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**Regulatory Compliance When the Rule of Law is Weak:
Evidence from China's Environmental Reform**

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Abstract

What drives regulatees' behaviors when the institution of law is weak? This study seeks to answer the question by examining environmental regulation enforcement in China. Based on survey and interview data on Hong Kong-owned manufacturing enterprises in the Pearl River Delta Region, Guangdong Province, we found that their decisions to adopt basic and proactive environmental management practices were less driven by concerns for legality than by their perceptions of the regulators' actions and gestures. Enterprises adopted basic environmental practices to avoid potential punishment, and they adopted more proactive practices to avoid potentially arbitrary impositions from regulatory officials. Regulated enterprises were more likely to adopt both basic *and* proactive environmental practices if they had less difficulties understanding the *enforced* regulations. These findings suggest important ways in which regulatory compliance behaviors in a developmental context may differ from those in Western countries.

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法律制度薄弱情况下的合规：以中国环保改革为例

摘要

在法律制度薄弱的情况下，什么因素影响受监管者的行为？此项研究通过审视中国环境保护法规的执行来解答这一问题。对位于广东省珠江三角洲的港资企业进行的问卷和采访表明，企业在决定是否采取基本的或是能动的环境管理措施时，基于对监管者的行为和态度的判断，比出于遵守法律的考虑更为重要。为防受惩罚，企业采取了基本的环境管理措施；而当监管官员的管理具有不确定性时，企业采取了更能动的环境管理措施。当**被执行的规则**更易理解时，企业则更可能采取基本**以及**能动的环境管理措施。这些研究结果表明在发展中国家，合规行为与在西方发达国家存在重大区别。

Most of the current regulatory compliance literature is based on data collected in Western countries (Winter and May 2001; May 2004; Gunningham, Thornton and Kagan 2005; Hawkins 1984; Ayres and Braithwaite 1992; Levi 1997; Tyler 2006). To what extent are findings in this literature applicable to developing countries? In recent years, scholars of regulatory enforcement have shown increased interest in answering this question (e.g., Braithwaite 2006; Araral, forthcoming), but the number of rigorous studies on regulatory compliance has remained limited (see Levi and Sacks 2009 for an exception), especially in relation to what drives enterprises in developing countries to evade or comply with environmental regulations.

In developing countries, regulatory enforcement and compliance are shaped by many contextual factors—for example, weak government capacity and legitimacy (Levi and Sacks 2009), official corruption, and inadequate protection for private property rights. In this paper, we examine one particular factor that is common across most developing countries—the lack of a governing framework that is supported by the rule of law. A brief review of the regulatory compliance literature shows that many of its key findings are premised on the existence of the rule of law. For example, the common criticism on regulations being overly rigid or “suffocating” (Bardach and Kagan 1982; Howard 1994) is valid only when the regulations are actually used by government officials as the authoritative guide for enforcement. The criticism becomes less relevant if both the regulators and the regulated do not treat the specific details of the regulations seriously in the first place. Another example concerns the praise for a more responsive and flexible approach to regulatory enforcement (e.g., Ayres and Braithwaite 1992, Potoski and Prakash 2004). Such an approach is less likely to work if the regulators are widely perceived to be arbitrary, partial, or corrupt. A third example concerns the importance of a sense of duty as a supplement to coercion as a

motivation for compliance (Tyler 2006). Yet the duty metaphor loses its meaning if the regulations are widely perceived as unreasonable and arbitrary, and one will hardly develop any “shameful” feeling for their violation (Grasmick and Bursik 1990).

These examples raise critical issues about the applicability of many arguments and findings in the current literature to governance contexts in which the law is not highly regarded as a legitimate source of authority: What if the formal regulations fail to serve as a useful guide for the regulatees (for being, say, too vague in wording or too broad in coverage)? What if most of the regulated do not believe the regulators intend on enforcing the formal regulations? In many developing countries, adherence to the rule of law as a governance principle is an exception rather than the rule, yet governments do continue to pass laws and regulations, which presumably would have an effect on people’s behaviors. What motivates regulatees’ behaviors under this rather common situation where the rule of law is not well established? Is it possible to find compliance and beyond compliance behaviors when legal authorities enjoy relatively low legitimacy? If so, how can we explain these behaviors?

This study seeks to answer these questions by examining environmental regulation enforcement in China. Based on survey and interview data on Hong Kong-owned manufacturing enterprises in the Pearl River Delta Region, Guangdong Province, we found that their decisions to adopt basic and proactive environmental management practices were less driven by a concern for legality than by their perceptions of the regulators’ actions and gestures. Enterprises adopted basic environmental practices to avoid potential punishment, and they adopted more proactive practices to avoid potentially arbitrary impositions from regulatory officials. Regulated enterprises were less likely to adopt both basic *and* proactive environmental practices if they had more difficulties understanding the *enforced* regulations.

These findings suggest important ways in which regulatory compliance behaviors in a developmental context may differ from those in Western countries. Next we first introduce the history of China's environmental reform and its recent move towards a legislative and regulatory approach. We then review further the current regulatory compliance literature and develop several hypotheses by taking into account China's governance context, in which the rule of law is yet to be firmly established.

China's Environmental Reform and Regulatory Setting

Thanks to Deng Xiaoping's Reform and Open (*Gaige Kaifang*) Policy in the early 1980s, China has achieved remarkable economic growth in the past three decades. The growth, however, has also brought devastating impact on its environment (see e.g., SEI & UNDP China 2002; Economy 2004; Economy and Lieberthal 2007). In the past decade, the Chinese government has shown a stronger commitment to reforming its environmental governance (Lo and Tang 2006, 2014; Lo, Fryxell and van Rooij 2009), with some encouraging results (see e.g., PRC 2006, 2007, 2008; UNDP China and RUC 2010). The year 2006 marked an important milestone as the central government decided to carry out the first national census on pollution sources.¹ Concrete work plans were also created to reduce air and water pollution. In 2007, China experienced the first significant drop in both COD (chemical oxygen demand) and SO₂ (sulfur dioxide) emissions.

How did China change course after its prolonged negligence toward the environment? As documented in many previous studies, China's environmental reform has been mainly a state-led process (Lo and Tang 2006; Martens 2006; Shi and Zhang 2006). The country's first

¹ Retrieved March 26, 2012, from the webpage of The Central People's Government of the People's Republic of China, http://www.gov.cn/gongbao/content/2006/content_268766.htm.

Environmental Protection Office was established in 1974, right after the United Nations Stockholm Conference in 1972. With major economic reform beginning in the late 1970s, the State Commission for Environmental Protection was established several years later in 1984 and was responsible for coordinating environmental responsibilities across ministries. This commission was upgraded in 1998 to become a semi-ministry-level government agency, the State Environmental Protection Administration (SEPA). In 2008, SEPA was elevated to become a full-fledged ministry, the Ministry of Environmental Protection.

