



## Copyright Undertaking

This thesis is protected by copyright, with all rights reserved.

**By reading and using the thesis, the reader understands and agrees to the following terms:**

1. The reader will abide by the rules and legal ordinances governing copyright regarding the use of the thesis.
2. The reader will use the thesis for the purpose of research or private study only and not for distribution or further reproduction or any other purpose.
3. The reader agrees to indemnify and hold the University harmless from and against any loss, damage, cost, liability or expenses arising from copyright infringement or unauthorized usage.

### IMPORTANT

If you have reasons to believe that any materials in this thesis are deemed not suitable to be distributed in this form, or a copyright owner having difficulty with the material being included in our database, please contact [lbsys@polyu.edu.hk](mailto:lbsys@polyu.edu.hk) providing details. The Library will look into your claim and consider taking remedial action upon receipt of the written requests.

CORPORATE COMPLIANCE WITH  
ENVIRONMENTAL REGULATION IN  
CHINA: STYLE, COMMITMENT, AND  
PROACTIVE MANAGEMENT

NING LIU

Ph.D

The Hong Kong Polytechnic University

2014

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

**Corporate Compliance with  
Environmental Regulation in China:  
Style, Commitment, and Proactive  
Management**

---

Ning LIU

A thesis submitted in partial fulfillment of the  
requirements for the Degree of Doctor of Philosophy

October 2013

## **CERTIFICATE OF ORIGINALITY**

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it reproduces no material previously published or written, nor material that has been accepted for the award of any other degree or diploma, except where due acknowledgement has been made in the text.

\_\_\_\_\_ (Signed)

\_\_\_\_\_ Nicole Ning LIU \_\_\_\_\_ (Name of student)

## **ABSTRACT**

A major question in the literature on environmental regulation and corporate environmental management concerns how industrial enterprises respond to external demands for environmental protection. Specifically, what compliance style do business enterprises employ to deal with external demands on environmental issues? How do institutional and organizational factors shape firms' adoption of compliance style and further influence corporate proactive environmental management? So far, neither the policy implementation nor the strategic management literature has adequately addressed these questions. To fill these research gaps, this study aims to develop a dimensional framework of corporate compliance style (CCS) and empirically explore how this concept can advance our understanding of the corporate compliance process. Specifically, I want to answer three core research questions: (1) Whether and to what extent regulated enterprises differ in adopting CCS towards environmental regulation, (2) How organizational capacity (OC) and external regulatory intensity (RI) jointly shape CCS adoption, and (3) How firms' normative green commitment (NGC) impacts proactive environmental management (PEM).

Based on the literature on regulatory compliance and corporate environmental management, we formulate four CCS dimensions to capture major corporate compliance behavior patterns, namely formalism, accommodation, referencing, and self-determination. By integrating the natural-resource-based view (NRBV) and regulatory compliance literature, we explore how OC and RI affect CCS adoptions. By incorporating organizational commitment into corporate environmental management,

we further explore how the indirect effect of OC on PEM (through CCS) depends on a firm's normative commitment to environmental protection.

We adopted a mixed methodology, with a three-phase research study in the Pearl River Delta (PRD) region in China, involving: 1) a pilot study of 72 manufacturers in 2010, 2) a main survey with 120 manufacturers in 2010 and 2011, and 3) in-depth case studies and interviews in 10 environmentally progressive enterprises in mid-2012. Survey findings supported a four-dimensional conceptual framework of CCS, and the main and interactive effects of OC and RI in determining CCS adoptions. Enterprises' compliance styles are highly dependent on organizational capacity and vary in responses to different configurations of external regulatory pressures. We also find that corporate environmental capacity does not always lead to improved PEM. Referencing and self-determination translate organizational capacity into PEM progress only when firms have a high level of normative green commitment. Formalism and accommodation do not show any bridging functions even though they are more widely adopted than the voluntary dimensions. Post-hoc case study and in-depth interview findings add to the survey results by firstly showing a more detailed and dynamic picture of CCS, and secondly by supporting the hypotheses set in the survey study and providing answers as to why some were not supported in the empirical context in China.

On the whole, this study contributes to the scholarly understanding of corporate compliance by suggesting that business enterprises adopt different compliance style dimensions to cope with the growing regulatory demands from various stakeholders (both individual and interwoven) and exhibit divergent green commitment in achieving

proactive environmental management. It also helps to refine the theoretical framework, survey and interview instruments for performing longitudinal and comparative studies on CCS in the future. The practical implications of this research are twofold. To policy makers, it is important to consider firm-level diversity in environmental approaches and the degree of green commitment. Instead of being dictators, policy makers and enforcement officials may work as “public choice architects” to be held responsible for organizing the context in which regulatees make decisions. Meanwhile, collaborative efforts between government and non-government entities may push enterprises to adopt more innovative compliance style dimensions and subsequently stronger environmental protection practices. To business managers, careful resource management in CCS adoption allows firms to better comply with regulatory demands in the face of both external and internal constraints. Nurturing green commitment, however, determines whether a selected environmental approach or strategy can effectively achieve expected compliance goals.

## **ACKNOWLEDGEMENTS**

First, I would like to express my wholehearted thanks to my chief supervisor Prof. Carlos Wing-Hung Lo for all of his efforts in guiding me on research throughout my Ph.D. study. His constructive insights and advice gave birth to this thesis, and his experience and expertise also helped me build a solid foundation at the very start of my research career. My research skills and attitude initially nurtured by him will help me in any other projects I may take up in the future.

Second, I would like to offer my sincere gratitude to my co-supervisor, Dr. Xueyong Zhan. I benefited greatly from his insightful advice on public administration research, but also learned from his knowledge and expertise in terms of my broader career development. Without his patient guidance and continuous encouragement, completing this thesis and many other research papers would have been impossible.

My heartfelt thanks also go to Prof. Shui-Yan Tang of the Sol Price School of Public Policy at the University of Southern California. His unfailing support and valuable comments on several research papers during my study at the beautiful USC helped me to develop the empirical part of this thesis.

In addition, special thanks are due to several scholars at PolyU and other universities. I express my gratitude to Prof. Benjamin Van Rooij, Prof. Richard Walker, Prof. Eric Ngai, Prof. Xu Huang, Dr. Ricky Chan, Dr. Na Ni, and Prof. Wei Wang, all of whom offered helpful advice and feedback at different stages of this research. I am also indebted to many people outside the field of academia, including Mr. Jun Ou, Mr.



Dingmin Qi, and Mr. Conglin Chen, for their considerable help in collecting research data. I would further like to thank the lovely staff in the general office of the Department of Management and Marketing, especially Martha, Candy, and Parika, for their kind assistance during my studies. My thanks also extend to my fellow students at PolyU, especially to Michelle Luo, Erica Xu, Cici Li, Vivien Chen, Ella Liu, and Doris Fan, for their advice, companionship, and emotional support.

Finally, I wish to express my deepest thanks to my family for supporting me in my pursuit of an academic career. I am grateful to my parents and dearest sister for their endless encouragement and enduring love throughout these years. Special thanks also go to my uncle for his tremendous efforts in helping me with the firm survey.

# TABLE OF CONTENTS

<b>ABSTRACT</b> .....	<b>4</b>
<b>ACKNOWLEDGEMENTS</b> .....	<b>7</b>
<b>TABLE OF CONTENTS</b> .....	<b>9</b>
<b>LIST OF TABLES</b> .....	<b>13</b>
<b>LIST OF FIGURES</b> .....	<b>14</b>
<b>ABBREVIATIONS</b> .....	<b>15</b>
<b>CHAPTER 1 INTRODUCTION</b> .....	<b>17</b>
1.1 Problem Statement in the Existing Corporate Compliance Research .....	20
1.2 Research Objectives and Research Questions.....	22
1.3 Structure of the Thesis.....	24
<b>CHAPTER 2 THEORETICAL BACKGROUND</b> .....	<b>25</b>
2.1 The Institutional Environment of Corporate Compliance.....	25
2.1.1 Government Actors and Demands.....	26
2.1.2 Non-government Actors and Demands .....	29
2.2 Organizational Views on Corporate Compliance.....	31
2.2.1 Corporate Responses to Institutional Demands.....	32
2.2.2 The Natural-Resource-Based View (NRBV) .....	37
2.2.3 Normative Green Commitment .....	39
2.3 Summary .....	40
<b>CHAPTER 3 RESEARCH MODELS AND HYPOTHESES</b> .....	<b>42</b>
3.1 CCS Conceptualization .....	42
3.1.1 Formalism.....	43
3.1.2 Accommodation.....	44
3.1.3 Referencing.....	44
3.1.4 Self-determination .....	45
3.2 OC, RI, and CCS (Study 1).....	47
3.2.1 OC and CCS .....	48

3.2.2 Regulatory Intensity and CCS .....	50
3.2.3 Interactions on CCS .....	52
3.3 The Moderated Mediation Model (Study 2) .....	53
3.3.1 The Mediating Role of CCS .....	54
3.3.3 The Moderating Role of NGC .....	55
<b>CHAPTER 4 RESEARCH DESIGN AND METHODOLOGY .....</b>	<b>57</b>
4.1 The Chinese Environmental Regulatory Context.....	57
4.2 Research Design .....	59
4.3 Data Collection.....	60
4.3.1 The Pilot Study .....	61
4.3.2 The Main Survey .....	62
4.3.3 Case Study & In-depth Interviews.....	65
4.4 Measurement .....	68
4.4.1 PEM .....	68
4.4.2 CCS.....	69
4.4.3 OC.....	71
4.4.4 RI .....	72
4.4.5 NGC.....	72
4.4.6 Controls .....	73
4.5 Analytical Procedures .....	73
<b>CHAPTER 5 SURVEY STUDY FINDINGS .....</b>	<b>76</b>
5.1 Results of Study 1 .....	76
5.1.1 Descriptive Statistics .....	76
5.1.2 Regression Results.....	80
5.2 Results of Study 2 .....	86
5.2.1 Descriptive Statistics .....	86

5.2.2 Tests of Mediation .....	89
5.2.3 Tests of Moderated Mediation.....	91
5.3 Hypotheses Testing Summary.....	95
<b>CHAPTER 6 CASE STUDY AND INTERVIEW FINDINGS .....</b>	<b>97</b>
6.1 Case Descriptions .....	97
6.1.1 Firm 1 .....	97
6.1.2 Firm 2 .....	99
6.1.3 Firm 3 .....	101
6.1.4 Firm 4 .....	105
6.1.5 Firm 5 .....	106
6.1.6 Firm 6 .....	109
6.1.7 Firm 7 .....	111
6.1.8 Firm 8 .....	112
6.1.9 Firm 9 .....	114
6.1.10 Firm 10 .....	116
6.2 Findings.....	118
6.2.1 CCS in Environmental Progressive Firms.....	118
6.2.2 Proactive Environmental Management.....	119
6.2.3 Organizational Factors.....	124
6.2.4 Regulatory Intensity from External Stakeholders.....	133
6.2.5 Benefits from Being Green.....	141
<b>CHAPTER 7 DELIBERATIONS AND REFLECTIONS .....</b>	<b>145</b>
7.1 Overall Findings .....	146
7.2 Discussions.....	150
7.3 Theoretical Implications.....	156
7.4 Limitations and Future Research Directions.....	158

7.4.1 Over-time changes of CCS .....	158
7.4.2 CCS adoptions: when and how? .....	159
7.4.3 Regional Variations of CCS .....	160
7.4.4 The Role of other Sub-CGC Dimensions .....	160
<b>CHAPTER 8 CONCLUSIONS .....</b>	<b>162</b>
<b>REFERENCES .....</b>	<b>166</b>
<b>APPENDICES .....</b>	<b>195</b>
Appendix I: The Interview Protocol for Case Studies .....	195
Appendix II: Survey Questionnaire (Chinese Version) .....	196
Appendix III: Bootstrapping Results of Multiple Mediation Test .....	203

## LIST OF TABLES

Table 2.1 Conceptual Classification of Corporate Responses to External Demands .....	33
Table 3.1 A Dimensional-Framework of CCS in Environmental Regulation .....	43
Table 4.1 Data Collection Procedure .....	61
Table 4.2 Organizational Features and Respondents Characteristics (N=192) .....	64
Table 4.3 Enterprise Profiles in Case Studies .....	67
Table 4.4 A Principal Component Analysis of CCS Items .....	70
Table 5.1 Descriptive Statistics and Correlations (N=192) <sup>a</sup> .....	78
Table 5.2 Descriptive Data of Organizational Capacity Measuring Items .....	79
Table 5.3 Descriptive Data of Regulatory Intensity Measuring Items .....	80
Table 5.4 Regression Coefficients of Model Predicting CCS Dimensions .....	82
Table 5.5 Descriptive Statistics of PEM (N=192) .....	87
Table 5.6 Descriptive Statistics and Correlation (N=192) .....	88
Table 5.7 The Mediating Role of CCS .....	90
Table 5.8 Regression Results of Moderated Mediation .....	92
Table 5.9 A Summary of Hypotheses and Testing Results in Study 1 and Study 2 .....	96
Table 6.1 Corporate Environmental Target, PEM, and Green Awards in 10 Cases.....	121
Table 6.2 Corporate Resources and Capabilities for Environmental Protection in 10 Cases .....	126
Table 6.3 Corporate Green Commitment in 10 Cases .....	129
Table 7.1 A Summary of the Theoretical and Empirical Investigation of Three Research Questions.....	147

## LIST OF FIGURES

Figure 1.1 Industrial Emission of Key Pollutants from 2001 to 2010 (million tons) .....	19
Figure 2.1 The Conceptual Framework .....	41
Figure 3.1 Research Model of Study 1 .....	48
Figure 3.2 The Moderated Mediation Model (Study 2).....	54
Figure 5.1 Plots of the Interactions between GVRI and NGRI in Predicting Accommodation (a), Referencing (b) and Self-determination (c) (N = 192) .....	84
Figure 5.2 Plots of the Interaction between Referencing and NGC on PEM .....	94
Figure 5.3 Plots of the Interaction between Self-determination and NGC on PEM.....	94

## **ABBREVIATIONS**

CAC — Command-and-Control

CCS — Corporate compliance style

CP — Cleaner Production

DOF — Department of Finance

EIA — Environmental Impact Assessment

EPB — Environmental Protection Bureau

ETC — Economic and Information Commission

FCB — Foreign-controlled businesses

FYP — Five-year-period

GMP — Good Manufacturing Practice

GVRI — Regulatory intensity from government stakeholders

IPO — Initial Public Offering

IS — Incentive Suggestion

MEP — Ministry of Environmental Protection

NGC — Normative green commitment

NGRI — Regulatory intensity from non-government stakeholders

NO<sub>x</sub> — Nitrogen Oxides

NRBV — Natural-resource-based view

OC — Organizational capacity

PEM — Proactive environmental management

POE — Private-owned enterprises



PRD — Pearl River Delta

PTBG — Pays To Be Green

RI — Regulatory intensity

SEPA — State Environmental Protection Administration

SHE — Safety Health and Environmental

SJV — State-controlled joint ventures

SO<sub>2</sub> — Sulfur Dioxide

SOE — State-owned enterprises

TEJS — Tuier Jinsan (suppress the second industry and advance the third industry)

TRI — Toxic Release Inventory

VEP — Voluntary Environmental Program

## CHAPTER 1 INTRODUCTION

The world has witnessed a green revolution over the last five decades since the publication of “Silent Spring” (Carson, 1962), which fundamentally changed the way businesses operate in the evolving business-natural environment interface. Government regulations and societal demands for business environmental management have grown in intensity, complexity, and stringency in both industrialized and developing countries (Baron, 2003; Eccles & Krzus, 2010; Prakash & Potoski, 2012; World Bank, 2000). Many business firms, which used to deny the negative environmental externality from industrial development in the early 1970s, have begun to seek business efficiencies and opportunities in sound and progressive environmental management (Gladwin, Kennelly, & Krause, 1995; Hoffman, 1999; Walls & Hoffman, 2013). Though the global trend generally indicates a greening of business in the past decades, environmental non-compliance and symbolic practices are also widespread (Delmas & Burbano, 2011; Eskeland, 2003; Lyon & Maxwell, 2011). Given the tremendous behavioral and performance variations in corporate environmental management, we still know little about how enterprises strategically respond to environmental regulatory demands (Blackman, 2006).

In China, industrial pollution control has become an urgent regulatory task due to the growing threat of environmental degradation. In the 10<sup>th</sup> five-year period (FYP, 2001-2005), for instance, industrial sulphur dioxide (SO<sub>2</sub>) discharge increased by 28%, while smoke dust emissions decreased only slightly, by 0.5% (the original target for both was a 10% decrease). Improvement in industrial compliance was not witnessed

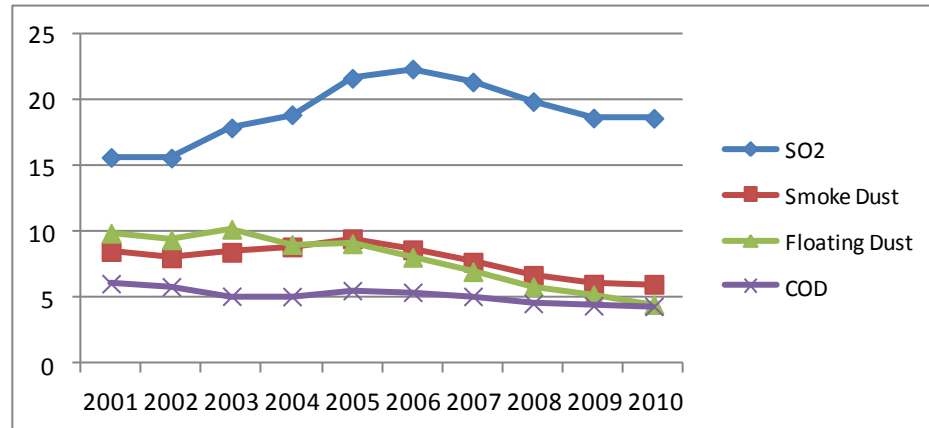
until the 11<sup>th</sup> FYP (year 2006-2010), when both SO<sub>2</sub> and smoke dust emissions were reduced to 18.64 and 6.03 million tons respectively in 2010. Figure 1.1 shows the industrial emission of key pollutants from 2000 to 2010<sup>1</sup>. Given the unsatisfactory industrial compliance performance, business firms have in recent years been facing mounting demands from various stakeholders—governments, the media, citizens, NGOs, and industrial associations—to improve their compliance with pollution control regulations (Francesch, Lo, & Tang, 2012; Zhan, Lo, & Tang, forthcoming). A comprehensive environmental legal infrastructure has been introduced, and aggressive environmental goals have been set. Meanwhile, the increasingly active participation of general citizens and public entities has exerted greater pressure on polluting enterprises to clean up (Tang & Zhan, 2008; Van Rooij, 2010). Though these comprehensive policy reforms and civic engagement might signal a new era in China’s environmental governance, how enterprises are actually dealing with environmental regulatory demands from the strategic point of view remains unknown. Therefore, the Chinese regulatory context provides an interesting research setting to study corporate environmental compliance<sup>2</sup>.

---

<sup>1</sup> Statistical data is from the 11<sup>th</sup> and the 12<sup>th</sup> FYP on national environmental protection. Although official statistics should be used with caution (Van Rooij, 2006), they are good indicators of the overall trends.

<sup>2</sup> Such changes are embedded in a decrease of the average gross domestic product growth from 13.3% in the 10<sup>th</sup> FYP to 10.5% in the 11<sup>th</sup> FYP. Meanwhile, the public spending on overall environmental protection quadrupled.

Figure 1.1 Industrial Emission of Key Pollutants from 2001 to 2010 (million tons)



The existing literature provides many insights to explain corporate compliance and proactive environmental management. Nevertheless, research evidence in western regimes may not be fully generalized to cover developing countries due to institutional and organizational differences. On the one hand, the socioeconomic and regulatory context in developing countries is different from that in western societies. These contextual differences can be partly attributed to differences in national styles of regulation (Gormley & Peters, 1992; Kagan, 2001), or cross-national cultural and organizational culture differences (Axelrad & Kagan, 2000; Hofstede, 1993; Howard-Grenville, 2006). On the other hand, business firms in developing countries have experienced a relative shorter span of greening in comparison with their counterparts in developed economies. Though much research interest has been centered on the prospect of sustainable corporation (Hart, 1997; Hoffman, 2005; Starik & Rands, 1995), what cannot be ignored is that many firms in developing economies are still on the threshold of minimum compliance or even in non-compliance.

Overall, both the institutional context in which firms operate and firm-level factors are critical in understanding corporate compliance and proactive environmental management. For an emerging economy like China, with increasingly rigorous environmental regulation and intensifying political intervention as well as shifting public and business consciousness towards environmental protection, the journey toward industrial greening is understandably different from that in western countries. Research efforts are thus needed to investigate whether and how firms respond differently to environmental demands, and how institutional and firm-level factors jointly decide corporate environmental behaviors and performance. This thesis aims to address these research objectives.

### **1.1 Problem Statement in the Existing Corporate Compliance Research**

Two major research gaps can be identified in the existing literature. The first relates to the approach of identifying behavioral patterns of corporate compliance with environmental regulation. Both regulatory and management studies have proposed and empirically investigated firm-level variations in environmental strategy (Boiral, 2007; Buysse & Verbeke, 2003), responses (Delmas & Toffel, 2008; King, 2000), and degrees of environmental proactivity (Hart, 1995; Henriques & Sadorsky, 1999; Roome, 1992). Notably lacking from the literature, however, is whether there exist distinctive styles rather than a performance continuum in response to external demands. Regulators may choose from a variety of enforcement styles to achieve policy targets (Bardach and Kagan, 1982; Tang, Lo, and Fryxell, 2003). Regulated entities, on the other hand, may choose different compliance styles in response to various regulatory demands (King,

2000; Potoski and Prakash, 2004; Rugman and Verbeke, 1998). In environmental governance, the specific compliance style adopted by a regulated entity not only shapes its environmental protection practices but also communicates to regulatory stakeholders its commitment to upholding corporate environmental responsibility (Lo, Fryxell, & Tang, 2010). This study thus seeks to explore this conceptual issue systematically.

The second research gap lies in the lack of a systematic framework to examine how regulatory and organizational factors co-shape corporate environmental responses and performance. Existing research has provided two different views. On the one hand, political science and public policy researchers focus on how external forces drive enterprises to clean up (Gunningham, Thornton, & Kagan, 2005; Jennings & Zandbergen, 1995; May & Wood, 2003). Organizational studies, on the other hand, focus on environmental competitive advantage and cultural and managerial perceptions, and therefore stress the importance of the organizational capability and managerial strength (Aragón-Correa & Sharma, 2003; Banerjee, 2001; Coglianese & Nash, 2001; Fernández, Junquera, & Ordiz, 2003; Flannery & May, 2000; Walls & Hoffman, 2013) that enable business firms to turn green.

It is widely acknowledged that neither regulatory nor organizational driving forces alone can lead to efficient and effective corporate environmental practices (Bardach & Kagan, 1982; Fiorino, 2001). This is not only because regulatory agencies are limited in their enforcement capacity; some degree of voluntary effort is also needed from corporations, especially if they are to go beyond compliance (Prakash & Potoski, 2006). Thus, a major research question in the literature is how various factors—both

internal and external to a corporation—influence compliance strategies, practices, and performance. A core argument is that effective environmental protection cannot be achieved by relying solely on pressure from the regulatory community (Mol, 2006; Weidner & Jänacke, 2002); instead, organizational factors such as complying capacity and green commitment must also be considered (Dehart-Davis & Bozeman, 2001; Liu et al., 2010; May & Wood, 2003).

Overall, it is necessary to combine these two separate streams of research to provide a holistic understanding of corporate environmental behaviors. By considering the interacting process of both the exogenous and endogenous factors, one can adequately understand how enterprises purposively develop a specific compliance strategy in the consideration of organizational strength to address external environmental concerns.

## **1.2 Research Objectives and Research Questions**

Based on the two research gaps identified above, this study has set the following three research objectives:

(1) To formulate a conceptual framework of corporate compliance style (CCS).

We propose that regulated firms adopt four compliance style dimensions in dealing with environmental regulations. A conceptual framework of CCS is developed in Chapter 2.

(2) To explore the role of mutually reinforcing regulatory and organizational forces in corporate environmental compliance. To fully understand corporate environmental behaviors and performance, both the external and internal determinants

of corporate responses to environmental regulation should be considered in one conceptual scheme. Drawing on the natural-resource-based view (NRBV) and the regulatory compliance literature, I will examine how these two sets of factors—organizational capacity and regulatory intensity—jointly affect CCS. I also explore how CCS translates organizational capacity into corporate progress in the adoption of proactive environmental management (PEM), and whether this process is influenced by firms' normative green commitment.

(3) To study corporate compliance studies in emerging economies. There is a lack of systematic understanding of corporate compliance in developing countries, in which the internal capacity of enterprises is often limited and regulatory pressures from government and non-government stakeholders differ in form and intensity from those in Western countries. With the growing environmental regulatory demands, firms emerging from a centrally planned economy may adopt various environmental actions and strategies to respond and adapt to the institutional changes. This study aims to take a step towards exploring such micro changes at the firm level. Setting our study in the Chinese context, we conduct empirical studies with mixed research methods. Data were collected through a firm-level survey and in-depth case studies and interviews in the manufacturing sector in the Pearl River Delta (PRD) region.

In sum, this study tries to answer the following research questions based on the existing literature on regulatory compliance and corporate environmental management: (1) Whether and to what extent regulated enterprises differ in adopting CCS towards environmental regulation, (2) How organizational capacity (OC) and external regulatory



intensity (RI) jointly shape CCS adoption, and (3) How firms' normative green commitment (NGC) impacts proactive environmental management (PEM).

### **1.3 Structure of the Thesis**

This thesis comprises eight chapters. Chapter 2 reviews two major threads of literature on corporate compliance and proactive environmental management, one focusing on the institutional environment and another on organizational-level behaviors and influencing factors. Chapter 3 develops a four-dimensional framework of CCS and hypotheses in two research models. Chapter 4 describes the research design and methodology. Chapters 5 and 6 present findings from survey studies and case studies/interviews respectively. Chapter 7 discusses the overall findings and addresses limitations, shedding light on appropriate future research directions. Chapter 8 concludes the study by presenting the implications of the research findings for both researchers and practitioners.

## **CHAPTER 2 THEORETICAL BACKGROUND**

Regulatory compliance is the goal that regulatees desire to achieve in their efforts to comply with relevant laws and regulations. A substantial theoretical and empirical literature has investigated the economic, political, social, and psychological bases of corporate environmental compliance (Burby & Paterson, 1993; Child & Tsai, 2005; Hoffman, 2005; LaPorte & Thomas, 1995; Lee, 2011; May, 2004; McCaffrey, Smith, & Martinez-Moyano, 2007; Shimshack & Ward, 2005; Winter & May, 2001). Recent empirical studies in China have also generated many insights into how external institutions and internal factors secure corporate compliance (Ma & Ortolano, 2000; Tilt, 2007; Yang & Yao, 2012) and beyond-compliance (Christmann & Taylor, 2001; Hu, 2007; Liu et al., 2010). In this chapter, I will review the related regulatory and organizational viewpoints on corporate compliance and proactive environmental management, with a focus on the research themes of this study: corporate compliance style, organizational capacity, regulatory intensity, normative green commitment, and proactive environmental management.

### **2.1 The Institutional Environment of Corporate Compliance**

In the early stage of environmental governance, legal and government intervention in various forms used to be the only means of getting industry to be responsible for the environmental externality it created (Kagan & Scholz, 1984; Reid & Toffel, 2009; Shimshack & Ward, 2005). However, firms today are facing more complexity since environmental governance has been moving towards a pluralistic

combination of instruments. External pressure not only comes from government but also from non-government actors that take part directly or indirectly in the regulatory process. I thus reviewed the literature on these two major constituents of the institutional environment of corporate compliance.

### **2.1.1 Government Actors and Demands**

The relationship between legal pressure and corporate compliance has been widely studied (Burby & Paterson, 1993; Gunningham, Thornton, & Kagan, 2005; May, 2005; Short & Toffel, 2010). Coercive pressure from the command and control (CAC) approach used to be the dominating regulatory demand faced by firms from the 1970s to the 1990s. Corporate compliance is achieved mainly through the deterrence effect that stems from the certainty and severity of sanctions (Becker, 1968). Businesses are perceived as “amoral calculators” (Kagan & Scholz, 1984) who act on the basis of economic calculus to magnify profitability and diminish environmental risk. To regulated firms, CAC means that environmental standards/targets set by a government authority must be complied with in order to avoid sanctions. Therefore, a key method of responding to such demands is the employment of remedial environmental techniques.

Market-based instruments (MBIs) and informational approaches have emerged as complementary regimes to the CAC during the past three decades (Hahn & Stavins, 1992; Stafford, 2012). One of the most prominent milestones of MBIs in controlling industrial pollution is the SO<sub>2</sub> emissions trading system established by the U.S. Clean Air Act, in which enterprises face fewer prescriptive demands—such as less restrictive

technology—and greater discrepancy and flexibility compared to CAC<sup>3</sup>. The informational approach consists mainly of education, training, and public disclosure as supplementary instruments to CAC. Regulated entities can obtain assistance and support from the regulatory agency to improve their capacity and expertise in addressing environmental problems (Chatterji & Toffel, 2010; Fung, Graham, & Weil, 2007). Meanwhile, they are also under stronger public surveillance since informational instruments provide the general public and local community directly affected with increased insight and political leverage (Harrison & Antweiler, 2003; Lee, 2010). Successes were witnessed in: 1) the Toxic Release Inventory (TRI) scheme in the U.S., which effectively induces firms to improve waste management (Hamilton, 1995; Hart, 2010), 2) the environmental disclosure law on residential lead paint hazard (Title X), which improves homebuyers' lead testing behavior (Bae, 2012), and 3) in developing countries, the “PROPER” (Program for Pollution Control, Evaluation and Rating) in Indonesia, which notably reduced pollution by over 40% only 1.5 years after its initiation (World Bank, 2000)<sup>4</sup>.

A new environmental governance paradigm that seeks to coordinate private, government and non-government actors in participatory dialogue and collaborative decision-making has emerged since the 1980s (Ansell & Gash, 2008; Emerson, Nabatchi, & Balogh, 2012; Freeman, 1997). This new regulatory form features a preference for environmental partnerships and regulatory flexibility initiatives to

---

<sup>3</sup> Some argue that MBIs fit particularly well in developing countries, where there is a lack of public and private resources available for pollution control. However, others doubt its feasibility due to inadequate administrative and regulatory capabilities in emerging regimes (Van Rooij, 2010).

<sup>4</sup> However, another public disclosure program in India—the Green Rating Project—only lead to pollution reductions in dirty plants, not in cleaner ones (Powers et al., 2011).

promote consensus and cooperation (Gunningham, 2009; Lubell, 2004). Therefore, there has been a global trend toward greater adoption of voluntary environmental programs (VEPs) to complement the traditional regulatory tools (Henriques, Husted, & Montiel, 2013; Kettl, 2002). With its promise of “win-win” outcomes, it is advocated in order to avoid the pitfalls of direct regulation and save considerable government costs (Prakash & Potoski, 2012). For enterprises, how to achieve compliance thus goes far beyond simply investing in end-of-pipe technologies these days. A wide range of voluntary and negotiated agreements was made between corporations and environmental stakeholders (King, 2007; Rondinelli & London, 2003).

However, it is difficult to prevent opportunistic behavior such as symbolic adoption and shirking (Delmas & Montes-Sancho, 2010; King & Lenox, 2000). For example, whether adoption of the ISO 14001 EMS program improves corporate environmental performance remains doubted in the current literature. The positive effect was confirmed by Potoski and Prakash (2005a) in a U.S.-based study, by Fryxell, Lo, and Tang (2004) in Chinese firms (modestly positive effect), and by Dasgupta, Hettige, and Wheeler (2000), who investigated Mexican companies’ self-reported compliance. Other researchers found that the relationship between ISO 14001 adoption and environmental performance was negative or insignificant (Darnall & Sides, 2008; Lyon & Maxwell, 2007). To enhance the effectiveness of VEPs, careful institutional design, enforcement, and monitoring are needed (Lenox & Nash, 2003; Potoski & Prakash, 2005b; Shi et al., 2008).

### **2.1.2 Non-government Actors and Demands**

Demands on corporate greening could also stem from non-government actors as a means of “social control of business” (Barnett, 2006; Jones, 1982; Reid & Toffel, 2009). From a stakeholder’s viewpoint, the agents of social control encompass various societal stakeholders, particularly the local community, mass media, non-government organizations, and market actors. First, the direct impact of pressure from the community on plant level emission reductions was confirmed (Dasgupta, Hettige, & Wheeler, 2000; Pargal & Wheeler, 1995). Nevertheless, its effectiveness may be limited due to lack of information and resources, or compromised by dependence on firms for employment (Wang & Jin, 2007).

