RUXI WANG

# Corporate Environmentalism in China

# Corporate Environmentalism in China

# Corporate Environmentalism in China

Milieugedrag van bedrijven in China

**Thesis**

To obtain the degree of Doctor from the
Erasmus University Rotterdam
by command of the
Rector Magnificus
Prof.dr. H.A.P. Pols

and in accordance with the decision of the Doctorate Board.

The public defense shall be held on

Thursday 01 June 2017 at 11:30 hrs
by

**Ruxi Wang**

Xi'an, China

Erasmus University Rotterdam

Doctoral Committee

Promotor: Prof.dr. P.P.M.A.R Heugens

Copromotor: Dr. F. Wijen

Other members: Prof. dr. J.P. Cornelissen
Prof.dr. C. Marquis
Dr. F. Bridoux

**Erasmus Research Institute of Management – ERIM**
The joint research institute of the Rotterdam School of Management (RSM)
and the Erasmus School of Economics (ESE) at the Erasmus University Rotterdam
Internet: http://www.erim.eur.nl

**ERIM Electronic Series Portal:**

**ERIM PhD Series in Research in Management**, 417
ERIM reference number: EPS-2017-417-S&E
ISBN 978-90-5892-473-5


Design: Icon Images

This publication (cover and interior) is printed by Tuijtel on recycled paper, BalanceSilk®
The ink used is produced from renewable resources and alcohol free fountain solution.
Certifications for the paper and the printing production process: Recycle, EU Ecolabel, FSC®, ISO14001.
More info: www.tuijtel.com



# PREFACE

In my final year of high school, I claimed that I would go for business schools after getting some sophisticated knowledge of mathematics and logical way of thinking from an engineering school. As I look back now, I am not sure whether I really knew what it meant back then, as I did not even know what engineering or business was. Oddly enough, I really followed that track, even though I made some "detours" to an economic school after college. RSM "happened" to be the only management school for PhD studies on my application list. But after I had a Skype interview with Pursey and Frank, I felt that was it. I still remember the first days when I could not understand anything in the field. Coming with engineering and economics background, every paper here to me was a nice piece of story. Luckily, the more time I spend in this field, the more fascinating I find conducting research in a management school is. There are such a numerous variety of theoretical domains, empirical settings, and intriguing phenomenon that I could touch upon solely based on my interest, refreshing my mindset and keeping me excited all the time.

I was concerned about the natural environment that I had been living in before I started my PhD project. In 2012, there was news indicating that seven out of the ten most polluted cities in the world were in China. Doing the PhD not only enriched my academic skills, but offered me deeper and more positive insights on the severe environmental challenges China faces with. The more I look into how the environmental issues have been addressed in China, the less negative I became. In September 2016, of the world's ten most polluted cities released by the WHO, two cities were from China. Admittedly the smog in China will not disappear in a day, but I believe that things are moving towards a positive direction. With the strong hands of the Chinese state, the increasingly compliant and voluntarily responsible firms, and the ever-improved awareness of environmental issues in the civil society, the effectiveness of the environmental institutions will make great progress eventually.

This dissertation would not exist had it not been the support I got from, but not limited to, the people and organizations I thank below. I can not thank enough for the great guide my promoter, Professor Pursey Heugens, has offered me. He has shaped my attitude

towards being an academic, encouraged me to enjoy conducting research out of my own interest, and showed me how a sharp mind should work. His wisdom also enlightened my perception of the world. I am incredibly grateful for his unconditional and unlimited support for me and his unreserved trust on me throughout my doctoral trajectory. He is the mentor of my career and my life.

Dr. Frank Wijen is my daily supervisor. I would not have realized the improvement in so many aspects such as my language skills, logical thinking, and even the way I deal with people if it were not Frank's patient guidance. He gave me many insightful and professional advices, generously passing on to me his experiences and lessons on both research and teaching activities. Such knowledge will equip me for my whole career. I am extremely grateful that I could have this great supervisory team that not only are great co-authors to collaborate with, but truly light up the future for me both in career and life.

I am also very fortunate to have been encouraged by many magnificent individuals. Professor Jianjun Zhang, my host in Guanghua Management School at Peking University, I thank him for sharing his wisdom and knowledge on so many topics we have discussed. His understanding of the Chinese context has always inspired me. I would like to thank Professor Chris Marquis for his invaluable advice to me on different occasions throughout my entire PhD trajectory as well as for being such a generous and supporting referee during my job application process. Professor Gengshen Zhao, I thank him for his tremendous support and effort in recommending me to a lot of contacts for my field study. The insights I got from the qualitative study are immeasurable. Special thanks also to Dr. Jochem Kroezen and Dr. Mia Raynard for many insightful feedback on my research projects during the early stages of my PhD.