Along with the enhancement of administrative capacity we saw a gradual change in regulatory enforcement approaches. Ever since the enactment of the first Environmental Protection Law in 1979, legislative efforts have resulted in an extensive set of environmental laws and regulations, covering such issues as pollution controls over air, water, solid waste, and noise, as well as natural resource conservation (see Beyer 2006 for review). Yet the Chinese government had been mostly relying on a campaign approach—that is, maintaining economic growth as the main developmental goal, while occasionally announcing ad-hoc measures to boost up environmental protection efforts (SEI and UNDP China 2002). In the past decade, this campaign approach has been gradually replaced by a legislative and regulatory approach (UNDP China and RUC 2010).

This top-down, government-led regulatory reform has emphasized energy saving and emissions reduction among enterprises (PRC 2007; 2008; Lo, Fryxell and van Rooij 2009). Centralized sewage treatment facilities were built in urban areas, while stricter regulations required enterprises in major industrial sectors to install tertiary effluent-treatment facilities (PRC 2006, 2007, 2008). A number of pollution-discharge and clean-production standards were also established for major polluting industries, whereas enterprises causing serious pollution (e.g., paper mills, chemical plants, textiles, printing and dyeing enterprises, small

thermal power units, outdated cement, steel, iron, and plate-glass-making units) were phased out or shut down. In the meantime, some environment-friendly economic policies were introduced, including such schemes as *Environmental Pollution Liability Insurance* and green credit policies. Local governments were urged to pressure local enterprises to cut down on pollutant emissions and energy consumption. Enterprises in response have been increasingly adopting various environmental management practices, from such basic measures as recycling and processing their wastes and emissions, to proactive and holistic measures such as developing certifiable environmental management systems and investing in cleaner production technologies.

Implementing the new legislative and regulatory approach, however, is not as straightforward as it may sound. Similar to many other policy and administrative reform initiatives in China, whether these government-led efforts can be sustained depends very much on the extent to which the initiatives are compatible with the country's governance system. Particularly, the move toward a regulatory enforcement approach took place at a time when China's legal system was also undergoing steady reform since the end of the Cultural Revolution. The rule of law was first recognized formally as a main principle of governance in 1997 (Yu 2010, 14). Instead of being dominated entirely by the Communist Party, the lawmaking process began to involve a broader array of governing entities, including the "State Council, the Communist Party Central apparatus, and the National People's Congress (NPC) and its Standing Committee" (Tanner 2003, 39). More recently, the court has been gradually playing a larger role in resolving "rights-based grievances"; judges are becoming more qualified, and increasingly looking into one another's judgments for reference (Liebman 2007). Constitutional amendments have also been introduced (for instance, the

Property Law was adopted in 2007²) to further accommodate the country's economic reform (Clarke 2007).

Despite these developments, China's legal system and its courts have yet to establish full independence, and there are many reasons to doubt if environmental laws and regulations are consistently enforced in practice. Apart from the relatively short history of legal reform, leaders of China seem to be interested in developing a legal system with Chinese characteristics. In a recent campaign led by the Party's Central Political-Legal Committee, legal practitioners were reminded of their loyalty to party leadership, their duty to serve "the overall situation", and their role to establish the "socialist rule of law" (Liebman 2007, 627). Entrenched local political networks, or "local protectionisms", have also presented major obstacles for local courts seeking to implement their rulings (Pei 2001, 2006; Diamant, Lubman and O'Brien 2005).

With respect to environmental regulation enforcement, "impossibly high" standards and weak local enforcement capability were often identified as major obstacles (SEI and UNDP China 2002, 80; Beyer 2006). Environmental regulations were worded "vaguely", leaving "considerable scope for interpretation" (SEI and UNDP China 2002, 82; Beyer 2006, 205-206). "Contradictions" were observed in the assignment of implementation authorities among different branches and levels of government; many local officials were also said to be colluding with enterprises, requesting the latter to "ignore [environmental] laws and regulations in their quest for ongoing GDP growth" (Economy and Lieberthal 2007, 92). There were reports about local environmental officials being more interested in running their environmental consulting firms than enforcing regulations, and some environmental officials

² Property Law of the People's Republic of China. Retrieved March 26, 2012, from the webpage of the Central People's Government of the People's Republic of China, http://www.gov.cn/flfg/2007-03/19/content_554452.htm.

seeking bribes directly from regulated enterprises. At times when environmental issues become politically salient nationwide or in a particular jurisdiction, local enforcement officials may impose extraordinary demands on enterprises to stop all pollutant emissions on short notices (Lo and Tang 2014).

From the perspective of enterprise executives, it remains highly haphazard when they try to respond to vaguely worded regulations and apparently arbitrary demands from local officials. For enterprise executives, it is often not just about understanding the regulations and coming up with the technologies and resources needed for compliance, but also trying to understand the actions, gestures, and priorities of the local officials, which in many cases may have little to do with the written regulations. How do enterprise executives behave in this regulatory setting? It is in this context we review further the literature on regulatory compliance.

The Rule of Law and Regulatory Compliance

The multifaceted impacts of the rule of law on the relationship between state and society are well documented in the contemporary literature. For scholars in development studies, the rule of law facilitates economic growth, as it protects property rights, guarantees individual security and liberty, constrains the power of government, and prevents corruption (e.g., Haggard and Tiede 2011; Murrell 2001). Political scientists are interested in its role in state building in democracies (e.g., Olson 1993; Weingast 1997). Public administration scholars are concerned about balancing legal and managerial values, and holding government officials accountable (Christensen, Goerdel and Nicholson-Crotty 2011; Kettl 2009; see also Rosenbloom, O’Leary and Chanin 2010). Kettl (2009), for example, reminded us that the

rule-of-law convention was cited as a guarantee of individual rights as the Progressives advocated for greater government regulatory power to counteract the rise of big corporations (Wilson 1887, see Kettl 2009, 12).

How does the rule of law affect regulatory compliance? According to A. V. Dicey (1982), the rule of law implies that (1) men are ruled by law and by law alone, (2) no one is above the law, and (3) the law is the *result* of “the rights of individuals” and “the ordinary law of the land” (emphasis added)³ (see also Bingham 2010). If these principles are followed in regulatory enforcement, (1) regulators’ regulatory power will be dictated by relevant regulations; (2) regulations will be enforced consistently; and (3) regulatory enforcement is shaped by prevailing social practices and expectations. Major findings from the regulatory compliance literature largely relate to these three main expectations.

The literature showed that regulatees comply with the regulations in order to avoid potential legal punishments and to fulfill their duty to obey the law (Becker 1968; Ehrlich 1972; Grasmick and Bursik 1990; Tyler 2006; Scholz and Pinney 1995; Winter and May 2001; May 2004). Later developments suggest that regulatees may, in some circumstances, engage in beyond-compliance behaviors (May 2005, 31; Potoski and Prakash 2004). Compliance and beyond-compliance behaviors may be encouraged by a cooperative regulatory approach, which fosters reciprocal relationships between the regulators and the regulatees. This approach may reduce the need for more stringent or “unreasonable” regulations in the future (Bardach and Kagan 1982; Hawkins 1984; Scholz 1984a, 1984b; Shapiro and Rabinowitz 1997; Potoski and Prakash 2004; May 2005; Koski and May 2006;

³ “[The rule of law] means, in the first place, the absolute supremacy or predominance of regular law as opposed to the influence of arbitrary power, and excludes the existence of arbitrariness, of prerogative, or even of wide discretionary authority on the part of the government. ... It means, again, equality before the law, or the equal subjection of all classes to the ordinary law of the land administered by the ordinary Law Courts. ... The ‘rule of law,’ lastly, may be used as a formula for expressing the fact that with us the law of the constitution ... are not the source but the consequence of the rights of individuals, ... thus the constitution is the result of the ordinary law of the land” (Dicey 1982: Part II: IV).