Second, the public media can serve as propagators of legitimacy (Miller, 2006) in monitoring industrial pollution. Traditional media instruments may influence society’s perceptions of a company, especially when environmental crises occur (Sharbrough & Moody, 1995; Tilt, 2007). The prevalence of the internet these days also greatly speeds up the diffusion of environmental information about companies who cause damage to human health, such as in the case of BP’s oil spill incident (Marquis, Zhang, & Zhou, 2011). Third, there has been institutional pressure from NGOs and other social groups seeking regulatory changes and policies (Ansell & Vogel, 2006), to urge firms to reduce pollution control by adhering to strict self-regulation such as through ISO 14001 certification (Christmann & Taylor, 2001; Hoffman & Bertel, 2010; King, 2007). For instance, emerging civic ENGOs in China in the past decade have been

successfully “expressing their interests, exchanging information, and achieving collective goals” in the environmental arena (Tang & Zhan, 2008; Yang, 2005).

Last but not least, market demands have motivated business firms to be environmentally responsible. Environmental concerns from market stakeholders such as consumers, suppliers, and investors are important in producing incentives for pollution control (Bansal & Clelland, 2004; Yang & Yao, 2012). For instance, under the TRI scheme, firms publicized as having the highest emissions among their peers experienced the largest stock price decline (Konar & Cohen, 1997). In industrializing countries where strong regulatory enforcement is absent, capital markets have also reacted negatively to adverse environmental issues and positively to green messages (Lanoie, Laplante, & Roy, 1998). The “pays-to-be-green” (PTBG) literature has also identified that firms can benefit from being compliant or green innovators (Barnett & Salomon, forthcoming; King & Lenox, 2002; Russo & Fouts, 1997). The ground-breaking Porter Hypothesis suggests that strict environmental regulations enhance efficiency and induce innovations to improve business competitiveness (Porter & van der Linde, 1995). Market opportunity involves both tangible benefits such as operational cost saving, and intangible benefits that show its economic value in the long term, such as improved firm reputation and competitiveness (Bansal & Roth, 2000).

However, it is still not clear how widespread the so-called green consumerism is (Pedersen & Neergaard, 2006; Vogel, 2005). Critics suggest that market actors are more concerned about product price, quality and brand, than firms’ greenness (Eriksson, 2004). Many consumers are not interested in whether a product is produced in an

environment-friendly way, or just ignore the environmental aspects of goods or services, as well as corporate environmental misconduct (Barnett, forthcoming; Berchicci & King, 2007). Investors may apply a discount on poor environmental performance, but either they do not give priority to environmental leaders or their roles vary among different export countries (Gunningham, Kagan, & Thornton, 2003).

## **2.2 Organizational Views on Corporate Compliance**

The organizational literature on corporate compliance and environmental management has paid considerable attention to the importance of the natural environment in the past decade, including (1) the institutional theory that emphasizes the role of isomorphism in explaining corporate environmental behaviors (Delmas & Toffel, 2008; Hoffman, 2001; Jennings & Zandbergen, 1995), and (2) the business strategy literature that stresses the link between a firm's strategic profile and its external environment (Boiral, 2007; Buysse & Verbeke, 2003; Christman, 2000; Shrivastava, 1995). One central domain in this research stream is the NRBV (grounded in the RBV theory) perspective, suggesting that a firm's competitive advantage is embedded in its ability to take up environmentally sustainable activities (Hart, 1995); (3) the stakeholder's perspective (Bansal & Clelland, 2004; Freeman, 1984; Harrison, Bosse, & Phillips, 2010; Mitchell, Agle, & Wood, 1997), arguing that businesses face environmental "shifts" among both internal stakeholders and external stakeholders; and (4) the "pays to be green" literature that argues a positive relationship between corporate environmental and financial performance (Howard-Grenville & Hoffman, 2003; King &



Lenox, 2001)<sup>5</sup>. A revolving progression in the literature is also noticed, moving from developing conceptual environmental models to examining the drivers of corporate environmental actions, then corporate responses to environmental pressures, and finally emergent directions (Hoffman & Georg, 2013). In the following section, I review the related literature on corporate responses to external demands as the research focus of this study, the NRBV in the corporate strategy literature, and the commitment perspective.

### **2.2.1 Corporate Responses to Institutional Demands**

Various typologies have been proposed and empirically investigated to capture firm-level variations in responding to institutional demands (Goodstein, 1994; Greenwood et al., 2011; Oliver, 1991; Pache & Santos, 2010; Westphal & Zajac, 2001), environmental responses and strategy (Boiral, 2007; Buysse & Verbeke, 2003; Delmas & Toffel, 2008; King, 2000), and degrees of environmental proactivity (Hart, 1995; Henriques & Sadorsky, 1999; Roome, 1992). For instance, Sharma (2000) adopted a categorization of environmental strategy as the continuum of conformance to regulations and standard industry practices, to actions firms take voluntarily to further reduce the negative environmental impacts. King's empirical study (King, 2000) detected various organizational responses to new pollution regulation, including creating buffers of technology and personnel, initiating changes to improve environmental performance, and (in a very few firms) adopting entirely new corporate strategies. Table 2.1 lists the major categorization frameworks developed in the existing literature.

---

<sup>5</sup> A more detailed review of these mainstream domains can be seen in Hoffman and Georg (2013).

Table 2.1 Conceptual Classification of Corporate Responses to External Demands

Author(s) & publication year	Research focus	Conceptual classifications/Findings
<i>Corporate responses/strategies to external demands in general</i>		
Miles & Snow (1978)	Organizational strategy	There are three patterns of behavior used by organizations in adjusting to their environments: prospectors, analyzers, defenders.
Oliver (1991); Pache & Santos (2010)	Strategic responses to institutional processes	There are five types of strategic responses: acquiesce, compromise, avoidance, defiance, manipulation; Variation in the ten dimensions of five institutional antecedents determines the choice of strategy.
Braithwaite (2003)	Motivational postures	There are five motivational postures to capture the way regulatees position themselves in relation to regulatory authority, including two positive orientations (commitment and capitulation) and three defiance postures (resistance, disengagement, and game playing).
Kraatz & Block (2008)	Strategic responses to institutional processes	There are four basic ways in which organizations may adapt to pluralistic legitimacy standards (or seen as approaches to organizational governance): resist/eliminate, balancing, detaching, compartmentalizing.
Oliver & Holzinger (2008)	Corporate political strategies	There are four corporate strategies to manage the political environment effectively: proactive, defensive, anticipatory, and reactive. The effectiveness of these strategies is determined by firms' dynamic political management capabilities

Table 2.1 Conceptual Classification of Corporate Responses to External Demands (Continued)

Author(s) & publication year	Research focus	Conceptual classifications/Findings
Crilly, Zollo, & Hansen (2012)	(Decoupling) Responses to institutional pressures	There are four configurations of responding to institutional pressures: two decoupling (evasive decoupling and emergent decoupling), and two implementation (strategic implementation and routine implementation). They are affected by four conditions: two environmental conditions—information asymmetry and stakeholder consensus, and two firm conditions—managerial consensus and perceived interests in implementing policy.
<i>Business responses/approaches related to the natural environment</i>		
Hunt & Auster (1990)	Environmental management	There are five stages of environmental management program development: beginner, firefighter, concerned citizen, pragmatist, proactivist.
Roome (1992)	Environmental management	There are four business positions on the environment: three reactive (driven by threat, legislation, and communication) and one discretionary (management driven). There are five strategic options business in shaping business responses: noncompliance, compliance, compliance plus, commercial and environmental excellence, leading edge.

Table 2.1 Conceptual Classification of Corporate Responses to External Demands (Continued)

Author(s) & publication year	Research focus	Conceptual classifications/Findings
Hart (1995)	Environmental strategy (natural-resource-based view)	There are three forms of environmental strategies: pollution prevention, product stewardship, and sustainable development. Each strategy is associated with different environmental driving forces, key resources, and competitive advantages.
Aragón-Correa & Sharma (1998)	Business & the natural environment (B&NE)	There are three types of types of corporate approaches to manage the natural environment: information & education, traditional/regulated correction, modern/voluntary prevention; These approaches are affected by firms' strategic proactivity.
Henriques & Sadorsky (1999)	Environmental commitment practices	There are four profiles of corporate environmental practices: reactive, defensive, accommodative, and proactive. Firms with more proactive profiles differ from less proactive ones in their perceived relative importance of different stakeholders.
Buysse & Verbeke (2003)	Resource-based environmental strategy	Three dominant environmental management strategies could be classified based on environmental management practices: reactive, pollution prevention, and environmental leadership. More proactive environmental strategies are related to a deeper and broader coverage of stakeholders.

Table 2.1 Conceptual Classification of Corporate Responses to External Demands (Continued)

<b>Author(s) &amp; publication year</b>	<b>Research focus</b>	<b>Conceptual classifications/Findings</b>
Murillo-Luna, Garcés-Ayerbe, & Rivera-Torres (2008)	Strategic responses to stakeholder pressures	There are four types of environmental proactivity degree: passive, attention to legislation, attention to stakeholders, total environmental quality. Managers' perceived environmental demand from stakeholders is positively related to the proactivity of corporate environmental responses.

Two different research focuses examining firm level environmental variances are identifiable in the literature. First, many prior typologies conceptualized corporate environmental behaviors at the operation level by classifying corporate performance along a continuum. For instance, the corporate social responsibility literature (Wartick & Cochran, 1985) categorizes firms in ascending order—reactive, defensive, accommodative, and proactive—based on their green commitment. Second, another stream of research focuses on corporate behavioral diversity in responding to specific environmental issues such as the ISO 14001 EMS certification (Boiral, 2007), climate change (Levi & Egan, 2003), or new regulations (King, 2000). Much less has been written on the diversity of corporate style to cope with growing regulatory demands in general. More recently, Lynch-Wood and Williamson (2010) suggested the need to study how regulated enterprises actually behave, and whether distinctive compliance orientations are jointly shaped by capability, visibility, and moral orientation. In dealing with regulatory requirements, enterprises have their own environmental preferences, professional standards, and experiences. Enterprises will only select approaches that are compatible with their own internal and external circumstances (Etzion, 2007; Oliver, 1991).

### **2.2.2 The Natural-Resource-Based View (NRBV)**

The NRBV literature (Hart, 1995) is a dominant strategic management approach to studying corporate greening, based on the fundamental principle that the basis for competitive advantage lies in applying valuable resources and capabilities. It focuses on resources that allow firms to reduce the negative impact on the natural environment,

thus addressing the fit between what a firm is capable of and what opportunity it has to act on environmental issues (Barney, 1991; Berchicci & King, 2007; Russo & Fouts, 1997). Therefore, it helps to understand how firms operating in the business-environment interface can achieve competitive advantage by developing unique capabilities<sup>6</sup> and environmental strategies (Reinhardt, 1998; Sharma & Vredenburg, 1998).

Building on the NRBV literature, we examine how a firm's organizational capacity affects its CCS adoption. OC refers to an enterprise's endowment such as technical knowledge, financial and human resources, and intangible resources that an enterprise can employ to comply with environmental regulations. Tangible resources such as technical assets, financial capacity, and human resources are decisive to a firm's environmental policy enforcement and ultimate environmental performance (Bansal, 2005; Darnall & Edwards, 2006; Winter & May, 2001). Intangible resources consisting of tacit and non-tacit knowledge/skills enable firms to influence public policy implementation (Hillman & Hitt, 1999; Walls & Hoffman, 2013; Wang et al., 2003). For instance, firms differ in their nonmarket capabilities related to corporate political activities (Baron, 2003; Hillman, Schuler, & Keim, 2004). In addition, these political resources are especially important in emerging regimes where firms rely more on informal institutions than formal administrative procedures and rules (Marquis & Qian, forthcoming; Peng & Heath, 1996).

---

<sup>6</sup> Following the prior literature (Russo & Fouts, 1997), the term "resource" and "capability" are used interchangeably in this study by referring to the tangible and intangible assets firms possess.

We are also interested in exploring how firms' internal capabilities influence proactive environmental management. Many NRBV studies have focused primarily on pollution prevention and partly ignored the development of product stewardship and sustainable strategies (Hart & Dowell, 2011). Proactive environmental management refers to environmental actions that not only fulfill regulations but also consider and deal with all the negative impacts associated with the full life cycle of production (Hoffman & Woody, 2008; Hunt & Auster, 1990; Ramus & Steger, 2000; Sharma, 2000). It is embodied in a series of corporate strategies, goals, and practical efforts to improve environmental performance (Christmann, 2000; Coglianese & Nash 2001; Hoffman & Ventresca, 2002). Regulatees expecting tighter regulation or increasing market opportunities in the future may prefer to invest in PEM activities (Hart, 1995; Russo & Fouts, 1997). However, internal implementation might be a barrier to whether PEM activities are genuinely integrated into business operation. In this study, we examine how PEM is affected by three organizational factors: organizational capacity, corporate compliance style, and normative green commitment.

### **2.2.3 Normative Green Commitment**

A regulated entity's green commitment consists of attitudinal and behavioral elements. Among the very limited studies, many adopted a behavioral or mixed perspective. For instance, Coglianese and Nash (2001) labeled managerial attitudes and actions as commitment, while Henriques and Sadorsky (1999) defined what a company is doing or has done as its commitment to the natural environment. To capture the attitudinal aspect, we draw on Meyer and Allen's (1997) organization commitment

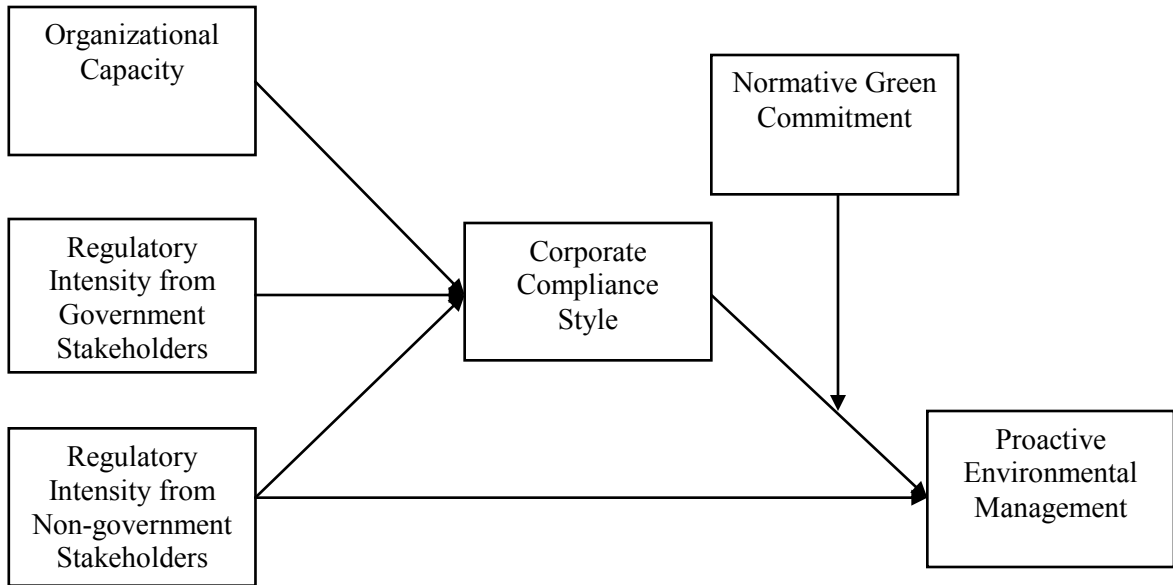


model and define corporate green commitment as the strength of a firm's identification with and willingness to improve environmental performance. Such attitudinal commitment embraces three features: (a) a strong belief in and acceptance of the goals and values of environmental protection; (b) a willingness to input great effort to achieve environmental goals; (c) a definite desire to be a member of a green company. Although organizational commitment originally referred specifically to commitment to an entity or behavior, some studies also suggest that organizations can commit to various moral philosophies, including environmental values (Sharma & Vredenburg, 1998) or environmental policy (Ramus & Steger, 2000). Following the existing literature, which emphasizes the importance of moral obligation and a sense of duty (May, 2005; Scholz & Pinney, 1995; Sutinen & Kuperan, 1999; Winter & May, 2001), this study focuses on the normative dimension of green commitment, defined as a sense of duty or obligation to pursue environmental goals (Keogh & Polonsky, 1998).

### **2.3 Summary**

Overall, this chapter reviews the existing literature on the impacts of institutional environment and internal capabilities/commitment to corporate compliance, as well as how firms respond to external environmental demands. A comprehensive framework to integrate these factors to explain corporate compliance and proactive environmental management is lacking. This study thus seeks to fill this gap by examining the combined effects of OC and RI on CCS, and the role of NGC in deciding PEM. Figure 2.1 depicts the conceptual framework.

Figure 2.1 The Conceptual Framework



## **CHAPTER 3 RESEARCH MODELS AND HYPOTHESES**

Chapter 3 first presents the conceptual framework of CCS based on the corporate environmental management and regulatory compliance literature. After that, two research models are developed. In Study 1, we hypothesize that OC is positively related to CCS adoptions (H1); GVRI is positively associated with the CCS dimensions of formalism and accommodation (H2); NGRI is positively associated with the compliance style dimensions of referencing and self-determination (H3); and OC, GVRI and NGRI have an interactive effect on corporate compliance style (H4). In Study 2, we hypothesize that CCS mediates the positive relationship between OC and PEM (H5), and that NGC moderates the indirect effect of OC on PEM through CCS (H6).

### **3.1 CCS Conceptualization**

In this section, we introduce how CCS is defined and how the four dimensions were differentiated from each other. Corporate compliance styles (CCSs) can be defined as the strategic-level approaches adopted by regulated enterprises to meet regulatory requirements. We conceptualized four dimensions of CCS—formalism, accommodation, referencing, and self-determination—based on an overview of the regulatory compliance and corporate environmental management literature (Aragón-Correa & Sharma 2003; Christmann 2004; Hansen & Mitchell 2000; Henriques & Sadosky 1999; Ma & Ortolano 2000). Each firm may adopt, to varying degrees, each of the four style dimensions. A multi-dimensional characterization captures the fact that firms have to face demands from different types of regulations and stakeholders, and firms often have

to develop complex arrays of compliance styles in order to meet their business needs (Schuler, Rehbein, & Cramer, 2002). Compliance styles are conceptually distinct from environmental management practices and their actual impacts on the environment, as the former refers to strategic-level approaches, which could result in different practices and impacts. Table 3.1 provides a summary of the main characteristics of these four dimensions.

Table 3.1 A Dimensional-Framework of CCS in Environmental Regulation

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

### 3.1.1 Formalism

The “formalism” dimension refers to a traditional “by-the-book” approach that strictly follows formal rules within a command-and-control regulatory context (Dasgupta, Hettige, & Wheeler, 2000; Scholz & Pinney, 1995; Winter & May, 2001). Dictated by a legal orientation, enterprises achieve compliance through the closest reference to the letter of the law, transforming the legal text into internal compliance procedures and verification mechanisms (May & Winter, 1999); they follow the letter of law as the sole guiding rule, without allowing any deviations.

### **3.1.2 Accommodation**

The “accommodation” dimension refers to a compliance approach that places priority on dealing with political or bureaucratic demands (Cho, Patten, & Roberts, 2006; Levy & Egan, 2003). Firms might consider regulatory agencies, rather than legislators, as the central point of contact for responding to the requirements of public policy (Economy, 2010; Wang et al., 2003). For example, the political pressure from campaign-style enforcement has contributed to reductions in industrial pollution in China in the past two decades (Li & Foster, 2008; Van Rooij, 2006). Unlike formalism, accommodation emphasizes achieving compliance legitimacy through reconciliation and adaptation to informal rules and demands. One form of accommodation is business participation in government-sponsored voluntary environmental programs (VEPs) to maintain or strengthen the relationship with regulators (Darnall, Potoski, & Prakash, 2010; Short & Toffel, 2008).

### **3.1.3 Referencing**

The “referencing” dimension refers to a compliance approach that embraces a close imitation (either intentional or unconscious) of peers’ compliance practices or follows professional guidelines recommended/promulgated by industrial trade associations (Bansal & Clelland, 2004; Greenwood, Suddaby, & Hinings, 2002; Lieberman & Asaba, 2006). It reflects the standards of external reference groups more than internal management preferences in compliance. Such behaviors may be a result of calculated judgment on who and when to follow (King & Lenox, 2000), or simply a lack

of experience. Regarding calculated imitation, gaining the approval and respect of others is often a key concern (May, 2005; Scholz & Lubell, 1998).

### **3.1.4 Self-determination**

The “self-determination” dimension refers to a discretionary approach that emphasizes intellectual flexibility, self-discretion, and autonomy (Majumdar & Marcus, 2001; Oliver, 1991; Rome, 1992; Sharma, 2000). Enterprises under this category prioritize their own interest with limited external influence and interference. Organization-environment studies have highlighted the importance of managerial discretion and autonomy in responding to external pressures (Crilly, Zollo, & Hansen, 2012; Goodrick & Salancik, 1996; Okhmatovskiy & David, 2012). In responding to mandatory demands, multi-national corporations (MNC) were found to use the “double standard” approach, adapting their subsidiaries’ environmental programs to local conditions instead of using a unified practice (Diestre & Rajagopalan, 2011). Organizational discretion is also found in responses to non-mandatory pressures. For instance, Okhmatovskiy and David (2012) discussed the “substitution response” whereby firms develop their own internal corporate governance codes when they find it difficult to comply with all non-mandatory governmental requirements. A number of case studies describe the detailed process of using alternative standards to respond to an external standard (Bartley, 2007; Hoffman, 1996). In adopting the ISO 14001 Environmental Management System, some firms follow the public audit procedure in EMS enforcement, while others choose to adopt it privately without certification (King, Lenox, & Terlaak, 2005) and establish flexibility in their internal implementations

(Huising & Silbey, 2011). Self-determination can also take an industrial form in which companies construct private regulation systems to deal with the negative spillover effect (Barnett & King, 2008; Terlaak & King, 2006). As a result of self-determination, some firms may no longer be subject to costly regulatory demands. For example, firms may transfer waste to a third party processor, which will take up the liability for pollution emission compliance. All these examples show that organizations do not ignore regulatory demands but simply use different approaches to address the related issues.

However, it should be noted that both greater complying efforts and evasion of regulations may coexist among self-determiners. For instance, in a study examining the adoption of internal corporate governance codes (ICGCs) in Russian firms, Okhmatovskiy and David (2012) found significant organizational variations: some ICGCs present very detailed and instrumental guidelines, whereas others only provide general policies. On the one hand, some companies employ advanced green technology. “Reverse decoupling” was detected, whereby many firms implement management systems that go beyond the ISO 14001 standards requirement (Terlaak & King, 2006). Some MNCs introduce uniform green standards and encourage global technology transfer (Christmann & Taylor, 2001; Dowell, Hart, & Yeung, 2000). On the other hand, some firms transfer their polluting businesses to more loosely regulated countries—a practice known as “regulation shopping” (Eskeland, 2003), decouple their daily operating practices with regulatory standards (Boiral, 2007), or lobby/influence legislators for favorable public policy decisions (Schuler, Rehbein, & Cramer, 2002)<sup>7</sup>.

---

<sup>7</sup> Greenwashing as an approach to attention deflection can be considered as an example of decoupling (Delmas & Burbano, 2011; Lyon & Maxwell, 2011; Marquis & Toffel, 2012).

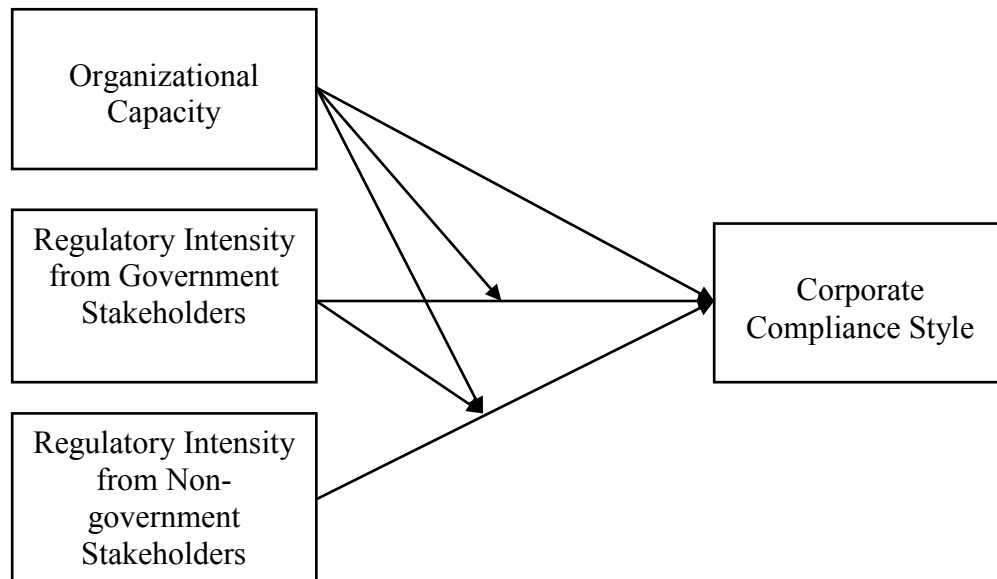
This evasion element in self-determination is thus similar to the “escape” tactic proposed by Oliver (1991), whereby the organization reduces the extent to which it is inspected and scrutinized.

### **3.2 OC, RI, and CCS (Study 1)**

Corporate behavior is often shaped by the strategic interplay between internal and external constraints (Hoffman, 2001; Oliver, 1991). For instance, Pache and Santos (2010) provide a theoretical model of organizational responses to institutional conflicts by considering the nature of both external demands and internal representations. CCS, which is highly dependent on institutional and organizational conditions, is no exception. Firms need to balance the inconsistencies between institutional expectations and internal organizational efficiency. Following regulatory compliance and the NRBV literature, we hypothesize that corporate responses to regulatory requirements are influenced by two key factors—organizational capacity (OC) and regulatory intensity (RI). In the following section, we develop hypotheses concerning the role of OC and RC in co-shaping CCS. Figure 3.1 presents the model.



Figure 3.1 Research Model of Study 1



### 3.2.1 OC and CCS

Since corporate success depends not only on the amount of resources but also the way they are allocated and deployed (Teece, Pisano, & Shuen, 1997), in general a firm's organizational capacity will positively affect its CCS adoption to secure compliance legitimacy, as the NRBV theory suggests. Drawing on this general assumption, we further explore the effect of OC on individual CSS dimensions.

First, organizational capacity is crucial to a mechanistic compliance approach of formalism (Gunningham, Kagan, & Thornton, 2003; May, 2005). Firms' knowledge of regulatory requirement is prerequisite to compliance, since non-compliance is sometimes due to ignorance rather than deliberate evasion (Brehm & Hamilton, 1996). Second, organizational capacity is indispensable in facilitating accommodation. In

addition to the tangible resources needed for internal implementation, intangible resources such as political acumen are also necessary to access policy makers' decisions (Baron, 2003; Bonardi & Keim, 2005) and manage external constituencies (Hillman & Hitt, 1999; Wang et al., 2003). For instance, managerial ties (e.g. the so-called "guanxi" in the Chinese context) can enable firms to pursue information such as potential regulation changes and political favors (Park & Luo, 2001). Firms that have direct experiences with politicians and regulators can also better understand policy makers' preference patterns (Hambrick, 2007; Ring, Lenway, & Govekar, 1990). Third, organizational capacity is essential to organizational learning. The question following whether a firm should learn from its peers' practices is whether resource adequacy allows the implementation of such imitation decisions (Russo & Harrison, 2005; Semadeni & Anderson, 2010). A firm with forward-thinking top executives might be more open-minded towards learning from environmental pioneers. An industrial new entrant's prior know-how in environmental protection is also highly valuable in enabling it to understand and follow the rules in the new domain (Diestre & Rajagopalan, 2011). Last, organizational capacity is a critical factor in being self-determining. Firms' history of experiences with regulators can assist intellectual interpretation of the dynamic environment in making independent decisions. Prior knowledge in improved performance will also reduce barriers to the pursuit of advanced environmental strategies (Rugman & Verbeke, 1998). Organizational and supervisory support is particularly important in encouraging employees' eco-innovation (Ramus & Steger, 2000).

In sum, we propose that:

*H1. A regulatee's organizational capacity is positively related to each of the four compliance style dimensions: formalism, accommodation, referencing, and self-determination.*

### **3.2.2 Regulatory Intensity and CCS**

Regulatory intensity (RI) is the degree of compliance demand from a wide variety of external stakeholders. Two groups of stakeholders are identified—one involving various government entities (GVRI) and the other involving various societal and market actors (NGRI) that may exert pressure on enterprises regarding their environmental performance. Regulatory pressure from government stakeholders may induce enterprise executives to meet their demands by making sure that formal regulatory requirements are met and that their opinions are taken into account. When these formal demands are clear and enforcement is strict, the safest strategy for an enterprise is to follow formal rules rigorously (Stafford, 2002) or to match the expressed expectations of political and bureaucratic stakeholders (Hansen, Johannsen, & Larsen, 2002). Recent empirical studies in China have generated many insights into how improvements in legal enforcement may help secure greater corporate compliance (Liu & Anbumozhi., 2010; Wang & Jin, 2007), and how campaign-style political actions may motivate enterprises to improve on environmental management (Li & Foster, 2008; Van Rooij, 2006).

Thus we hypothesize that:

*H2. The regulatory intensity from government stakeholders is positively associated with the compliance style dimensions of formalism and accommodation.*

Regulatory demands/pressures from non-government stakeholders create more complex challenges to enterprise executives, as their demands often go beyond simply meeting government-mandated pollution-reduction targets. In the context of China, for example, environmental NGOs have become more and more active in promoting policy reform and corporate compliance (Zhan & Tang, 2013). To respond to these types of demands, enterprise executives often have to draw on experiences from their peers and to adopt more innovative approaches to meet rising societal expectations. An enterprise, for example, may follow the known practices of its peers as a way to maintain its corporate reputation in the industry. An enterprise may gain the first-mover advantage in a highly competitive market by investing in eco-innovation and progressive programs (Doh & Pearce, 2004). Under the pressures of market stakeholders, some Chinese auto manufacturers have, for instance, begun to adopt green supply chain management (Zhu, Sarkis, & Lai, 2007).

Thus we hypothesize that:

*H3. The regulatory intensity from non-government stakeholders is positively associated with the compliance style dimensions of referencing and self-determination.*

### **3.2.3 Interactions on CCS**

Recent empirical studies of environmental protection in China also generated some insights on how external institutional environments and internal organizational factors affect enterprises' environmental management practices in China (Chan, 2005; Christmann and Taylor, 2001; Liu et al., 2010; Ma and Ortolano, 2000; Yang and Yao, 2012; Zhan, Lo, and Tang, forthcoming). Of particular relevance for this paper are two recent studies on enterprises in Guangdong, China. Based on a survey in 2007 of Hong Kong-owned enterprises operating in Guangdong Province, Lo, Fryxell, and Tang (2010) found that government pressures are associated with stronger management motivation for better environmental protection measures, but societal pressures are associated with weaker management motivation. Drawing on the same survey Yee, Lo, and Tang (2013) found that demands from the local environmental protection bureau and top management attitude were positively associated with better environmental management practices, but extra-legal community action had a negative association with corporate environmental management practices. Both studies offered reasonable explanations for these results by reference to the specific political and social contexts of China. A limitation of the two studies, however, was that they did not examine the effect of internal organizational capacity, the interactive effects of government and non-government pressures, and different corporate compliance styles.

Regulatory intensity and organizational capacity are likely to interact in complex ways to influence corporate compliance style. From an efficiency perspective, compliance with regulatory requirements often represents pure costs. To minimize such costs, an enterprise has to consider the constraints imposed by both organizational

capacity and pressures from a wide array of external stakeholders. The interacting effects of internal resource constraints and external stakeholder pressures have been identified in a number of previous studies (Aragón-Correa & Sharma, 2003; Bansal, 2005; Rugman & Verbeke, 1998). Business firms, for example, may find more effective solutions to environmental challenges by working closely with suppliers and customers (Prakash & Potoski, 2006). In addition to the dyadic relationship between the focal organization and individual stakeholders, pressures coming from government and non-government stakeholders may have interacting influences on a firm's environmental practices (Delmas & Toffel, 2008; Gunningham, Kagan, & Thornton, 2003). Enterprises in China are often faced with regulatory pressures from multiple fronts (government and non-government actors) and varied means (legal and extra-legal) (Tilt, 2007; Van Rooij, 2010). Different alignments of internal and external factors may affect a firm's compliance strategies (Neville & Menguc, 2006). Since it is difficult to speculate on all the possible scenarios, we adopt the following general hypothesis in an exploratory analysis:

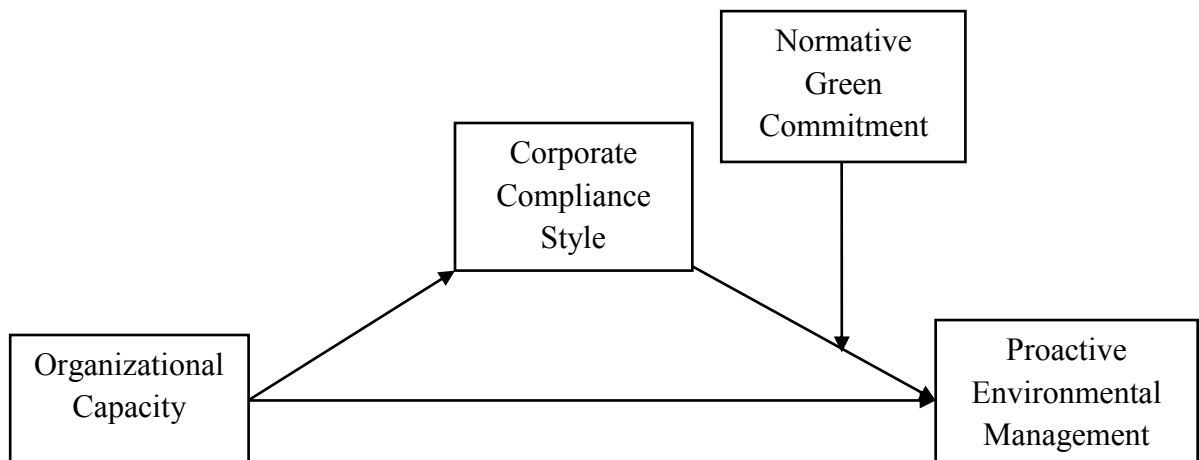
*H4. Organizational capacity and regulatory intensity from government and non-government stakeholders have an interactive effect on corporate compliance style.*

### **3.3 The Moderated Mediation Model (Study 2)**

The central premise of this model is that the relationship between organizational capacity and environmental practices is non-linear, and there are factors that mediate and moderate the relationship between OC and PEM. We examine how the effects of

OC on PEM are mediated by the extent to which firms adopt a certain CCS dimension. We also developed the theoretical rationale for the moderating role of NGC on the mediation process. All these proposed relationships are summarized and presented in Figure 3.2.