My colleagues and my friends made my PhD journey colorful. Roxana and Jacomijn, I can not imagine how bored I would have been in Room T7-01 if it were not them alongside me all the time. Pengfei, my academic older brother, I will miss his sarcasm and the sweet ladies of his family. Qiushi, glad we explored almost every piece of the Netherlands together (I still have four provinces left that we can go in the future!). Wenting, I do not feel lonely having her in Rotterdam. Heather, thanks for all the fun at home and the thoughtful conversations. I hope we will continue with the help of Internet and letters. Debbie, Diana, Dongnan, Guoliang, Hendra, Ingrid, Jing Li, Jing Wu, Jingjing

Liu, Kati, Joost, Lameez, Mirko, Qiaomei, Qin Su, Qinghong, Riccardo, Rick, Saeedeh, Thijs, Ting Xiao, Wei Sun, Yanwei, Yang Feng, Yifei, Ying Feng, Ying Geng, Ying Zhang, Yingjie, Yiyun, Yuanyuan, Yunlong, and many other individuals, thank you all for the good memories we share. I look forward to meeting each of you in every corner of the world in the next ten years. I would also like to take this chance to thank Carolien, Patricia, Miho, Kim, Tineke, Natalija, and Marleen for their kind and patient support on all kinds of administrative issues. I must also thank CSC, my department of Strategic Management and Entrepreneurship at RSM, ERIM, and Erasmus Trustfond for their generous support.

I would like to express my deepest love with my family. My parents, my grandparents, aunt Ren and uncle Zhao, my parents in law, Xiaoxiao, and Xiangyun, thank you that you have always been there for me. I will make every effort to make sure that we see each other more often from now on. ZUO Wei, we have had so many sweet memories since 2009, and I look forward to continuing our exciting lives together.

WANG Ruxi
王汝曦

Beijing,
April, 2017

**Table of Contents**

**List of Tables**

**List of Figures**

# Chapter 1. Introduction

## 1.1 Corporate Environmentalism

The world's largest economy (measured by Gross Domestic Product by purchasing power parity), China, has caught tremendous attention over the globe in the past decade as the world's largest greenhouse gases emitter and energy consumer (World Bank, 2015). China is also a prominent example of an emerging economy whose environmental impact has been non-negligible yet studied relatively little compared with the research already done in developed countries. An in-depth investigation on the management of the natural environment and energy consumption in emerging economies, especially China is, therefore, of paramount importance. Research shedding light on how corporate environmental practices in China is (in)effectively addressed and reinforced by the public and private sectors, as will be shown in this dissertation, is profoundly meaningful and closely relevant to the welfare of mankind and the way business and society interact and move forward together.

Since the degradation of the natural environment over the globe manifested in global warming, deforestation, air pollution, etc., increasingly extensive concerns, discussions, and debates among policy makers, civil society, and industrial firms have been invoked in the past several decades. With this trend, the perceptions and interpretations of corporate environmentalism among firms, government, and the public has been ever-changing and evolving (Banerjee, 2001; Chrun, Dolšak, and Prakash, 2016; Hoffman, 2001). In the 1970s, firms carried out environmental performances as required by law, given such activities were considered a threat to the ultimate corporate goal of the maximization of profit (Hoffman, 2001). Later, both societal and scholarly emphasis on

corporate benign environmental practice started to change dramatically. Environmental issues have always been brought up as a more pressing and salient topic, especially after the Rio de Janeiro Earth Summit in 1992 (Etzion, 2007).

From the 1990s, scholars have started to use various theoretical lenses such as corporate political activities, resource-based view, and stakeholder theory to investigate the mechanisms driving firms to behave environmentally responsibly and assess the related financial and societal impacts. Studies have shown that firms perform in an environmentally friendly way to comply with government regulations (Delmas and Toffel, 2004), to outcompete their rivals in the market (Bremmers *et al*., 2007), and to respond to demands by their local communities and customers (Henriques and Sadorsky, 1996). The terminology on corporate environmental strategies ranges from phrases such as "corporate environmental commitment", "ecologically sustainable strategies", and "sustaincentric paradigm" to "corporate environmentalism" (Banerjee, 2002). By definition, corporate environmentalism is "the process by which firms address environmental issues and develop environmental management strategies" (Banerjee, 2001: 489-490), integrated together with the financial goals into their corporate mission (Etzion, 2007). Below, I provide a brief description of each of the major theoretical arenas explaining the mechanisms for the effectiveness of corporate environmentalism.

The first group of scholars view corporate environmentalism as a type of political activity. Through activities such as lobbying and building political connections, firms reduce uncertainty and exert influence in the policy-making process (Hillman, Keim, and Schuler, 2004). In the context of corporate environmentalism, instead of showing how the firms could "manipulate" or shape the regulatory decisions, studies have shown that firms practice in an environmentally friendly way in order to seek for political legitimacy as a critical strategic resource (Marquis and Qian, 2014; Luo, Wang and Zhang, 2016). In such an intersection of corporate political strategies and corporate environmentalism, research has been featuring studies on corporate environmental and social practices in China, the largest yet complicated autocratic country in the world facing increasingly severe environmental and social challenges. This line of research takes the perspective that the government is the dominant actor which sends out strong signals through both coercive

and normative channels by issuing stringent regulations and supportive guidelines to push forward corporate environmentalism (Child, Lu, and Tsai, 2007).

Scholars using a resource-based view argue that the possession of resources and capabilities that are valuable and hard to imitate are the premise to sustain a competitive advantage (Hart, 1995). In the context of corporate environmentalism, not only scholars but also the industries have been aware that the capability of balancing economic and environmental sustainable developments has become a crucial competitive advantage (Hart, 1995; Judge and Douglas, 1998; Sharma and Vredenburg, 1998). The resources and legitimacy firms gain through corporate environmental practices secure their survival and growth (Russo and Fouts, 1997; Chrun *et al*., 2016). In China, in particular, firms carry out environmental performances in order to seek for legitimacy from the government and the society as a strategic resource for their future development (Li, Meng, Zhang, and Zhou, 2008; Marquis and Qian, 2014). For instance, the strategic usage of political connections and the possession of business group resources endows firms with competitive advantages and drives them to respond to environmental pressures differently. This line of research attributes the various corporate environmental performances to the necessity to remain legitimate or the privilege firms bolster because of the critical resources the firms retain.