Press and Mazmanian 2010). These findings are in line with the first two expectations above that both the regulators and the regulatees treat the regulations seriously.

The literature also found that compliance behaviors are driven *socially*, through the sanctions that the compliers' peers may invoke when they break the law or when they violate the societal norm related to the specific law (Grasmick and Bursik 1990; Tyler 2006; Winter and May 2001). Compliance is higher when strong social norms govern the regulated behaviors (Hawkins 1984; Posner 2000). "Civil regulations", or regulations governing market actors without government enforcement, are also expected to encourage the regulatees' voluntary beyond-compliance behaviors (Vogel 2008). These findings suggest that regulatees' compliance and beyond-compliance behaviors are related to the social setting in which regulatees are embedded.

Recent literature has also examined how compliance behaviors are affected by regulatory information and enforcement styles. The literature suggests that regulatees possessing better regulatory information (such as details about specific requirements and the means to achieve them) will be more likely to comply (Winter and May 2002; Koski and May 2006; Lee 2010), though it is unclear how information may affect beyond-compliance behaviors. In terms of enforcement styles, two major styles are considered to be conducive to compliance (see May and Wood 2003). The first one is the "formalistic" (May and Wood 2003) or "legalistic" style (Kagan 1994). It involves the regulator demanding compliance uniformly and consistently, as well as interpreting the regulations rather strictly and rigidly. Such a style fosters a sense of fairness among the regulatees, raising the perceived level of "ethical reciprocity" among them, and thus compliance rates (Levi 1997). The other one is the "facilitative" style. Regulators with this style relate to the regulatees in a "friendly" and "forgiving" manner (May and Wood 2003), demanding compliance "flexibly" to foster trust

with the regulatees, and hence the latter's contribution to the regulatory goal in the long run (Ayres and Braithwaite 1992; Potoski and Prakash 2004).⁴

Hypotheses

The first set of motivations reviewed above suggests that regulatees act according to the regulators' demands because of their concerns for legality. As the regulatees act to fulfill their sense of duty to the law, reduce the risk of lawsuits, and lower the odds for stricter legislation in the future, they tend to follow closely the laws and regulations, and thus are more likely to adopt compliance and beyond-compliance behaviors.

H1: A concern for legality is positively related to enterprises' compliance and beyond-compliance behaviors.

Nevertheless, in China's governance context where the rule of law is not firmly established, these expectations need adjustments. First of all, regulations may serve as an indication of regulatory goals, but regulatees can no longer rely on them as the sole objective reference to decide on their compliance behaviors. From earlier discussion, we learned that China's legal system has yet to become fully independent, and the regulatory enforcement process has remained haphazard, being influenced by various local political interests and administrative malpractices. Deficiencies in the environmental regulations themselves (e.g., vague wording, unreasonable standards) also prevented them from being a reliable source of reference for the regulatees. If these accounts are accurate, the concern for legality is unlikely to be relevant in enterprises' decisions. It remains to be seen whether H1 is valid in the context of China.

As discussed earlier, environmental laws and regulations are numerous in China. Many of them are not clearly formulated, and local environmental officials may not enforce laws

⁴ Other enforcement styles are also identified in the literature, including "coercion", "educational", "prioritization" and "accommodation". See Lo, Fryxell and van Rooij (2009) for details.

and regulations consistently. It has often become a challenge for the regulated enterprises to understand which regulations are most relevant to their respective operations and how exactly officials will enforce them. Whether enterprise managers are able to understand the relevant requirements depends very much on the regulators' willingness, effort, and ability to help. If the regulatory officials are able to establish constructive relationships with the enterprises by providing clear indications about the behaviors required, together with sufficient technical advice and support, enterprise executives will have a better understanding of the *enforced* regulations and face less challenges in compliance. Otherwise, they will be less likely to engage in environmental compliance behaviors.

H2a: An understanding of the *enforced* regulations is positively related to enterprises' compliance behaviors.

If regulators can help enterprise executives to understand the *enforced* regulations, this will encourage the latter to engage in beyond-compliance behaviors. When the rule of law is weak, the exercise of regulatory power depends very much on the regulators' will. When the written regulations cannot serve as a reliable reference, regulatees can easily become suspicious of the regulators' commitment to the regulatory goal. Such suspicion may severely undermine regulatees' willingness to engage in beyond-compliance behaviors. Yet if the regulatory officials manage to convey to the regulatees relevant information about what requirements are being enforced, such efforts represent an important commitment of the regulators to restrain their use of power and to pursue the regulatory goal. Thus the less challenges regulatees find in understanding the *enforced* regulations, the less likely will they be suspicious about the regulator's intention, and hence the more likely will they engage in beyond-compliance behaviors.

H2b: An understanding of the *enforced* regulations is positively related to enterprises' beyond-compliance behaviors.

Like their counterparts in Western countries, enterprise executives in China want to avoid regulatory punishment (Ehrlich 1972; Winter and May 2001; May 2004). In China, the extent of regulatory punishment may not be dictated by formal regulations based on severity of violation, but result from arbitrary impositions by the regulators. Regardless of origins, if enterprise executives do perceive a higher chance for substantial punishment, they are more likely to engage in compliance behaviors to ward off potential losses. Yet the motivations to prevent substantial punishment may not lead to beyond-compliance behaviors.

H3a: A perception of potential punishment is positively related to enterprises' compliance behaviors.

H3b: A perception of potential punishment is not related to enterprises' beyond-compliance behaviors.

In Western countries, social expectations play a significant role in motivating enterprise executives to engage in environmental management practices. In general the stronger the demands from societal groups such as the media, the community, and NGOs, the more likely an enterprise cares about environmental management; similarly the stronger the demands from peer groups such as shareholders, employees, competitors, and industry associations, the more likely an enterprise cares about environmental management. In China, environmental demands from peers may have increased, but their effects on enterprises have been limited (Zhu and Sarkis 2006; Yee, Lo and Tang 2013). There have also been increasing societal concerns for pollution, but there is a lack of societal expectations for strict compliance with government regulations in general, regardless of policy arenas (Tang 2012). Although the media and the community have paid more attention to pollution issues and

some environmental NGOs have emerged in recent years, they have in general been quite restrained in directly criticizing government's regulatory enforcement practices (Tang and Zhan 2008; Zhan and Tang 2013). Business executives tend not to believe that societal actors have the moral authority to compel them to follow regulations when most others ignore them any way.

H4: Perceptions of demands from societal and peer groups are not related to enterprises' compliance and beyond-compliance behaviors.