Figure 3.2 The Moderated Mediation Model (Study 2)



### 3.3.1 The Mediating Role of CCS

The positive association between organizational resources (capabilities) and environmental performance has been confirmed in many resource-based view (RBV) studies (e.g., Aragón-Correa & Sharma, 2003; Russo & Fouts, 1997; Sharma & Vredenburg, 1998). Compared to remedial actions, PEM activities usually require more tangible and intangible inputs in internal management. For instance, some ISO-certified firms do not fully implement the standards because of the high costs of complying with the continual improvement principle in the ISO standards (Yeung & Mok, 2005). A firm

with a more experienced board of directors is also more likely to adopt a proactive environmental strategy (Walls & Hoffman, 2013).

Besides having a direct impact, organizational capacity can also indirectly affect PEM engagement via CCS adoptions. To enterprises nowadays, resource application in environmental protection is far from a simple investment in green technologies, but rather involves more complex tactics and strategies in balancing compliance legitimacy and organizational efficiency. The adoption of a compliance style either offers an external benchmark set by formal laws and political demands to go beyond compliance, or allows market adaptation and organizational autonomy to facilitate green changes. Therefore, CCS adoptions can potentially improve resource allocation and enhance PEM performance. We develop a general hypothesis that a firm's CCS adoption level plays an important role in bridging a firm's resource endowment and PEM:

*H5. Corporate compliance style mediates the positive association between organizational capacity and proactive environmental management.*

### **3.3.3 The Moderating Role of NGC**

The indirect association between OC and PEM through CCS may further depend on firms' normative green commitment. This is because NGC relates not only to firms' interpretation of the legitimacy of environmental issues but also to their effort to support environmental policy implementation. Regarding formalism, highly committed firms are likely to exceed formal demands, while less committed ones may adopt a more ceremonial behavior (Weaver, Treviño, & Cochran, 1999). In terms of accommodating



political demands, firms with a strong commitment may consider the potential benefit to society and nature, while the less committed may be more concerned about the cost of satisfying additional requirements.

Whether referencing firms take up pro-environmental actions depends on how they perceive that their peers are doing. Highly committed firms are inclined to follow proactive models, while the less committed may deem it unnecessary to invest in greener technologies, or may even follow bad apples. The latter is common, especially in a loose regulatory context where non-compliance overwhelms “beyond green”. In these circumstances, the more a firm remains consistent with its peers, the less likely it is to improve in PEM. In terms of self-determination, firms are more likely to engage in pro-environmental practices if they strongly perceive reducing environmental harm to be a social duty (Gunningham & Grabosky, 1998). Less committed firms, however, are likely to race to the bottom. Thus, we predict that:

*H6. Normative green commitment moderates the indirect effect of organizational capacity on proactive environmental management through corporate compliance style: the indirect effect of compliance style dimensions is stronger when a firm has a higher degree of normative green commitment.*

# **CHAPTER 4 RESEARCH DESIGN AND METHODOLOGY**

## **4.1 The Chinese Environmental Regulatory Context**

The existing literature has provided many insights into how the unique Chinese context, such as the cultural, political and legal background, and the stage of economic development, affects corporate environmental protection. For instance, Chinese managers were found to favor a centralized decision-making approach in dealing with environmental issues (Cummings, 2008). In terms of VEP participation, firms in China are more likely to engage in symbolic implementation for ISO certification, because the concepts of self-regulation are relatively new in the transition economy (Christmann & Taylor, 2006). Such symbolic implementation is also accompanied by a relatively weaker involvement of industrial associations in China than in industrialized countries (Hu, 2007). These findings might be partly explained by the specific environmental regulatory context in China.

As widely stated in the literature, policy implementation in China relies on a top-down political structure (Manion, 2004), and many elements of environmental measures are policy statements and propositions of ideals rather than formal laws (Beyer, 2006). With the environmental legal framework relying greatly on informal demands rather than rule-based mediation (Morton, 2006), political efforts in the past three decades increasingly established institutions and norms to protect the environment, as well as

laying the foundation to integrate environmental protection into future economic development (Economy, 2010). For instance, the “energy saving and emission reduction” policy implementation became a national campaign in 2007, when the Premier was in charge of the issue. In addition, the former State Environmental Protection Administration’s (SEPA) upgrade to the Ministry of Environmental Protection (MEP) in 2008 also gave a considerable boost to both the enforcement capacity of local EPBs and regulated entities’ perception of the importance of compliance legitimacy. Nevertheless, the “fragmented authoritarianism” problem (Tanner, 1994) of segmentation of governmental authorities into environmental and non-environmental ministries remains and has limited the legislation and implementation of some environmental policies and regulations (Jahiel, 1998; Zhu & Ru, 2008).

Though government intervention is still the primary force in environmental governance in China, civil society is becoming more active than before in improving corporate compliance. For example, citizens in China’s urban areas have become better informed about environmental problems (Huang, Zhang, & Deng, 2006). The survey results suggest that about 64% of respondents in the Ningbo area are aware of “Chinese environmental labeling”; over two thirds are willing to pay for environmental improvement and green products. Regarding direct involvement, Tilt’s case study (2007) found that media exposure by a provincial level television station, alerted by the local farmers’ collective actions, played a key part in the decision to permanently close polluting firms in a small town in China. Similar findings can be seen in Van Rooij’s study (2006), where strong community pressure had a regulatory impact, especially

when the media became involved. In terms of market demands on greener companies, listed/IPO companies are currently under stringent regulatory demands from the Securities Regulatory Commission (SRC) and the Stock Exchange on environmental performance and information disclosure (Liu & Anbumozhi, 2009). Given such institutional uniqueness and evolution in China's environmental regulation in the past decade, further research is needed to investigate the mechanisms through which enterprises respond and adapt to regulatory dynamics.

## **4.2 Research Design**

We collected data in manufacturing firms operating in the PRD region of Guangdong Province. Widely known as the “world’s factory” for almost three decades, it is home to tens of thousands of manufacturing plants, which differ widely in their environmental performance. The region also leads the nation as the forerunner of local environmental policy reform, making it a useful window for identifying the frontier of ecological modernization in China (Yee, Lo, & Tang, 2013). Indeed, enterprises in this region have been increasingly under more legalistic regulation and stricter enforcement from local environmental protection bureaus (EPBs) (Francesch, Lo, & Tang, 2012). At the same time, they have been under greater societal and market demands for industrial pollution reduction from an increasingly affluent society (Lo, Fryxell, & Tang, 2010). Given the vastness and geographical diversity of China, experiences in Guangdong are not necessarily representative of the whole country; yet they provide useful clues for understanding corporate environmental compliance in China and other developing countries.

The research strategy in this study involved the complementary use of a survey, personal interviews (both in-depth and structured) and a case study within manufacturing companies. A pilot study was conducted first to serve three purposes: (1) to get a general idea of how companies perceive and deal with environmental regulation, (2) to pretest the reliability of key variables, and 3) to help troubleshoot the questionnaire to be used in the second phase survey and inform the semi-structured interview and the design of the case study. Considerable effort was devoted to administering a larger sample survey as well as a post-survey case study and interviews. The triangulation effect of mixed methods was achieved. The survey provides data on a broad spectrum of enterprises in different sizes and industries, as well as internal and external circumstances. The follow-up case study and interviews help to identify varied patterns in specific situations and to contextualize statistical findings from the surveys (Axinn & Pearce, 2006; Yin, 1989). In addition, data triangulation was also achieved in the case study through comparison between the interview results and objective data such as official environmental statistics.

### **4.3 Data Collection**

A summary of data collection is shown in Table 4.1.

Table 4.1 Data Collection Procedure

		<b>Response rate &amp; Interview material</b>
<b>Pilot survey</b>	2010.9-2011.2 Manufacturing companies in PRD	71/110, 64.5%
<b>The main survey</b>	2011.3-5 Manufacturing companies in PRD	121/300, 40.3%
		<b>Total: 192/410, 46.8%</b>
<b>Case study and in-depth interviews</b>	2012.4-5 Vice presidents, general managers, and environmental managers	Archival documents and semi-structured interview

### 4.3.1 The Pilot Study

The first stage was a pilot survey performed in late 2010 in a business environmental seminar. The survey questionnaire was given to the most senior corporate executive of each company or the top manager of the company who was most knowledgeable about corporate environmental management issues. Out of 110 questionnaires distributed, 71 executives responded, giving a response rate of 64.5%. Given the exploratory nature of the pilot study, the sample size was considered appropriate for obtaining preliminary insights and for assessing the validity of measurement items (Denzin & Lincoln, 1994). We removed one item measuring formalism and one item measuring self-determination to achieve better reliability. The

Cronbach's alphas ranged between 0.76 and 0.92, indicating that the measurements were reliable (Nunnally, 1967)<sup>8</sup>.

### **4.3.2 The Main Survey**

The main survey was implemented in early 2011, with logistic support from the management offices of four industrial parks in the PRD region. Before the survey, we organized a briefing session for the personnel assigned to administering the survey, concerning the procedure of distributing and collecting the questionnaires in individual enterprises within their respective industrial parks. We contacted them three weeks later to follow up on their progress. Among the 300 enterprises selected, 121 usable questionnaires were returned, representing a response rate of 40.3%. Since the samples in the pilot study and the main survey were not significantly different in terms of firm features, we combined these two datasets in the statistical analysis (for a total of 192 samples)<sup>9</sup>. The Cronbach's alphas reported in the following section and the statistical analysis are based on the combined dataset.

Surveyed enterprises included hardware and electronics, paper and packaging, chemical, power plant, metal and machinery manufacture, among others. Table 4.2 presents detailed information on these demographical features. About two thirds of the surveyed companies were private-owned enterprises (67%), followed by foreign-controlled businesses (17%) and state-controlled joint ventures (13%). State-owned

---

<sup>8</sup> Specifically, the alpha scores of the CCS variables are: formalism (3 items)— $\alpha = .76$ , accommodation (4 items)— $\alpha = .83$ , referencing (4 items)— $\alpha = .88$ , and self-determination (3 items)— $\alpha = .92$ .

<sup>9</sup> Additional regressions were conducted using the main survey data only. The hypotheses testing results remain consistent with those using the combined dataset with the exception that the interaction of GVRI and NGRI on accommodation is only marginally significant.

enterprises only accounted for 3% of the sample. All firms had factories operating in mainland China, and about 85% percent were headquartered there. With regard to the years of operation, about 60% of the enterprises had been operating in their current location for 10 years or less, and 17.7% of them for 11-15 years. About 22.3% of the companies had operated in the local area more than 15 years. Firm size is divided into three groups: “1” including firms with fewer than 100 employees (38%), “2” 100-499 employees (32%), and “3” more than 500 employees (30%). Concerning the percentage of exports, 10% of the companies had fewer than 10 percent of export sales, 16% had 11-20 percent of exports, 13% had 21-30 percent of exports, 10% had 31-40 percent of exports, 11% had 41-50 percent of exports, and 16% had over 50 percent of exports. The majority of respondents were general managers (78.7%), followed by 11.2% environmental managers, and 10.1% board members.



Table 4.2 Organizational Features and Respondents Characteristics (N=192)

<b>Firm features</b>		<b>No. of firms</b>	<b>Percentage</b>
<b>Year of operation</b>	Less than 5 years	60	31.3
	5-10 years	57	29.7
	11-15 years	34	17.7
	16-20 years	14	7.3
	21-25 years	4	2.1
	> 25 years	10	5.2
<b>Type of ownership</b>	Private-owned enterprises (POEs)	130	67.7
	Foreign-controlled businesses (FCBs)	32	16.7
	State-controlled joint ventures (SJVs)	24	12.5
	State-owned enterprises (SOEs)	6	3.1
<b>Number of employees</b>	Under 100	74	38.5
	100-499	61	31.8
	500-999	28	14.6
	1000-4999	18	9.4
	Over 5000	6	3.1
<b>Percentage of products exported</b>	Under 10%	19	9.9
	10-20%	30	15.6
	21-30%	26	13.5
	31-40%	19	9.9
	41-50%	22	11.5
	Above 50%	31	16.1
	Not applicable	31	16.1
<b>Headquarter</b>	China	160	83.3
	Abroad	9	4.7
	HK	11	5.7
<b>Respondent features</b>		<b>No. of respondents</b>	<b>Percentage</b>
<b>Position</b>	Board member	17	10.1
	General manager	133	78.7
	Environmental manager/staff	19	11.2
<b>Tenure</b>	Less than 5 years	66	43.4
	5-10 years	61	40.1
	> 10 years	25	16.5

To appreciate the value of the two surveys, one needs to understand the general difficulties of administering policy and management questionnaire surveys in China

(Christensen et al., 2012; Roy, Walters, & Luk, 2001), particularly when the survey involves sensitive environmental issues (Lo & Tang, 2006). Enterprise executives, for example, are often concerned about information on their companies' environmental practices being passed on to the mass media and business competitors, causing them political or economic problems. Response rates in this study were higher than those in recent environmental studies in the U.S. (20%, Christmann, 2004; 13%, Darnall, Potoski, & Prakash, 2010; 11.2%, Delmas & Keller, 2005) and China (10.2%, Liu et al., 2010). This is partly due to the assistance we obtained from the business seminar organizer (for the pilot survey) and the industrial park management offices (for the main survey). Meanwhile, to ensure that all participation was voluntary and that participants were free to express their opinions, strict confidentiality was promised and no identification information was requested of the respondents. Since the questions measuring compliance styles are not directly about environmental performance, but about strategic approaches, social desirability bias for the respondents to over-state achievements are minimized.

### **4.3.3 Case Study & In-depth Interviews**

In-depth interviews were conducted after the completion of the survey and data analysis in the first half of 2012. From the same population above, 10 firms with outstanding environmental performance were chosen for interview. As indicated by their voluntary participation in the Clean Production Program organized by the provincial environmental protection bureau, this group of exemplary firms can be considered as the pioneers in corporate environmental compliance in China.

I included these 10 cases because it became evident that few new ideas were emerging as the data collection process progressed. This sign of “theoretical saturation” (Glaser & Strauss, 1967) suggested that there was enough data methodologically in the selected 10 cases to meet the research objectives. Four of the selected firms were located in the downtown area, while the other six were in the suburbs (industrial parks). Six firms were SOEs, three were POEs, and one was a joint venture (JV). Regarding the listing status, 6 were listed in the mainland China stock market, one in Singapore, one was in IPO, and the remaining two did not have any IPO plans at the time of the interviews. Table 4.3 shows the key characteristics of the interviewed firms.

Table 4.3 Enterprise Profiles in Case Studies

<b>Firms</b>	<b>Industrial sector</b>	<b>Location</b>	<b>Ownership</b>	<b>Listing status</b>	<b>Interviewees</b>
1	Pharmaceutical	Downtown	SOE	Subsidiary of listed company in China	Environmental manager (EM)
2	Chemical	Downtown	SOE	China	EM
3	Electric power	Downtown	SOE	Subsidiary of listed company in China	Vice president and EM
4	Machinery	Downtown	POE	/	General manager
5	Electrical machinery	Suburb	JV	/	General manager
6	Chemical	Suburb	POE	Singapore	EM
7	Non-metallic material	Suburb	SOE	Subsidiary of listed company in China	EM
8	Food	Downtown	SOE	In IPO	EM
9	Electronic component	Suburb	SOE	China	EM
10	Waste recycling	Suburb	POE	China	EM

We collected data from two different sources: (1) Archival documents: including annual reports, internal environmental documents such as the sustainability report (Case 3 & 7), CP program application and assessment files (Case 1), and the environmental performance report for IPO or listed companies (Case 1, 2, 3, 7, 8, 9, & 10). (2) Interviews: we conducted interviews in 10 selected firms between April and July 2012. Before each interview, we emailed or called the company to seek permission and confirm the interview schedule. In the majority of cases, we interviewed senior executives because they were likely to be involved in their company's overall strategic decision-making. All the interviewees were knowledgeable about or directly in charge

of the company's environmental management. Each interview lasted around 1.5 hours, with questions focused on seven aspects of corporate regulatory compliance: major tasks of compliance, environmental strategies, internal capacities, compliance experiences, sources of compliance pressure, possible improvement, and stakeholder expectations (see Appendix I).

#### **4.4 Measurement**

The measures of corporate compliance style, organizational capacity, regulatory intensity, corporate green commitment, and proactive environmental management were in the questionnaire. We developed the measurements of OC, RC, NGC and PEM following well-tested constructs in the current literature. All items were measured on a seven-point Likert scale, with detailed wording provided in Appendix II (CCS measurement is also shown in Table 4.4, while PEM measurements are also shown in Table 5.5). All measures were developed in English and translated into Chinese by a bilingual expert.

##### **4.4.1 PEM**

PEM is the dependent variable in the research model of Study 2. Since PEM does not necessarily equal the sum of environmental programs and tools, a feasible measurement is to identify to what extent the major pro-environmental programs/initiatives are integrated into business operations. Following the scales developed in corporate environmental management studies (particularly those in the Chinese regulatory context, e.g. Liu et al., 2010; Lo, Fryxell, & Tang, 2010; Yee, Lo, &

Tang, 2013), we asked respondents to describe the adoption level of 10 pro-environmental practices. For each practice, we presented the following seven-point scale: “not being considered” (coded 1), “considered with no further implementation” (2), “piloted it without official implementation” (3), “implemented but not the focus” (4), “currently implementing as a focus” (5), “implemented and closely connected to other departments” (6), and “successfully implemented as an integral part of business operation” (7). By providing intermediate choices to respondents, we were able to obtain a more nuanced measure instead of a simple dichotomous response as to whether or not a PEM practice was adopted. We then summed the 10 items together to measure PEM (Cronbach’s alpha: .93).

#### **4.4.2 CCS**

We adopted a total of 14 items to measure four CCS dimensions (after the deletion of 2 items based on pilot study results). Each item is based on a statement by which respondents indicate how strongly they agree that their company has adopted a certain compliance style dimension. Items were first reviewed by a group of academics, industry experts, and local EPB officials to ensure that the measures were relevant and easy to understand. Revisions to the questionnaire were made based on these inputs. Factor analysis was conducted using varimax rotation. Table 4.4 shows that four components, accounting for 61.4% of the variance among the 14 items, were extracted—each with an eigenvalue greater than 1.0. We then formed a scale for each style dimension by averaging all items under each heading.

Table 4.4 A Principal Component Analysis of CCS Items

Component/item content	Component			
	1	2	3	4
<b>Formalism <math>\alpha = .70</math></b>				
We emphasize whether we meet the formal environmental standards	-.010	.291	.009	<b>.623</b>
Our most important duty is to strictly follow environmental laws	.296	.069	.120	<b>.818</b>
Formal regulation is our compliance benchmark and guideline	.069	.069	.121	<b>.793</b>
<b>Accommodation <math>\alpha = .72</math></b>				
Central political leaders' environmental opinion is important to us	.148	<b>.797</b>	-.022	.193
Local political leaders' environmental opinion is important to us	.101	<b>.855</b>	.095	.021
Local people's congresses and CPPCC's opinion is important to us	.490	<b>.500</b>	.036	.184
Local EPB's environmental opinion is not important to us (R)	-.033	<b>.519</b>	.313	.184
<b>Referencing <math>\alpha = .78</math></b>				
We learn from green pioneers' environmental actions	<b>.773</b>	.063	.203	.086
We try to be consistent with competitors' environmental behaviors	<b>.614</b>	.188	.131	.019
We communicate with peers on environmental issues	<b>.776</b>	.047	.203	.094
We adopt industrial associations' environmental recommendations	<b>.795</b>	-.005	.035	.111
<b>Self-determination <math>\alpha = .73</math></b>				
We have our own plan in environmental protection	.295	.147	<b>.678</b>	-.038
We have our own understanding of greening the company	.116	.028	<b>.875</b>	.126
We have our own environmental performance evaluation system	.130	.079	<b>.731</b>	.128
<i>Note: (R) Reverse worded</i>				

We further conducted a confirmatory factor analysis to evaluate the convergent, discriminant, and nomological validity of the CCS constructs using AMOS 19.0. The results showed that the hypothesized four-factor model yields a good fit (CFI = .95, TLI = .93, RMSEA = .05;  $\chi^2 = 102.52$ , degrees of freedom = 66,  $p < .01$ ). A better fit was noted when compared with the one-factor model ( $\Delta\chi^2 = 300.45$ ,  $\Delta df = 11$ ,  $p < .001$ ). The  $\chi^2/df$  ratios 1.55 ( $< 2.0$ ) in the four-factor model indicates a very good fit (Hair et al. 2010). The RMSEA of 0.05 here is below the standard threshold (.08). These results confirm that all loadings are highly significant, as required for convergent validity. The average variance-extracted values for any two factors are greater than the corresponding inter-construct squared correlations, indicating no problems with discriminant validity for the four-factor CCS model. Nomological validity was also supported, as the four factors are positively related to each other<sup>10</sup>.

#### **4.4.3 OC**

The measurements for OC are adapted from Russo and Fouts (1997), which capture managers' perceptions of a firm's resource endowment. A total of 12 items were used, including those related to technical resources, human and financial capital, and various intangible resources. More specifically, three items were set to indicate firms' technical resources. Five items were used to measure financial and human resources. Four items were used to measure intangible resources. The Cronbach's alpha was .87.

---

<sup>10</sup> It also suggests that the common method bias is not a serious problem since four factors were identified.



#### **4.4.4 RI**

A total of 12 items were used to measure RI<sup>11</sup>. GVRI was measured by asking respondents if they had faced explicit environmental demands from four government stakeholders, namely the central government, the local government, the local EPB, and other government agencies. The Cronbach's alpha was .80. Similarly, NGRI was measured by asking respondents if they faced demands from eight non-government stakeholders. The Cronbach's alpha was .88.

#### **4.4.5 NGC**

The measurement of NGC was adapted from the normative dimension of Meyer and Allen's (1997) scale as the most widely used organizational commitment measurement. To be more suitable for the environmental context, we revised the original items and excluded those unrelated to environmental management. A total of three items were employed: (1) "we are responsible for the negative environmental externality that we produced", (2) "the reason we keep working on environmental management is that we strongly believe compliance is important and we feel a moral obligation to do so", and (3) "reducing environmental pollution is our responsibility". The Cronbach's alpha was .85.

---

<sup>11</sup> Exploratory factor analysis results show that the two components (GVRI and NGRI) accounting for 59% of the variance among the 12 items—each with an eigenvalue greater than 1.0.

#### **4.4.6 Controls**

We included dummy and other proxy variables in the analysis: (1) years of operation in the current location, (2) firm size, (3) export proportion, (4) ownership, and 5) degree of industrial pollution. Years of operation are important because more developed firms are likely to encounter greater pollution problems and face the need to adjust corporate strategies to cope with them (Henderson & Clark, 1990). Regarding the role of firm size, larger enterprises 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. We also controlled the effect of export proportion in the firm's annual sales. This is because export-oriented firms usually face greater pressure from international markets and export countries for better environmental practices (Christmann & Taylor, 2001; Gunningham, Kagan, & Thornton, 2003). We introduced three dummy variables to differentiate firms among four ownership groups: SOEs, SJVs, FCBs, and POEs. We selected these four types because existing studies show that managers' perception of environmental issues reflects different ownership types in China (e.g. Steger, Fang, & Lü, 2003). Two dummy variables were introduced to capture the industrial differences in pollution levels. Three groups—high, medium, and low—were classified following the advice of a vice deputy of a local EPB.

#### **4.5 Analytical Procedures**

We conducted several preliminary analyses before testing the hypotheses. We examined the likelihood of non-response bias in the main survey, following Kanuk and

Berenson's recommendations (1975). First, there are no obvious demographic differences between responding and non-responding enterprises in terms of firm size and ownership. Second, we divided the respondents into two groups by response time. T-test results revealed no significant differences in mean scores of firm features between early respondents (first 75%) and late respondents (last 25%)<sup>12</sup>. To minimize the potential risk of common method biases, we presented the survey items in a nonthreatening, neutral tone (Nederhof, 1985), followed by a Harman one-factor test (Harman, 1976). The first factor accounted for 25% of the variance. The results hence eliminated the possibility of any serious problem associated with common method biases.

To test the hypotheses in Study 1, we conducted hierarchical multiple regressions. All variables were standardized before entering into the regression, to avoid multicollinearity and unstable regression estimates<sup>13</sup>. After regressing CCS on the control variables in step 1, we entered OC, GVRI, and NGRI in step 2. In step 3, we entered the three interaction terms: OC×GVRI, OC×NGRI, and GVRI×NGRI.

To test the mediation hypothesis in Study 2, we followed Baron and Kenny's (1986) procedure of mediation effect test. In a complementary analysis, we used an SPSS macro developed by Preacher and Hayes (2008) to test the multiple-mediator model. The advantage of this technique is that one learns whether the mediation is independent of the effect of the other mediators by testing all mediators simultaneously.

---

<sup>12</sup> As late respondents to mail surveys resemble more to non-respondents than early respondents (Fowler, 1993), significant differences could have indicated a response bias.

<sup>13</sup> The correlation between GVRI and NGRI is relatively high (.73) and may lead to multicollinearity concerns. We checked the Variance Inflation Factor (VIF) measures of these two variables, and the VIF for both was around 2.0 and below the threshold (5.0).

To test the moderated mediation hypothesis, we conducted hierarchical multiple regressions following the steps suggested by Muller, Judd, and Yzerbyt (2005) in testing moderated mediation. Three models were tested<sup>14</sup>:

$$Y=b_{10}+b_{11}X+b_{12}Mo+b_{13}XMo+e_1 \quad (1)$$

$$Me=b_{20}+b_{21}X+b_{22}Mo+b_{23}XMo+e_2 \quad (2)$$

$$Y=b_{30}+b_{31}X+b_{32}Mo+b_{33}XMo+b_{34}Me+b_{35}MeMo+e_3 \quad (3)$$

The moderated mediation effect is confirmed if 1)  $b_{11}$  is significantly different from zero while  $b_{13}$  is not, or 2) either (or both) of two patterns exist: both  $b_{23}$  and  $b_{34}$  are significant or both  $b_{21}$  and  $b_{35}$  are significant (Muller, Judd, & Yzerbyt, 2005).

As regards the qualitative study, we prepared an interview summary after each firm visit, including interview results, field observations and other information collected. We then combined the interview summary and previously collected firm background information to create an individual profile for each case. Transcript coding was completed by three researchers based on our research focuses: compliance style, organizational capacity, regulatory environment, commitment and proactive environmental practices. Further data analyses were conducted by grouping and integrating archival and interview data, and triangulating between managers' perceptions and official data<sup>15</sup>.

---

<sup>14</sup> Y: the dependent variable; X: the independent variable; Mo: moderator; Me: mediator.

<sup>15</sup> Content analysis rather than a qualitative comparative analysis was adopted in this study mainly because the case studies aim only to supplement the quantitative methodology rather than work as a main study.

## CHAPTER 5 SURVEY STUDY FINDINGS

### 5.1 Results of Study 1

This section presents the hypotheses testing results of Study 1. We hypothesized that OC is positively related to CCS (H1); GVRI is positively associated with the compliance style dimensions of formalism and accommodation (H2); NGRI is positively associated with the compliance style dimensions of referencing and self-determination (H3); and OC, GVRI and NGRI have an interactive effect on corporate compliance style (H4).

#### 5.1.1 Descriptive Statistics

Table 5.1 presents means, standard deviations, and correlations. On average, the surveyed firms score higher on the compliance style dimensions of formalism ( $\bar{x} = 5.73$ ) and accommodation ( $\bar{x} = 5.41$ ) than those of referencing ( $\bar{x} = 5.23$ ) and self-determination ( $\bar{x} = 5.25$ ). Some control variables also suggest interesting relationships. First, private firms are likely to score higher on the referencing dimension than firms of other ownership types. This might indicate that private firms in China are usually subject to greater market competition than firms of other ownership types. Second, firms in highly polluting industries are likely to score lower on the referencing and self-determination dimensions. This may be because highly polluting industries were the major targets for regulatory enforcement by governments. Explicit regulatory standards

and close surveillance from regulatory agencies make it unnecessary to follow others' practices; they also leave limited room for organizational initiatives.

Table 5.1 Descriptive Statistics and Correlations (N=192)<sup>a</sup>

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Organizational capacity	5.41	.86														
2. Regulatory intensity from government stakeholders	5.15	1.21	.46*													
3. Regulatory intensity from non-government stakeholders	4.99	1.17	.44*	.73*												
4. Formalism	5.73	.99	.52*	.17*	.15*											
5. Accommodation	5.41	.94	.46*	.32*	.24*	.38*										
6. Referencing	5.23	1.14	.57*	.33*	.46*	.28*	.35*									
7. Self-determination	5.25	1.08	.45*	.19*	.16*	.24*	.29*	.40*								
8. Operation years	2.30	1.36	-.11	-.23*	-.20*	.01	-.03	-.14*	.046							
9. Firm size	2.04	1.10	-.05	-.23*	-.22*	-.07	-.05	-.09	.15*	.63*						
10. Export	4.19	2.03	-.03	-.04	-.07	-.03	-.04	-.10	-.12	-.05	-.13					
11. POE	.68	.46	.18*	.25*	.42*	.05	.10	.25*	.01	-.36*	-.32*	-.06				
12. FCB	.17	.37	-.11	-.21*	-.28*	-.02	-.06	-.21*	.02	.26*	.26*	.09	-.64*			
13. SJV	.13	.33	-.05	-.07	-.20*	.01	-.04	-.04	-.02	.07	.10	.02	-.54*	-.16*		
14. High polluting firm	.17	.37	-.22*	-.18*	-.27*	-.05	-.05	-.24*	-.13	.29*	.29*	-.15*	-.22*	.13	.12	
15. Medium polluting firm	.40	.49	.10	.20*	.30*	.07	-.04	.13	-.03	-.20*	-.23*	.04	.24*	-.10	-.21*	-.36*

<sup>a</sup> \*. Correlation is significant at the 0.05 level (2-tailed).

Table 5.2 shows the descriptive survey data of firms' OC. In general, the surveyed firms are technically capable, while intangible resources related to environmental issues are in relative low sufficiency. Also worthy of note is that professional human resources in the environmental field are the most lacked resources in the firms we studied.

Table 5.2 Descriptive Data of Organizational Capacity Measuring Items

	<b>Items</b>	<b>Mean</b>	<b>SD</b>
<b>Technical resources</b>	Green technology	5.53	1.18
	Technical update	5.54	1.18
	Cleaner production process	5.74	1.13
<b>Human &amp; Financial resources</b>	Environmental staff	5.09	1.43
	General employee involvement	5.50	1.32
	Financial capacity	5.36	1.40
	Manager holds more duties	5.60	1.29
	Internal coordination	5.39	1.32
<b>Intangible resources</b>	Green reputation	5.49	1.29
	Channel of policy information	5.36	1.42
	Channel of tech information	5.30	1.42
	Close stakeholder relationship	5.31	1.56

Table 5.3 shows the descriptive statistics on RI from regulatory stakeholders. From the perspective of the surveyed firms, "local EPB" from the government stakeholder group exerted the greatest environmental demand on the firms ( $\bar{x}=5.35$ ). This is followed by customer demands ( $\bar{x}=5.25$ ). The central government exerts a higher degree of demands than the local government, while non-environmental agencies exert the lowest degree of demands among all government stakeholders ( $\bar{x}=5.00$ ). In addition, local government exerts fewer pressures than two major societal stakeholders:



the local community ( $\bar{x}=5.14$ ) and environmental NGOs ( $\bar{x}=5.16$ ). Two actors from the market category (financial organizations and competitors) rank the lowest, with mean values of 4.69 and 4.78 respectively.