The research stream of stakeholder theory centers on the importance of maintaining a good relationship with groups or individuals that can affect or are affected by the firms (Freeman, 1984). The incentive of practicing corporate environmentalism is emanated from the recognition of stakeholder interests (Banerjee, 2001). While some studies showed that legitimacy or reputation might be sustained among the stakeholders at the expense of shareholders' interests (Jensen, 2002), others contend that competitive advantage could be achieved with a sustainable strategy (Hart and Milstein, 2003; Porter and Vander Linde, 1995). In the context of corporate environmentalism, stakeholders primarily consist of governments who are the environmental regulators (Henriques and Sadorsky, 1999), public interest groups such as local community and environmental activists (Berry and Rondinelli, 1998), and market-related actors such as customers and suppliers (Darnall, Henriques and Sadorsky, 2010).

In pluralistic and democratic societies, stakeholder theory is normally the most preferred lens, as the multiple stakeholders mentioned above function almost equivalently

in those contexts. In the western societies, non-government organizations (NGOs) raise the public environmental awareness in civil society, and forcefully push the progress of environmental regulatory actions (Child *et al*., 2007; Egri and Herman, 2000; Yaziji and Doh, 2009). On the other hand, in a state featuring centralization and autocracy such as China, environmental initiatives are planned and designed by the state, implemented by its different departments and local branches, and if any, only morally supported by the NGOs and in the civil society. Therefore, in such contexts like China where environmental requirements from multiple stakeholders are rare, corporate political activity and resource-based view appear to be much more relevant for the exploration of corporate environmentalism.

## 1.2 Research Questions

The discussion of the literature in the field of corporate environmentalism has revealed a few major theoretical and empirical puzzles. First, understanding how the complexity within a single entity could bring any differentiated impact to corporate environmental performances requires both nuanced theoretical lens and rich empirical context. The current literature has an underlying assumption that every constituent sets consistent expectations and thus exerts monolithic influences on firms. So far, we have limited understanding of the multifacetedness in a seemingly unitary entity and its related impact on corporate environmental performances. Especially when studying governmental influences on corporate environmentalism, most of the studies solely focused on a state's consistent and coercive functions with a clear set of expectations vis-à-vis firms. We have little knowledge of how firms react if different levels of a state exert divergent demands. Moreover, when such a multifaceted state is of dominant importance to business development, it is more crucial for firms to respond strategically to the different demands. The different priorities between economic and sustainable development the Chinese central and local government hold offer an extraordinary context to investigate such a research gap. As such, the first research question I address in this dissertation is:

*1. What is the influence of the multifaceted state on corporate environmentalism in China?*

Second, the transition in organizational forms as global industrial production shifts from the West to especially China has been largely overlooked. In other words, to get a comprehensive view of how the effectiveness of environmental institutions could be achieved in the largest economy in the world, China, the field of corporate environmentalism begs for a much more careful check on the most prevalent and impactful organizational form, business group in this economy. Students have explored the separate influences of the state, civil society, and industry on the firm. Moreover, scholars in the arena of business group studies have shed much light on the comparison between business group and standalone firms. Yet, both fields have remained silent on business group affiliates and their environmental strategies as a specific unit of analysis. The important number of Chinese business group affiliates, the complex nature within the business groups they belong to, and their contribution to the Chinese economy, or even the world economy, have provided a rich context to address this research gap. As such, the second research question I address in this dissertation is:

*2. What economic and political factors can exert influences on the propensity of a Chinese business group affiliate to adopt an environmental management system?*

In order to set the stage for the aforementioned central research questions, in the rest of this chapter, I will first provide an overview of the ongoing situation of environmental protection in China and then summarize each of the two studies in this dissertation.

## 1.3 Environmental Protection in China

Since the Open-door Policy in 1978, China has started to resume its prominent leading position in the world economy as it did multiple times centuries ago. It is unfortunate that as a developing economy, China followed the developmental trajectories of presently developed western countries by sacrificing the natural environment for economic prosperity (World Resources Institute, 2014). On the positive side, China has been restructuring its major sectors and has made great effort for more sustainable economic development. On September 3, 2016, the eve of the G20 summit, together with the former

US president Barack Obama, the Chinese President Xi Jinping announced that the world's two biggest greenhouse emitters will formally ratify the Paris climate change agreement (The Guardian, 2016). This signifies that the Chinese central government and the leading party commit themselves to conserving resources and protecting the environment, also specified as one of the fundamental national policies. As a matter of fact, the environmental protection issue requires efforts from not only the government but also corporations and civil society. I will provide a general overview of how the government and business are addressing the environmental issues in China together in this section. More details will be discussed in separate chapters in this dissertation.