As noted earlier, some combinations of “legalistic” and “facilitative” regulatory styles work well in the context of Western countries. In China where laws and regulations cannot be relied on as a useful reference for compliance, will regulators regulating too flexibly be perceived by regulatees as partial and inconsistent? Will regulators applying the same standard to all be seen as too tough or too rigid? A major concern for regulatees in China is the high probability that the regulators may abuse their power. While formal punishment informs the regulatees about basic regulatory requirements, any partial relaxation of old standards or use of new standards may easily lead the regulatees to believe that the regulators are regulating arbitrarily—demanding inconsistently from different regulatees, giving favors to some while treating others unreasonably and unfairly. In response to such uncertainty, regulatees are likely to try to anticipate and stay away from the regulators' interference in order to foster a more stable environment for their operations. Enterprise owners are more likely to engage in compliance and beyond-compliance behaviors if they believe that local regulatory officials specifically target them for enforcement. There may be a variety of reasons why a particular enterprise may be arbitrarily targeted: the enterprise lacks political backing from high-level officials in the jurisdiction; the enterprise is located in a highly visible location; or the regulatory officials believe the enterprise has more available

resources. Regardless of the underlying reasons, enterprise executives in China understand that if the regulatory officials really target them, there is not much they can do other than finding ways to comply with, or even go beyond their demands in order to avoid being a target in the first place. Thus, the higher the perception of being arbitrarily targeted, the more likely will the enterprises engage in compliance and beyond-compliance environmental behaviors.

H5a: A perception of being arbitrarily targeted in regulatory enforcement is positively related to enterprises' compliance behaviors.

H5b: A perception of being arbitrarily targeted in regulatory enforcement is positively related to enterprises' beyond-compliance behaviors.

Data and Methods

The data were collected through a large-scale survey of senior executives of Hong Kong-owned, small and medium enterprises that maintained manufacturing operations in the Pearl River Delta (PRD) region of Guangdong Province. The region is widely regarded as the frontier of reform towards the use of a legislative and regulatory approach in environmental governance (see UNDP China and RUC 2010). Experiences in the region represent an “extreme”, best-case scenario in the implementation of China’s environmental reform (Flyvberg 2006).

Hong Kong-owned enterprises are particularly suitable for the analysis as their executives are likely to be more familiar with the international legal environment than their mainland counterparts. A former British colony, Hong Kong has one of the world’s freest market economies. After its return to China in 1997, the Special Administrative Region has

maintained the common-law tradition. In comparison with their mainland counterparts, enterprise executives from Hong Kong are more familiar with operating in a legal-institutional environment typical of developed economies.

The survey was conducted in cooperation with the Federation of Hong Kong Industries (FHKI) in 2007 and the questionnaire was mailed to the most senior executive of each company listed in the FHKI's 2007 Members' Directory. A total of 1,800 questionnaires were sent, and 377 responses were received, representing a response rate of 21 percent. The response rate was reasonable considering that the survey asked for politically sensitive information about the enterprises' environmental practices. Possible self-selection bias should be taken into account when interpreting the findings, as those who were more eager to adopt environmental practices might be more likely to respond to the survey. As will be explained later, steps have been taken to remedy this possible bias. Overall, the enterprises participating in the survey were diverse in terms of size and industrial sector (see Table 2).

To help interpret findings from the survey data, we also conducted a series of in-depth, semi-structured interviews with a selected group of companies from the same Directory (see Appendix A). We adopted a convenient sampling method by selecting companies that had been recognized with environmental awards for their outstanding environmental performance. A total of 27 representatives, chiefly senior executives and environmental managers, from 17 companies were interviewed in their offices from January to June 2010. Each interview lasted for about an hour.

Measurement

We measured an enterprise's environmental behaviors by asking the respondents, "How well are the following activities integrated into your company's business model?" A

list of 16 corporate environmental management practices (EMPs) were provided, which contained items ranging from minimal measures such as “recycling of waste streams” and “using filters and other emission controls in our production process”, to more proactive and comprehensive ones such as “developing certifiable environmental management systems” and “incorporating ecological themes when marketing our products” (see Table 3). Respondents were asked to “use 1 to 7 to describe the operational situation” of these practices in their company (1 = never considered; 2 = considered, but no action taken; 3 = experimented with, but did not adopt; 4 = have adopted, but does not seem to be a priority; 5 = adopted and emphasized; 6 = fully integrated into all functions of the company; 7 = a way of life) (see Table 1).

Taking into account the distinction between compliance and beyond-compliance practices in the literature (May 2005; Potoski and Prakash 2004), we conducted a principal component factor analysis (with varimax rotation) on all the 16 EMPs. A two-factor solution was extracted in the analysis; the first factor is termed *basic practices* and the second *proactive practices* (see Table 3).

We measured the variable *concern for legality* by asking the respondents to rate how likely certain outcomes their company can achieve by adopting better environmental protection measures. The variable was aggregated from the scores of these questions: (1) “better comply with existing environmental regulations”; (2) “avoid facing stricter environmental regulations in the future”; and (3) “reduce the risk of lawsuits”.

For the variable *understanding of the enforced regulations*, we asked the respondents to rate their agreement with a list of challenges they faced in complying with environmental regulations. The variable was formed by aggregating the reversed scores attained in the following items (1) “many environmental regulations are too complicated for us to fully

understand”, (2) “our relationship with the local environmental protection bureau (EPB) has not been as constructive as it probably should be”, and (3) “we have been unable to get sufficient technical support from the local EPB”.

To measure the *perception of potential punishment*, we asked the respondents whether (1) the pollution discharge fees and (2) pollution fines are an *insignificant* amount in terms of expenses for their company, the sum of the reversed scores were then multiplied with the reversed score of a third question (3) whether it is *difficult* for the local EPB to detect their regulatory violations. This multiplication method resembles how the expected value of regulatory punishment may be calculated for individual regulatees, i.e., multiplying the perceived potential amount of punishment with the perceived likelihood of detection. The questions might not appear to be measuring directly potential punishment at first glance; they were so designed because of the sensitive nature of the requested information. To encourage the respondents to give an honest and accurate response, we put the above questions in the section “Challenges to Environmental Compliance”, hoping that respondents would interpret the questions as measuring whether they perceived the potential punishment—the “challenge”—to be strong and likely (or weak and unlikely) enough to affect their environmental behaviors.

To measure *demands from societal and peer groups*, we asked the respondents to rate how strongly various actors demanded that their companies adopt EMPs. Their responses were grouped into two variables: the first one was termed *demands from peer groups*, consisting of demands from actors who frequently interacted with the respondent, i.e., (1) shareholders, (2) employees, (3) major competitors, and (4) industry associations; the second one was termed *demands from societal groups*, consisting of demands from civil society actors who may be interested in environmental advocacy, i.e., (1) environmental interest

groups, (2) community (via means such as the internet, blogs, boycotts, or demonstrations), and (3) media organizations.

Similarly, to measure the *perception of being arbitrarily targeted in regulatory enforcement*, we asked the respondents to rate the following items: (1) “the local EPB is inconsistent in their enforcement of environmental regulations”, (2) “the local EPB does not seem interested in really trying to understand our difficulties in trying to comply with local environmental regulations”, and (3) “the local EPB has been very much ‘picking’ on us in the enforcement of environmental regulations”. The scores were aggregated to form the variable.