Table 5.3 Descriptive Data of Regulatory Intensity Measuring Items

	<b>Actors</b>	<b>Mean</b>	<b>SD</b>
<b>Government Demands</b>	Central Government	5.19	1.56
	Local Government	5.06	1.47
	Local EPB	5.35	1.47
	Non-environmental Agencies	5.00	1.63
<b>Non-government Demands</b>	Local Community	5.14	1.51
	Public Media	5.01	1.51
	Environmental NGOs	5.16	1.49
	Financial Organizations	4.69	1.65
	Investors	4.96	1.67
	Competitors	4.78	1.63
	Industrial (Business) Associations	4.96	1.76
	Consumers	5.25	1.52

### 5.1.2 Regression Results

The estimates for the regression models are reported in Table 5.4. We found that OC has a positive impact on all four dimensions (formalism:  $b = .59, p < .001$ ; accommodation:  $b = .39, p < .001$ ; referencing:  $b = .52, p < .001$ ; self-determination:  $b = .47, p < .001$ ). These results lend solid support to Hypothesis 1, which predicts that a organizational capacity is positively related to each of the four compliance style dimensions. The results also suggest that compared with “formalism” and “referencing”, “self-determination” and “accommodation” are likely to require more resources given that their beta-coefficients are lower. It is interesting to note that “accommodation” appears to be the most resource-intensive dimension ( $b = .39$ ). Apparently, handling

political demands may distract firms from achieving cost-effective compliance, since many political demands are temporary rather than long-term. In the Chinese regulatory context, however, satisfying political demands is almost as important as, if not more important than, being legally in compliance.

Table 5.4 Regression Coefficients of Model Predicting CCS Dimensions

	<b>Formalism</b>		<b>Accommodation</b>		<b>Referencing</b>		<b>Self-determination</b>	
Steps and variables	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Constant	5.81		5.32		5.26		5.22	
<b>(a) Controls</b>								
Years of operation	.16	.09	.043	.09	.02	.12	.01	.11
Firm size	-.18	.09	-.07	.09	.02	.11	.17	.11
Export	-.04	.07	-.03	.07	-.15	.09	-.15	.08
POE	.05	.21	-.01	.20	.63*	.25	.24	.25
FCB	.06	.17	.02	.16	.27	.21	.20	.20
SJV	.12	.16	.02	.15	.35	.20	.13	.19
High polluting firm	.05	.08	.00	.07	-.22*	.10	-.22*	.09
Medium polluting firm	.05	.07	-.08	.07	.06	.10	-.06	.09
<b>(b) Main effect</b>								
OC	.59***	.09	.40***	.09	.52***	.08	.47***	.09
GVRI	-.03	.11	.23*	.10	-.21*	.11	.041	.11
NGRI	-.10	.12	-.02	.11	.42***	.11	.059	.12
<b>(c) Interaction</b>								
OC × GVRI	.10	.11	.19	.10	-.13	.11	-.11	.12
OC × NGRI	-.14	.11	-.18	.10	-.14	.11	-.15	.12
GVRI × NGRI	-.02	.05	.14**	.05	.12*	.06	.14*	.06
<b>(d) Model Information</b>								
R <sup>2</sup> Controls only	3.5%		3.4%		14.6%**		7.1%	
ΔR <sup>2</sup> Controls + main effects	28.4%***		23.3%***		28.3%***		18.1%***	
ΔR <sup>2</sup> Controls + main Effects + Interactions	1%		5.1%**		4.4%**		5.0**	
Total R <sup>2</sup> (best model)	32.9%		31.8%		47.4%		30.3%	
* $p < .05$ ; ** $p < .01$ ; *** $p < .001$ .								

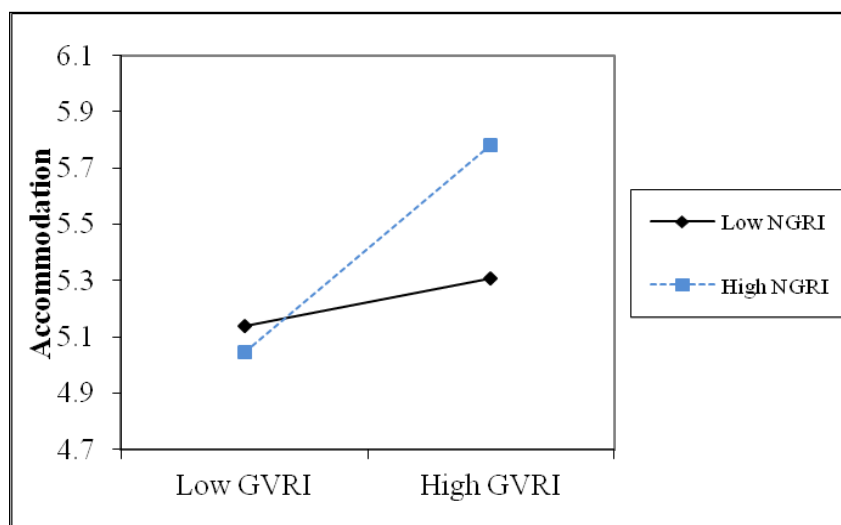
The regulatory intensity from government stakeholders (GVRI) is positively related to accommodation ( $b = .23, p < .05$ ). Thus H2 is partially supported. In support of H3, regulatory intensity from non-government stakeholders (NGRI) has a positive and statistically significant effect on referencing ( $b = .42, p < .05$ ). But this positive influence was insignificant on self-determination ( $b = .06, n.s.$ ), possibly because self-determination stresses internal flexibility and autonomy rather than passive responses to external demands.

In support of H4, which predicts interactions among internal capacity and regulatory intensities from two groups of stakeholders, we found a marginally significant effect of the interaction between OC and NGRI on accommodation ( $b = -.18, p = .08$ ). Nevertheless, the statistical results did not show any significant effects of interactions between OC and GVRI. In other words, government demands play a limited role in either strengthening or weakening the positive association between organizational capacity and compliance style.

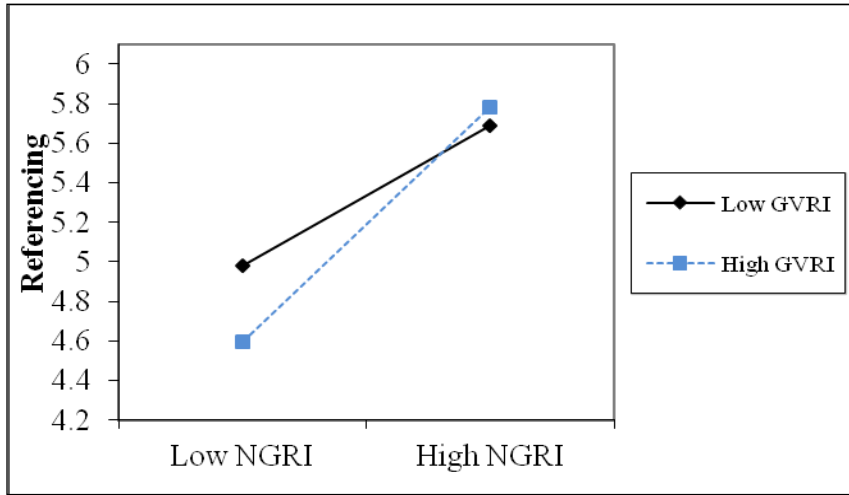
In support of H4, which predicts interactions between two groups of regulatory stakeholders, we found significant interactive effects of GVRI and NGRI on three CCS dimensions: accommodation ( $b = .14, p < .01$ ), referencing ( $b = .12, p < .05$ ), and self-determination ( $b = .14, p < .05$ ). Apparently, regulatory pressures from government and non-government stakeholders have a joint effect on all dimensions except formalism. Following the procedures outlined by Aiken and West (1991), the forms of these joint effects are shown in Figure 5.1 (a-c).

The positive effect of GVRI on accommodation only exists when the regulatory intensity from non-government stakeholders is high (see Figure 5.1(a), simple slope test:  $b = .37, p < .05$ ). This positive effect fades away when there is a low degree of demand from non-government stakeholders (simple slope test:  $b = .09, n.s.$ ). Similar interaction effects can also be observed on self-determination (see Figure 5.1(c). Referencing appears to be mainly driven by the pressure from non-government stakeholders. NGRI's positive influence is stronger when regulatory intensity from governmental stakeholders is high (see Figure 5.1(b), simple slope test:  $b = .59, p < .001$ ) than when it is low (simple slope test:  $b = .35, p < .05$ ). Overall, a firm's adoption of these three CCS dimensions is highest when it is under high regulatory pressure from both government and non-government stakeholders.

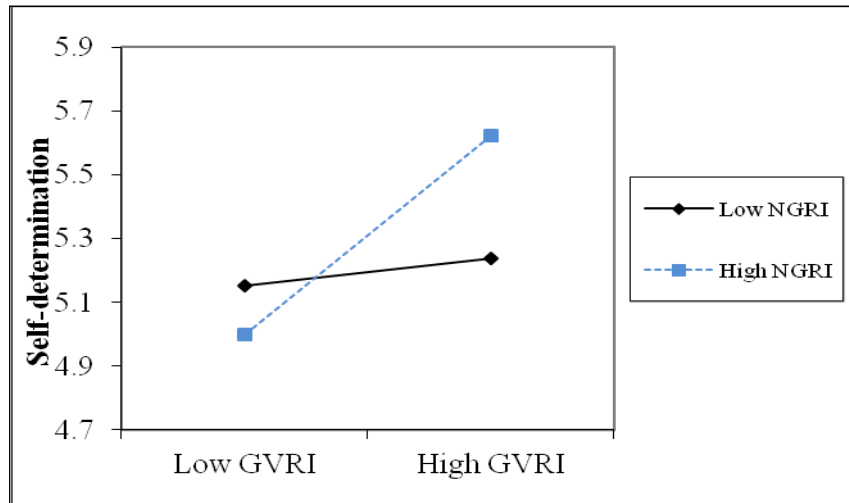
Figure 5.1 Plots of the Interactions between GVRI and NGRI in Predicting Accommodation (a), Referencing (b) and Self-determination (c) (N = 192)



(a)



(b)



(c)

## **5.2 Results of Study 2**

This section presents the hypotheses testing results of Model 2. We hypothesized that CCS mediates the positive relationship between OC and PEM (H5), and NGC moderates the indirect effect of OC on PEM through CCS (H6).

### **5.2.1 Descriptive Statistics**

Table 5.5 provides a summary of surveyed companies' PEM. The top four integrated environmental programs (rated 5-6) are: recycling of resources and byproducts ( $\bar{x} = 5.39$ ), routine environmental audits ( $\bar{x} = 5.22$ ), EMS certification, ( $\bar{x} = 5.18$ ), and reductions in resources consumption ( $\bar{x} = 5.08$ ). The least adopted proactive environmental practice is drafting an annual environmental report ( $\bar{x} = 4.56$ ), which is consistent with previous empirical results of studies on corporate environmental management in China (Liu et al., 2010).

Table 5.5 Descriptive Statistics of PEM (N=192)

	<b>Mean</b>	<b>SD</b>
1. Clean Production Assessment	4.98	1.78
2. EMS certifications, such as ISO 14001	5.18	2.01
3. Reduction in resources consumption (e.g. clean water, electricity, material)	5.08	1.62
4. Substitution by renewable materials or energy sources	5.39	1.59
5. Periodical evaluation of firms' environmental performance	5.22	1.64
6. Environmental training for managers	5.00	1.75
7. Environmental training for operatives	4.90	1.74
8. Setting environmental objectives as part of the annual business plans	4.93	1.70
9. Including environmental performance measures in management evaluations	4.95	1.80
10. Preparation and release of environmental reports	4.56	1.86

Table 5.6 presents means, standard deviations, and correlations. Some control variables first suggest interesting relationships. Regardless of the CCS dimensions, firms with the following features are more likely to perform better in PEM: (1) fewer years of operation in the existing location, (2) larger size, and (3) higher level of general environmental demands from non-government stakeholders. Meanwhile, SJVs are less likely to achieve better PEM than other ownership types. When the CCS dimensions are controlled, high polluting enterprises are more likely to achieve better PEM than less polluting entities.



Table 5.6 Descriptive Statistics and Correlation (N=192)

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
OC	5.41	.86																	
Formalism	5.41	.94	.52**																
Accommodation	5.23	1.14	.46**	.38**															
Referencing	5.25	1.08	.57**	.28**	.35**														
Self-determination	5.73	.99	.45**	.24**	.29**	.40**													
NGC	5.83	.89	.56**	.46**	.29**	.33**	.37**												
PEM	5.01	1.36	.73**	.27**	.33**	.52**	.38**	.33**											
Operation Year	2.30	1.36	-.11	.01	-.03	-.14*	.04	.08	-.23**										
Size	2.04	1.10	-.05	-.07	-.05	-.09	.15*	.08	-.05	.63**									
Export	4.19	2.03	-.12	-.16*	-.19*	-.08	-.22**	-.17*	-.13	-.02	-.07								
POE	.68	.46	.18**	.05	.10	.25**	.01	.04	.25**	-.36**	-.32**	-.22**							
FCB	.17	.37	-.11	-.02	-.06	-.21**	.02	.03	-.15*	.26**	.26**	.18*	-.64**						
SJV	.13	.33	-.05	.015	-.04	-.04	-.02	-.04	-.14*	.07	.10	.15	-.54**	-.17*					
High polluting	.17	.37	-.22**	-.05	-.05	-.24**	-.13	-.12	-.17*	.29**	.29**	-.06	-.22**	.13	.12				
Medium polluting	.40	.49	.10	.07	-.04	.13	-.03	.03	.16*	-.20**	-.23**	.09	.24**	-.11	-.21**	-.36**			
GVRI	5.15	1.21	.46**	.17*	.32**	.33**	.19**	.14	.40**	-.23**	-.23**	-.07	.25**	-.21**	-.07	-.18*	.20**		
NGRI	4.99	1.17	.44**	.15*	.24**	.46**	.16*	.15*	.48**	-.20**	-.22**	-.09	.42**	-.29**	-.20**	-.27**	.30**	.73**	

### 5.2.2 Tests of Mediation

Table 5.7 shows the results of the mediation test. After entering all the control variables, OC was found to be positively related to PEM ( $b = .92, p < .001$ ). At the same time, OC was positively related to an adoption of formalism ( $b = .69, p < .001$ ), accommodation ( $b = .46, p < .001$ ), referencing ( $b = .60, p < .001$ ), and self-determination ( $b = .54, p < .001$ ). However, none of the CCS dimensions (formalism:  $b = -.11, n.s.$ ; accommodation:  $b = .01, n.s.$ ; referencing:  $b = .09, n.s.$ ; self-determination:  $b = .07, n.s.$ ) was related to PEM when controlling the effect of OC. This result is further supported by bootstrapping estimates based on 5,000 bootstrap samples (see Appendix III). Thus Hypothesis 5 about the mediation effect of CCS is not supported. Although the mediation model was not significant, it suggested the presence of a potential moderator regulating the mediation effects on PEM.

Table 5.7 The Mediating Role of CCS

	<b>Model 1</b>	<b>Model 2 (formalism)</b>	<b>Model 3 (accommodation)</b>	<b>Model 4 (referencing)</b>	<b>Model 5 (self- determination)</b>	<b>Model 6</b>
Variables	Estimate	Estimate				Estimate
Years of operation	-.37***	.16	.07	-.04	-.00	-.35***
Firm size	.24**	-.19*	-.07	.04	.17	.20*
Export	-.03	-.03	-.02	-.08	-.12	-.02
POE	-.30	.05	.05	.17	-.04	-.31
FCB	-.25	.06	.03	.04	.03	-.24
SJV	-.37*	.12	.01	.11	-.05	-.36*
High polluting firm	.14	.04	.02	-.07	-.12	.16*
Medium polluting firm	.10	.05	-.09	.01	-.06	.11
GVRI	-.13	-.02	.14	-.17	.03	-.10
NGRI	.34**	-.08	-.01	.36***	-.01	.26**
OC	.92***	.69***	.46***	.60***	.54***	1.05***
Formalism						-.11
Accommodation						.01
Referencing						.09
Self-determination						.07
Model F statistics	26.22***	7.07***	5.50***	7.76***	5.10***	19.69***
Adjusted R <sup>2</sup>	.61***	.27***	.219***	.21***	.20***	.61***

### 5.2.3 Tests of Moderated Mediation

Hypothesis 5 predicted that NGC moderates the indirect effect of OC on PEM through CCS, such that the mediation effects of CCS on the association between OC and PEM are stronger when the NGC level is high. As shown in column 1 in Table 5.8, the negative effect of years of operation and ownership of SJV, and the positive effect of firm size and high degree of pollution on PEM are consistent with the result in the mediation model. Column 2 shows the results from equation 1, indicating an overall effect of OC on PEM ( $b_{11} = .926, p < .001$ ). This effect is not moderated by NGC ( $b_{13} = -.10, n.s.$ ). Columns 2-4 show the results of equations 2 and 3 respectively when referencing is the mediator. In equation 2, there is a significant effect of OC ( $b_{21} = .47, p < .001$ ) on referencing. From the equation 3 results, referencing has a significant effect on PEM ( $b_{34} = .17, p < .05$ ) and there is a significant CCS  $\times$  NGC interaction ( $b_{35} = .18, p < .01$ ). Thus a significant moderated mediation is noted: the magnitude of the indirect effect of OC, via referencing, varies in magnitude as a function of NGC.

Table 5.8 Regression Results of Moderated Mediation

Predictors	Referencing		Self-determination				Formalism			Accommodation								
	Model 1	Model 2a	Model 3a	Model 2b	Model 3b	Model 2c	Model 3c	Model 2d	Model 3d									
Constant	5.03	5.21	5.03	5.24	4.99	5.77	5.03	5.42	5.04									
Years of operation	-.35**	.12	-.03	.10	-.32**	.09	.01	.11	-.33**	.12	.17	.10	-	.09	.07	.10	-.31**	.10
Size	.32*	.12	.08	.10	.22*	.09	.21	.11	.21*	.09	-.13	.10	.20*	.09	-.03	.09	.21*	.09
Export	-.05	.09	-.09	.08	-.01	.06	-.13	.08	-.01	.0	-.05	.08	-.03	.06	-.02	.07	-.03	.07
POE	.02	.27	.35	.24	-.24	.20	.12	.25	-.25	.06	.26	.23	-.28	.20	.19	.21	-.28	.20
FCB	.01	.22	.18	.19	-.18	.16	.15	.20	-.24	.20	.22	.19	-.24	.16	.13	.17	-.25	.16
SJV	-.13	.21	.24	.18	-.34*	.15	.06	.19	-.33*	.16	.27	.18	-.36*	.15	.10	.16	-.36*	.15
High polluting	-.01	.10	-.15	.08	.17*	.07	-.19	.09	.16*	.15	-.05	.08	.17*	.07	-.04	.07	.16*	.07
Medium polluting	.03	.10	-.03	.08	.08	.07	-.10	.09	.11	.07	.01	.08	.11	.07	-.12	.07	.11	.07
GVRI	.13	.13	-.05	.11	-.11	.10	.18	.12	-.16	.07	.14	.11	-.13	.10	.29**	.10	-.12	.10
NGRI	.54***	.14	.53***	.12	.29**	.11	.09	.13	.36**	.10	.03	.12	.31**	.10	.06	.11	.30**	.11
X: OC	.92***	.09	.47***	.10	.86***	.10	.35**	.10	.89***	.09	.45***	.08	.97**	.10	.34**	.08	.92**	.10
												*		*		*		
MO: NGC	-.08	.08	.08	.08	-.08	.08	.20*	.09	-.06	.08	.23**	.08	-.06	.08	.08	.08	-.08	.08
XMO:	-.10	.06	.02	.06	-.17*	.07	-.01	.07	-.14*	.06	-.01	.06	-.10	.07	.01	.06	-.08	.07
OC*NGC																		
ME:					.17*	.08			.09	.07			-.09	.08			.011	.07
ME*MO:					.18**	.07			.17*	.07			.01	.08			-.06	.07

\*  $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

Columns 2, 5, and 6 in Table 5.8 show the results of the moderating role of NGC, with self-determination being the mediator. In equation 2, there is a significant effect of OC ( $b_{21} = .349, p < .05$ ) on self-determination. Further, this is not moderated by NGC ( $b_{23} = -.015, n.s.$ ). In the equation 3 results, there is a significant  $CCS \times NGC$  interaction ( $b_{35} = .168, p < .05$ ). This significant interaction is indicative of moderated mediation. It means that the magnitude of the indirect effect of OC, via self-determination, varies in magnitude as a function of NGC. The insignificant coefficient  $b_{35}$  shown in Columns 8 and 10 suggests that the moderated mediation effect is insignificant when formalism and accommodation are mediators.

Overall, H5 is partially supported. The indirect effect of OC on PEM through referencing and self-determination depends on the degree of NGC. Figure 5.2 shows the plot of the interactive effect of referencing and NGC on PEM, following the procedures outlined by Aiken and West (1991) for testing simple slopes. The effect of referencing is positive under conditions of high normative commitment (simple slope test:  $b = .351, p < .01$ ), but insignificant when commitment is low (simple slope test:  $b = -.005, n.s.$ ). Similarly, Figure 5.3 plots the interactive effect of self-determination and NGC on PEM. As posited, self-determination is not significantly related to PEM ( $b = -.076, n.s.$ ) when NGC is low, but is positively related to PEM ( $b = .26, p < 0.05$ ) when a firm has a high level of CGC. Therefore, the mediating effects of referencing and self-determination are stronger in firms with a higher level of normative commitment.

Figure 5.2 Plots of the Interaction between Referencing and NGC on PEM

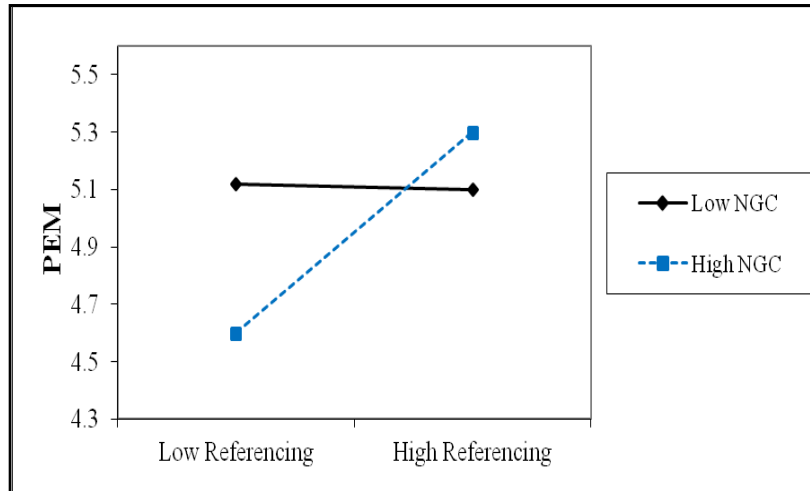
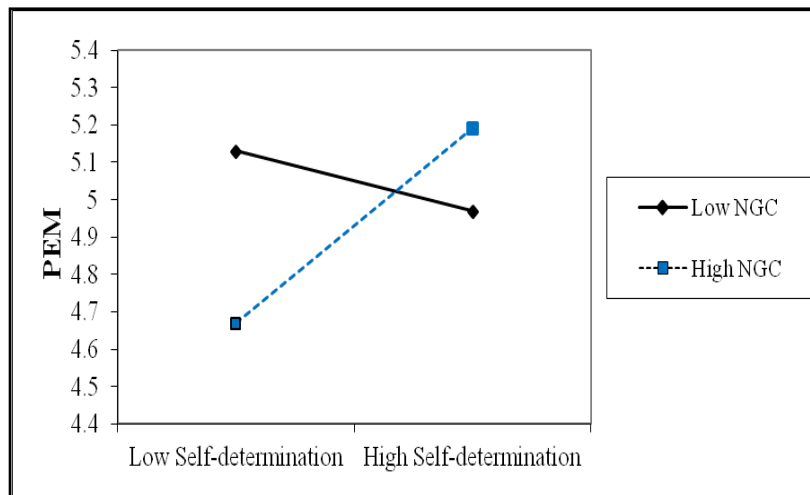


Figure 5.3 Plots of the Interaction between Self-determination and NGC on PEM



### **5.3 Hypotheses Testing Summary**

Table 5.9 summarizes all the hypotheses and empirical results. In Study 1, the main effect of OC is fully supported, while the main effects of GVRI and NGRI are partially supported. The interaction hypothesis among OC, GVRI, and NGRI is also partially supported. In Study 2, the mediating effect of CCS is not supported. The moderated mediating effect of NGC is partially supported.



Table 5.9 A Summary of Hypotheses and Testing Results in Study 1 and Study 2

<b>Hs</b>	<b>Description</b>	<b>Results</b>	<b>Details</b>
<b>Study 1</b>			
<b>H1</b>	OC is positively related to each of the four compliance style dimensions: formalism, accommodation, referencing, and self-determination.	Supported	OC is positively related to all CCS dimensions
<b>H2</b>	The regulatory intensity from government stakeholders is positively associated with the compliance style dimensions of formalism and accommodation.	Partially supported	GVRI has positive effect on adoption of accommodation, but such effect is insignificant on formalism dimension; GVRI also has a negative impact on referencing.
<b>H3</b>	The regulatory intensity from non-government stakeholders is positively associated with the compliance style dimensions of referencing and self-determination.	Partially supported	NGRI has positive effect on adoption of referencing, but such effect is insignificant on self-determination dimension.
<b>H4</b>	Organizational capacity and regulatory intensity from government and non-government stakeholders have an interactive effect on corporate compliance style.	Partially supported	The interactions between GVRI and NGRI are significant on three CCS dimensions: accommodation, referencing, and self-determination.
<b>Study 2</b>			
<b>H5</b>	CCS mediates the positive association between organizational capacity and proactive environmental management.	Not supported	None of the CCS dimensions significantly mediated the relationship between OC and PEM
<b>H6</b>	NGC moderates the indirect effect of organizational capacity on proactive environmental management through corporate compliance style:	Partially supported	The indirect effect of referencing and self-determination is stronger when a firm has a higher degree of CGC

## CHAPTER 6 CASE STUDY AND INTERVIEW FINDINGS

An in-depth case study and interviews were conducted in 10 environmentally progressive firms in the PRD region to provide further understanding of our three key research questions. We present descriptions of each case first, followed by the key findings and how they triangulate with prior survey results.

### 6.1 Case Descriptions

#### 6.1.1 Firm 1

**Company Background:** Firm 1 is a state-owned pharmaceutical company with more than 60 years' history and currently a subsidiary of a listed company in China. Located downtown, it was a top 500 manufacturing company and in the top 50 in the pharmaceutical industry in China. Firm 1 planned to relocate to the suburbs under the policy of “suppress the second industry and advance the third industry—the so-called Tuier Jinsan (TEJS)” introduced by the local government in 2007. Due to some unsettled land use issues, it is currently still operating in the downtown area.

**Environmental Strategy:** Firm 1's environmental strategy is “low carbon business development and environmentally friendly medicine manufacturing. Do not harm the living environment of the local community, and convince them that we are a clean company operating in their neighborhood”.

**Complying Initiatives:** A number of end-of-pipe and preventive programs were initiated in Firm 1, including: 1) Transition to clean energy—in response to the municipal government’s “Clean Energy Transformation Project”, an energy-saving and environment-friendly natural gas fueled boiler was introduced to replace the old oil burning systems in 2008; 2) Water recycling and reuse—instead of directly discharge, a new approach was adopted to recycle and reuse the shop floor bottle washing water after filtering, 3) Reclaimed water use—recycled the reclaimed water after sewage treatment to reduce the volume of wastewater and total chemical oxygen demand (COD) discharge, 4) Office lighting system reconstruction—replaced the current lighting with LED energy-saving lamps, and 5) CNY 0.2 million was invested in noise control to meet the demands of local residents, and over 0.4 million in a rainwater and sewage shunting system to ensure that rainwater does not enter the city sewage network.

**Voluntary Initiatives & Green Awards:** Firm 1 voluntarily adopted the Cleaner Production (CP) certification in 2008, and was granted “Provincial CP Company” and “Municipal CP Outstanding Company” in 2010. It was certified “municipal environment-friendly enterprise” in 2011. In 2010, it adopted GMP (good manufacturing practice) certification (an industrial standard with a similar role to that of ISO 14001). All its suppliers were required to adopt ISO14001 to improve their environmental performance.

**Internal Management Arrangements:** A number of internal environmental routines were established, including the managerial environmental target accountability

policy, waste management inspection, noise control facilities maintenance, canteen fume dust treatment device operation, and environmental incentive and punishment. An environmental emergency plan was also established. For new environmental projects, the environmental department submits the feasibility plan to the vice-president in charge of environmental issues, who used to head the department. Environmental staff also exchange views with top leaders and supervisors, who will put the plan into practice if they consider it feasible. Sometimes the department head goes to visit example firms (both domestic and abroad) to learn about advanced environmental measures. In June 2010, a GMP Management Committee was established to lead the GMP certification. In addition, an informal communication mechanism was built between Firm 1 and the local community, so that local residents can contact the environmental manager directly whenever there are environmental problems.

### **6.1.2 Firm 2**

**Company Background:** Located downtown, Firm 2 is a listed SOE focusing for more than half a century on chemical products manufacturing. It used to be among the top 500 manufacturing companies in China, and was relocated to the suburbs under the policy of TEJS introduced by the local government in 2007.

**Environmental Strategy:** The environmental strategy in Firm 2 is “Pollution control and energy saving are essential for the company in order to strike a balance among economic, environmental and social benefits”. It was also clearly identified that

the feasibility of any environmental initiative always depends on the analysis of its cost-effectiveness.

**Complying Initiatives:** Firm 2's pollution control effort is mainly focused on wastewater treatment. A pre-treatment facility was updated based on the existing wastewater treatment system. Instead of mixing wastewater from different sources, the pre-treatment procedure helps to lower the concentration of pollutants before final treatment, and leads to reduced treatment costs. As for air pollution control, most of the SO<sub>2</sub> produced is absorbed by the product (washing powder), and the firm only has to deal with the smoke and dust in waste gas emission.

**Voluntary Initiatives & Green Awards:** In 1997, Firm 2 spent CNY 20 million on a sewage treatment station, and was certified by the local Economic and Information Commission (ETC) as a showcase company in "reduction of total emission amounts". In 2003, Firm 2 initiated a research program to develop a green product to substitute the existing petroleum by-products. In 2004, it received the "China Green Label Products Outstanding Award" along with other 23 companies nationwide. Also known as the "Ten Rings" certification, this award is the most prestigious certification of environment-friendly products in China. In 2005, Firm 2 was among the first 14 enterprises honored as an "Outstanding Water-Saving Enterprise" in the local province. It was also among the second batch of enterprises (a total of 100) mandated to CP certification in the local province. After the compulsory CP certification in 2006, it joined the voluntary CP agreement in 2010. In 2008, it actively participated in the "One Factory-One Year-One Environmental Project (1-1-1) Program" launched by the

Federation of Hong Kong Industries (FHKI), and won a green medal<sup>16</sup> in the “Hang Seng Pearl River Delta Environmental Awards”. This award was established by FHKI and the Hang Seng Bank in 2007, set up under the manufacturing category of the 1-1-1 program to recognize and encourage greening practices by manufacturing companies in Hong Kong and the PRD.

**Internal Management Arrangements:** The internal environmental management scheme in Firm 2 consists of three aspects. First, top leaders propose further improvement ideas and inform the environmental department of the green information updates of the industry. Second, front line staff also provide many ideas for innovation or further improvement in daily operations. An employee participation program—“incentive-suggestion (IS)”—has been carried out for many years. Proposals on both production and environmental protection are collected from employees by the environmental department each quarter in order to analyze their feasibility. The company rewards proposals that can bring certain economic and environmental benefits on an annual basis. Last, the company has signed “environmental responsibility contracts” with all department heads, to make sure that they will take care of the environmental issues under their jurisdictions.

### 6.1.3 Firm 3

**Company Background:** One of the largest coal-fired power plants in southern China, firm 3 is a subsidiary of a listed SOE established about 20 years ago. The coal-

---

<sup>16</sup> The program has four levels of recognition: Environmental Awardees, Green Medalists, Green Participants, and 3 Years + entrants.

fired power industry has been a major contributor to air pollution in terms of SO<sub>2</sub> and NO<sub>x</sub> (nitrogen oxides) in China, due to primarily coal-fueled electricity generation (roughly 80 percent<sup>17</sup>). It was thus one of the most tightly regulated industries during the 10<sup>th</sup> and 11<sup>th</sup> FYP with a target of reducing SO<sub>2</sub> emissions by 10% in both five-year periods.

**Environmental Strategy:** The environmental strategy of Firm 3 is “Try to be an environmental pioneer”. Environmental compliance plays a veto role in its business operation, so that all negative environmental consequences are rigorously controlled.

**Complying Initiatives:** In 2006, Firm 3 pioneered the building of a desulfurization project in the local province before the official regulation was released. Over CNY 350 million was invested in a two-stage desulphurization project, and annual SO<sub>2</sub> emissions were considerably reduced from 19,841 tons in 2006 to 1,569 in 2011. In 2009, another CNY 250 million was voluntarily invested in NO<sub>x</sub> pollution control. Annual NO<sub>x</sub> discharge was greatly reduced from 7,957 tons in 2009 to 2,273 tons in 2011. In order to meet the updated emission standards, an advanced bag-filtering dust precipitator costing CNY50 million was adopted to replace the old electrostatic precipitator. A wastewater treatment project was also constructed in 2009 to handle water pollution and improve water recycling.