### *1.3.1 Structure in the state for environmental issues*

As the largest autocratic country in the world, China has a highly hierarchical political system. The National People's Congress (NPC), the State Council, and the Communist Party of China (CPC) Central Committee are the three supreme state organs on the central level that are empowered with the top rights for country level decisions and administration. One of the nine special committees under the NPC, the Environmental Protection and Resources Conservation Committee, takes the responsibility to examine and draw up bills and to assist the NPC and its Standing Committee in their legislative and oversight work related to the environmental field. As important parts of the State Council, several coordinating organs, ministries and commissions take charge of issues related to the environment, energy and climate change, namely, the National Development and Reform Commission (NDRC), the Ministry of Environmental Protection (MEP), the Ministry of Industry and Information Technology (MIIT), the Ministry of Land and Resources (MLR), the Ministry of Civil Affairs, the National Leading Group on Climate Change (NLGCC), the State Council Energy Conservation and Emissions Reduction Leading Group (SCECERLG), and the National Energy Commission (NEC).

A set of targets on the country level will be issued by one or several relevant governmental organs at the ministerial level under the State Council first to address a major issue according to the strategic plan from the Central Committee of CPC, the State Council, and the NPC for the country. Then all the relevant governmental organs at the ministerial (state) level work out detailed regulations, laws, plans, measurements, or standards to implement the plans. Almost each of the organizations at the central

government level (the NPC and the different departments of the State Council) has branches in local areas, ranging from provincial, to municipal, county, and township levels. In the detailed plans, tasks will be allocated from the central government to local levels through the political hierarchy. Later, specific targets will be made for each involved corporation to complete the assigned tasks in the local area.

The implementation of the corporate environmental targets is primarily supervised by the different levels of the Chinese state, rarely with the help of the civil society and the media. Activities that might invoke conflicts, spontaneously or with the help of NGOs, are implicitly not advocated and very often restricted in China (Ho, 2001). Therefore, environmental NGOs in China seek to guide the public to be aware of the environmental issues and to serve as helping hands for the government, rather than generate more conflicts in society and complaining about the government's performances (China Development Brief, 2013; Ho, 2001).

One drawback of the state's multi-level branches in the local area is that they have dual identities: they are governed both vertically and horizontally (Tsang and Kolk, 2010). Thus, a local branch is vertically governed through a vertical hierarchy by its relevant ministry at the central level; meanwhile, it is a part of the geographical local government horizontally. The vertically related organizations have the same goal of solving issues in a certain field, while the horizontal relationship requires a focus on local development. When the local government and the organs from the State Council have different demands and expectations on how a region should develop, a conflict of interests emerges (Child *et al.*, 2007; Luo *et al*., 2016). I will elaborate on the conflict of interests within the Chinese government and its impact on corporate environmentalism among local firms in further details in Chapter 2.

### *1.3.2 Structure in business for environmental issues*

Hierarchy prevails in Asian cultures, especially China, not only in the political system but also in the structure of business. In the most prevalent organizational form of business group in China, execution and supervision of regulations are also implemented through the hierarchy within the groups. Confronted with the social and regulatory pressures brought along by their environmental challenges, firms not only listen to the pertinent government

(Child *et al*., 2007) but also are obliged to complete the tasks their business groups have assigned to them as subordinates (Vissa *et al*., 2010).

As illustrated in Section 1.3.1, targets and plans on environmental performances are firstly worked out by the central state, followed by concrete implementation led by local governments. At this stage, detailed targets are assigned, specifically for many related firms individually to complete the assigned tasks, not only for the state but also for the business groups. On the one hand, firms listen to the local government or their controlling government and strategically carry out environmental performances in order to balance the different demands from different levels of the state (for a detailed elaboration, see Chapter 2). On the other hand, the environmental performances of business group affiliates are also monitored and regulated through the hierarchical system within their own business groups. For instance, if a business group receives environmental obligatory targets from the central level, it will act accordingly by specifying and assigning more concrete targets and tasks to all of its affiliates across the country. Just as the Ministry of Environmental Protection has its local branches of the Environmental Protection Bureau in the political system, an affiliated firm also has a Department of Environmental Protection/Energy Saving as a corresponding unit to the Section of Environmental Protection/Energy Saving at the group level to receive orders and implement corporate plans. The environmental practices among business group affiliates, as evidenced in Chapter 3, diverge as well, not only because they belong to different business groups but also because different organizational factors encourage or dissuade such practices among the affiliates. I will further investigate these attributes at both the group and the affiliate levels in Chapter 3.

## 1.4 Dissertation Overview

The dissertation consists of two studies that have several attributes in common. First, both studies aim to expand the current scope of corporate environmentalism to China, a major economic context that has received scant scholarly attention despite the major environmental implications of its economic activities. Second, each study explores corporate environmental performances and their related strategies as they are influenced by external constituencies, such as the state and business group attributes. Third, both studies

employ a specific quantitative method, panel data analysis, to test the proposed statistical models. Other than these similarities, the two studies are quite distinct from each other. An overview showing how the studies in Chapters 2 and 3 of the dissertation explored the multifacetedness of the state and business group influence, respectively, is provided in Table 1.1. In the remaining sections of this chapter, a brief summary is provided for each of the two studies.