Several control variables were used. Specifically, we used the variable *company benefit* to control for the benefits an enterprise may receive by adopting EMPs. Following the literature on corporate environmental management, we also controlled for *firm size*, *financial status*, as well as *export-orientation* (see Bansal 2005). We also acknowledged the influences of enterprise owners’ *personal* commitment to the environment cause, as well as the potential self-selection bias that more environmentally committed respondents would be more likely to respond to the survey. The control variable *commitment to environmental protection* was derived to address these issues. The variable was aggregated from respondents’ agreement to the following items: (1) “we are personally interested in developing and implementing environmental protection measures within the company”, (2) “we want to be viewed as leaders in environmental protection in our industry sector”, and (3) “we recognize that the company has an ethical responsibility to adopt better environmental protection measures.”

Findings

Table 1 shows the list of variables and their measurements. Table 2 displays the descriptive statistics and the correlations for all variables. Table 4 presents two ordinary least square (OLS) regression models for the adoption of basic as well as proactive practices. The analyses showed that in China's governance context, enterprises' basic and proactive practices were not significantly associated with their executives' *concern for legality* (H1). *Perceived demands from societal groups and peer groups* were not significantly related to environmental practices in general, except that significant association was observed between *perceived demands from peer groups* and proactive practices (H4). Enterprise executives' *understanding of the enforced regulations* was significantly and positively associated with both basic practices and proactive practices (H2a & H2b). Meanwhile, *a perception of potential punishment* was significantly and positively associated with basic practices, but not with proactive practices (H3a & H3b). Finally, enterprise executives' *perception of being arbitrarily targeted in regulatory enforcement* was significantly and positively associated with proactive practices (H5b) but not with basic practices (H5a).

Consistent with the overall argument that formal environmental laws and regulations by themselves are not useful guides for enterprises' environmental behaviors, we did not find significant support for H1. As described vividly by one of our interviewees, environmental regulations in China were "relatively vague" and "there [was] not much that can be relied on as reference". To him, decisions of regulatory enforcement depended very much on the will of the regulators.

For enterprises investing in the mainland, the greatest difficulty is that the [environmental] rules and regulations (制度, *zhidu*) are relatively vague. There is not much that can be relied on as reference (依據, *yiju*). It is purely "man-made" (人為, *renwei*). For every generation of [Party] secretary, when he came to this

town to assume office ... if it so happened that a certain [political/policy] wind was blowing, he would then bring his “flyswatter” (蒼蠅拍, *cangyinpai*) and squash continuously.⁵

An implication of this regulator-driven approach was that potential punishment inflicted by local regulators became a major inducement for enterprises’ environmental behaviors. This is supported by the result that a *perception of potential punishment* was significantly associated with enterprises’ adoption of basic environmental practices. This point can be illustrated by a comment from an interviewee, who ran an environmentally progressive company. In his assessment, his company protected the environment “actively and voluntarily” without being urged, while others in the industry did it passively, and resembled “children” who were forced by their parents.

Relatively speaking, our company is moving faster than others. I estimate that some companies in the industry are not doing it actively and voluntarily [主動, *zhudong*]. Since in the mainland the standard is getting stricter and stricter... for example, some practices reported in newspapers in the past are no longer allowed nowadays. You must refrain from doing it, or there will not be licenses issued. Therefore, if you do it passively [被動, *beidong*], it is like children who study only when the parents beat and scold them [打罵, *dama*]. [But] just like [the interviewer], he does not need the urge of his parents. He studies because he thinks that it enhances his knowledge. He is doing it actively and voluntarily. Here, we have two different attitudes. If you do it actively and voluntarily, you will self-consciously find things to do. Since our factory has a very large scale, there are “thousands of strands and loose ends” [千頭萬緒, *qiantouwanxu*] –

⁵ Interview with O.

there is much room for improvement, and it is not finished when you have just done some. Why [should we] wait till the government presses us? We should do it actively and voluntarily.⁶

Apparently, many enterprises would comply only when there was continuous monitoring from regulatory officials backed up by proportional punishment. Potential punishment, in other words, was a major method for motivating environmental behaviors in China's regulatory setting.

Since rules and regulations were many and vague, regulators had large discretion on what is actually enforced. As shown in the regression models, enterprise executives' *understanding about the enforced regulations* was highly relevant to their adoption of environmental practices, both basic and proactive. From the interviews, we learned that many executives found it challenging to identify the standards used in enforcement, so much so that they felt that there was no effective guideline constraining the regulatory officials' power. Such a skeptical view on regulators' intentions can be illustrated by the experience of an interviewee. According to him, a factory in his enterprise was often visited by some local government officials; they requested without referencing any specific laws or regulations that his factory "do better" on various environmental measures that were already in place. This incident happened in a large northeastern city. In response, the interviewee said that he met with the factory's general manager and sought to find out whether other firms in the same area faced the same type of demand. Since the answer was positive, he asked the manager to "try [his] best to please them [the government officials] when they visit again, but at the same time we [the enterprise] will have to do something as well". It appeared that his limited understanding about the *enforced* regulations had made him suspicious and reluctant to

⁶ Interview with K.

comply at first. Yet after clarifying with the managers about the existence of the *enforced* regulations, he decided to cooperate further with the regulator's demand.

... But in the Dalian factory, local municipal government officials came and visited us to ask us, "your company ... ICP, ventilation ... though you have done it, we want you to do it better". But they would not bring up a law to talk to you. ... "We have a number of consultancy companies. Try one of them". ... Actually they would like to make money. ... [If you do well, will there be less interference?] Actually, I had discussed with the GM [general manager] there, [asking] "Did they only bother [the company's name]? [He replied], "No". He said in the past few months these officials visit every [company] one by one. ... Try your [the manager] best to please them [the government officials] when they visit again, but at the same time [the enterprise] will have to do something as well".⁷

Such an attitude changed if regulatory officials demonstrated a willingness to ease their suspicion and show clearer expectations. Consider an interviewee whose company was identified as the "dragonhead" of the industry and was asked to do "more than enough" in environmental protection. Interestingly, he saw this pressure from the local government officials as "positive influence" on the industry. As reported, the local authority did not impose on the enterprise some predetermined standards but sent some "experts specialized in the operation of the industry" to develop environmental solutions together with the enterprise.⁸ These acts might have helped ease the interviewee's suspicion about the regulator's intention and increased the regulatee's willingness to help achieve the regulatory goal. Notably, the above interpretation is somewhat different from the functional role of

⁷ Interview with A.

⁸ Interview with B

regulatory information portrayed in the literature. We will discuss this further in the next section.

With respect to the enterprise executives' *perception of being arbitrarily targeted in regulatory enforcement*, we found that they interpreted it as unreasonable threats to their operations, causing them to adopt a more cautious and proactive compliance strategy. As one of our interviewees commented, the environmental laws in China were very "comprehensive" and at the same time "vague", so much so that the regulator could charge the company with almost anything.