**Voluntary Initiatives & Green Awards:** In 2003, Firm 3 adopted ISO 14001 EMS certification. In order to update the regulatory, technical, and market information

---

<sup>17</sup> Data source: IMF <http://www.imf.org/external/data.htm>.

on environmental protection in a timely fashion, it actively joined a number of environmental associations, such as the provincial Energy Conservation Association, the Association of Resources Utilization, and the China Building Material Market Association (green building materials). A green procurement standard was introduced to make sure energy-intensive equipment was not purchased. A monitoring system and emergency plan were developed with third party assessment. Risk assessments and regulatory information updates were organized periodically by the environmental department. The firm also collaborated with an environment-friendly building materials manufacturer in recycling and reutilizing the solid waste it produced in electricity generation.

Firm 3 voluntarily joined the CP program in 2009, and was certified a “municipal outstanding CP enterprise” and “provincial CP enterprise” in 2010. It also invested CNY 0.25 billion in denitrification equipment in response to the “blue sky” project initiated by the local government in 2009. It is one of the two firms<sup>18</sup> in all 10 cases that have released a sustainability report. In 2011, Firm 3’s parent company released its first annual corporate sustainability report to the public. In 2012, it was one of the 10 listed companies in China that were given the “2011 Corporate Information Disclosure Award” by the Shanghai Stock Exchange.

A number of environmental awards were granted to Firm 3 in 2009-2010 by the local government, related departments, and environmental organizations, including 1)

---

<sup>18</sup> Both firms are subsidiaries of the same company but in different industrial sectors.



“2009-2010 energy-saving outstanding enterprise” by the provincial government; 2) “2006-2010 green credit enterprise” by the provincial EPB; 3) “The most environmentally socially responsible enterprise in 2011” by the China Environmental Newspaper Press, 4) “municipal environmentally friendly enterprise in 2011” by the EPB, and 5) “Asian Games air pollution control outstanding enterprise” by the municipal government.

**Internal Management Arrangements:** A hierarchical environmental management system was established in Firm 3. At the top level, the Safety Health and Environmental (SHE) Management Committee was established in the parent company, with the CEO in charge. The vice-president heads the sustainability team in drafting an annual sustainability report. At the mid-level, a SHE department is in charge of environmental policy implementation. The investor relations department is responsible for corporate social responsibility information disclosure and related consulting work. A specialized team in the environmental department focuses on collecting environmental regulatory information regularly. The financial office and the consulting department are also involved in bidding in environmental protection.

In addition to these routine mechanisms, some temporary actions have also been taken up to deal with specific issues. For instance, a leading team was set up for when a new environmental program is adopted. The desulfurization office was established before the firm officially started SO<sub>2</sub> pollution control, with a vice-president in the lead. This office was then assigned to conduct denitrification research after the SO<sub>2</sub> project was finished in 2007. Meanwhile, the office head conducted field trips to learn from an

environmentally pioneering power plant. A specialized team was set up to investigate other companies' methods of NO<sub>x</sub> pollution control.

#### **6.1.4 Firm 4**

**Company Background:** Firm 4 is a machinery manufacturing JV with over 15 years' history. Its parent company is the largest motor manufacturer in China and is committed to various public activities, such as helping the disabled, disaster relief, assistance, and poverty alleviation. Firm 4 is a flagship company in the local city, and government leaders visit it from time to time.

**Environmental Strategy:** The environmental strategy of Firm 4 is “to convince the public that they are living in a clean neighborhood”.

**Complying Initiatives:** Firm 4 invested over CNY 30 million in air pollution reduction, and is the only company in the industry that has adopted an electroplating pollution control system. As the largest business partner of a leading international automobile company, it gained considerable experience in corporate environmental management from its partners. To reduce energy consumption, Firm 4 joined the Hong Kong-Guangdong CP partnership program. A total of CNY 0.37 million in operating costs was saved, together with satisfactory carbon emission reduction.

**Voluntary Initiatives & Green Awards:** Firm 4 hired a third party consulting firm to test its pollutant emissions independently. Its key product was a well-known brand in China and was identified as a “Green Exemption Product”. In 2008, Firm 4 voluntarily adopted ISO 14001 certification. In 2010, the National Automotive Industry

Association initiated the “Greening the Chinese Motorcycle Industry” program before the new National Emissions Standard came into effect. Firm 4 voluntarily signed the agreement with over 100 peer enterprises.

**Internal Management Arrangements:** Firm 4 has an air pollution control team led by the chief engineer, who conducts regular field trips to pioneering firms and qualified environmental service companies. To meet the demands of overseas customers, several environmental management approaches were introduced. For example, Firm 4 had adopted the 5s-site management method (sort out, straighten, sweep, sanitation, and style) when it was established. Originally designed to improve production efficiency, it was extended to cover environmental management issues. An incentive-based approach was also brought in by the overseas shareholders to encourage employee participation. The “proposal improvement” instrument was introduced from Japan in 1995, with a special office in charge of policy implementation. This is similar to the IS approach in other companies, except it is compulsory in Firm 4 for every employee to write proposals for environmental improvement. The company awards CNY 4 to each proposal and more (up to a maximum of 0.2 million) to those that can bring in considerable profit.

### **6.1.5 Firm 5**

**Company Background:** Firm 5 is a JV focusing on waste battery recycling and manufacturing. It is a domestic industrial leader focusing on new energy and circular economy technology (e.g. industrial solid waste treatment). Its foreign partner is a

global leader in battery recovery and hi-tech materials, with 200 years' history. Firm 5 was among the first batch of circular economy pilot companies in the local province.

**Environmental Strategy:** The environmental strategy of Firm 5 is “prepare for the future, go beyond end-of-pipe and be environment-friendly from the beginning of production through reducing raw material consumption and energy conservation.”

**Complying Initiatives:** In order to operate in the nickel-containing waste recycling and treatment industry, Firm 5 has to stay in full environmental compliance to get an environmental license. Its major pollutants—E-NH<sub>3</sub> (NH<sub>4</sub>) and heavy metals—were highly regulated in the 12<sup>th</sup> national Five-Year-Plan of environmental protection. CNY 10 million was invested in treating the two pollutants effectively. The unique ammonia-containing waste treatment technique is the research outcome of Firm 5's collaboration with a research institute.

**Voluntary Initiatives & Green Awards:** A pollution control research project was initiated by the vice-president (who is an expert in water pollution control) to make the quality of wastewater that Firm 5 discharges in the future meet the drinking water source standard. Firm 5 was one of two cases that conducted both compulsory and voluntary CP certifications. As a company with hazardous waste, it adopted mandated CP certification under the guidance of the local EPB in 2009, and voluntarily joined the CP agreement regulated by the provincial EIC in 2010. An EHS system that incorporates both EMS and OSHA was established in 2010, with power to veto all production project construction. To make sure all products meet the environmental

standards in importing countries, Firm 5 chose green suppliers (e.g. ISO 14001 EMS-certified) in all of its raw materials procurement.

In June 2011, Firm 5 was awarded the “provincial resources reutilization outstanding enterprise” award. Launched by the provincial EIC in 2011, this program is part of the local effort to implement the “The Circular Economy Promotion Law in the PRC”, and promote the local resource utilization industry. The pre-condition for applying for this certification is that the firm should be in full environmental compliance, and no environmental pollution accident should have been detected (or reported) in the previous three years.

**Internal Management Arrangements:** The CEO of Firm 5 majored in environmental engineering, and almost all of the top managers are professionals in the chemical and environmental fields. The foreign partner takes corporate environmental performance so seriously that they put forward many internal requirements even stricter than the local regulatory standards. The implementation of EHS is a routine topic at its board meetings. Firm 5 has also hired a consulting company to conduct a risk assessment and evaluate its environmental performance regularly, with the report reviewed by the board of directors. Firm 5 has devoted many efforts to encouraging employees’ participation at different levels in eco-innovation. About 100 improving proposals were received in 2011, and 22 were officially adopted as part of the CP plan.

### 6.1.6 Firm 6

**Company Background:** Located in an industrial park in a suburban area, Firm 6 is a subsidiary of a Singapore-listed energy manufacturing company with over 10 years' operational history in China. It focuses on clean energy production and is the largest manufacturer of dim ethyl ether (DME, a worldwide-accepted super-clean energy). As an identified national high-tech enterprise, Firm 6 now has many subsidiaries in China. It is also in charge of drafting the DME fuel industrial standard, as assigned by the provincial government.

**Environmental Strategy:** Firm 6 aims to be the key new energy-manufacturing base in the local area and play an active role in alleviating energy pressure and improving local environmental quality by adjusting the traditional energy consumption structure. Environmental protection is one of the two most important issues in its business strategy. The environmental strategy is to “stay in full compliance and further improve by investing in environmental projects with potential economic benefits”.

**Complying Initiatives:** In Firm 6, all construction projects are built strictly following the environmental impact assessment (EIA) and the “three-synchronization” requirements. CNY 0.3 million was invested in an industrial noise insulation screen when the firm was already in compliance. All ordinary glass windows inside the firm were replaced by sound-proofing double-layer vacuum glass, and all equipment was installed with noise abatement facilities.

**Voluntary Initiatives & Green Awards:** Firm 6 obtained the ISO 14001 EMS certification and voluntarily adopted CP certification in 2009. It received the province's environment-friendly enterprise certification (in the first batch in a local city) in 2008. Two domestic subsidiaries were also awarded "environment-friendly enterprise" at the provincial level. It was awarded "the outstanding CP enterprise" at both municipal and provincial levels, and was certified as "a national DME clean energy vehicle demonstration enterprise".

**Internal Management Arrangements:** An environmental department was set up and staffed with experienced technical engineers when Firm 6 was established, with the guideline of "monitor environmental details at all levels". A substantial environmental investment was made annually to take the company down the path towards low-carbon economic development. In the early stages, most of the environmental activities were initiated in a top-down way whereby top managers proposed ideas for the lower level employees to implement. The IS approach was then extended to encourage employee participation in the environmental domain. Any ideas related to energy saving and emission reduction will be rewarded according to the actual benefit achieved. Instead of learning from peers, inter-firm (subsidiaries) communication and sharing inside the business group was introduced. The firm established and implemented an "environmental experience-sharing seminar" scheme long ago.

### **6.1.7 Firm 7**

**Company Background:** Firm 7 is a subsidiary of a state-owned listed company established about 20 years ago. It is located in a suburban area, focusing on construction material manufacturing from solid waste such as burned coal dust from coal-fired power plants.

**Environmental Strategy:** The environmental strategy of Firm 7 is “to be an environmental pioneer in the industry, doing environmental protection in a long-term way and always maintaining internal standards higher than state regulations.”

**Complying Initiatives:** Firm 7 focuses on source pollution control. It invested CNY100 million in an environment-friendly production line to reduce solid waste effectively. Pollution monitoring in air outlets is not mandatory for small and medium enterprises. In Firm 7, however, a round-the-clock online monitoring facility was installed in all air outlets as a routine check.

**Voluntary Initiatives & Green Awards:** Firm 7 was a pioneer in terms of CP certification in the construction material manufacturing industry. It voluntarily adopted CP certification in 2009, and was awarded “Municipal Outstanding CP Company” with another 11 certified companies. Through continuous CP efforts, the product qualification rate rose to 98% in late 2009 compared with the previous 93.28%, the reutilization rate of solid waste increased by 18.2%, and raw materials consumption was reduced by 15%. A total of CNY 4 million was saved annually.



**Internal Management Arrangements:** Firm 7 actively participated in environmental training organized by the provincial CP center. Its internal environmental standard was established based on the law, but was stricter than regulatory requirements. Every time the regulatory bar rose, the company revised the internal standard slightly higher to keep it above the mandates. Firm 7 also adopted the ISO 14001 EMS certification, as mandated by the parent company, and hired a consulting firm to be responsible for environmental technical issues. Environmental projects are inspected and evaluated upon completion by top executives from the corporate headquarters. Programs that have achieved considerable environmental or economic benefits are introduced and recommended to other executives in formal meetings.

### **6.1.8 Firm 8**

**Company Background:** Established in the mid-1950s, Firm 8 is one of the largest dairy manufacturers in southern China. It has two subsidiaries, and was preparing for its IPO (initial public offering) in the Chinese stock market when we conducted the visit in mid 2012. Firm 8 is included in the relocation plan under the local TEJS policy.

**Environmental Strategy:** The environmental strategy of Firm 8 is “keep improving in accordance with the regulatory changes”. In addition, a low-carbon business model was the key theme in Firm 8’s “building a learning organization” business strategy.

**Complying Initiatives:** Firm 8 did not conduct an EIA when it was established because there was no environmental protection law at that time. In 2002, it completed the sewage treatment station reconstruction and conducted an EIA, which was approved by the local EPB in 2003. Its subordinate firms set up after 2000 strictly followed regulatory requirements on pollution discharge declaration and registration, applying for pollution permits, and paying pollution fees. Various pollution treatment facilities were also established together with a water recycling system. Meanwhile, an environmental department and internal environmental policies were set up. Firm 8 standardized its environmental practices in around 2008, after participating in a number of seminars and workshops organized by the local EPB. This is consistent with the official data showing that many pollution control practices were formalized after several detected non-compliance in 2008. However, Firm 8 did not use advanced water pollution control techniques due to high costs.

**Voluntary Initiatives & Green Awards:** Firm 8 voluntarily adopted the CP program in 2011, saving CNY 0.5 million in operational costs annually. In 2008, Firm 8 began to use an environmentally friendly and recyclable glass bottle package (can be reused more than 10 times) to partially replace the paper packaging. By actively promoting it among consumers, the firm increased its glass bottled milk sales in 2010 to nearly 10 times than that in 2008. Glass bottled milk sales also accounted for 20% of the total sales in 2010, compared to less than 1% two years previously. As one of the largest local companies, Firm 8 played an active role in responding to and cooperating with the local government's demands to improve environmental quality. For example, it

represented all local enterprises during the “National Environmental Protection Model City” reassessment. To get ready for this reassessment, Firm 8 proactively collaborated with the local EPB by holding an on-site environmental seminar for all major regulated enterprises.

**Internal Management Arrangements:** Both the vice-president in charge of corporate environmental management and the environmental manager attended the CP training organized by the local EPB. A top-down internal management mechanism was established, with a special team focusing on CP led by the vice-president. Meanwhile, middle-level managers in other departments cooperate and coordinate in primary environmental projects such as CP. Chiefs of all factory workshops are responsible for enforcing and collecting ideas and feedback from frontline employees.

### **6.1.9 Firm 9**

**Company Background:** Firm 9 is a national high-tech enterprise identified by the Ministry of Science and Technology, and also a provincial innovative enterprise certified by the Guangdong Provincial Department of Science and Technology. As an SOE, it was established in 2000 and listed in 2011 in the Shenzhen Stock Exchange. The company has ten branches and four subsidiaries focusing on electronic information and communication technology. It was a top 100 manufacturer in the province and won the 2010 “Provincial Software and Information Services Outstanding Enterprise Award”.

**Environmental Strategy:** The environmental strategy of Firm 9 is “do not violate the rules and follow the exact regulatory requirement; develop a green company

and contribute to green nature”. Both production safety and environmental protection are top priorities in Firm 9’s business strategy.

**Complying Initiatives:** As an electronics manufacturing company, key environmental issues are waste water pollution control, water recycling, and waste gas treatment. All construction projects have implemented EIA and meet the “three synchronization” requirements. A newly built plant was set up in an electroplating industrial park with a central wastewater treatment plant (WWTP) to help the firm deal with water pollution. CNY 45 million was invested in the new plant’s pollution control system.

**Voluntary Initiatives & Green Awards:** Firm 9 adopted the ISO 14001 EMS in 2009 and voluntarily joined the CP program in 2010. To deal with customer pressure for green products from overseas markets, it invested in an expensive production line and hired a third party firm to monitor its environmental performance.

**Internal Management Arrangements:** Environmental protection was integrated into Firm 9’s business strategy to make sure all potential environmental impacts were closely monitored. A feedback scheme was introduced to collect employees’ ideas for energy conservation and pollution control. Meanwhile, a specialized team was set up with increased human resources. Some staff were assigned to collect regulatory and technical updates from official governmental websites. Some middle-level managers were trying to promote an energy audit within the firm and have finished some pilot projects in several departments.

### **6.1.10 Firm 10**

**Company Background:** Firm 10 was a private-owned enterprise established in 1994 and focusing on industrial and domestic waste recycling and reutilization. As a leading company with 16 subsidiaries in China, its business now includes recycling and reutilization of over 500 types of materials, covering industrial waste, community waste, electronic and electrical waste, and building and garden waste. Located in the largest industrial zone in the province, Firm 10 has constructed a highly efficient business network with the surrounding manufacturing companies.

**Environmental Strategy:** The general business strategy of Firm 10 is “creating a leading brand in the resource recycling and reutilization industry”, with the environmental strategy of “going beyond regulatory compliance, and always being prepared for the future”.

**Complying Initiatives:** The primary environmental focus of Firm 10 is on solid waste, wastewater, and noise treatment. Metallic waste was categorized first and then broken down into different products. A treatment plant was set up to pre-treat wastewater before further treatment in a central treatment plant inside the industrial park. Noise reduction measures were adopted in production workshops. Meanwhile, health training was provided to frontline workers to reduce and prevent employees’ injuries from excessive noise. All these pollution control and preventive measures were adopted when the firm expanded the scope of its business into waste reutilization (in the beginning it was mainly focused on waste recycling).

**Voluntary Initiatives & Green Awards:** A community-based solid waste classification and recycling treatment program was introduced to promote public interest in waste classification and minimization in the surrounding neighborhood. A community waste recycling treatment center has been established to take charge of this program. The top management team also promoted a firm-level circular economy model, which was certified as a national pilot project with 30 other programs. To further improve its environmental performance, managers visited and learned from peer companies in Germany. Firm 10 also played an important role in environment-related associations and committees. For instance, it is a committee member of the Sino-Japan circular economy city program, and vice-president of the unit of provincial resources comprehensive utilization association. It adopted the ISO 14001 EMS in 2011, and voluntarily joined the CP agreement in 2010 (awarded “Provincial Environmental Outstanding Company”). It has also been awarded the “Provincial Resource Recycling Outstanding Enterprise” by the local EPB, and “the third batch of National Circular Economy Promotion Enterprise” by the National Development and Reform Commission.

**Internal Management Arrangements:** An environmental department was established in 2004 to take charge of daily pollution control when Firm 10 began to standardize its environmental management. In addition, a community survey of the firm’s impact on local environmental quality is conducted once or twice year. Based on a go-international strategic vision, Firm 10 has launched communication and partnership programs with renewable resource recycling institutions and organizations in developed countries.

## **6.2 Findings**

In this section, we present the case study and interview findings as well as their triangulation with prior survey results. We first describe the CCS and PEM in the 10 cases. This is followed by an investigation of the role of organizational factors, including resources, green commitment, and top-down and bottom-up coordinating mechanisms. We then go on to present how firms dealt with demands from government and non-government stakeholders. In the end, we describe how these firms have benefited from being green.

### **6.2.1 CCS in Environmental Progressive Firms**

Our interview findings suggest that the four CCS dimensions do co-exist. Firstly, self-determination is the most commonly adopted dimension, with more than half of the firms emphasizing independent decision-making and pragmatism. For instance, it is explicitly indicated in Firm 2's environmental strategy that only proactive environmental programs with economic benefit will be implemented. Our interview records further suggest that JVs and FCBs are likely to score higher on self-determination, since they are under closer watch by international buyers and consumers. In the words of an interviewee: "We are subject to dual regulation from both the Chinese government and foreign shareholders, who set higher environmental benchmarks than local regulatory standards (Firm 5)."

Secondly, the conventional formalism dimension still plays an important role, with all firms shown to be sticking to formal regulation as the compliance benchmark, though varying in the extent of priority. In addition to the dominating role of CAC means in the current regulation system, the finding is also partly due to the fact that all firms were members of the CP program in which legal compliance is a prerequisite of participation.

Thirdly, firms' active participation in VEPs initiated by governments and EPBs (e.g. CP, Environment-Friendly Enterprise) provide further evidence of the accommodation dimension. Official statistics show that half of the 10 firms adopted voluntary CP certification in 2009, three in 2010 and two in 2011. Two firms (Firms 2 & 5) were mandated to undergo certification at first, and subsequently conducted voluntary certification.

Lastly, in regard to the referencing dimension, most of the firms conducted field trips to industrial green pioneers to learn from their experiences (Firms 1, 3, 4, 6, 7, 8, & 10). However, none of them explicitly emphasized referencing in their environmental strategies. Nevertheless, it is a common practice in the early stages of some firms' implementation of environmental programs as well as adopting advanced environmental practices (see Firms 3 & 10).

### **6.2.2 Proactive Environmental Management**

The CP Program is the most popular proactive environmental program in all of the selected firms. It was initiated in 2002 by the local government, and was more



prominently featured in the EPB's strategic plan in 2008. Firms' CP application and assessment were regulated by multiple governmental departments including the EPB, the ETC, and the Department of Science & Technology (DST). In our study, all firms successfully joined the program by 2011. Two firms (Firms 2 & 5) were mandated to become certified at first, and they further engaged in voluntary certification after that. Therefore, we did not differentiate between these two and the rest, who were purely voluntary participants.

In addition to CP certification, all firms joined other VEPs such as (1) the ISO 14001 EMS (8 out of 10) as the second most popular environmental program. Two companies did not conduct EMS certification because a similarly-functioning industrial self-regulation program was adopted (Firm 1), or managers perceived the program as not cost-effective (Firm 2). This is consistent with the results of selected proactive firms in the survey study, which found that EMS was the most frequently adopted environmental program, followed by CP; (2) green product labels such as "the National Green Label" (Firm 1) and the CE (Conformite Europeenne) label (Firm 10); and (3) other government-initiated VEPs such as "Environmentally Friendly Firms" (Firm 1 & 6). Detailed information is provided in Table 6.1.

Table 6.1 Corporate Environmental Target, PEM, and Green Awards in 10 Cases

Firm	Corporate environmental target	PEM		Green awards
		Participation in government-initiated VEPs	Participation in other VEPs	
1	Low carbon production & environment-friendly manufacturer, do not harm the living environment in local community.	<ol style="list-style-type: none"> <li>1. CP (2010, voluntary)</li> <li>2. Municipal clean energy transformation project</li> <li>3. Municipal environment-friendly enterprise</li> </ol>	GMP (Good Manufacturing Practice) certification inside the pharmaceutical manufacturing industry	<ol style="list-style-type: none"> <li>1. “Provincial CP company” and “Municipal CP Outstanding Company”</li> </ol>
2	Pollution control and energy saving is the essential part for companies to achieve a balance among economic, environmental and social benefits.	<ol style="list-style-type: none"> <li>1. CP (2008, compulsory &amp; 2011, voluntary)</li> <li>2. Municipal clean energy transformation project</li> <li>3. Municipal environment-friendly enterprise</li> </ol>	<ol style="list-style-type: none"> <li>1. One Factory-One Year-One Environmental Project (1-1-1) Program by the Federation of Hong Kong Industries (FHKI)</li> <li>2. Green medalist in the “Hang Seng Pearl River Delta Environmental Awards”.</li> </ol>	<ol style="list-style-type: none"> <li>1. China Green Label Products Outstanding Award</li> <li>2. Emission total amount control and compliance show case company</li> <li>3. “Water Saving Outstanding Enterprise”</li> </ol>
3	Try to be an environmental pioneer. Environmental compliance has a veto in approving construction projects inside the firm.	<ol style="list-style-type: none"> <li>1. CP (2010, voluntary)</li> <li>2. Municipal environment-friendly enterprise</li> </ol>	<ol style="list-style-type: none"> <li>1. ISO 14001 EMS</li> <li>2. Voluntary Information Disclosure (annual sustainability report from parent company)</li> </ol>	<ol style="list-style-type: none"> <li>1. Energy saving outstanding enterprise at provincial level</li> <li>2. 2006-2010 Green Credit Enterprise</li> <li>3. The most environmental social responsible enterprise in 2011</li> <li>4. Asian Game air pollution control outstanding enterprise</li> <li>5. Outstanding CP enterprise in city and provincial level</li> </ol>
4	Let the public feel that they are living in a clean neighborhood.	CP (2009, voluntary)	<ol style="list-style-type: none"> <li>1. ISO 14001 EMS</li> <li>2. Initiated and joined the “Greening the Chinese Motorcycle Industry” program.</li> </ol>	<ol style="list-style-type: none"> <li>1. National green exemption products</li> </ol>

Table 6.1 Corporate Environmental Target, PEM, and Green Awards in 10 Cases (Continued)

Firm	Corporate environmental target	PEM		Green awards
		Participation in government-initiated VEPs	Participation in other VEPs	
5	Go further beyond end-of-pipe pollution control and to be environment-friendly from the beginning of production. Always prepare for the future.	1. CP (compulsory in 2008 & voluntary in 2009) 2. Circular economy pilot company program	ISO 14001 EMS	1. "Provincial Resources reutilization outstanding enterprises"
6	Environmental protection is the second top issue following safety. Satisfy all regulatory requirements and also further improve by investing in environmental projects with potential economic benefits.	1. CP (2009, voluntary) 2. Provincial environmental-friendly enterprise certification	ISO 14001 EMS	1. Outstanding CP enterprise at the municipal and provincial level 2. National DME clean energy vehicle demonstration enterprise
7	To be an environmental pioneer inside the industry. Doing environmental protection in a long-term way and always have internal standard higher than regulation.	CP (2009, voluntary)	1. ISO 14001 EMS 2. Voluntary Information Disclosure (annual sustainability report from parent company)	Municipal Outstanding CP Enterprise
8	Keep improving based on regulatory changes. A low carbon business mode was the key theme in its "building a learning organization" strategy.	CP (2011, voluntary)	1. ISO 14001 EMS 2. Environmental-friendly package and production site	Municipal Outstanding CP Enterprise

Table 6.1 Corporate Environmental Target, PEM, and Green Awards in 10 Cases (Continued)

Firm	Corporate environmental target	Participation in government-initiated VEPs	PEM	Participation in other VEPs	Green awards
9	Do not violate rules and follow the exact regulatory requirement. Develop a green company and contribute to a green natural environment. Environmental protection is the first priority in business principals.	CP (2010, voluntary)	ISO 14001 EMS		Municipal Outstanding CP Enterprise
10	Go further beyond regulatory standards, and always prepare for the future.	1. CP (2010) 2. Circular Economy Pilot Enterprise (first batch at provincial level)	ISO 14001 EMS		1. “Provincial Outstanding CP Enterprise” 2. “Provincial Resources Reutilization Outstanding Enterprise” 3. “The third batch of National Circular Economy Promotion Enterprise”

### **6.2.3 Organizational Factors**

In this section, we present an analysis of critical organizational factors that influence proactive corporate environmental management, including resources, green commitment, and two distinct coordinating mechanisms.

#### **6.2.3.1 Organizational Capacity**

Our interview findings confirm the importance of organizational capacity for CCS adoptions. Table 6.2 summarizes all cases' profiles in three types of capacities. Technical capacity is indispensable in enabling firms to comply with formal regulatory requirements. Firms in industries with mature environmental technologies seldom indicate technical issues as an impediment (Firms 1, 2, 3, 6, 7 & 9). The main difficulty they face is that modern environmental facilities do not fit well with existing land-use patterns. This is particularly common among firms built over 20 years ago, when environmental protection was rarely considered in business design. In industries where technical maturity is absent, firms are trying hard to develop appropriate green technologies (Firms 4, 5, 8 & 10). The environmental manager of firm 4 shares this experience.

We have searched for an appropriate pollution treatment technology in both the domestic and international markets for a long time. There are no peer references, and even experts in EPB have no ideas. In the end, we set up a specialized team led by the vice-president and invested over CNY 8 million in 2 systems. Although one of them was already approved and checked by the EPB, there are

still some problems due to technical immaturity. In order to meet the regulatory demands, we have no choice but to use the current system while continuing to search for a better solution.

Table 6.2 Corporate Resources and Capabilities for Environmental Protection in 10 Cases

<i>Firm</i>	<i>Technical</i>	<i>Human resources</i>	<i>Financial</i>
<b>1</b>	N/A	Sufficient staff, a department in charge; encourage lower-level participation	Marginally sufficient; EPB subsidies covers 30% of total cost
<b>2</b>	N/A	Leaders are very supportive; shop floor workers are committed	No monetary difficulties
<b>3</b>	Existing business structure (e.g. land use shortage) is incompatible with new technology	A department in charge with inter-departmental coordination; specialized staff to collect information	N/A
<b>4</b>	Potential risk of immature technology; no domestic case to refer to; hard to find feasible solutions	Vice president in charge; full participation of all-level employees	High operating cost (1 million/month) and no subsidies for new technology
<b>5</b>	Had been searching viable technology for a very long time	Green actions initiated from upper-level; encourage employee participation	Increased cost due to advanced tech; not too much financial difficulty
<b>6</b>	Potential risk of new technology	Empowered environmental department; seek employees' advice	N/A
<b>7</b>	Very few third-party treatment companies on the market	Supportive leaders; encourage employee participation	No difficulties because leaders are supportive
<b>8</b>	Historical reasons such as land use	Vice president in charge, mid managers to coordinate, workshop chief to enforce and collect ideas and feedback from employees	Not a burden
<b>9</b>	Land use shortage; very few qualified third party treatment companies	A specialized environment team, with increasing specialized staff	Increasing investment
<b>10</b>	Need to work hard on technical innovation	Set up a research & development center on biomass technology	Very few financial difficulties

Both financial capacity and human resources are critical in compliance. Half of the firms are financially capable, mainly because “upper-level leaders (or owners) are very supportive” (Firms 1, 2, 7, 8 & 10). In addition, reduced operational costs due to preventive programs (e.g. the CP program) and subsidies/awards from local EPBs and governments also help to relieve the monetary pressure (Firm 1). Human resources are particularly important for self-determination. Several interviewees noted that an empowered environmental department within the firm is indispensable for eco-innovation research and environmental information collection. In addition, the general managers in three highly eco-innovative firms were all experts in industrial pollution control (Firms 1, 4 & 5). In the words of one interviewee (Firm 1):

Our new department head used to lead the environmental department in two different peer firms. He came to our firm three years ago and brought along his prior experiences and ideas, even including the practices he was unable to implement previously due to financial constraints.

### **6.2.3.2 Corporate Green Commitment**

All interviewed managers expressed their full support for the tough environmental legislature because “it is for the sake of individual citizens, the whole country, and future generations” (Firms 2, 3, 6, 7, & 9). We were not able to further explore how corporate green commitment (CGC) differentiates firms in terms of PEM, since all 10 selected cases were environmentally progressive firms. However, case study findings



provide further details of how firms differ in the three dimensions of corporate green commitment<sup>19</sup>. In addition to the normative green commitment we examined in the survey study, the continuous commitment component of CGC refers to a “need” (Meyer & Allen, 1991) for top leaders to engage in environmental activities. The high level of punishment as well as the increasing likelihood of detecting violations leave firms no choice but do as the regulations require. In contrast to the cold calculations of continuance commitment, the affective component reflects leaders’ intrinsic desire to engage in environmental actions. After coding the 10 firms’ descriptions of commitment to capture the three dimensions, we identified some key features of CGC in each firm. As shown in Table 6.3, affective commitment is the least mentioned dimension in all 10 firms, with only Firm 1 explicitly noting an intrinsic interest in environmental protection. Half of the firms identified only one commitment dimension—normative commitment (Firms 3, 8, & 10) or continuance commitment (Firms 5 & 9). Two firms prioritize normative commitment over continuance commitment (Firms 2 & 7) while another two do the opposite (Firms 4 & 6). In addition, we even detected some evidence of shifts among the three dimensions (Firm 1).

---

<sup>19</sup> Though we focus on the normative dimension of CGC in hypotheses test, a further investigation of other dimensions using qualitative data is helpful to enlighten further research.

Table 6.3 Corporate Green Commitment in 10 Cases

<b>Firm</b>	<b>Descriptions of Commitment</b>	<b>Features</b>
<b>1</b>	In old days we do environmental production to appeal government. In recent years we have changed our attitudes and become more sincerely interested in turning green.	Continuance→ affective
<b>2</b>	What matters most is that companies should be responsible for the negative influence it produced. We were also pressured to control pollution.	Normative & continuance
<b>3</b>	Firms are members of society and should take responsibility.	Normative
<b>4</b>	We have to comply due to the external pressure. It is also part of the corporate social responsibility.	Continuance & Normative
<b>5</b>	We have no choice but invest in environmental protection.	Continuance
<b>6</b>	We have to comply with environmental regulations, and it is also an issue of social responsibility.	Continuance & Normative
<b>7</b>	Firstly it is a social responsibility, and we also have to comply with environmental regulations	Normative & continuance
<b>8</b>	It is for the social benefit and we have to be responsible for the future generation;	Normative
<b>9</b>	We have to comply because it is required by the government.	Continuance
<b>10</b>	Firms should comply for the good of society. It is also a business code for an emerging green industry.	Normative

### **6.2.3.3 The Top-down and Bottom-up Coordinating Mechanisms**

In addition to organizational resources and green commitment, our qualitative findings provide more details of how internal coordinating mechanisms help in corporate environmental management. We summarize these mechanisms into two groups: 1) a “top-down” approach that stresses strong top manager commitment, and 2)

a “bottom-up” approach that emphasizes employee empowerment. Within a top-down mechanism, environmental activities are initiated by top management to mid-level managers and front-line employees. For instance, an environmental manager told us, “Most of the time it is the vice-president in charge of environmental protection who urges us to continuously promote environmental protection. The idea of establishing a low carbon industrial park was put forward by him and we are mainly responsible for implementing it. Whenever we feel an environment-friendly enterprise application is a difficult endeavor, he strongly encourages us to do it and always throws his support behind us (Firm 1).”