**Table 1.1 Overview of the constructs of the studies in this dissertation**

| | **Study 1 (Chapter 2)** | **Study 2 (Chapter 3)** |
|---|---|---|
| **Title** | Government's green grip: multifaceted state influence on corporate environmental practices in China | Differences in environmental management system adoption (EMS) among Chinese business group affiliates |
| **Phenomenon** | Corporate environmental practices | Affiliate adoption of an EMS |
| **Manifestation of the multifacetedness** | Hierarchical state level of controlling entity, dominant controlling power in China | Structural position in a business group, dominant organizational form in China |
| **Theoretical lens** | Government influence, political activity | Business group strategy |
| **Analytical method** | Manual secondary data collection, in-depth interviews, content analysis, panel data analysis | Manual secondary data collection, panel data analysis, case illustration |
| **Major contribution** | Disentangling the varied roles of different levels of government on corporate environmentalism | Understanding the drivers of the different environmental practices among the business group affiliates |

### *1.4.1 Study 1: Government's green grip: Multifaceted state influence on corporate environmental practices in China*

The first study probes into the impact of the multiple governments at different levels within the Chinese autocratic state on corporate environmentalism in China. In this study, I challenge the assumption in the extant literature that governmental influence on corporate environmental performances is monolithic, with clear and consistent expectations vis-à-vis firms. In the Chinese context, on the one hand, inferior levels of the state listen to their superiors as power travels through the political hierarchy, pushing corporate environmentally friendly performances. On the other hand, due to the political autonomy also granted by the central government, local states at the farther end from the central on the political hierarchical spectrum become impactful as well, with an inclination to prioritize regional economic development. I investigate how such a complex state apparatus in China spurs different reactions among firms, as evidenced by their environmental practices.

I manually collected 480 firm-year observations, spanning the period from 2008 to 2012. Using content and panel data analysis (random effect regressions), I show that the hierarchical level of the state body controlling a firm and the firm's environmental practices are related in an inverted U-shaped way. In addition, further analysis reveals that such an inverted U-shaped influence is strengthened by regulatory stringency, and weakened by state financial participation. To facilitate the interpretation of the statistical results, I have also conducted over 60 hours of in-depth interviews with representatives of Chinese firms, different levels of government, and environmental NGOs. The qualitative evidence from these interviews helps us to more deeply understand the multifaceted state influence. This paper primarily contributes to the corporate environmentalism literature by exploring the influence exerted by the diversity of power and expectations from and within a single state on corporate environmental practices.

### *1.4.2 Study 2: Differences in Environmental Management System Adoption among Chinese Business Group Affiliates*

The second study unpacks the influence of pressure sensitivity and pressure resistance on the different strategic adoption of an environmental management system (EMS). In this study, I distinguish the factors that make business group affiliates pressure sensitive and

pressure resistant. I argue that pressure sensitivity stems from the social needs the affiliates need to maintain their social capital and brand image. On the other hand, pressure resistance emanates from the privileges the affiliates enjoy because of their organizational and group-level attributes.

I manually collected 732 firm-year observations of 166 business group affiliates spanning the period of 2008 to 2012. These observations are all listed firms with their main business in the traditional environmentally demanding sectors. Using panel data analysis (probit and logit random effect regressions), I show that being affiliated with a family-owned business group and having a Business-to-Consumer model increases the sensitivity the affiliates are confronted with, pushing them to adopt an EMS. Furthermore, being a core member of a business group and having corporate political connections adds to the resistance towards the adoption of an EMS. In this study, I have two major contributions. First, I extend the ongoing conversation from a comparison of business group affiliates and standalone firms to a discussion on the different strategic choices among business group affiliates. Second, as the center of global economic development has shifted from developed countries to emerging economies, I explore the most prevalent organizational form in the largest emerging economy in China, the business group.

## 1.5 Declaration of Contribution

I (hereinafter 'the author') declare my contribution to each of the chapters in this dissertation and acknowledge the contributions of other people that have been involved.

Chapter 1: The author has completed this chapter primarily on her own, with the feedback from the supervisory team.

Chapter 2: The majority of the work in this chapter has been completed by the author in collaboration with her supervisory team (i.e. Professor Dr. Pursey P.M.A.R. Heugens and Dr. Frank Wijen). Different versions of this paper has been presented in several international conferences, one of which was collected in the best paper proceedings at a conference, and a recent version is currently under review at a top management journal. The author is the first author, the daily supervisor second, and the promoter third.

Chapter 3: The majority of the work in this chapter has been completed by the author in collaboration with her supervisory team. This paper has been presented in an

international conference, and is currently in preparation to submit to a top management journal. The author of this dissertation is the first author of the paper, the promoter second, and the daily supervisor third.

## 1.6 Conclusion

The research presented in this dissertation aims to advance the understanding of the corporate environmentalism in China. Theoretically, it offers novel perspectives to unveil the complexity of the influence a single entity, the state, exerts on corporate environmentalism, and to unpack the factors causing the heterogeneity in strategic choices within a same organizational form, the business group. Empirically, the dissertation covers the major mechanisms through which corporate environmental practices in Chinese listed firms could be affected by external formal influences, including two opposing effects, (mounting pressure and increasing autonomy) brought along by the different expectations and priorities of various levels of the state, as well as the pressure resistance and pressure sensitivity business group affiliates possess. Practically, it is impactful as it plots a deep and comprehensive picture for practitioners around the globe to better understand the effectiveness of the environmental institutions in China. For instance, performing business with China under the backdrop of a sustainable developmental strategy advocated by the central government, firms or governments from developed economies could understand and/or cooperate with their Chinese competitors or partners better by sorting out where they are positioned in the political hierarchy and business group structure, analyze the environmental pressures they might be confronted with, and attune the development of their strategies. It also reminds the public policy makers for environmental solutions to keep a closer eye on the conflicts from within the bureaucratic system rather than from the outside.