We always tell them [global customers], China's [environmental] laws are more comprehensive than the sum total of all those in the U.S. and Europe. It is a matter of enforcement. It is not a matter of [...], because the laws [China's environmental laws] are very vague. If they want to charge you, *everything of you can be charged* (emphasis added). Therefore, it is not a matter of the law.⁹

An interviewee from another company explained further the logic behind this cautious strategy. As reported, the government authority often came to monitor the company, "gave [its] opinion", and introduced to the company some "[environmental] consulting companies", which charged a "very, very high price" for improving some of his company's production processes. To avoid this, he found himself a licensed environmental [consulting] company, with whom he has now been partnering for more than a decade. Very often, he would introduce this consulting company to other enterprises in the same industry or in the same town. In the words of the interviewee, he had been doing this for his "self-protection," "in order to avoid ... [the government's] harsh demand for correction".

⁹ Interview with P.

We are actually self-protecting (自保, *zibao*). Truly speaking, in two words, it is “self-protection” for our enterprise, in order to shield ourselves from the so-called government functional departments and their rather harsh demand for correction in our enterprise. For the demand for correction, there is completely no need [for the officials] to consider our problems. All they care is how they may report to their supervisor (交差, *jiaocha*).¹⁰

Evidently, a proactive compliance strategy was essential for these enterprises to anticipate local regulators’ requirements, and correspondingly keep them away from arbitrary impositions.

Regarding social expectations, we did not observe any significant relationship between *demands from societal groups* and enterprises’ environmental practices. This finding was in line with our expectation that the norm of environmental protection was yet to be firmly developed among civil society actors, and thus not strong enough to influence enterprises significantly. In fact, a great majority of our interviewees reported that they saw themselves as *leaders* of their community and felt themselves being responsible to the well-being of the local community and the next generation (see also Yee, Lo and Tang 2013). It remained unclear, nonetheless, why there was a significant positive relation between *demands from peer groups* and the adoption of proactive practice but *not* basic practice. We learned from our interviewees that extra environmental protection efforts had largely been pioneered by international companies, followed by local industrial leaders (i.e., our interviewees), and subsequently smaller companies down the supply chain (see also Yee, Lo and Tang 2013). Enterprises at the frontier of this trend are more likely to meet various international standards by adopting, for instance, certifiable environmental management

¹⁰ Interview with O.

systems and conducting product life-cycle impact assessments. Interacting with shareholders and competitors will likely lead them to focus even more on fostering proactive environmental practices. More research is needed to sort out further the effects of peer influence.

Overall speaking, the empirical findings correspond to our expectations that the promotion of environmental protection in China has remained largely state-led, and that regulatees' environmental behaviors have been largely regulator-driven. Given China's governance context, threats of regulatory punishment were key inducements for adopting basic environmental practices, while concerns for legality and demands from societal groups were not particularly relevant to enterprise executives' environmental practices. As written regulations failed to serve as a reliable reference, challenges in understanding the *enforced* regulations easily created suspicions on the regulators' intention. Thus the better the understanding of the *enforced* regulations, the less suspicion, and the more likely the enterprises acted in an environmentally responsible way. Meanwhile, enterprises' perception of being targeted arbitrarily in regulatory enforcement would lead enterprises to adopt a cautious and proactive strategy to deal with officials' potentially unreasonable demands. Further investigation is needed though to understand its relationship with the adoption of basic environmental practices.

Discussion and Conclusion

With an aim to understand regulatees' behaviors in developing countries, this study examined the applicability of existing regulatory compliance literature to the governance context of China. Various compliance and beyond-compliance motivations were tested

among enterprise executives operating in Guangdong under the country's recent environmental reform. The reform presents an interesting case—despite the central government's effort to adopt a legislative and regulatory approach to environmental governance, the country's legal institutions are yet to be firmly established. It is against this context we discuss the theoretical implications of our findings.

Our analysis suggests the need to distinguish between whether regulatees' behaviors are regulation-driven or regulator-driven. In regulatory settings where the rule of law is relatively weak, regulatees are less likely to see regulations as a reliable reference for behaviors, or as a meaningful constraint on regulators' discretionary power. In contrast to theoretical expectations in the current literature (Scholz and Pinney 1995; Tyler 2006), regulatees' compliance and beyond-compliance practices in China are less likely to be driven by a concern for legality. Instead, they are likely to be regulator-driven. For *compliance* practices, regulatees behave similarly to theoretical expectations of the literature (Winter and May 2001; Lee 2010): regulatees' compliance increases with increased perceptions of potential punishment, as well as with their understanding about what is being enforced. Regulatees' *beyond-compliance* behaviors also vary positively with their understanding of the *enforced* regulations, and positively with their perceptions of being targeted arbitrarily in regulatory enforcement. Unclear understanding about the *enforced* regulations makes enterprise executives suspicious about the regulators' commitment to the regulatory goal, thus lowering their willingness to engage in beyond-compliance practices; whereas a perception of being targeted arbitrarily in regulatory enforcement encourages enterprise executives to adopt beyond-compliance practices as a way to fend off unreasonable interference from the regulators.

Our analysis suggests important policy implications and new directions for future research. First of all, the analysis suggests a different role for regulatory information. While the literature understands regulatory knowledge as politically neutral, informing the regulatees what and how to comply (Lee 2010), our findings showed that good knowledge about regulators' *enforced* regulations may enhance beyond-compliance behaviors in the Chinese context; such knowledge creates confidence on the part of the regulatees, allowing them to trust the regulators' motive and commit further to the regulatory goal. In other words, showing recognizable enforcement standards and understandable compliance guidelines can not only empower the regulatees, but more importantly demonstrate the regulators' commitment to the regulatory goal, reducing the regulatees' suspicion against the regulator, and increasing their likelihood to adopt beyond-compliance practices. This strategy provides a possible way for developing countries such as China to develop a more effective legislative and regulatory approach to environmental governance.

Regarding enforcement styles, the literature recommends a flexible approach that punishes non-cooperative regulatees but forgives cooperative ones, who show credible commitment to the regulatory goal, for occasional minor violations. This approach would supposedly enhance trust building between regulators and regulatees, generating greater compliance and beyond-compliance (e.g., Scholz 1984a, 1984b; Potoski and Prakash 2004). Our analysis suggests that simply adopting a more reasonable and regulatee-friendly approach in a developmental context like China's is likely to encounter setbacks for two reasons. First, when regulations fail to serve as a reliable guide, regulators' partial relaxation of the regulatory standard without simultaneously demonstrating clearly their commitment to the regulatory goal would create confusion among the regulatees about what is truly being enforced. It would deepen regulatees' suspicion against the regulators, making the former less

willing to act in accordance with the regulatory goal. Second, regulatory punishment remains indispensable for inducing compliance behaviors. In fact, some scholars have suggested the need for China to continue or even strengthen its former political-campaign approach (van Rooij 2006, 57), which better balances local interests and “their relation with the legal system”, potentially enhancing regulatory effectiveness.¹¹ *As far as* regulatory effectiveness is concerned, continuous inspection and punishment are essential for compliance when the rule of law remains relatively weak.