Established in an early stage of corporate environmental management, the top-down mechanism is a traditional and popular approach in all cases. This is consistent with findings of prior empirical studies that top-down effects were stronger than bottom-up influences in the early greening stages (Branzei et al., 2004). This is mainly because: (1) green initiatives are investment-intensive and need financial support from top executives or board members; (2) top leaders’ green consciousness and long-term vision are critical to integrating environmental strategy into business operation (Firms 1 & 3); in some traditional polluting firms, top managers are more environmentally experienced and knowledgeable than mid-managers and employees; (3) top leaders usually have more regulatory information channels and knowledge of peers’ environmental initiatives to guide policy implementation inside the company (Firms 3, 5, & 8). Overall, top managers take up the role of “boundary spanners” as suggested in the social psychology literature (Walls & Hoffman, 2013; Williams, 2002), or technical gatekeepers according

to the innovative literature (Cohen, March, & Olsen, 1972); (4) top leaders' support can guarantee employee participation at different levels and coordinate environmental activities across multiple departments. This will then facilitate a clear hierarchical infrastructure and delineation of roles and responsibilities in environmental management.

The bottom-up mechanism emphasizes that grass-root employees are the important stimulant of eco-promotion. One key factor affecting the effectiveness of environmental management relates to the management methods that enable employees to participate in improving corporate environmental performance. The respondent in Firm 2 shared an example with us:

One key factor leading to outstanding environmental performance in the firm is the involvement of shop floor workers, who provide many ideas for innovation and further improvement. They are the people most familiar with the production process and daily work, thus their suggestions are very important. In addition, their enthusiasm and commitment are important.

The bottom-up approach (Firms 1, 2, 3, 4, & 6) emerges usually following the development of the top-down approach, in particular when corporate environmental strategy and guidelines are confirmed, and macro configuration is founded inside the organization. At this stage, employee engagement is considered as an “effective and efficient way to maintain normal operations, improve in small details and detect the blind corners in daily practice (Firm 6)”. In our study, this mechanism is enforced in all firms for a long time, mainly through the so-called IS approach. The IS approach was

originally designed to improve the production efficiency, and was later extended into the environmental field, so that any ideas with the potential to improve environmental performance get rewarded. It effectively “enhances employees’ commitment and enthusiasm in actively contributing to business management (Firm 2)”, and “promotes eco-innovation inside the firm based on frontline workers’ wisdom (Firm 3)”. In particular, two different forms were undertaken: one voluntary (see Firms 7 & 4) and the other compulsory (see Firm 5).

We have carried out the IS program for many years. Each quarter we collect innovative ideas (both production and environmental protection) from all employees and analyze their feasibility. Every year, we reward people whose suggestions have brought in economic or environmental benefits (*Firm 7*).

Besides encouraging voluntary participation of employees, we also sign “responsibility contracts” with each department in relation to its environmental target. Those who meet the target will get an extra bonus at the end of the year (*Firm 4*).

We imported the “proposal improvement” approach from Japan in 1995, with a specialized office taking charge. This is similar to the IS approach in other companies, except that it is compulsory for everyone to write proposals for improvement. We award 4 Yuan to each proposal, and more (up to a maximum of 0.2 million) to those bringing in considerable profit (*Firm 5*).

Several respondents further suggested that the bottom-up approach also helped strengthen employee loyalty: “The point is more than whether their suggestions are feasible or not (in fact some of them are unrealistic), but it reinforces their belief that they are members of a big family (Firm 3).” We also found that the extent to which this approach is adopted depends on firms’ environmental experience. For example, one company abandoned this approach after more than 10 years because “we found that there is very limited room for further improvement after many years’ effort (Firm 5).”

## **6.2.4 Regulatory Intensity from External Stakeholders**

### **6.2.4.1 Government Actors**

We found that there are some differences between SOEs and non-SOEs in terms of the government pressure intensity they face and the way they deal with it. SOEs, in particular larger ones, have a closer relationship with local EPBs and governments than their non-SOE counterparts. On the one hand, this close relationship provides SOEs with easier access to government support. This is in accordance with former studies indicating that government ties are more important to SOEs than to non-SOEs (Li et al., 2010; Peng & Luo, 2000). On the other hand, SOEs are under greater pressure when an informal demand is presented (Firms 1, 2, 3 & 8). We hear similar responses, such as, “As a SOE, we should set a good example for other firms. Therefore, we feel proud that we are in line with the state policy and can contribute to improved environmental quality in China (Firm 8)”.

Government pressure also differs among firms with different locations. Downtown firms are under the regulation of the urban planning policy of TEJS announced by the municipal government in 2007. This adjustment of urban land use structure reduces the proportion of manufacturing enterprises and improves service industry development. It is also an important component to improve local environmental quality by demanding polluting enterprises to relocate to 11 industrial parks before the deadline. 206 firms are required to relocate in three batches, by 2009, 2012, and 2015 respectively. The relocation plan is going smoothly, in that all firms in the first batch list had relocated by mid-2012.

In this study, three out of the four firms located in the downtown area were listed in the relocation plan (Firms 1, 2 & 8). Two of them planned to move to an industrial park by 2012, while the other one was not able to relocate due to some unsettled land use problems (Firm 1). Firm 1 became more accommodative to external demands since they had to “keep running in the local community”, and thus their environmental goal became “do not harm the living environment of local citizens, and convince them that we are a green company”. Firms planning to move to the industrial park need to follow the coded industrial practices such as “installing updated pollution control equipment (Firm 2)” or “integrating into the centralized pollution control system in the industrial park (Firm 8)”.

Inter-agency collaboration in environmental governance also emerged in recent years. Based on the “Interim Procedure of Environmental Information Disclosure”

released by the original SEPA, the Shanghai Stock Exchange released the “listing company environmental information disclosure guidelines” in 2008. According to its specifications, listed companies that have a negative impact on environment quality, such as power plants, are mandated to disclose their information on seven environmental issues<sup>20</sup>. The parent company of Firms 3 and 7 is the only firm in this study that has released a sustainability report. We checked the parent company’s sustainability report in 2010 and 2011 and confirmed that all the information disclosure requirements were met. In 2012, it was one of the 10 listed companies in China that were given a “2011 Corporate Information Disclosure Award” by the Shanghai Stock Exchange.

#### **6.2.4.2 Social Actors**

All firms were facing increasing pressure from societal stakeholders, and 8 firms received complaints in 2009-2012<sup>21</sup>. Whether a firm attaches great importance to the need of local residents depends partly on its location. For example, Firm 1 moved to its current location about 20 years ago, when there was no residential area surrounding it. Currently, it is surrounded by local communities fewer than 5 meters away, due to the urbanization process. The environmental manager conveyed how Firm 1 prioritizes the neighborhood demands.

---

<sup>20</sup> The seven environmental issues are: (1) corporate environmental protection policy, annual environmental target and effectiveness; (2) annual total amount of resource consumption; (3) environmental investment and environmental technology development; (4) pollution discharge; (5) environmental facilities construction and operation; (6) solid waste disposal, treatment, recovery, and reutilization; (7) joining voluntary environmental agreements initiated by EPBs.

<sup>21</sup> The other two firms did not receive local community complaints because they are far away from residential areas (Firms 5 & 7).



Our environmental target is that we do not harm the living environment of the local community. This is because our firm is located in an urban community, and we have to be very environment-friendly in order to survive. We need to convince the public that we are not a traditional polluting company, and that we take care of the pollution produced and the adverse impact it generates on local citizens.

Some firms were found to be aiming for a closer business-community relationship. For instance, Firm 10 took a proactive step to improve mutual understanding by conducting a community survey on its impact on local environmental quality once or twice a year. In order to enhance local residents' awareness of waste classification and minimization, it established a community-based waste classification and recycling treatment system. This program aimed not only to help promote public environmental consciousness, but also to work as a public relations initiative to enhance public understanding of Firm 10's environmental practices. However, as the manager noted, "very few local citizens classify solid waste before disposal due to poor awareness and knowhow". Instead of relying on the local EPB to settle an environmental dispute between the neighborhood and the firm, Firm 1 has developed a direct and informal communication mechanism between the firm and local residents in the past five years.

According to the respondents, the fact that the general public has been paying increasing attention to corporate environmental performance is a positive development.

Nevertheless, false and unreasonable complaints have also become a problem (Firms 1, 2, 4 & 8). For example, the general manager in Firm 4 told us that “although we have been behaving well in recent years (as supported by the official data), we still get complaints from local residents. The EPB comes to investigate, and in some cases the evidence shows that we did not violate the rules. These unfounded complaints put us under tremendous pressure and, at the same time, hurt the firm’s reputation.”

### **6.2.4.3 Market Actors**

We found that firms with international business were under great pressure from the product market to turn green. A prevalent opinion among Chinese firms is that customers and suppliers in overseas markets are more concerned with firms’ environmental performance than the domestic market, sending a clear signal that basic compliance is not enough. When asked whether improved environmental performance is good for firms’ public image, most of the respondents answered in the affirmative. These influences were illustrated by one manager as follows: “The key motivation for us to go greener is that the programs we participate in can bring in real benefits. For instance, our marketing colleagues told us that the environment-friendly product logos are attractive to customers. Therefore, we keep on extending our certification periodically (Firm 2).”

Consistent with the current literature, JVs and FCBs are under greater pressure from the market than others. As suggested by the vice-president in Firm 5 (a JV), the firm was under “dual regulation from both the Chinese government and foreign

shareholders, who set higher environmental benchmarks than the local regulatory standards”. Therefore, a consulting company was hired to conduct periodical risk assessment and regular evaluation of the firm’s environmental performance. This independent third party informs Firm 5 immediately when there are new domestic regulatory updates. “They also tell us what potential risk there might be in a certain scenario, and these scientific evaluation methods help us continuously improve”, said the interviewee. Firm 6 is listed in the Singapore stock market. Though there are no additional demands set specifically by shareholders, “most of them conduct site visits from time to time, and we have to make sure that no pollution is detected (Firm 6)”.

In recent years, the domestic stock market has also become more sensitive to corporate greening, especially for listed companies. For instance, Firm 2 successfully developed a green product from natural renewable materials to resolve the industry’s long-term dependence on non-sustainable petroleum resources. This eco-innovation, based on 8 years’ research, was shown to have paid off when the firm’s stock price surged after the new product press meeting (Shanghai Stock Exchange, 2012). In China, listed companies and those with IPO plans are under more stringent regulatory pressure than before. To make heavily polluting industries comply, the SEPA mandated in 2003 that all pre-IPO firms should pass an environmental performance assessment<sup>22</sup>. The environmental manager in Firm 8 told us “in order to succeed in

---

<sup>22</sup> Data source: <http://www.zhb.gov.cn/>. In 2011, over 50% of pre-IPO firms failed the assessment.

our IPO, we have to pass this assessment and prove that our firm is in full compliance”.

#### **6.2.4.4 Triangulation with Survey Results**

Our interview findings may to some extent explain why some hypotheses were not supported in the survey results. First, the insignificant role of regulatory intensity from government stakeholders on formalism might be because business firms nowadays consider sticking to legal regulations as inherently important, regardless of regulatory pressures from government entities. In our interviews, we heard similar responses: “No matter whether the local EPB conducts frequent and random inspections, we make sure our pollution control facilities are operating normally as a daily routine (Firm 2).” In addition, a firm’s confusion over formal regulatory requirements may also explain why GVRI is not statistically related to formalism. In our interviews, only one respondent clearly suggested that there is no problem understanding and following formal regulations (Firm 7). Others described formal regulations in the following terms: “confusing (Firms 1, 2 & 6)”, “unfeasible (Firms 6, 8 & 9)”, “conflicting (Firms 4, 8 & 10)”, “updated too slowly (Firm 10)”, and “changing too often (Firms 3, 5 & 8)”. The latter two might seem contradictory, but they actually are consistent in suggesting that the one-size-fits-all regulations have created much confusion for the enterprises.

Second, the weak role of regulatory intensity from government stakeholders in affecting the relationship between organizational capacity and CCS adoptions may be due to the fact that although government regulators have been more forthright in recent

years about their expectations of corporate environmental performance, many enterprises have remained unsure about the technical means for meeting those expectations. Some interviewees expressed the following:

Some requests are too general to follow. For instance, the EPB often requires us to fix a problem without providing any help for feasible solutions. We have no idea what techniques should be adopted or are available in the market (Firms 4 & 5).

Last, the story of Firm 1 may provide some clues as to why the interaction between GVRI and NGRI has an insignificant effect on formalism. The firm is located in a downtown area and has received regular complaints about its operating noise from residents in the immediate neighborhood. Instead of relying on the local EPB to handle the complaints, the firm has developed a direct and informal communication channel between the firm and local residents in the past five years. The environmental manager in the firm told us that:

All popular figures (local environmental activists) in the neighborhood have my number and call me directly whenever there are environmental problems. I can deal with these complaints immediately since I live in the neighborhood. This is more efficient than calling the EPB because it takes one or two days for me to receive the complaints from the EPB. Such direct communications not only solve the problem but also reduce the negative impact on our firm's reputation.

### **6.2.5 Benefits from Being Green**

To examine how firms benefit from being green, we asked our respondents questions such as “Did corporate environmental protection/management bring any benefit to firms?” We summarize interviewees’ responses to these questions into three categories as follows:

**Improved Environmental Performance:** Instead of relying on official data on firms’ environmental performance, this study focuses on managers’ perceptions. The environmental benefits lie in reduced pollution and better quality of life (Firms 3, 4, 6, 8, & 9) through pollution treatment. Most of the respondents suggest that the working environmental quality is greatly improved, which is very helpful in recruitment and maintaining employee loyalty (Firms 1, 2, 3, 4, 7, & 10). Nevertheless, respondents’ comments on some other firms may still indicate a pursuit of the “rational myth” that spurs symbolic gestures. This thus casts doubt on the reliability of self-reported environmental performance data, and suggests that firms may not be “good apples” all the time. Due to the limited sample size, we did not conduct further analysis on this issue.

**Enhanced Organizational Efficiency:** we detected some strictly calculated economic benefits through implementation of various environmental programs. First, operational costs were reduced since less pollution was generated as a result of enhanced production efficiency (Firms 1, 2, 3, 6, 7, & 8). This is consistent with the PTBG argument that preventive measures provide unexpected profits compared with

traditional end-of-pipe approaches (King & Lenox, 2002). Take the CP program, for example, there is no certification charge. The Department of Finance (DOF) takes care of the certification costs incurred and rewards firms that yield a good environmental outcome through CP. The demonstrated CP cases receive additional financial support such as priority in pollution fee usage and provincial/national environmental projects application. In addition, all respondents suggested that the local EPB also provide support, including on-site visits, assistance hotlines, holding CP workshops, and organizing inter-firm visits and learning. This helps reduce participants' administrative/transaction costs in searching information and technologies. The manager of Firm 1 shows how preventive programs help reduce costs:

We had never expected that considerable costs could be saved before we replaced oil with cleaner natural gas. Through improving the boiler efficiency, we reduced desulfurization costs by about CNY0.5-0.6 million annually. Energy consumption has also gone down, saving 1,000 tons of standard coal per year. In addition, we received a CNY 0.2 million reward from the EPB for energy-saving and water reuse, as we are saving 500 tons of water per day (representing a CNY 60,000 reduction in water costs).

Second, internal management is improved through implementing environmental programs (Firms 1, 2, 3, & 9). Since some industrial pollution stems from weak internal management, external audits can help identify existing problems and exploit opportunities for further improvement. In this way, environmental enhancement can be

achieved at a low price by improving internal management such as increasing equipment efficiency, conducting a materials and energy audit, and educating employees to be environmentally conscious.

Third, corporate reputation is improved. Better environmental performance delivers more than environmental benefits: firms can strategically use it to improve sales of environment-friendly products (Firms 1, 2, & 3) and attract highly educated or skilled employees who are more sensitive to environmental protection (Firms 1, 2, 3, 4, 6, 7, & 10), as well as maintaining corporate sustainability (Firms 5 & 10).

Although preventive programs were deemed to be economic beneficial by most of the respondents, environmental investment as a whole may weaken good firms' competitiveness in industries with unfair regulatory environment, which is "a typical example of a lemon market in which bad firms drive out green firms (Firm 4)". This is conveyed by one vice-president's experience (Firm 4):

The regulatory injustice makes the situation worse, in that firms may face different pressures even in the same area. This unfairness leads to weakened competitiveness of environmentally-friendly firms due to high environmental investment. In addition, some firms cheat or use other tactics to evade regulation. For instance, we know that the product price of a local competitor is very low, since they do not invest a lot in NH<sub>3</sub> treatment. In order to compete, we have no choice but to mark down the price, and our profit is reduced.



**Lessened Regulatory Pressure:** The regulatory benefits of adopting various environmental programs (in particular those sponsored by governments) consist of three aspects. First, firms may face less frequent inspections by maintaining a good reputation in the EPB and the eyes of the local government (Firms 1, 2, 3, & 6), leading to a potential “win-win” cooperative interaction with regulators. This is consistent with the current literature on the relationship between self-policing and enforcement relief (Toffel & Short, 2011). Second, updating pollution treatment technologies and optimizing internal environmental management prepares firms for enhanced regulatory stringency in the future (Firms 3, 4, 5, & 10). It also helps reduce the potential risk of being non-compliant (Firms 5 & 9). Last, members of government-sponsored VEPs received less external scrutiny such as local community complaints (Firms 1, 2, 3, 4, 6, 8, & 9), which used to place a burden on firms. This is consistent with the purported benefits of “green clubs” proposed in the current VEP studies (Darnall, Potoski, & Prakash, 2010), namely that green club members can easily differentiate themselves from non-participants in the eyes of external stakeholders.

## **CHAPTER 7 DELIBERATIONS AND REFLECTIONS**

The aim of this thesis was to develop and examine a multi-dimensional perspective of corporate compliance style, and a systematic analytical framework of corporate compliance and proactive environmental management. The CCS framework we have developed provides a dimensional perspective to study corporate compliance. Formalism refers to a traditional “go-by-the-books” approach that strictly follows formal rules. Accommodation prioritizes dealing with political or bureaucratic demands. Referencing embraces a close imitation of peer companies’ compliance practices and follows professional codes and guidelines recommended by industrial and trade associations. Self-determination refers to a discretionary approach that emphasizes intellectual flexibility and values autonomy. Based on this conceptualization, we conducted further empirical studies to explore our research questions. In the final chapter, I intend to review and combine the quantitative and qualitative findings to see whether this triangulation will lead to new observations. Further discussion focusing on the Chinese context and how the western theories can be complemented is presented. The chapter also discusses the limitations of this study, some of which may guide future research.

## **7.1 Overall Findings**

I present the findings by answering the three research questions raised in Chapter 1. Table 7.1 summarizes to what extent these questions were theoretically explored and empirically investigated.

Table 7.1 A Summary of the Theoretical and Empirical Investigation of Three Research Questions

Research Questions	Theoretical Investigation and Empirical Findings (Quantitative/Qualitative)	
Q1: (1) Whether and to what extent regulated enterprises differ in adopting CCS towards environmental regulation.	Conceptual Quantitative Qualitative	Development of a dimensional-framework of CCS Validity of CCS variations CCS distributions in environmental progressive firms
Q2: How organizational capacity (OC) and external regulatory intensity (RI) jointly shape CCS adoption.	Quantitative  Qualitative	Provide full support to the positive relationship between OC and CCS, partial support to main effect of GVRI and NGRI, and partial support to the interaction effect.  Confirm the important role of OC and RI; Provide additional support to the interaction effects.
Q3: How firms' normative green commitment (NGC) impacts proactive environmental management (PEM).	Quantitative  Qualitative	Confirmed the mediation effect of self-determination and referencing depends on NGC. Formalism and accommodation has no mediating effect on the OC-PEM relationship.  NGC is common in environmentally progressive firms; sub-dimensions of green commitment may change overtime.

The first question was “Whether and to what extent regulated enterprises differ in adopting CCS towards environmental regulation”. The quantitative findings suggest that enterprises in China differ in their compliance style—four dimensions of CCS (formalism, accommodation, referencing and self-determination) co-exist. In addition, formalism and accommodation are more favored by the surveyed firms than referencing and self-determination. Case study and interview findings provide further evidence of the CCS developed in the theoretical framework. The co-existence of all four CCS dimensions was exhibited in all 10 environmentally progressive enterprises. In addition, firms vary in the extent to which they adopt a certain style dimension. The most commonly adopted dimension is self-determination. The conventional dimension of formalism plays an important role in that all firms consider formal rules as compliance benchmarks, though the extent to which they give these rules priority varies from firm to firm. Enterprises that have a close relationship with the local government are also more likely to adopt the CCS dimension of accommodation. The referencing dimension is common in the early stages of environmental protection, but almost no firm explicitly emphasized it in its environmental management.

To answer the second question, “How organizational capacity (OC) and external regulatory intensity (RI) jointly shape CCS adoptions”, we explored the mechanisms through which external and internal factors independently and jointly affect CCS. The quantitative findings show that organizational capacity is positively related to each of the four compliance style dimensions. However, the four CCS dimensions differ in their resource intensities. Formalism is the most resource-intensive dimension, followed by

accommodation. Referencing and self-determination are relatively less resource-intensive CCS dimensions. Regulatory intensities from government and non-government stakeholders interact with each other and with organizational capacity in a variety of ways to affect enterprises' adoption of different compliance style dimensions.

The importance of organizational capacity and regulatory intensity was also confirmed in the case study and interviews. The interview findings provide further clues as to the salience of the sub-categories of resources and internal coordinating mechanisms. Environmental initiatives in most of the cases we studied are largely implemented in a top-down manner (promoted by top leaders and the environmental department). Through a bottom-up mechanism, employee participation also contributes to improved environmental performance. We further find some evidence of improved involvement of other functional departments, such as engineering (for technical eco-innovation) and sales departments (the first to be aware of market concerns about suppliers' environmental management practices or performance), as well as increasing interactions between environmental and non-environmental departments. Regarding the role of regulatory intensity, firms responded to government, societal, and market stakeholders in a variety of ways depending on firm features.

The last question was "How firms' normative green commitment (NGC) impacts proactive environmental management (PEM)". The regression results suggest that the mediation effect of referencing and self-determination depends on firms' corporate green commitment level. The indirect effect of OC on PEM through referencing and

self-determination is stronger if the firm has a higher degree of normative green commitment. Regarding the role of formalism and accommodation, our quantitative findings show no mediating effect.

## **7.2 Discussions**

This research was an initial step toward identifying the co-existence of various corporate compliance style dimensions in a developing country. Chinese enterprises adopted four types of CCS—formalism, accommodation, referencing, and self-determination—in response to regulatory demands for corporate environmental protection. More specifically, formalism and accommodation are popular among manufacturing enterprises, whereas referencing and self-determination are less common.

The conventional formalistic dimension is important for Chinese enterprises, probably due to China's authoritarian setting, in which enterprises can be subject to closure for non-compliance without much legal recourse. Yet simply following the written rules is often insufficient, as enterprise executives can hardly ignore informal pressures from governmental actors (Morton, 2006), pointing to the need for adopting an accommodation dimension as well. Yet there may be differences between SOEs and non-SOEs with respect to accommodation. SOEs, especially larger ones, have closer relationships with local EPBs and governments than their non-SOE counterparts (Peng & Luo, 2000); these informal ties provide SOEs with more convenient access to governmental support, therefore accommodation is a cost-effective approach to

achieving regulatory compliance. Yet SOEs are under greater pressure when bureaucratic demands are presented to them.

The weaker role of referencing and self-determination probably reflects the resource constraints faced by the regulated enterprises. Business firms in developing countries like China are less familiar with environmental management as compared to their industrial counterparts in developed economies. Many enterprises were established at a time when environmental issues were not a major business concern, and resource scarcity prevented them from pursuing superior environmental performance (Christmann & Taylor, 2001; Liu et al., 2010). In addition, responding to environmental demands is a relatively recent demand for some managers, who may not fully understand the nature of the issues and their business impacts (Berchicci & King, 2007). Our follow-up interviews with ten environmentally progressive firms supported these explanations, as most of them reported the adoption of self-determination strategies, more so than is evident from the broader survey. In other words, firms tend to adopt a self-determination dimension when the regulatory environment leaves room for autonomy and the firm is highly capable of dealing with environmental issues.

Possible over-time changes of CCS might be considered. Apparently, formalism is the primary compliance style dimension in a government-dominated mode of regulation. The other three dimensions have begun to emerge in the more recent regulatory context, which involves a wider range of private, public, and non-government stakeholder interactions. Meanwhile, new entrants into the industry could also bring



with them new perspectives on environmental issues. While external institutional changes have an effect on CCS, internal organizational experiences also matter. A referencing dimension may work well in some circumstances, but not necessarily in all situations. Firms need to learn from their past experiences in order to know what works and what does not. Internal structural and managerial changes in a firm can also trigger different compliance styles (King, 2000). Not all firms will ultimately employ a self-determination compliance style dimension, and multiple dimensions may co-exist. Overall, a perspective that changes over time should be considered to explore the temporal shifts of CCS in both regulatory and management research.

Our findings also extend the current view of the NRBV literature. We show that organizational capacity is always critical to any CCS dimension. However, resources will be leveraged to accommodate political interests only when non-governmental demands are unclear. In addition, pressures from government and non-government groups appear to have opposite effects on referencing: explicit societal demands appear to encourage environmental learning among firms, while clearly-stated government demands distract firms from mimetic behaviors. These results probably reflect the fact that government authority remains the most powerful institutional force in China; when government demands are clearly evident, firms will have no choice but to accord them higher priorities than demands from other societal actors.

In Western setting, a strong civil society may help provide voluntary solutions to collective action problems when the formal political system is facing the problem of

fragmented authority (Berardo & Scholz, 2010; see also Feiock & Scholz, 2010). In China, we also found interesting role of the local policy context. The interactions between government and non-government stakeholders do not affect formalism, but they do affect accommodation, referencing, and self-determination. The latter three dimensions are favored by enterprises that face clear demands from both government and non-government stakeholders. These findings suggest that government-non-government collaboration can help transform corporate environmental practices in China; specifically, non-government stakeholders may strengthen their influence on enterprises' compliance by partnering with the more powerful government stakeholders (Gunningham, Kagan, & Thornton, 2003; Scholz & Wang, 2006). In recent years, increasing numbers of cases have indeed emerged in China in which community-based movements against industrial pollution have successfully led to efforts by local governments to engage enterprises more actively in improving their environmental management practices (Johnson, 2010; Zhan & Tang, 2013).

Past literature on pro-environmental management generally supports a resource-based perspective that there is a direct relationship between organizational input and proactive performance. However, in a regulatory context characterized by central planning and campaign-style implementation (van Rooij 2006; Zhou 1993), a theoretical extension of the current perspective is needed. Our finding suggests that although organizational capacity is still a fundamental determinant of PEM, there are various indirect mechanisms through which this positive association is sustained. An interesting finding is that only voluntary dimensions—referencing and self-

determination—successfully translate firm capability into proactive environmental management. The mediating role of responsive dimensions—formalism and accommodation—is not identified even they are more highly adopted than voluntary dimensions<sup>23</sup>. Such paradox leads to a concern of symbolic governance that the formal regulatory tools and political intervention brings minimal changes (Coglianese, Kilmartin, & Mendelson, 2009; Lubell, 2004), and a concern of symbolic compliance that regulatees only pay ceremonial effort in responding to external demands.

The insignificant role of formalism and accommodation might be partly explained by the unique regulatory context in China, in which local EPBs have weaker regulatory authority compared with development-oriented governmental agencies. With regard to formalism, existing command and control-dominated regulation may not have provided enough incentives and guidance to enable firms to pursue progressive improvement. In terms of accommodation, on the one hand, it may mean selectively joining less demanding pro-environment programs that help secure minimum or symbolic compliance instead of genuine improvement. On the other hand, compromising with political demands may distract firms' attention from focusing on their own priorities, since many of these demands are temporary rather than long-term. Over-interference by politicians may even undermine regulatees' perception of the legitimacy of formal laws and regulations (MacLean & Behnam, 2010), and induce a fallacious perception that consistent abidance with laws is unnecessary.

---

<sup>23</sup> Another possible explanation is that instead of related to proactive environmental management, formalism and accommodation (as relatively responsive compliance styles) might be more likely to relate to compliance performance. We tested such rival hypotheses, which are not supported.

The significant impact of referencing and self-determination compliance style dimensions suggests that, at least in the context of China, one way to promote stronger environmental protection practices among enterprises is to encourage them to strengthen their referencing and self-determination styles of compliance. When this suggestion is combined with our earlier results on the drivers for CCS dimensions, a key to promoting stronger corporate environmental protection practices is not to just exert stronger government pressures (which may only lead to more accommodation), but to find policy tools, such as various compliance assistance programs (Stafford, 2012), to help enterprises enhance their internal organizational capacity. At the same time, it is important to encourage the partnership between governments and non-government stakeholders in promoting referencing and self-determination, and subsequently stronger environmental protection practices among enterprises.

Nevertheless, the ineffectiveness of responsive CCS dimensions does not mean voluntary dimensions could guarantee corporate environmental performance all the time. Organizational failure might be more serious than regulatory failure in many situations such as minimum compliance, where traditional mandatory regulation was found more effective than the discretionary approach alone (Harrison & Antweiler, 2003; May, 2005). In this research, CCS is neither a sufficient nor a necessary condition of better PEM, the road towards which is different among firms with different degrees of green commitment. This may suggest that self-regulation and management-based regulation are desirable and effective in enhancing PEM only in highly committed firms. In fact, following market trends and reliance on self-judgment are detrimental to PEM if a firm

has little commitment. Our findings suggested that referencing and self-determination are negatively related to PEM in low NGC conditions, though the coefficient is insignificant. This is consistent with the literature that corporate self-policing helps leverage the normative motivations of regulatees but can hardly replace traditional enforcement tools (Short & Toffel, 2010).

Overall, our research suggests that the existing insights into corporate compliance and environmental management can be applied to the Chinese context to a large extent. Nevertheless, the specific compliance style dimension that firms adopted to respond to environmental regulation and the mechanisms through which these dimensions transform organizational capability into genuine progress in PEM may differ across regulatory regimes. Although corporate compliance in China is usually largely related to accommodation when political and societal pressures are in place, what cannot be ignored is that regulated enterprises are becoming increasingly independent in pursuing proactive corporate environmental management.

### **7.3 Theoretical Implications**

This study on corporate environmental compliance is situated in the developmental context of China; yet it has implications to corporate environmental management and regulatory enforcement studies in other countries. Overall, this study contributes to the regulatory enforcement and compliance literature on three fronts. First, we have added new insights to the existing literature by examining the strategic-level approaches adopted by enterprises to meet regulatory pressures. Taken together, the

four-dimension classification enables us to move beyond the traditional focus on formal compliance results, and to adopt a more nuanced view on how corporations may address regulatory compliance issues. An empirical study based on this classification allows us to examine in some details the strategic and behavioral orientations behind daily environmental management practices.

Second, we have offered a refined framework for examining how enterprises respond to regulatory pressures from multiple stakeholders by adjusting different compliance style dimensions. The framework highlights the need to investigate not only the relative importance of organizational and public policy forces, but also how they reinforce each other and the processes through which they induce corporate behavioral changes. This study also contributes to the growing literature on how stakeholder interactions influence corporate environmental strategies (Crilly, Zollo, & Hansen, 2012; Gunningham & Grabosky, 1998). Nevertheless, emphasizing the synergetic effect of regulatory intensity from different stakeholder groups does not mean that greater stakeholder involvement is always better in ensuring corporate compliance. Different synergetic effects may work in different circumstances and during various phases of the policy process.

Last, by extending the organizational commitment view into the corporate compliance context, we further find that highly environmentally committed firms differ from less committed firms in the greening process. Green commitment was found to be of critical importance in achieving genuine green proactivity when firms take up various approaches to deal with environmental regulation. It also denotes a possible ecological

modernization in China (Mol, 2006; Yee, Lo, & Tang, 2013), that an increasing number of firms are taking up environmental management practices due to internal commitment and entrepreneurial spirit rather than merely as a passive response to external pressure (as suggested in the conventional wisdom). Though such commitment might not be common at the current stage, it suggests a possible future trend.