As China is facing increasingly important environmental challenges and worldwide critique, especially over the past five to ten years, as the largest emitter of greenhouse gases and the leading consumer of non-renewable energy, its influence on the global climate change begs for immediate, effective, and united actions to solve its major environmental problems. Given the importance of the Chinese economy, the outcomes of this study have repercussions stretching beyond the Chinese context. This dissertation

appears timely for scholars and practitioners in rethinking better and more effective environmental institutions as well as making a deliberate attempt to eventually solve environmental challenges. Moreover, the economic and environmental impact China brings along is non-negligible. Given that China has been the world's largest economy by purchasing power parity from 2014 onwards, doing business with Chinese firms becomes unavoidable, lucrative, yet challenging in the age of globalization. Despite of the culture difference, considering that China actually is in a development stage in which it prioritizes economic development, whereas the western society has moved on from this stage and is now pursuing sustainable development, there will be a lot of differences in the mindsets, corporate practices, and ultimate goals between the two contexts when doing business together. This dissertation offers a careful investigation of two critical actors, the autocratic state and the dominant business group, in pushing environmentally sustainable economic development in China. The dissertation's insights will help different relevant players, including government, business, and NGOs, in the world get a more comprehensive view of the current semi-institutionalized environmental institution in China.

## Chapter 2. Government's Green Grip: Multifaceted State Influence on Corporate Environmental Practices in China[1]

**Abstract**

Emerging economies such as China enjoy economic expansion but also face dramatic environmental challenges. China's government is a central actor in both stimulating economic activities and pursuing environmental protection. Drawing on panel data and in-depth interviews, we examined the influence of the state on environmental practices of Chinese publicly listed firms at different levels of administrative hierarchy. The results show that corporate environmental practices follow an inverted U-shape as control of environmental practices moves from the central government to the most decentral administrative level. This curvilinear relationship is positively moderated by regulatory stringency and negatively by state financial participation in the corporate ownership structure. We conclude that state influence on corporate environmental practices in China is multifaceted and subject to 'policy-policy decoupling'.

[1] This study is conducted in collaboration with Frank Wijen and Pursey Heugens.

## 2.1 Introduction

The government is a key driver of corporate environmental practices (Delmas and Toffel, 2004; Henriques and Sadorsky, 1996; Marquis and Qian, 2014; Porter and Van der Linde, 1995). Government instruments like regulation, pollution levies, and subsidies induce firms to develop and implement environmentally friendly policies (Kemp, Soete, and Weehuizen, 2012). The influence of government has been studied extensively in the context of Western societies (Bansal and Hoffman, 2012; Wijen, Zoeteman, Pieters, and Van Seters, 2012), but scholars have only to a limited extent investigated how the government affects environmental practices in *emerging* economies (Marquis and Raynard, 2015). This is surprising, as the combination of high economic growth, shifts in global industrial production patterns, and important governance challenges (Hoskisson, Eden, Lau, and Wright, 2000) has led to major environmental problems in many emerging economies (UNEP, 2012).

The quintessential example is China. After decades of sustained growth, China became the world's biggest economy in terms of purchasing power parity in 2014 (IMF, 2015). China also became the world's largest emitter of greenhouse gases in 2006, and the leading consumer of (non-renewable) energy in 2009 (World Bank, 2015), even though the country made some progress in terms of resource efficiency and clean product development (Mol and Carter, 2006; Li and Shui, 2015). The growing magnitude of the environmental challenges facing emerging economies, therefore, calls for a better understanding of their environmental governance.

While researchers have recognized the central role of the government in environmental governance, they have treated its influence on corporate environmental practices as monolithic, consisting of a clear and consistent set of expectations (e.g. Delmas and Toffel, 2008; Sharma and Henriques, 2005). However, the government exerts influence at different levels, from the central state to the village — the most decentral governmental organ. Previous studies have suggested that the Chinese government is a dominant actor with a complex organizational structure and multiple levels of administrative hierarchy, each of which may influence corporate behavior in different ways (Child *et al.,* 2007; Carter and Mol, 2006; Luo *et al.*, 2016). While the Chinese central state has acknowledged the existence of major environmental problems and has

served as the major driver of sustainable development, lower-level administrative branches have not always prioritized sustainable development to the same degree (Qi *et al.*, 2008). As one Chinese proverb capturing the mindset of lower-tiered magistrates states, the emperor is as far away as the sky (*tian gao huang di yuan*, in Chinese). Local governments thus have their own development agendas for the firms they control, which need not be consistent with central governmental policies emphasizing environmental protection.

We focus on the multifaceted impact of the government on corporate environmentalism. In the absence of objective performance measures, we seek to explain company-reported practices, thereby addressing two essential issues. First, we discuss how administrative hierarchical distance — the degree of power separation between the central government and the level of government holding the monitoring and control rights over a firm — affects environmental practices. We identify nine levels of administrative hierarchy in China, and assess their impact on corporate environmental practices. Second, we focus on regulatory stringency and state financial participation in firm ownership as contextual factors that may moderate the focal relationship. We thus unpack the multifaceted influence of the Chinese government, a seemingly unitary yet internally plexiform actor, on corporate environmental practices. China's transitional market offers an excellent context for examining how a single constituent can exert multiple and sometimes contradictory influences on firms. As firms are both the source of and solution to environmental problems (Bansal and Hoffman, 2012), we study their corporate environmental practices, defined as the extent to which Chinese firms evidence "the recognition and integration of environmental concerns into a firm's decision-making process" (Banerjee, 2002: 177). Our leading *research questions* are: (1) what is the influence of administrative hierarchical distance on corporate environmental practices in China; and (2) what government-related factors moderate this influence?