A perception of being arbitrarily targeted in regulatory enforcement induces beyond-compliance behaviors. When the written regulations cannot be relied on as reliable reference, gestures and actions of the regulators may easily generate a sense of fear on the part of the regulatees, making them especially cautious in order to stay away from potential troubles with the regulators. Yet whether this enforcement style is compatible with the establishment of a rule-based regulatory approach is open to question. The targeted regulatees may develop negative feelings about the regulators as being unfair, partial, and inconsistent; such an enforcement style may also create opportunities for corrupt officials to take bribes from regulatees. Nonetheless, a targeted increase in enforcement may be particularly useful when local regulators lack the resources to carry out full-scale enforcement.¹²

Enterprise executives from Hong Kong are personally well acquainted with the rule of law. Yet when they operate in Mainland China, they are less influenced by a concern for legality, and are driven by their wish to avoid potential exploitation from regulatory officials. This shows the importance of governance context in shaping motivations for compliance and beyond-compliance practices. The rule of law and the extent to which it is “recognized and

¹¹ “The use of political campaigns to enhance enforcement in China shows that the flexibility of political short-term policy instruments can offer incremental improvements to enhance the balance between the conflicting interests themselves and their relation with the legal system”. (van Rooij 2006, 57)

¹² The authors thank the anonymous reviewer for suggesting this point.

accepted” in a specific governance context is an important factor shaping regulatory enforcement and compliance (see Searle 2010). Policymakers must examine carefully a country’s governance context before recommending regulatory approaches (see also Levi and Spiller 1994). Future research in regulatory enforcement must extend the scope of empirical investigation to cover experiences in developing countries, and to examine more systematically the interplay between regulators and regulatees in diverse governance settings.

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Tables and Appendix

Table 1 Variables and Measures

Variables	Measures
Environmental Management Practices (EMPs)	Respondents were given a list of corporate environmental management practices and asked: “How well integrated are the following activities into your company’s business model?” The response scale for these questions ranged from 1, “never considered”, through the midpoint “have adopted, but does not seem to be a priority” to 7, “a way of life”.
Basic practices (alpha = .845)	Derived from principal component analysis of a list of corporate EMPs (see Table 3).
Proactive practices (alpha = .943)	Derived from principal component analysis of a list of corporate EMPs (see Table 3).
Concern for legality (alpha = .746)	Respondents were asked to rate the likelihood of the outcomes that their company can achieve by adopting better environmental protection measures. The response scale for these questions ranged from 1, “strongly disagree”, through the midpoint “neutral” to 7, “strongly agree”. <ul style="list-style-type: none"> - Better comply with existing environmental regulations - Avoid facing stricter environmental regulations in the future - Reduce the risk of lawsuits
Understanding of the <i>enforced</i> regulation (alpha = .795)	Respondents were asked to rate the challenges their company faces in complying with environmental regulations. The response scale for these questions ranged from 1, “strongly disagree”, through the midpoint “neutral” to 7, “strongly agree”. The composite score is calculated by reversing the ratings. <ul style="list-style-type: none"> - Many environmental regulations are too complicated for us to fully understand - Our relationship with local EPB has not been as constructive as it probably should be - We have been unable to get sufficient technical support from local EPB
Perception of potential punishment	Respondents were asked to rate, from 1, “strongly disagree” to 7, “strongly agree” with the following statements. The score is calculated by reversing the ratings, and multiplying the first item with the sum of the last two items. <ul style="list-style-type: none"> - It is difficult for the EPB to detect regulatory violations by our company - The pollution discharge fees paid by our company are an insignificant amount in terms of expenses for our company - The pollution fines are an insignificant amount in terms of expenses for our company
Demands from societal and peer groups	Respondents were given a list of stakeholder groups and asked to rate their influence on the respondent’s company to develop better environmental protection measures. The response scale for these questions ranged from 1, “strongly disagree”, through the midpoint “neutral” to 7, “strongly agree”.
Demands from societal groups (alpha = .836)	<ul style="list-style-type: none"> - Environmental interest groups - The community via other means (e.g., internet, bloggers, boycotts, or demonstrations) - Media organizations (e.g., official newspaper and broadcast media)
Demands from peer groups (alpha = .873)	<ul style="list-style-type: none"> - Shareholders - Employees - Major competitors (i.e., through fear of losing business to them) - Industry associations
Perception of being	Respondents were asked to rate the challenges their company faces in

<p>arbitrarily targeted in regulatory enforcement (alpha = .863)</p>	<p>complying with environmental regulations. The response scale for these questions ranged from 1, “strongly disagree”, through the midpoint “neutral” to 7, “strongly agree”.¹³</p> <ul style="list-style-type: none"> - The local EPB is inconsistent in their enforcement of environmental regulations - The local environmental protection bureau (EPB) does not seem interested in really trying to understand our difficulties in trying to comply with local environmental regulations - The local EPB has been very much ‘picking’ on us in the enforcement of environmental regulations
<p>Company benefit (alpha = .776)</p>	<p>Respondents were asked to rate the likelihood of the outcomes that their company can achieve by adopting better environmental protection measures. The response scale for these questions ranged from 1, “strongly disagree”, through the midpoint “neutral” to 7, “strongly agree”.</p> <ul style="list-style-type: none"> - Lower production costs - Improve our corporate reputation - Improve the quality of our products - Increase the customer base of its products
<p>Firm size</p>	<p>Respondents were asked for the number of employees in their business, which were coded correspondingly: 1 for <100; 2, 100-499; 3, 500-599; 4, 1000-4999; 5, >5000.</p>
<p>Financial status</p>	<p>Firms were asked about their yearly profit in 2006. Choices were given ranging from “making a serious loss” (denoted as -2) to “making a substantial profit” (denoted as 2). The higher the score, the more profit a firm made in 2006.</p>
<p>Export-orientation</p>	<p>Firms were asked to indicate “the percentage of [their] product sold to overseas markets”. Whether a firm is export-oriented was coded as a dummy variable, with 1 denoting firms than export more 50% of their product, and 0 otherwise.</p>
<p>Commitment to environmental protection (alpha = .855)</p>	<p>Respondents were asked to rate, from 1, “strongly disagree” to 7, “strongly agree” with the following statements. The score is aggregated by summation to indicate the top management commitment to environmental protection.</p> <ul style="list-style-type: none"> - We are personally interested in developing and implementing environmental protection measures within the company - We want to be viewed as leaders in environmental protection in our industry sector - We recognize that the company has an ethical responsibility to adopt better environmental protection measures

¹³ Items for both the variables *understanding of the enforced regulations* and *perception of being arbitrarily targeted in regulatory enforcement* come from the same survey question, which asked the respondents to rate the challenges their company faces in complying with environmental regulations. Principal component factor analysis (with varimax rotation) were conducted with these items, and a two-factor solution was extracted with very good loadings (.696-.882) (see Appendix B).