#### **7.4 Limitations and Future Research Directions**

This research has a few limitations. First, the survey was limited to one region in China where private and joint-venture firms account for a large proportion of the surveyed companies (67% and 12% respectively in this study), one needs to be careful when generalizing our results to other regulatory contexts. Meanwhile, we cannot generalize our results to all ownership types, as different types of firms may differ in their emphasis on the various compliance style dimensions. A second limitation is that because the research design was cross-sectional, the current study is not able to trace CCS changes over time (though the interview findings have provided some hints). Therefore, many research questions remain on both the theoretical and empirical research agenda for the further study of CCS. Some of the most interesting questions can be grouped as follows:

##### **7.4.1 Over-time changes of CCS**

A call to investigate organizational responses to institutional pressures as a dynamic and evolving process has been emerging in organizational research (Edelman & Petterson, 1991; Hoffman, 1999). As Tilcsik (2010) suggests, “an organization that

complied with institutional pressures a year ago may resist them today, and an organization that used to circumvent a mandate may have embraced it by now”. With regard to regulatory compliance, there might be systematic shifts in compliance style dimensions among enterprises. The CCS alteration across time and space, not only in a specific enterprise but also at the industrial level, deserves further attention in both regulatory and management research. CCS is formed during the process of dealing with regulatory demands, and this process does not take place overnight. In other words, one should not expect a sudden shift from one dimension of CCS to another, rather an evolving perspective should be considered. The conceptual model we developed in this research mainly presents a static picture of CCS. In-depth case studies and longitudinal explorations may facilitate a more comprehensive investigation of CCS changes over a long period of time.

#### **7.4.2 CCS adoptions: when and how?**

In the Business & Natural Environment literature, time is an important variable of interest (Berchicci & King, 2007). Firms can play a more active role in adopting different CCS dimensions at different stages of policy implementation. Just as the timing of an environmental investment determines its financial impact on a firm (Nehrt, 1996), so does CCS adoption. We provide a primary investigation of “when” is the appropriate timing for CCS adoption by examining the role of regulatory intensity. An avenue for future study would therefore be to explore the optimal CCS at different stages of policy implementation and business development. At different stages of business growth, organizations may employ different CCS towards regulation. For



instance, a new entrant to the industry may adopt formalistic CCS at first before moving to self-determination when it is able to do so. Future research may also examine whether firms with multiple CCS dimensions differ in ultimate environmental outcome from those focusing on a single dimension. On the one hand, firms endeavoring to a single CCS can focus their resources on priorities, leading to a better performance due to economies of scale. On the other hand, enterprises with more than one CCS might be more adaptable to the changing external environment and capable of further reducing regulatory uncertainty.

#### **7.4.3 Regional Variations of CCS**

Another research question is whether regional variations in regulatory, political, and cultural contexts affect corporate compliance style. Future studies may include more cities to represent a wider diversity of experiences in terms of economic development and environmental condition. For instance, do multi-national corporations adopt remarkably different CCS in different localities? In addition, the CCS framework may be applicable to a wide array of regulatory domains where businesses are subject to government regulations, such as those related to taxes, workplace health and safety, and product safety. Learning from other policy settings may help develop theoretical insights for the further development of this integrative model.

#### **7.4.4 The Role of other Sub-CGC Dimensions**

One possible explanation to why the moderated mediating effect of NGC is only partially supported may lie in the existence of other commitment dimensions. Adapted

from the management literature on organizational commitment, corporate green commitment is also likely to capture other two components—continuance and affective commitment in addition to the normative commitment we studied in the current research. Our qualitative findings have already shown some evidence of how firms attach different levels of importance to each dimension, as well as the possible shifts among them. Though beyond the scope of the present study, whether and how different CGC dimensions play a role in corporate compliance deserves further research attention. Future research may take a further step to examine such differences and how they contribute to corporate compliance performance.

## CHAPTER 8 CONCLUSIONS

A mystery in environmental governance is that there is no perfect regulatory and policy solution to guarantee industrial environmental performance. Actions of regulatees are so puzzling that empirical evidence of the effectiveness of external efforts on corporate compliance and proactivity remains inconsistent. One possible reason is that the organizational mechanisms through which regulated entities address environmental concerns are partly ignored in the current literature (Schaltegger, Burritt, & Petersen, 2003). This research has developed and empirically examined a systematic analytical framework to capture the significance of these internal processes in determining corporate compliance and proactive environmental outcome.

Just as regulators may choose from a variety of enforcement styles to achieve policy targets, this study suggested that regulated entities may also choose different compliance styles in response to various regulatory demands. Survey findings supported a four-dimensional perspective of CCS, the main and interactive effects of OC and RI in determining CCS adoptions, and the moderating role of NGC on the mediating effect of CCS (on the OC-PEM association). More specifically, organizational capacity is positively related to each of the four compliance style dimensions. Regulatory intensities from government and non-government stakeholders interact with each other and with organizational capacity to affect enterprises' adoption of different CCS dimensions in a variety of ways. Furthermore, we find that resource sufficiency does not always lead to improved PEM. Two voluntary dimensions of CCS, referencing and self-

determination, translate organizational resources into PEM progress only when firms have a high level of normative green commitment. The two responsive dimensions of CCS, formalism and accommodation, do not show any bridging functions even though they are more frequently adopted than voluntary dimensions. Post-hoc case study and in-depth interview findings add to the survey results by first showing a more detailed and dynamic picture of CCS. They also support the hypotheses in the survey study and provide some possible answers as to why some hypotheses were not supported in an empirical context in China.

Practical implications of this research are twofold. Inferences for managers are clear. Careful resource management in strategic planning will allow regulated firms to make better compliance decisions under both external and internal constraints. A full evaluation of a firm's resource endowment is important since resource limitation requires enterprises to allocate them rationally to meet regulatory demands and be economically efficient. Managers should also consider the priority of each dimension and specify which environmental program or activity to fund if more resources become available, or which activity to reduce if the total budget is reduced. Moreover, instead of dealing with demands from each regulatory group separately, a full evaluation of the firm's regulatory environment will help develop smarter and more effective strategies for achieving regulatory compliance. Green commitment also deserves further attention in order to improve a firm's environmental performance. Managers should realize that whether a selected environmental approach or strategy can achieve an expected goal depends on the extent to which the company is genuinely committed to environmental

protection. Programs such as green training for staff are helpful in fostering green commitment.

To policy makers, a proper understanding of the antecedents of corporate compliance style helps in the design of better regulatory policies and implementation strategies. More specifically, collaborative efforts between government and non-government entities may encourage enterprises to adopt more innovative compliance style dimensions. In addition, policy makers, industry associations, and NGOs may consider ways for helping enterprises develop their internal capacity for pursuing more effective strategies for regulatory compliance.

It is also important for policy makers to understand that firm-level diversity in environmental approaches and their level of green commitment matter. Instead of being dictators, policy makers and enforcement officials may work as “public choice architects” (Thaler & Sunstein, 2008), holding responsibility for organizing the context in which regulatees make decisions. Not all roads lead to Rome if policy makers cannot adopt an appropriate combination of policy instruments to induce and encourage firms with different environmental preferences to go proactive. Bridging the gap between environmental policy and the facts in private-sector management may require further changes in regulatory design. As Fiorino (2006) stated in his book, the key question is “How do we design and build a regulatory system that will promote a continuing, broad, and enduring greening of industry that builds on the demonstrated achievements of the leading firms?”

Overall, the results of this thesis clearly demonstrate that regulated businesses do adopt various compliance style dimensions in response to environmental regulation. An investigation of corporate compliance style provides a new lens to study the impact and effectiveness of environmental policies from regulatees' side. This research further clarifies the mechanisms of how institutional and organizational factors determine CCS involvement and proactive environmental management. The empirical study went further than merely investigating the main effects and shows the interactions among firms' environmental capacity, perceived regulatory intensity, and corporate green commitment. Taken together, the thesis findings not only contribute to the scholarly understanding of corporate compliance but also provide strong insights for investigating CCS in a wide range of fields in the future. It is hoped that the theoretical framework and empirical findings in this research will offer some interesting and elucidating insights to both managers and policy makers, enabling them to achieve better results in regulatory enforcement and compliance.

## REFERENCES

- Aiken, L.S., & West, S.G. (Eds.). (1991). *Multiple regression: Testing and interpreting interaction*. Newbury Park, Calif.: Sage Publications.
- Ansell, C. and Gash, A. (2008). Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory*, 18: 543-71.
- Ansell, C., & Vogel, D. (2006). *What's the Beef: the Contested Governance of European Food Safety*. Cambridge, MA: MIT Press.
- Aragón-Correa, J.A. (1998). Strategic proactivity and firm approach to the natural environment. *Academy of Management Journal*, 41: 556-567.
- Aragón-Correa, J.A., & Sharma, S. (2003). A contingent resource-based view of proactive corporate environmental strategy. *Academy of Management Review*, 28: 71-88.
- Axelrad, L., & Kagan, R.A. (2000). *Regulatory Encounters: Multinational Corporations and American Adversarial Legalism*. Berkeley: Univ. of California Press.
- Axinn, W.G., & Pearce, L.D. (2006). *Mixed Method Data Collection Strategies*. New York: Cambridge University Press.
- Bae, H. (2012). Reducing Environmental Risks by Information Disclosure: Evidence in Residential Lead Paint Disclosure Rule. *Journal of Policy Analysis and Management*, 31(2): 404-431.
- Banerjee, S.B. (2001). Managerial perceptions of corporate environmentalism: interpretations from industry and strategic implications for organizations. *Journal of*

- Management Studies*, 38(4): 489-513.
- Bansal, P. (2005). Evolving sustainably: A longitudinal study of corporate sustainable development. *Strategic Management Journal*, 26: 197-218.
- Bansal, P., & Clelland, I. (2004). Talking trash: legitimacy, impression management, and unsystematic risk in the context of the natural environment. *Academy of Management Journal*, 47(1): 93-103.
- Bansal, P., & Roth, K. (2000). Why companies go green: A model of ecological responsiveness. *Academy of Management Journal*, 43(4): 717-736.
- Bardach, E., & Kagan, R.A. (1982). *Going by the Book: The Problem of Regulatory Unreasonableness*. Rev. Ed. Philadelphia: Transaction Publishers.
- Barnett, M.L. (2006). Finding a Working Balance Between Competitive and Communal Strategies. *Journal of Management Studies*, 43: 1753–1773.
- Barnett, M.L. (forthcoming). Why Stakeholders Ignore Firm Misconduct: A Cognitive View. *Journal of Management*.
- Barnett, M., & King, A.A. (2008). Good fences make good neighbors: An institutional explanation of industry self-regulation. *Academy of Management Journal*, 51: 1150-1170.
- Barnett, M.L., & Salomon, R.M. (forthcoming). Does it pay to be really good? Addressing the shape of the relationship between social and financial performance. *Strategic Management Journal*, 33: 1304-1320.
- Barney, J.B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17: 99-120.



- Baron, D. (2003). *Business and its environment*. Upper Saddle River, NJ: Prentice-Hall.
- Bartley, T. (2007). Institutional emergence in an era of globalization: The rise of transnational private regulation of labor and environmental conditions. *American Journal of Sociology*, 113(2): 297–351.
- Becker, G.S. (1968). Crime and punishment: an economic approach. *Journal of Political Economy*, 76: 169-217.
- Berardo, R., & Scholz, J.T. (2010). Self-Organizing Policy Networks: Risk, Partner Selection, and Cooperation in Estuaries. *American Journal of Political Science*, 54(3): 632-649.
- Berchicci, L., & King, A. (2007). Chapter 11: postcards from the edge. *Academy of Management Annals*, 1: 513-547.
- Beyer, S. (2006). Environmental Law and Policy in the People's Republic of China. *Chinese Journal of International Law*, 5(1): 185-211.
- Blackman, A. (2006). Introduction: Small Firms and the Environment. In *Small Firms and the Environment in Developing Countries*, edited by A. Blackman. Washington, DC: Resources for the Future.
- Boiral, O. (2007). Corporate greening through ISO 14001: a rational myth? *Organization Science*, 18(1): 127-146.
- Bonardi, J. P., & Keim, G. (2005). Corporate political strategies for widely salient issues. *Academy of Management Review*, 30: 555-576.
- Braithwaite, V. (2003). Dancing with tax authorities: Motivational postures and non-compliant actions. In V. Braithwaite (Ed.), *Taxing democracy. Understanding tax*

- avoidance and tax evasion* (pp. 15-39). Aldershot: Ashgate.
- Branzei, O., Ursacki-Bryant, T.J., Vertinsky, I., & Zhang, W. (2004). The transformation of green strategies in Chinese firms: Matching corporate environmental responses and individual principles. *Strategic management Journal*, 25: 1075-1095.
- Brehm, J., & Hamilton, J. T. 1996. Noncompliance in Environmental Reporting: Are Violators Ignorant, or Evasive, of the Law? *American Journal of Political Science*, 40 (2): 444-477.
- Burby, R., & Paterson, R.G. (1993). Improving compliance with state environmental regulations. *Journal of Policy Analysis and Management*, 12: 753-772.
- Buyse, K., & Verbeke, A. (2003). Proactive environmental strategies: a stakeholder management perspective. *Strategic Management Journal*, 24(5): 453-470.
- Carson, R. 1962. *Silent Spring*. Boston: Houghton Mifflin.
- Chatterji, A.K., & Toffel, M.W. (2010). How firms respond to being rated. *Strategic Management Journal*, 31(9): 917-945.
- Child, J., & Tsai, T. (2005). The dynamic between firms' environmental strategies and institutional constraints in emerging economies: Evidence from china and Taiwan. *Journal of Management Studies*, 42(1): 95-125.
- Cho, C.H., Patten, D.M., & Roberts, R.W. (2006). Political expenditures, environmental performance, and environmental disclosure. *Journal of Business Ethics*, 67: 139-154.
- Christensen, T., Dong, L.S., Painter, M., & Walker, R.M. (2012). Imitating the West? Evidence on Administrative Reform from the Upper Echelons of Chinese Provincial

- Government. *Public Administration Review*, 72(6): 798-806.
- Christmann, P. (2000). Effects of “Best Practices” of Environmental Management on Cost Advantage: The Role of Complementary Assets. *Academy of Management Journal*, 43(4): 663-680.
- Christmann, P. (2004). Multinational companies and the natural environment: determinants of global environmental policy standardization. *Academy of Management Journal*, 47(5): 747-760.
- Christmann P., & Taylor, G. (2001). Globalization and the Environment: Determinants of Firm Self-Regulation in China. *Journal of International Business Studies*, 32(3): 439-45.
- Christmann, P. & Taylor, G. (2006). Firm Self-Regulation through International Certifiable Standards: Determinants of Symbolic versus Substantive Implementation. *Journal of International Business Studies*, 37(6): 863-878.
- Coglianesse, C., & Nash, J. (2001). *Regulating from the Inside: Can Environmental Management Systems Achieve Policy Goals?* Washington D.C.: Resources for the Future.
- Coglianesse, C., Kilmartin, H., & Mendelson, E. (2009). Transparency and Public Participation in the Federal Rulemaking Process: Recommendations for the New Administration. *George Washington Law Review*, 77: 924-972.
- Cohen, M.D., March, J.G., & Olsen, J.P. (1972). A garbage can model of organizational choice. *Administrative Science Quarterly*, 17: 1-25.
- Crilly, D., Zollo, M., & Hansen, M.T. (2012). Faking it or Muddling Through?

- Understanding Decoupling in Response to Stakeholder Pressures. *Academy of Management Journal*, 55(6): 1429-1448.
- Cummings, L.S. (2008). Managerial Attitudes Toward Environmental Management within Australia, the People's Republic of China and Indonesia. *Business Strategy and the Environment*, 18: 16-29.
- Darnall, N., & Edwards, D.J. (2006). Predicting the cost of environmental management system adoption: the role of capabilities, resources and ownership structure. *Strategic Management Journal*, 27(4): 301-320.
- Darnall, N., Potoski, M., & Prakash, A. (2010). Sponsorship matters: Assessing business participation in government- and industry- sponsored voluntary environmental programs. *Journal of Public Administration Research and Theory*, 20(2): 283-307.
- Darnall, N., & Sides, S. (2008). Assessing the performance of voluntary environmental programs: Does certification matter? *Policy Studies Journal*, 36: 95-117.
- Dasgupta, S., Hettige, H., & Wheeler, D. (2000). What Improves Environmental Compliance? Evidence from Mexican Industry. *Journal of Environmental Economics and Management*, 39(1): 39-66.
- DeHart-Davis, L., & Bozeman, B. (2001). Regulatory Compliance and Air Quality Permitting: Why Do Firms Overcomply? *Journal of Public Administration Research and Theory*, 11(4): 471-508.
- Delmas, M.A., & Burbano, V.C. (2011). The Drivers of Greenwashing. *California Management Review*, 54(1): 64-87.
- Delmas, M.A., & Keller, A. (2005). Strategic free riding in voluntary programs: the case

- of the US EPA WasteWise program. *Policy Sciences*, 38(1): 91-106.
- Delmas, M.A., & Montes-Sancho, M.J. (2010). Voluntary agreements to improve environmental quality: symbolic and substantive cooperation. *Strategic Management Journal*, 31 (6): 575-601.
- Delmas, M. & Toffel, M. (2008). Organizational Responses to Environmental Demands: Opening the Black Box. *Strategic Management Journal*, 29(10): 1027-1055.
- Denzin, N. K., Lincoln, Y. S. (1994). *Handbook of Qualitative Research*. Thousand Oaks, CA: Sage.
- Diestre, L., & Rajagopalan, N. (2011). An environmental perspective on diversification: the effects of chemical relatedness and regulatory sanction. *Academy of Management Journal*, 54(1): 97-115.
- Doh, J.P., & Pearce, J.A. (2004). Corporate entrepreneurship and real options in transitional policy environments: theory development. *Journal of Management Studies*, 41: 645-664.
- Dowell, G., Hart, S., & Yeung, B. (2000). Do corporate global environmental standards create or destroy market value? *Management Science*, 46(8): 1059-1076.
- Eccles, R.G., & Krzus, M.P. (2010). *One report: Integrated reporting for a sustainable strategy*. New York: John Wiley & Sons, Inc.
- Economy, E. (2010). *The River Runs Black: The Environmental Challenge to China's Future* (2nd edition). Ithaca: Cornell University Press.
- Edelman, L.B., & Petterson, S. (1991). Legal ambiguity and the politics of compliance: Affirmative action officers' dilemma. *Law and Policy*, 13(1): 73-91.

- Emerson, K., Nabatchi, T., & Balogh, S. (2012). An Integrative Framework for Collaborative Governance. *Journal of Public Administration Research and Theory*, 22: 1-29.
- Eriksson, C. (2004). Can green consumerism replace environmental regulation: a differentiated products example. *Resource and Energy Economics*, 26(3): 281-293.
- Eskeland, G.S., & Harrison, A.E. (2003). Moving to greener pastures? Multinationals and the pollution haven hypothesis. *Journal of Development Economics*, 70 (1): 1-23.
- Etzion, D. (2007). Research on organizations and the natural environment, 1992-present: A review. *Journal of Management*, 33 (4): 637-664.
- Feiock, R.C., & Scholz, J.T. (eds 2010). *Self-Organizing Governance: Collaborative Mechanisms to Mitigate Institutional Collective Action Dilemmas*. New York: Cambridge University Press.
- Fernández, E., Junquera, B., & Ordiz, M. (2003). Organizational culture and human resources in the environmental issue: A review of the literature. *International Journal of Human Resource Management*, 14: 634-656.
- Fiorino, D.J. (2001). Environmental Policy as Learning: A New View of an Old Landscape. *Public Administration Review*, 61(3): 322-334.
- Fiorino, D.J. (2006). *The New Environmental Regulation*. Cambridge, MA: MIT Press.
- Flannery, B.L., & May, D.R. (2000). Environmental ethical decision making in the U.S. metal-finishing industry. *Academy of Management Journal*, 43: 642-662.
- Fowler, F.J. (1993). *Survey Research Methods*. Newbury Park, CA: Sage.
- Francesch-Huidobro, M., Lo, C.W.H., & Tang, S.Y. (2012). The local environmental

- regulatory regime in China: changes in pro-environment orientation, institutional capacity, and external political support in Guangzhou. *Environment and Planning A*, 44: 2493-2511.
- Freeman, J. (1997). Collaborative governance in the administrative state. *UCLA Law Review*, 45:1.
- Freeman, R.E. (1984). *Strategic Management: A Stakeholder Approach*. Boston: Pitman.
- Fryxell, G.E., Lo, C.W.H., & Chung, S.S. (2004). Influence of Motivations for Seeking ISO 14001 Certification on Perceptions of EMS Effectiveness in China. *Environmental Management*, 33(2): 239-251.
- Fung, A., Graham, M., & Weil, D. (2007). *Full disclosure: The Perils and Promise of Transparency*. Cambridge University Press: Cambridge, MA.
- Gladwin, T., Kennelly, J., & Krause, T. (1995). Shifting paradigms for sustainable development: implications for management theory and research. *Academy of Management Review*, 20: 874-907.
- Glaser, B.G., & Strauss, A.L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Aldine, Chicago, IL.
- Goodrick, E., & Salancik, G.R. (1996). Organizational discretion in responding to institutional practices: Hospitals and cesarean births. *Administrative Science Quarterly*, 41(1): 1-28.
- Goodstein, J.D. (1994). Institutional pressures and strategic responsiveness: Employer involvement in work-family issues. *Academy of Management Journal*, 37(2): 350-382.
- Gormley, W.T., & Peters, B.G. (1992). National Styles of Regulation: Child Care in

- Three Countries. *Policy Sciences*, 25: 381-99.
- Greenwood, R., Raynard, M., Kodeih, F., Micelotta, E.R., & Lounsbury, M. (2011). Institutional Complexity and Organizational Responses. *Academy of Management Annals*, 5(1): 317-371.
- Greenwood, R., Suddaby, R., & Hinings, C.R. (2002). Theorizing change: The role of professional associations in the transformation of institutional fields. *Academy of Management Journal*, 45: 58-80.
- Gunningham, N.A. (2009). The new collaborative environmental governance: the localization of regulation. *Journal of law and Society*, 36(1): 145-166.
- Gunningham, N.A., & Grabosky, P. (1998). *Smart Regulation: Designing Environmental Policy*. Oxford: Oxford Univ. Press.
- Gunningham, N.A., Kagan, R.A., & Thornton, D. (2003). *Shades of Green: Business, Regulation, and Environment*. Stanford University Press, Stanford, California.
- Gunningham, N.A., Thornton, D., & Kagan, R.A. (2005). Motivating management: Corporate compliance in environmental protection. *Law & Policy*, 27: 289-316.
- Hahn, R.W., & Stavins, R.N. (1992). Economic Incentives for Environmental Protection: Integrating Theory and Practice. *The American Economic Review*, 82 (2): 464-468.
- Hair, J.F., Black, W.C., Babin, B.J., & Anderson, R.E. (2010). *Multivariate Data Analysis* (7th edition). New Jersey: Pearson Education International.
- Hambrick, D.C. (2007). Upper echelons theory: An update. *Academy of Management Review*, 32(2): 334-343.
- Hamilton, J. (1995). Pollution as News: Media and Stock Market Reactions to the



- Toxics Release Inventory Data. *Journal of Environmental Economics and Management*, 28: 98-113.
- Hansen, K., Johannsen, K.S., & Larsen, A. (2002). Recommendations for negotiated agreements. *Environment and Planning C: Government and Policy*, 20(1): 19-37.
- Hansen, W.L., & Mitchell, N.J. (2000). Disaggregating and explaining corporate political activity: Domestic and foreign corporations in national politics. *American Political Science Review*, 94: 891-903.
- Harman, H.H. (1976). *Modern factor analysis* (3<sup>rd</sup> edition). Chicago: The University of Chicago Press.
- Harrison, J.S., Bosse, D., & Phillips, R.A. (2010). Managing for stakeholders, stakeholder utility functions, and competitive advantage. *Strategic Management Journal*, 31(1): 58-74.
- Harrison, K., & Antweiler, W. (2003). Incentives for Pollution Abatement: Regulation, Regulatory Threats, and Non-Governmental Pressures. *Journal of Policy Analysis and Management*, 22(3): 361-382.
- Hart, S.L. (1995). A natural-resource-based view of the firm. *Academy of Management Review*, 20: 986-1014.
- Hart, S.L. (1997). Beyond greening: strategies for a sustainable world. *Harvard Business Review*, 75: 66-76.
- Hart S.L. (2010). *Capitalism at the Crossroads: Next Generation Business Strategies for a Post-Crisis World* (3rd ed.). Upper Saddle River, NJ: Pearson Education.
- Hart, S.L., & Dowell, G. (2011). Invited editorial: a natural-resource-based view of the

- firm: fifteen years after. *Journal of Management*, 37(5): 1464-1479.
- Henderson, R., & Clark, K. (1990). Architectural innovation: the reconfiguration of existing. *Administrative Science Quarterly*, 35(1): 9-30.
- Henriques, I., Husted, B.W., & Montiel, I. (2013). Spillover Effects of Voluntary Environmental Programs on Greenhouse Gas Emissions: Lessons from Mexico. *Journal of Policy Analysis and Management*, 32(2): 296-322.
- Henriques, I., & Sadowsky, P. (1999). The relationship between environmental commitment and managerial perceptions of stakeholder importance. *Academy of Management Journal*, 42(1): 87-99.
- Hillman, A., & Hitt, M. (1999). Corporate political strategy formulation: A model of approach, participation and strategy decisions. *Academy of Management Review*, 20: 193-214.
- Hillman, A., Schuler, D., & Keim, G. (2004). Corporate political activity: A review and research agenda. *Journal of Management*, 30: 837-857.
- Hoffman, A.J. (1996). A strategic response to investor activism. *Sloan Management Review*, 37(2): 51-64.
- Hoffman, A.J. (1999). Institutional evolution and change: Environmentalism and the U.S. chemical industry. *Academy of Management Journal*, 42(4): 351-371.
- Hoffman, A.J. (2001). Linking organizational and field level analyses: the diffusion of corporate environmental practice. *Organization & Environment*, 14 (2): 133-156.
- Hoffman, A.J. (2005). Business decisions and the environment: Significance, challenges, and momentum of an emerging research field. In G. Brewer and P. Stern (eds.),

- Decision Making for the Environment: Social and Behavioral Science Research Priorities*. Washington D.C.: National Research Council, National Academies Press.
- Hoffman, A.J., & Bertels, S. (2010). Who is part of the environmental movement? Assessing network linkages between NGOs and corporations. in T. Lyon (ed). *Good Cop Bad Cop: Environmental NGOs and their Strategies toward Business*. Washington DC: Resources for the Future Press.
- Hoffman, A.J., & Georg, S. (2013). A history of research on business and the natural environment: Conversations from the field. Introduction in S. Georg and A. Hoffman (eds.) *Business and the Environment: Critical Perspectives in Business and Management*, Volume 1. Oxford, UK: Routledge.
- Hoffman, A.J., & Ventresca, M.J. (Eds.). (2002). *Organization, policy and the natural environment: Institutional and strategic perspectives*. Stanford, CA: Stanford University Press.
- Hoffman, A.J. & Woody, J.G. (2008). *Climate change: What's your business strategy?* Cambridge, MA: Harvard Business Press.
- Hofstede, G. (1993). Culture constraints in management theories. *Academy of Management Executive*, 7(1): 81-94.
- Howard-Grenville, J. (2006). Inside the "black box": how organizational culture and subcultures inform interpretations and actions on environmental issues. *Organization & Environment*, 19(1): 46-73.
- Howard-Grenville, J., & Hoffman, A.J. (2003). The importance of cultural framing to the success of social initiatives in business. *Academy of Management Executive*, 17(2):

- 70-84.
- Hu, Y. (2007). Implementation of voluntary agreements for energy efficiency in China. *Energy Policy*, 25: 5541-5548.
- Huang, P.S., Zhang, X.L., & Deng, X.D. (2006). Survey and analysis of public environmental awareness and performance in Ningbo, China: a case study on household electrical and electronic equipment. *Journal of Cleaner Production*, 14: 1635-1643.
- Huising, R. & Silbey, S.S. (2011). Governing the gap: Forging safe science through relational regulation. *Regulation & Governance*, 5: 14–42.
- Hunt, C.B., & Auster, E.R. (1990). Proactive environmental management: Avoiding the toxic trap. *Sloan Management Review*, 31 (2): 7-18.
- Jahiel, A.R. (1998). The Organization of Environmental Protection in China. *The China Quarterly*, 156: 757-787.
- Jennings, P.D., & Zandbergen, P.A. (1995). Ecologically sustainable organizations: an institutional approach. *Academy of Management Review*, 20: 1015–1052.
- Johnson, T. (2010). Environmentalism and NIMBYism in China: promoting a rules-based approach to public participation. *Environmental Politics*, 19(3):430-448.
- Jones, T. (1982). An integrating framework for research in business and society: A step toward the elusive paradigm? *Academy of Management Review*, 8: 559-564.
- Kagan, R.A. (2001). *Adversarial Legalism: The American Way of Law*. Cambridge, MA: Harvard Univ. Press.
- Kagan, R.A., & Scholz, J.T. (1984). Criminology of the corporation and Regulatory

- Enforcement Styles, In *Enforcing Regulation*, ed. Keith Hawkins and John M. Thomas. Boston: Kluwer-Nijhoff.
- Kanuk, L., & Berenson, C. (1975). Mail surveys and response rates: a literature review. *Journal of Marketing Research*, 12: 440-453.
- Keogh, P.D., & Polonsky, M.J. (1998). Environmental commitment: a basis for environmental entrepreneurship? *Journal of Organizational Change Management*, 11(1): 38-49.
- Kettl, D.F. (Ed.). (2002). *Environmental governance: A report on the next generation of environmental policy*. Washington, DC: Brookings Institution.
- King, A.A. (2000). Organizational Response to Environmental Regulation: Punctuated Change or Autogenesis? *Business Strategy and the Environment*, 4(9): 224-238.
- King, A.A. (2007). Cooperation between corporations and environmental groups: a transaction cost perspective. *Academy of Management Review*, 32(3): 889-900.
- King, A.A., & Lenox, M. (2001). Does it really pay to be green? An empirical study of firm environmental and financial performance. *Journal of Industrial Ecology*, 5(1): 105-116.
- King, A.A., & Lenox, M. (2002). Exploring the Locus of Profitable Pollution Reduction. *Management Science*, 48(2): 289-299.
- King, A.A., Lenox, M. & Terlaak, A. (2005). The Strategic Use of Decentralized Institutions: Exploring Certification with The ISO 14001 Management Standard. *Academy of Management Journal*, 48(6): 1091-1106.
- Konar, S., & Cohen, M.A. (1997). Information as Regulation: The Effect of Community

- Right to Know Laws on Toxic Emissions. *Journal of Environmental Economics and Management*, January, 32: 109-24.
- Kraatz, M.S., & Block, E.S. (2008). Organizational implications of institutional pluralism. In R. Greenwood, C. Oliver, K. Sahlin, & R. Suddaby (Eds.), *The SAGE handbook of organizational institutionalism* (pp. 243-275). London: Sage.
- Lanoie, P., Laplante, B., & Roy, M. (1998). Can capital markets create incentives for pollution control? *Ecological Economics*, 26: 31-41.
- LaPorte, T.R., & Thomas, C.W. (1995). Regulatory compliance and the ethos of quality enhancement: surprises in nuclear power plant operations<sup>1</sup>. *Journal of Public Administration Research and Theory*, 5(1):109-138.
- Lee, E. (2010). Information disclosure and environmental regulation: green lights and gray areas. *Regulation & Governance*, 4: 303-328.
- Lee, E. (2011). Information, interest intermediaries, and regulatory compliance. *Journal of Public Administration Research and Theory*, 21(1): 137-157.
- Lenox, M.J., & Nash, J. (2003). Industry self-regulation and adverse selection: a comparison across four trade association programs. *Business Strategy and the environment*, 12(6): 343-356.
- Levy, D.L., & Egan, D. (2003). A neo-gramscian approach to corporate political strategy: conflict and accommodation in the climate change negotiations. *Journal of management studies*, 40(4): 803-829.
- Li, G., & Foster, K.W. (2008). Administrative Campaigns and Environmental Governance in Contemporary China. *China Environmental Science & Sustainability*

- (CESS) UBC-Research Group, Working Paper #2.
- Li, S.X., Yao, X.T., Chan, C.S., & Xi, Y.M. (2010). Where do social ties come from: institutional framework and governmental tie distribution among Chinese managers. *Management and Organization Review*, 7:1 97-124.
- Lieberman, M.B., & Asaba, S. (2006). Why do firms imitate each other? *Academy of Management Review*, 31: 366-385.
- Liu, B.B, Shishime, T., Yu, Q., Bi, J., & Fujitsuka, T. (2010). An empirical study on the driving mechanism of proactive corporate environmental management in China. *Journal of Environmental Management*, 91: 1707-1717.
- Liu, X.B., & Anbumozhi, V. (2009). Determinant factors of corporate environmental information disclosure: an empirical study of Chinese listed companies. *Journal of Cleaner Production*, 17(6): 593-600.
- Lo, C.W.H., Fryxell, G.E., & Tang, S.Y. (2010). Stakeholder pressures from perceived environmental impacts and the effect on corporate environmental management programmes in China. *Environmental Politics*, 19(6): 888-909.
- Lo, C.W.H., & Tang, S.Y. (2006). Institutional Reform, Economic Changes, and Local Environmental Management in China: the Case of Guangdong Province. *Environmental Politics*, 15(2):190-210.
- Lubell, M. (2004). Collaborative Environmental Institutions: All Talk and No Action? *Journal of Policy Analysis and Management*, 23(3): 549-573.
- Lynch-Wood, G., & Williamson, D. (2010). Regulatory compliance: organizational capacities and regulatory strategies for environmental protection. In *Regulation and*