Using content analysis and panel analysis on data collected on Chinese listed firms between 2008 and 2012, we theorized and found the relationship between administrative hierarchical distance and corporate environmental practices to follow an inverted U-shaped pattern. Two opposing forces produce this phenomenon. On the one hand, firms experience *mounting pressure*, meaning that environmental compliance pressures accumulate with administrative hierarchical distance. Due to China's highly

centralized political system (Lin, 2011), we expect the pressures emanating from more central governmental levels to carry greater weight than those exerted at more decentral levels. On the other hand, we expect firms to experience *increasing autonomy*, as local governments in China tend to use their distance from the central government to prioritize economic development over environmental protection. Since the careers of lower-tiered magistrates in China are often determined by their track record for stimulating economic growth (Li and Zhou, 2005), we expect autonomy to prevail at local governmental levels. Moreover, we expect the contextual factors of regulatory stringency and state financial participation to moderate the balance between the two forces in different ways. Firms subject to more stringent regulation conduct more environmental practices at intermediate levels of administrative control, whereas state ownership reduces such activities at those levels.

Our study makes two contributions. First, we add to the corporate environmentalism literature by disentangling the varied roles of different levels of government. Most prior studies have treated governments as unitary entities, assuming that they operate in consistent and concerted ways across hierarchical levels (Delmas and Toffel, 2008; Sharma and Henriques, 2005). Contrastingly, we show that governments have multiple faces, and that governmental bodies operating at different levels can exert alternate and even conflicting influences on corporate environmental practices. This may be true not only in emerging economies, but also in developed nations, especially in federal states with high levels of local autonomy, like Germany and the United States.

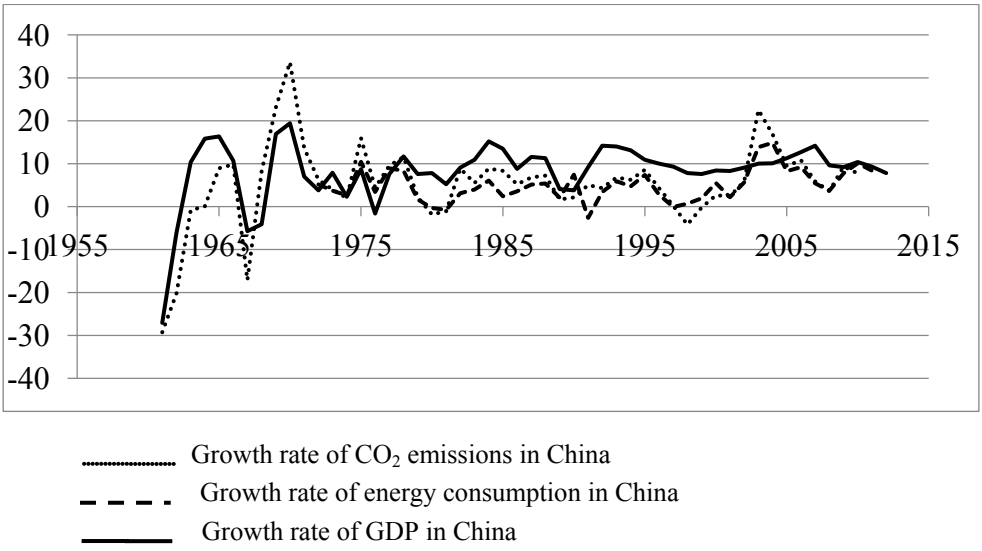
Second, our empirical examination of environmental governance in an emerging economy adds new perspectives to the literature on corporate environmentalism. The existing body of work has privileged investigations of environmental governance in developed economies, in which civil society provides an important complementary 'check' on firms' environmental behavior (Bansal and Hoffman, 2012; Wijen *et al*., 2012). Nonetheless, many contemporary nations facing important environmental challenges—including China and Russia—are characterized by far greater involvement of the government in both corporate ownership and environmental custodianship. Since civil society is a much weaker force in these contexts (Earnhart *et al.*, 2014), our existing insights into corporate environmentalism—built on democracy, stakeholder dialogue, and

the influence of non-governmental organizations (NGOs)—are also less applicable. Shedding light on the influence of the government on environmental practices in an emerging economy like China furthers our understanding of the ways in which the world's rapidly growing environmental challenges can be contained more effectively.

## 2.2 Environmental Governance in China

In the aftermath of its economic success, China faces important environmental challenges. The similar patterns displayed in the growth rates of carbon dioxide ($CO_2$) emissions, energy consumption, and gross domestic product (GDP) in Figure 2.1 suggest that economic development in China has been inextricably linked to environmental degradation.