Table 2 Descriptive Statistics and Pearson Correlation Coefficients (n=312)

	N	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12
1. Basic practices	301	16.797	5.461												
2. Proactive practices	294	40.442	17.426	.736											
3. Company benefit	309	19.563	3.930	.440	.531										
4. Firm size	312	2.933	1.239	.256	.353	.194									
5. Financial status	305	.548	.9097	.080	.197	.167	.196								
6. Export-orientation	287	.767	.424	.150	.071	.035	.229	-.042							
7. Commitment to environmental protection	310	15.258	3.115	.587	.628	.520	.196	.176	-.020						
8. Concern for legality	308	16.016	2.816	.379	.443	.588	.234	.122	.096	.466					
9. Understanding of the <i>enforced</i> regulation	309	10.939	2.774	.267	.312	.173	.134	.232	.015	.217	.106				
10. Perception of potential punishment	300	34.103	12.582	.214	.191	.190	.087	.138	-.019	.171	.244	.322			
11. Demands from societal groups	302	9.9603	3.686	.026	.005	.023	-.015	-.057	.118	.048	.028	-.067	-.077		
12. Demands from peer groups	305	15.066	5.034	.260	.301	.298	.132	.005	.139	.328	.219	.064	.031	.659	
13. Perception of being arbitrarily targeted in regulatory enforcement	307	13.808	2.873	-.117	-.118	-.139	-.144	-.192	.031	-.131	.050	-.568	-.283	.114	-.015

Firm size (employees): <100 = 13.5%; 100–999 = 46.5%; 1000–4999 = 30.1%; >5000 = 9.9%.

Industry: Plastics: 17.3%; Electronics: 18.9%; Textiles & Dyeing: 12.5%; Chemical, Paper, Electroplating, Cement: 7.1%; Others: 44.2%.

Table 3 Dimensions of EMPs

	Loadings	
	Proactive practice	Basic practice
Measuring key aspects of our business's environmental performance	.805	.287
Including environmental performance measures in our management evaluation	.800	.378
Scientifically assessing the life-cycle impact of our products	.790	.160
Setting environmental performance objectives as part of our annual business plan	.789	.368
Preparation and release of environmental reports	.765	.248
Company displays about environmental programs	.696	.407
Developing certifiable environmental management systems	.675	.249
Making investments in clean production technologies	.666	.309
Participation in government-sponsored environmental programs	.641	.245
Incorporating ecological themes when marketing our products	.633	.459
Sponsorship of events about environmental protection	.618	.336
Routine environmental audits	.603	.548
Recycling waste streams	.091	.816
Environmental training for operatives	.448	.773
Environmental training for managers	.436	.762
Using filters and other emission controls in our production process	.334	.639
Eigenvalue	6.568	3.708
Variance explained	41.052%	23.175%

Dimensions were derived using principal component analysis with varimax rotation; same dimensions were obtained using oblimin rotation. Kaiser-Meyer-Olkin index = .938; Bartlett's Test of Sphericity is significant at 0.001 level.

Table 4 OLS Regression Models on EMPs adoption

	Basic practices (n = 256)			Proactive practices (n = 249)		
	Standardized Beta	t	Sig.	Standardized Beta	t	Sig.
(Constant)		-2.900	.004		-5.985	.000
Company benefit	.101	1.588	.114	.188***	3.257	.001
Firm size	.102**	2.002	.046	.153***	3.298	.001
Financial status	-.100**	-2.034	.043	.017	.387	.699
Export-orientation	.104**	2.121	.035	.012	.273	.785
Commitment to environmental protection	.457***	7.631	.000	.433***	8.031	.000
Concern for legality	.064	1.003	.317	.043	.760	.448
Understanding of the <i>enforced</i> regulation	.140**	2.352	.019	.215***	3.926	.000
Perception of potential punishment	.132**	2.579	.010	.037	.796	.427
Demands from societal groups	-.034	-.538	.591	-.060	-1.038	.300
Demands from peer groups	.071	1.049	.295	.140**	2.280	.023
Perception of being targeted in regulatory enforcement	.073	1.238	.217	.137**	2.513	.013
R-Square	.478			.588		
Adj. R-Square	.454			.569		
F	20.379 ***			30.925 ***		

** significant at .05 level; ***significant at .01 level.

Variation inflation factors (VIF) for all independent variables in both models were less than 5.

Appendix A
Characteristics of the Interviewed Firms

Name	Date of interview	Year of est.	Number of employees (approx.)	Size (HKD, approx.)	Nature / Industry	Interviewee
A	February 22, 2010	1981	2,500	n/a	Wire and cable products	Assistant Manager, Environment, Health and Safety
B	February 24, 2010	1969	15,700	Sales (2008) = 6.1B	Textiles and garments	Project Manager; Corporate Communications and Investor Relations Manager
C	March 4, 2010	Early 1980s	> 4800	n/a	After-market printer consumables	Chief Operations Officers
D	March 12, 2010	1992	> 1,200	Capital (2003) = 156M	Printed circuit board services and products	CEO, Chairman; Quality Systems Assistant Manager; Financial Controller
E	March 23, 2010	1963	n/a	Confidential	Home, medical and health care electronic products	Managing Director
F	March 29, 2010	1982	18,000	Confidential	Printing and paper products	Director, Environment, Facilities and Outsourcing Management
G	March 29, 2010	1974	6,000	n/a	Lingerie materials and accessories suppliers	Technical Director
H	March 29, 2010 (by FHKI)	1987	> 2,000	n/a	Precision metal stamping products	Chairman
I	March 30, 2010	1888	n/a	Sales (2009) = a few billions	Sauce products	Director of Engineering and Manufacturing Services; Engineering Manager; Corporate Communication Manager
J	April 7, 2010	1986	> 8,000	Sales (2008) = 3B	Electronics manufacturing services	Chairman & Senior Managing Director
K	April 9, 2010	1997	> 6,500	Sales (2010) = 5.8B	Customized knitted fabric in textile industry	Chairman
L	April 12, 2010	1974	n/a	n/a	Home textiles	Chairman; Deputy Managing Director; contracted environmental consultant
M	April 12, 2010	1985	> 16,000	Sales (2009) = 24B	Products in home improvement & construction industries	Group Vice Chairman, Executive Director

N	April 19, 2010	1953	n/a	n/a	Fabric and yarn production	Director
O	April 21, 2010	1969	n/a	n/a	Plastic and metal stationery supply	Director
P	May 14, 2010	1964	9,800	Sales (2009) = 4.7B	Batteries and battery-related products	Director; environmental manager A & B*
Q	May 17, 2010	1975	8,000	n/a	Metal stamping, tooling fabrication and product assembly	President; environmental manager*

* Exact title missing.

Appendix B
Dimensions of Compliance Challenges

	Loadings	
	Perception of being arbitrarily targeted in regulatory enforcement	Understanding of the <i>enforced</i> regulation
The local EPB is inconsistent in their enforcement of environmental regulations	.882	.209
The local environmental protection bureau (EPB) does not seem interested in really trying to understand our difficulties in trying to comply with local environmental regulations	.865	.302
The local EPB has been very much ‘picking’ on us in the enforcement of environmental regulations	.789	.281
Our relationship with local EPB has not been as constructive as it probably should be	.192	.867
We have been unable to get sufficient technical support from local EPB	.280	.845
Many environmental regulations are too complicated for us to fully understand	.286	.696
Eigenvalue	2.345	2.164
Variance explained	39.091%	36.064%

Dimensions were derived using principal component analysis with varimax rotation; same dimensions were obtained using oblimin rotation. Kaiser-Meyer-Olkin index = .807; Bartlett's Test of Sphericity is significant at 0.001 level.