- Criminal Justice: Innovations in Policy and Research*. Cambridge University Press, Ch. 6, p. 136.
- Lyon, T.P., & Maxwell, J.W. (2007). Environmental public voluntary programs reconsidered. *Policy Studies Journal*, 35: 723-750.
- Lyon, T.P., & Maxwell, J.W. (2011). Greenwash: Environmental Disclosure Under Threat of Audit. *Journal of Economics and Management Strategy*, 20(1): 3-41.
- Ma, X., & Ortolano, L. (2000). *Environmental Regulation in China: Institutions, Enforcement, and Compliance*. Rowan & Littlefield Publishers, Inc, NY.
- MacLean, T.L. & Behnam, M. (2010). The dangers of decoupling: the relationship between compliance programs, legitimacy perceptions, and institutionalized misconduct. *Academy of Management Journal*, 53(6): 1499-1520.
- Majumdar, S.K., & Marcus, A.A. (2001). Rules versus discretion: the productivity consequences of flexible regulation. *Academy of Management Journal*, 44(1): 170-179.
- Manion, M. (2004). *Corruption by Design, Building Clean Government in Mainland China and Hong Kong*. Cambridge, MA: Harvard Univ. Press.
- Marquis, C., & Qian, C.L. Forthcoming. Corporate Social Responsibility Reporting in China: Symbol or Substance? *Organization Science*.
- Marquis, C., & Toffel, M.W. (2012). When Do Firms Greenwash? Corporate Visibility Civil Society Scrutiny, and Environmental Disclosure. *Harvard Business School Working Paper*, 11-115.
- Marquis, C., Zhang, J.J., & Zhou, Y.H. (2011). Regulatory Uncertainty and Corporate



- Responses to Environmental Protection in China. *California Management Review*, 54(1): 39-63.
- May, P.J. (2004). Compliance motivations: Affirmative and negative bases. *Law and Society Review*, 38(1): 41-68.
- May, P.J. (2005). Regulation and compliance motivation: Examining different approaches. *Public Administration Review*, 65(1): 31-44.
- May, P.J., & Winter, S. (1999). Regulatory enforcement and compliance: Examining Danish agro-environmental policy. *Journal of Policy Analysis and Management*, 18: 625-651.
- May, P.J., & Wood, R.S. (2003). At the regulatory front lines: inspectors' enforcement style and regulatory compliance. *Journal of Public Administration Research and Theory*, 13(2): 117-139.
- McCaffrey, D.P., Smith, A.E., & Martinez-Moyano, I.J. (2007). Then let's have a dialogue": interdependence and negotiation in a cohesive regulatory system. *Journal of Public Administration Research and Theory*, 17(2): 307-334.
- Meyer J.P., & Allen, N.J. (1991). A Three-Component Conceptualization of Organizational Commitment. *Human Resource Management Review*, 1: 61-89.
- Meyer J.P., & Allen, N. J. (1997). *Commitment in the workplace, Theory, Research and Application*. Thousand Oaks, CA: Sage.
- Miles, R.E., & Snow, C.C. (1978). *Organizational Strategy, Structure and Process*. McGraw Hill, New York.
- Miller, G.S. (2006). The press as a watchdog for accounting fraud. *Journal of*

- Accounting Research*, 44: 1001-1033.
- Mitchell, R., Agle, B., & Wood, D. (1997). Toward a theory of stakeholder identification and salience: defining the principle of who and what really counts. *Academy of Management Review*, 22: 853-886.
- Mol, A.P.J. (2006). Environment and modernity in transitional China: frontiers of ecological modernization. *Development and Change*, 15(1): 29-56.
- Morton, K. (2006). Surviving an Environmental Crisis: Can China Adapt? *Brown Journal of International Affairs*, 13(1): 63-75.
- Muller, D., Judd, C.M., & Yzerbyt, V.Y. (2005). When moderation is mediated and mediation is moderated. *Journal of Personality and Social Psychology*, 89: 852-863.
- Murillo-Luna, J.L., Graces-Ayerbe, C., & Riverra-Torres, P. (2008). Why do patterns of environmental responses differ? A stakeholders' pressure approach. *Strategic Management Journal*, 29: 1225-1240.
- Nederhof, A.J. (1985). Method of coping with social desirability: A review. *Journal of European Social Psychology*, 14: 163-200.
- Nehrt, C. (1996). Timing and intensity effects of environmental investments. *Strategic Management Journal*, 17(7): 535-547.
- Neville, B.A., & Menguc, B. (2006). Stakeholder Multiplicity: Toward an Understanding of the Interactions between Stakeholders. *Journal of Business Ethics*, 66: 377-391.
- Nunnally, J. (1967). *Psychometric Methods*. New York: McGraw Hill.
- Okhmatovskiy, I., & David, R. (2012). Setting your own standards: internal corporate

- governance codes as a response to institutional pressure. *Organization Science*, 23(1): 155-176.
- Oliver, C. (1991). Strategic responses to institutional processes. *Academy of Management Review*, 16(1): 145-179.
- Oliver, C., & Holzinger, I. (2008). The effectiveness of strategic political management: A dynamic capabilities framework. *Academy of Management Review*, 33(2): 496-520.
- Pache, A.C., & Santos, F. (2010). When worlds collide: The internal dynamics of organizational responses to conflicting institutional demands. *Academy of Management Review*, 35(3): 455-476.
- Pargal, S., & Wheeler, D. (1995). Informal regulation of industrial pollution in developing countries: evidence from Indonesia. *Policy research working paper*, No. 1416, Washington, DC.
- Park, S.H., & Luo, Y.D. (2001). Guanxi and organizational dynamics: organizational networking in Chinese firms. *Strategic Management Journal*, 22: 455-477.
- Pedersen, E.R., & Neergaard, P. (2006). Caveat empto—let the buyer beware: environmental labeling and the limitations of green consumerism. *Business Strategy & the Environment*, 15(1): 15-29.
- Peng, M.W., & Heath, P.S. (1996). The Growth of the Firm in Planned Economies in Transition: Institutions, Organizations, and Strategic Choice. *Academy of Management Review*, 21(2): 492-528.
- Peng, M.W., & Luo, Y.D. (2000). Managerial Ties and Firm Performance in a Transition Economy: The Nature of a Micro-Macro Link. *Academy of Management*

- Journal*, 43(3): 486-501.
- Porter, M. & van der Linde, C. (1995). Toward a new conception of the environment-competitiveness relationship. *Journal of Economic Perspectives*, 9: 119-132.
- Potoski, M., & Prakash, A. (2004). The Regulation Dilemma: Cooperation and Conflict in Environmental Governance. *Public Administration Review*, 64(2): 152-163.
- Potoski, M., & Prakash, A. (2005a). Green clubs and voluntary governance: ISO 14001 and firms' regulatory compliance. *American Journal of Political Science*, 49 (2): 235-248.
- Potoski, M. & Prakash, A. (2005b). Covenants with Weak Swords: ISO 14001 and Facilities' Environmental Performance. *Journal of Policy Analysis and Management*, 24(4): 745-769.
- Powers, N., Blackman, A., Lyon, T.P., & Narain, U. (2011). Does Disclosure Reduce Pollution? Evidence from India's Green Rating Project. *Environmental and Resource Economics*, 50: 131-155.
- Prakash, A., & Potoski, M. (2006). *The voluntary environmentalist: Green clubs, ISO 14001, and voluntary environmental regulations*. Cambridge, U.K.: Cambridge University Press.
- Prakash, A., & Potoski, M. (2012). Voluntary Environmental Programs: A Comparative Perspective. *Journal of Policy Analysis and Management*, 31(1): 123-138.
- Preacher, K.J., & Hayes, A.F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3): 879-891.

- Ramus, C.A., & Steger, U. (2000). The Roles of Supervisory Support Behaviors and Environmental Policy in Employee “Ecoinitiatives” at Leading-Edge European Companies. *Academy of Management Journal*, 43(4): 605-626.
- Reid, E.M., & Toffel, M.W. (2009). Responding to public and private politics: corporate disclosure of climate changes strategies. *Strategic Management Journal*, 30: 1157-1178.
- Reinhardt, F. (1998). Environmental product differentiation: implications for corporate strategy. *California Management Review*, 40(4): 43-73.
- Ring, P.S., Lenway, S., & Govekar, M. (1990). Management of the political imperative in international business. *Strategic Management Journal*, 11: 141-151.
- Rondinelli, D.A., & London, T. (2003). How Corporations and Environmental Groups Cooperate: Assessing Cross-Sector Alliances and Collaborations. *Academy of Management Executive*, 17(1): 61-76.
- Roome, N. (1992). Developing environmental management systems. *Business Strategy and the Environment*, 11: 11-24.
- Roy, A., Walters, P., & Luk, S. (2001). Chinese puzzles and paradoxes: Conducting business research in China. *Journal of Business Research*, 52(2): 203-210.
- Rugman, A.M., & Verbeke, A. (1998). Corporate strategies and environmental regulations: an organizing framework. *Strategic Management Journal*, 19: 363-375.
- Russo, M.V., & Fouts, P.A. (1997). A resource-based perspective on corporate environmental performance and profitability. *Academy of Management Journal*, 40(3): 534-559.

- Russo, M.V., & Harrison, N.S. (2005). Organizational design and environmental performance: Clues from the electronics industry. *Academy of Management Journal*, 48(4): 582-593.
- Schaltegger, S., Burritt, R., & Petersen, H. (2003). *An introduction to corporate environmental management*. Sheffield, UK: Greenleaf.
- Scholz, J.T., & Lubell, M. (1998). Trust and taxpaying: Testing the heuristic approach to collective action. *American Journal of Political Science*, 42: 398-417.
- Scholz, J.T. & Pinney, N. (1995). Duty, Fear, and Tax Compliance: The Heuristic Basis of Citizenship Behavior. *American Journal of Political Science*, 39(2): 490-512.
- Scholz, J.T., and Wang, C.L. (2006). Cooptation or transformation? Local policy networks and federal regulatory enforcement. *American Journal of Political Science*, 50(1): 81-97.
- Schuler, D., Rehbein, K., & Cramer, R. (2002). Pursuing strategic advantage through political means: A multivariate approach. *Academy of Management Journal*, 45: 659-672.
- Semadeni, M., & Anderson, B.S. (2010). The followers' dilemma: innovation and imitation in the professional services industry. *Academy of Management Journal*, 53(5): 1175-1193.
- Sharbrough, W.C., & Moody, J.W. (1995). Managing the media. *Journal of Systems Management*, 46(4): 4-11.
- Sharma, S. (2000). Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. *Academy of Management Journal*,

- 43(4): 681-697.
- Sharma, S., & Vredenburg, H. (1998). Proactive corporate environmental strategy and the development of competitively valuable organizational capabilities. *Strategic Management Journal*, 19(8): 729-753.
- Shi, H., Peng, S.Z., Liu, Y., & Zhong, P. (2008). Barriers to the implementation of cleaner production in Chinese SMEs: government, industry and expert stakeholders' perspectives. *Journal of Cleaner Production*, 16: 842-852.
- Shimshack, J.P., & Ward, M.B. (2005). Regulator reputation, enforcement, and environmental compliance. *Journal of Environmental Economics and Management*, 50(3): 519-540.
- Short, J.L., & Toffel, M.W. (2008). Coerced confessions: selfpolicing in the shadow of the regulator. *Journal of Law, Economics & Organizations*, 24(1): 45-71.
- Short, J.L., & Toffel, M.W. (2010). Making Self-Regulation More Than Merely Symbolic: The Critical Role of the Legal Environment. *Administrative Science Quarterly*, 55: 361-396.
- Shrivastava, P. (1995). The role of corporations in achieving environmental sustainability. *Academy of Management Review*, 20(4): 936-960.
- Stafford, S.L. (2002). The effect of punishment on firm compliance with hazardous waste regulations. *Journal of Environmental Economics and Management*, 44(2): 290-308.
- Stafford, S.L. (2012). Do Carrots Work? Examining the Effectiveness of EPA's Compliance Assistance Program. *Journal of Policy Analysis and Management*, 31(3):

- 533-555.
- Starik, M., & Rands, G. (1995). Weaving an integrated web: multilevel and multisystem perspectives of ecologically sustainable organizations. *Academy of Management Review*, 20(4): 908-935.
- Steger, U., Fang, A.B., & Lü, W. (2003). *Greening Chinese Business: Barriers, Trends and Opportunities for Environmental Management*. UK: Greenleaf Publishing Limited.
- Sutinen, J.G., & Kuperan, K. (1999). A Socio-Economic Theory of Regulatory Compliance. *International Journal of Social Economics*, 26 (1): 174-193.
- Tang, S.Y., Lo, C.W.H., & Fryxell, G.E. (2003). Enforcement styles, organizational commitment, and enforcement effectiveness: an empirical study of local environmental protection officials in urban China. *Environment and Planning A*, 35: 75-94.
- Tang, S.Y., & Zhan, X.Y. (2008). Civic Environmental NGOs, Civil Society, and Democratisation in China. *Journal of Development Studies*, 44(3): 425-448.
- Tanner, M. (1994). The Erosion of Communist Party Control over Lawmaking in China. *China Quarterly*, 138: 381-403.
- Teece, D.J., Pisano, G. & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18: 509-34.
- Terlaak, A., & King, A.A. (2006). The effect of certification with the ISO 9000 quality management standard: a signaling approach. *Journal of Economic Behavior and Organization*, 60(4): 579-602.



- Thaler, R.H., & Sunstein, C.R. (2008). *Nudge: Improving Decisions About Health, Wealth, and Happiness*. New Heaven & London: Yale University Press.
- Tilcsik, A. (2010). From ritual to reality: Demography, ideology, and decoupling in a post-communist government agency. *Academy of Management Journal*, 53(6): 1474-1498.
- Tilt, B. (2007). The political ecology of pollution enforcement in China: a case from Sichuan's rural industrial sector. *The China Quarterly*, 192: 915-932.
- Toffel, M.W., & Short, J.L. (2011). Coming Clean and Cleaning Up: Does Voluntary Self-Reporting Indicate Effective Self-Policing? *Journal of Law and Economics*, 54(3): 609-649.
- Van Rooij, B. (2006). *Regulating Land and Pollution in China: Lawmaking, Compliance, and Enforcement; Theory and Cases*. Leiden: Leiden Univ. Press.
- Van Rooij, B. (2010). Greening industry without enforcement? An assessment of the world banks pollution regulation model for developing countries. *Law & Policy*, 32: 127-152.
- Vogel, D. (2005). *The market for virtue: The potential and limits of corporate social responsibility*. Washington, DC: Brookings Institution Press.
- Walls, J.L. & Hoffman, A.J. (2013). Exceptional boards: environmental experience and positive deviance from institutional norms. *Journal of Organizational Behavior*, 34(2): 253-271.
- Wang, H., & Jin, Y.H. (2007). Industrial ownership and environmental performance: Evidence from china. *Journal of Environmental and Resource Economics*, 36(3): 255-

273.

- Wang, H., Mamingi, N., Laplante, B., & Dasgupta, S. (2003). Incomplete enforcement of pollution regulation: Bargaining power of Chinese factories. *Environmental and Resource Economics*, 24(3): 245-262.
- Wartick, S.L., & Cochran, P.L. (1985). The evolution of the corporate social performance model. *Academy of Management Review*, 4: 758-769.
- Weaver, G.R., Treviño, L.K., & Cochran, P.L. (1999). Integrated and decoupled corporate social performance: Management commitments, external pressures, and corporate ethics practices. *Academy of Management Journal*, 42: 539-552.
- Weidner, H., & Jänacke, M. (2002). *Capacity building in national environmental policy: a comparative study of 17 countries*. Berlin: Springer-Verlag.
- Westphal, J.D., & Zajac, E.J. (2001). Decoupling policy from practice: The case of stock repurchase programs. *Administrative Science Quarterly*, 46(2): 202-228.
- Williams, P. (2002). The Competent Boundary Spanner. *Public Administration*, 80(1): 103-124.
- Winter, S.C., & May, P.J. (2001). Motivation for compliance with environmental regulations. *Journal of Policy Analysis and Management*, 20(4): 675-698.
- World Bank. (2000). *Greening Industry: New Roles for Communities, Markets and Governments*. Oxford University Press for the World Bank, New York.
- Yang, G.B. (2005). Environmental NGOs and institutional dynamics in China. *The China Quarterly*, 181: 46-66.
- Yang, X., & Yao, Y. (2012). Environmental Compliance and Firm Performance:

- Evidence from China. *Oxford Bulletin of Economics and Statistics*, 74(3): 397-424.
- Yee, W.H., Lo, C.W.H., & Tang, S.Y. (2013). Assessing ecological modernization in China: Stakeholder demands and corporate environmental management practices in Guangdong Province. *The China Quarterly*, 213: 101-129.
- Yeung, G., & Mok, V. (2005). What are the impacts of implementing ISOs on the competitiveness of manufacturing industry in China? *Journal of World Business*, 40 (2): 139-157.
- Yin, R.K. (1989). *Case Study Research: Design and Methods*. Sage, Newbury Park, CA.
- Zhan, X.Y., Lo, C.W.H., & Tang, S.Y. Forthcoming. Contextual Changes and Environmental Policy Implementation: A Longitudinal Study of Street-Level Bureaucrats in Guangzhou, China. *Journal of Public Administration Research and Theory*.
- Zhan, X.Y., & Tang, S.Y. (2013). Political opportunities, resource constraints, and policy advocacy of environmental NGOs in China. *Public Administration*, 91(2): 381-99.
- Zhu, D., & Ru, J. (2008). Strategic environmental assessment in China: Motivations, politics, and effectiveness. *Journal of Environmental Management*, 88: 615-626.
- Zhu, Q.H., Sarkis, J., & Lai, K.H. (2007). Green supply chain management: pressures, practices and performance within the Chinese auto mobile industry. *Journal of Cleaner Production*, 15:1041-1052.

# APPENDICES

## Appendix I: The Interview Protocol for Case Studies

---

**Q1.** 请说明贵公司对企业环境保护的看法，及简要地介绍你们如何开展环境保护和污染控制工作以及过去几年的主要进展。

Please elaborate your view of corporate environmental protection and its relationship with business operation. Please also briefly introduce how the company carries out environmental protection and pollution control work, as well as the major progress achieved in the past few years.

**Q2.** 贵公司在推动企业环保及整治污染过程中有哪些得益？遇到了哪些困难？

How did the company benefit from being compliant and proactive environmental management (if any)? Were any difficulties encountered during this process?

**Q3.** 贵公司在开展企业环境保护工作时主要考虑的因素，以及决策的机制。请说明贵公司积极承担及推动企业环境保护工作的主要动力来源。

What are the main considerations in corporate environmental protection? How is an environmental decision made? Please describe the key motivation to actively undertake and promote environmental protection.

**Q4.** 请具体说出贵公司环境保护工作的压力来自何方？地方政府？竞争者？媒体？社区？顾客？他们如何影响你们的环保工作？

Where does the external pressure come from? E.g. Local government, Competitors, Media, Community, Customers. How do these pressures affect the environmental management and focus?

**Q5.** 贵公司在开展企业环境保护工作，制定环保措施时，那些是主要参考的对象？

What are the main reference groups when your company carries out corporate environmental protection work?

**Q6.** 贵公司对目前的环保及污染控制的法规的评价如何？对环保局的执法工作有什么意见？需要在那方面做出改善？

What is your opinion of the current environmental regulatory system as well as the EPA's enforcement? Do any improvements need to be made?

**Q7.** 请对贵公司环保工作表现做出评价—成功要素及改善方法。

Please evaluate your company's environmental performance. What are the determining factors that contribute to its success and future plans for improvement?

---

## Appendix II: Survey Questionnaire (Chinese Version)



### 企业环境管理情况调查问卷

您好！首先衷心感谢各位参与此项研究。这是一份有关企业环境管理情况的调查问卷，由香港理工大学管理与市场学系进行。本次调查旨在了解企业在推进企业内部环境保护管理过程中遇到的一些实际问题以及企业管理者的相关看法和意见。这对于将来为企业在持续环境管理方面提供适当的帮助有很重要的意义。研究结果的可信赖度取决于阁下对问题认真和客观地回答。请您填写此问卷时仔细阅读各题，真实地表达您的感受。

1. 请您回答所有问题并尽可能选择您认为最适当的答案。
2. 此次调查的所有答卷都将严格保密, 所有答卷资料仅用于综合统计分析, 而不会对答卷内容进行单独的个案处理。
3. 建议您在 30 分钟左右内完成整份问卷。

阁下如希望进一步了解研究结果, 或您对此项研究有任何疑问或建议, 请通过下列方式与我们联系:

卢永鸿教授

香港理工大学管理及市场学系 香港九龙红磡

电话: (852) 2766 7385 邮箱: mscarlos@

刘宁 (博士研究生)

香港理工大学管理及市场学系 香港九龙红磡

电话: (852) 2766 7343 邮箱: nicole.liu@

最后, 再次对您的参与及帮助表示衷心的感谢!

## 第一部分: 企业的环境管理方式

**填写说明:** 请您回顾贵企业的实际情况, 圈出您认为合适的数字, 以表示您对句子的同意程度。如果该表述与贵企业的情况完全一致, 请选择 7; 如果完全不一致, 请选择 1; 如果您对该句子的描述无法判断, 或者难以有具体的倾向性意见, 可选择 4 也就是“中立”。

	完全不同意		中立			完全同意	
	1	2	3	4	5	6	7
<b>在采取具体的企业环保措施方面,</b>	完全不同意	颇为不同意	不同意	中立	同意	颇为同意	完全同意
1. 中央政府领导人的环保政策意向对我们影响很大	1	2	3	4	5	6	7
2. 地方政府领导人的环保政策意向对我们影响很大	1	2	3	4	5	6	7
3. 地方人民代表大会及政协关于环保的提议对我们影响很大	1	2	3	4	5	6	7
4. 地方环保局对于企业环保的要求对我们影响不大	1	2	3	4	5	6	7
5. 我们经常参考环境绩效突出的企业的环保技术和管理方式	1	2	3	4	5	6	7
6. 在环境达标水平上我们希望和竞争者保持一致	1	2	3	4	5	6	7
7. 我们经常和其他企业交流环境保护的经验和技术	1	2	3	4	5	6	7
8. 我们经常参考行业协会(商会)推荐的环保措施和方案	1	2	3	4	5	6	7
9. 我们在开展企业环保方面有自己独特的目标和计划	1	2	3	4	5	6	7
10. 我们对企业环保如何达标有自己的想法和思路	1	2	3	4	5	6	7
11. 我们有自己的企业环保绩效评估方式	1	2	3	4	5	6	7
12. 我们在环境保护方面力求创新	1	2	3	4	5	6	7
13. 与环保部门交流时, 我们倾向以正式的书面方式而非口头沟通	1	2	3	4	5	6	7
14. 在遵守环保法规方面, 我们注重最终结果是否达标	1	2	3	4	5	6	7
15. 保证企业环境绩效达标是我们最重要的职责	1	2	3	4	5	6	7
16. 环保法规及标准是我们开展环保的最重要依据和准则	1	2	3	4	5	6	7

## 第二部分:影响企业环保的内部因素: 态度, 能力 以及企业理念

### 2A: 企业开展环保的资源:

**填写说明:** 通过本部分内容, 您可以对企业开展环保所需资源的配备情况做一个大概了解。请回顾贵企业的实际情况, 圈出您认为合适的数字, 以表示您对句子的同意程度。

贵企业,	完全 不同 意	颇为 不同 意	不同 意	中立	同意	颇为 同意	完全 同意
1. 能够配备应对污染控制的技术系统	1	2	3	4	5	6	7
2. 能够对现有的污染控制技术或流程进行优化 (或升级) 以提高效率	1	2	3	4	5	6	7
3. 能够改进现有产品以符合环保要求	1	2	3	4	5	6	7
4. 涉及环境保护工作的人力资源很充足	1	2	3	4	5	6	7
5. 能够鼓励各阶层员工参与改善企业环境管理	1	2	3	4	5	6	7
6. 企业高层能给予开展环保充分的资金支持	1	2	3	4	5	6	7
7. 管理层对企业的环保表现较以前需担负更多的责任	1	2	3	4	5	6	7
8. 能够确保各部门在环保问题上协调和配合	1	2	3	4	5	6	7
9. 在环境保护方面享有良好的企业声誉	1	2	3	4	5	6	7
10. 有充分的信息渠道去了解环境保护的政策信息	1	2	3	4	5	6	7
11. 有充分的信息渠道去了解环境保护的技术信息	1	2	3	4	5	6	7
12. 能够与利益相关者 (例如环保局、客户等) 在环保方面保持密切联系	1	2	3	4	5	6	7

## 2B: 企业的环保理念

填写说明: 请您参照上述1-12的回答形式来评估下列各项。

	完全 不同 意	颇为 不同 意	不同 意	中立	同意	颇为 同意	完全 同意
1. 本企业应该为经营过程中产生的环境影响负责	1	2	3	4	5	6	7
2. 本企业坚持环保工作的原因之一在于我们坚信守法是很重要的, 并且有道德义务去这么做	1	2	3	4	5	6	7
3. 尽力减少本企业对环境的污染是一种责任	1	2	3	4	5	6	7



### 第三部分: 利益相关方的影响

填写说明: 通过本部分内容, 您可以对一系列利益相关方对企业环境管理造成的影响进行简要回顾。请您回顾贵企业的实际情况, 圈出您认为合适的数字, 以表示您对句子的同意程度。

	完全不同意			中立			完全同意			
	1	2	3	4	5	6	7			
以下各方就贵企业加大环保力度减少环境污染是否明确提出要求:				完全不同意	颇为不同意	不同意	中立	同意	颇为同意	完全同意
1. 中央政府				1	2	3	4	5	6	7
2. 当地政府 (如市长, 政协等)				1	2	3	4	5	6	7
3. 当地环保局 (例如检查, 通报等)				1	2	3	4	5	6	7
4. 其他相关政府部门 (例如工商局, 发改委等)				1	2	3	4	5	6	7
5. 银行等金融机构				1	2	3	4	5	6	7
6. 当地社区				1	2	3	4	5	6	7
7. 新闻媒体				1	2	3	4	5	6	7
8. 环保组织				1	2	3	4	5	6	7
9. 投资方或股东				1	2	3	4	5	6	7
10. 主要竞争对象				1	2	3	4	5	6	7
11. 行业 (商业) 协会				1	2	3	4	5	6	7
12. 客户和消费者				1	2	3	4	5	6	7

#### 第四部分: 贵企业的环境管理运作和成果

**填写说明:** 通过本部分内容, 您可以对目前普遍采取的环保措施有一个大概了解。以下列出了适用于企业的一系列环保项目和措施, 请您回顾贵企业的实际情况, 圈出您认为合适的数字, 以表示您对句子的同意程度。

- |                        |                      |
|------------------------|----------------------|
| [1] 从来没有考虑过            | [2] 考虑过, 但没有付诸行动     |
| [3] 曾作试验性推行, 但没有正式采用   | [4] 已经采用, 但看来并不是首要工作 |
| [5] 已经采用并且列为重点项目       | [6] 与企业各个部门的运行基本结合起来 |
| [7] 已经成功融入企业成为日常运作的一部分 |                      |

贵企业:	从未考虑过	考虑过, 但未付诸行动	曾作试验性推行但没有正式采用	已采用但不是首要工作	已经采用并且列为重点项目	与其它部门的运行基本结合起来	已成为企业正常运作的有机部分
1.参与清洁生产认证	1	2	3	4	5	6	7
2.参与环境保护 ISO14001 认证	1	2	3	4	5	6	7
3.使用清洁能源	1	2	3	4	5	6	7
4.对资源进行循环回收利用	1	2	3	4	5	6	7
5.定期审查企业的环保表现	1	2	3	4	5	6	7
6.开展企业高层管理人员的环保培训	1	2	3	4	5	6	7
7.开展基层员工的环保培训	1	2	3	4	5	6	7
8.将环保目标定为企业年度总体目标的一部分	1	2	3	4	5	6	7
9.将对企业环境表现的评估纳入企业管理的总体评估内容	1	2	3	4	5	6	7
10.编写及发布本企业的环境报告	1	2	3	4	5	6	7

## 第五部分: 企业和个人信息

最后, 请回答下列有关贵企业和您个人情况的问题。您提供的所有资料只供研究, 不会告诉其他人员, 请放心回答。

1. 贵企业属于哪一个行业? \_\_\_\_\_
2. 贵企业类别: \_\_\_\_\_ (请填相应的数字)
  - (1) 在交易所上市的企业
  - (2) 私营企业
  - (3) 外商独资经营企业
  - (4) 合资经营
  - (5) 国有企业
  - 其它(请注明): \_\_\_\_\_
3. 贵企业的总部设于: 中国大陆 (请注明城市) \_\_\_\_\_ 其它 (请注明国家) \_\_\_\_\_
4. 贵企业的工厂设于: 中国大陆 (请注明城市) \_\_\_\_\_ 其它 (请注明国家) \_\_\_\_\_
5. 贵企业在现址生产营运已经有多少年? \_\_\_\_\_ (请填响应的数字)
  - (1) 少于5年
  - (2) 5-10年
  - (3) 11-15年
  - (4) 15-20年
  - (5) 21-25年
  - (6) 超过25年
6. 贵企业现在共有多少名员工? \_\_\_\_\_ (请填响应的数字)
  - (1) 少于 100
  - (2) 100-499
  - (3) 500-999
  - (4) 1000-4999
  - (5) 超过 5000
7. 2009年贵企业产品的出口量占总产量的百分比? \_\_\_\_\_ (请填响应的数字)
  - (1) 小于 10%
  - (2) 11-20%
  - (3) 21-30%
  - (4) 31-40%
  - (5) 41-50%
  - (6) 超过 50%
  - (7) 不适用
8. 在 2010 年贵企业被环保局检查的次数大约是? \_\_\_\_\_
9. 阁下在贵企业已经工作了: \_\_\_\_\_ 年
10. 阁下在贵企业的职位是 \_\_\_\_\_

再次感谢您的帮助!

### Appendix III: Bootstrapping Results of Multiple Mediation Test

\*\*\*\*\*

#### IV to Mediators (a paths)

	Coeff	se	t	p
Formalism	.6898	.0863	7.9891	.0000
Accommodation	.4584	.0853	5.3719	.0000
Referencing	.6045	.0919	6.5767	.0000
Self-determination	.5456	.0985	5.5368	.0000

#### Direct Effects of Mediators on DV (b paths)

	Coeff	se	t	p
Formalism	-.1134	.0796	-1.4238	.1564
Accommodation	.0059	.0811	.0729	.9420
Referencing	.0877	.0749	1.1711	.2433
Self-determination	.0751	.0698	1.0768	.2832

#### Total Effect of IV on DV (c path)

	Coeff	se	t	p
OC	1.0701	.0869	12.3169	.0000

#### Direct Effect of IV on DV (c' path)

	Coeff	se	t	p
OC	1.0516	.1155	9.1054	.0000

#### Partial Effect of Control Variables on DV

	Coeff	se	t	p
Operation Years	-.3489	.0919	-3.7955	.0002
Size	.2026	.0919	2.2052	.0288
Export	-.0187	.0681	-.2750	.7837
Ownerd1	-.3085	.2039	-1.5135	.1321
Ownerd2	-.2472	.1636	-1.5104	.1329
Ownerd3	-.3605	.1554	-2.3200	.0216
Pollu_d1	.1618	.0746	2.1672	.0317
Pollu_d2	.1107	.0733	1.5103	.1329
GVRI	-.1041	.0845	-1.2322	.2197
NGRI	.2558	.0945	2.7057	.0075

#### Model Summary for DV Model

R-sq	Adj R-sq	F	df1	df2	p
.6458	.6130	19.6894	15.0000	162.0000	.0000

\*\*\*\*\*

#### BOOTSTRAP RESULTS FOR INDIRECT EFFECTS

#### Indirect Effects of IV on DV through Proposed Mediators (ab paths)

	Data	Boot	Bias	SE
TOTAL	.0185	.0132	-.0053	.0899
Formalism	-.0782	-.0798	-.0016	.0728

Accommodation	.0027	.0010	-.0017	.0509
Referencing	.0530	.0463	-.0067	.0512
Self-determination	.0410	.0457	.0047	.0420

Bias Corrected Confidence Intervals

	Lower	Upper
TOTAL	-.1546	.1988
Formalism	-.2391	.0488
Accommodation	-.0838	.1220
Referencing	-.0496	.1529
Self-determination	-.0314	.1338

\*\*\*\*\*

Level of Confidence for Confidence Intervals: 95

Number of Bootstrap Resamples: 5000