusing standards and enforcement” and “inspection frequency” in predicting proactive practices



Appendix: Measurement

Clear political commitment towards stronger environmental protection (α = 0.77)

Do you agree with the following statement on political commitment? 1 "Strongly disagree" - 7 "Strongly agree"

1. Environmental commitment of the central government is clear.
2. Environmental commitment of the local government is clear.
3. Commitment of non-environmental government departments to engage in environmental protection is clear.

Confusing standards and enforcement (α = 0.83)

Do you agree with the following statements about environmental regulation and enforcement? 1 "Strongly disagree" - 7 "Strongly agree"

1. The existing regulations and standards are incomprehensive to address all environmental problems.
2. The existing regulations and standards are incomprehensive are inconsistent, and sometimes conflict with each other.
3. Sanctions for non-compliance are implicitly stated in the existing environmental regulations.
4. The ways EPB enforce environmental regulations are unclear.

Basic environmental practices

To what extent the following environmental practices are integrated in your company: 1 "not being considered"; 2 "considered with no further implementation"; 3 "piloted without official implementation", 4 "implemented but not the focus", 5 "currently implementing as a focus", 6 "implementation and closely connected to other departments", and 7 "successfully implemented as an integral part of business operation".

1. End-of-pipe equipment to reduce pollution emission

Proactive environmental practices (α = 0.90)

To what extent the following environmental practices are integrated in your company:

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 our firm's environmental performance
6. Setting environmental objectives as part of the annual business plans
7. Including environmental performance measures in management evaluations
8. Preparation and release of environmental reports