**Figure 2.1 Growth rates of $CO_2$ emission, energy consumption, and GDP in China**
(World Bank, 2014)

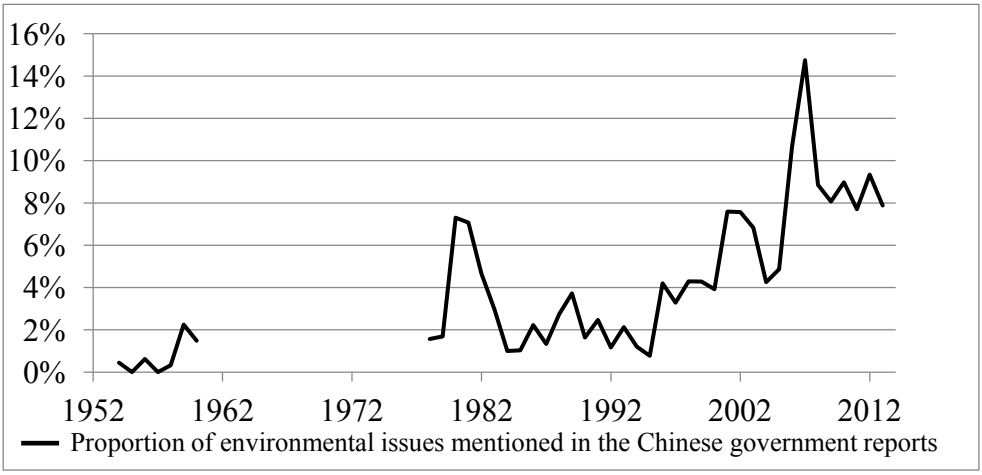



In China, the largest autocratic country in the world, the state is the dominant actor in terms of advancing corporate environmentalism (Beeson, 2010; Marquis and Qian, 2014). NGOs play a supporting role in this process (Ma and Ortolano, 2000), relieving pressure on the government by educating civil society on environmental issues (Spires, 2011). The central government has become increasingly aware of its environmental challenges. For instance, the former State Environmental Protection Administration (SEPA)

was officially promoted to the highest level of governance in the Chinese political structure, and became the Ministry of Environmental Protection (MEP) in 2008. Clear, obligatory environmental targets were set in the 11th Five-Year Plan in 2006, whereas the 12th Five-Year Plan in 2011 tightened them further. As shown in Figure 2.2, almost one tenth of the central government's 2012 annual report was focused on environmental protection, as compared to only one percent in 1985.

**Figure 2.2 Proportion of environment-related issues in Chinese annual government reports**

(Central People's Government of the People's Republic of China, 2014)

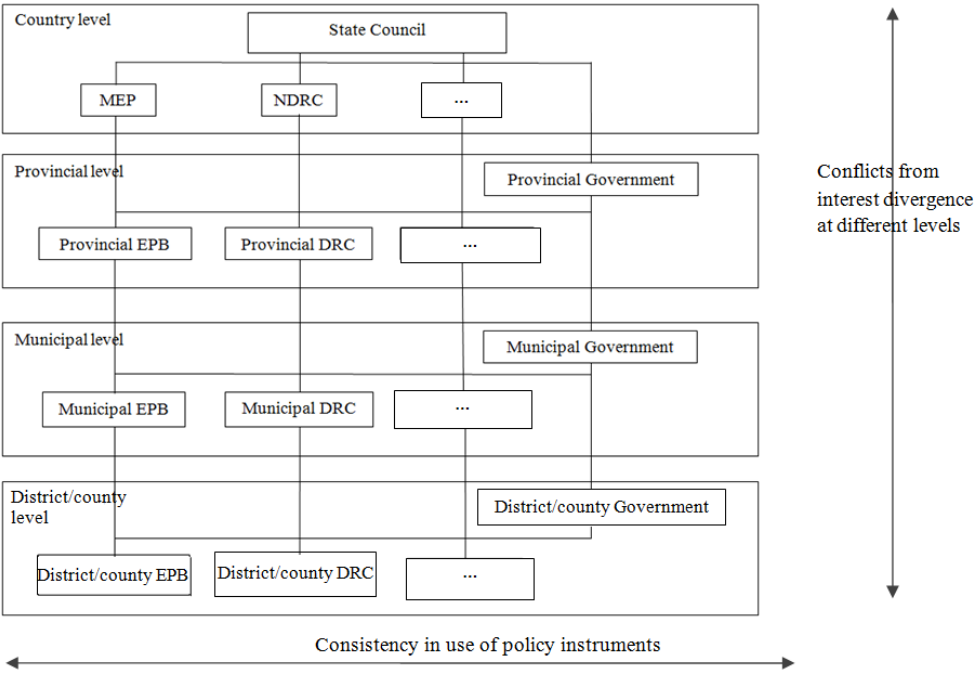



In China, both local governments and the central state have the power to allocate significant resources to the development of industries and regions (Luo *et al.*, 2016; Marquis and Qian, 2014). Policy enforcement differs across administrative hierarchical levels, however, as local governments have pursued development strategies that vary from those of the central government for historical reasons. After the establishment of the People's Republic of China in 1949, priority was given to the development of heavy industry for economic reconstruction. The 1978 Open Door Policy, with its decentralization of revenue appropriation and investment allocation from the provincial governments down to individual enterprises, was conducive to the establishment of a market regime (Oi, 1995). When local governments began to be evaluated primarily in terms of GDP growth from 1985 onwards, environmental protection laws and regulations

effectively became dead letters. Local governments had "strong incentives to circumvent those policies adopted in Beijing that might constrain local growth" (Lieberthal, 1995: 316). Profitable firms in heavy industry often enjoyed the protection of local governments (Marquis, Zhang, and Zhou, 2011). Differences in regional development policies between central and local governments quickly became apparent. As the Chinese saying goes, "local policies trump central governmental policies" (*shang you zheng ce, xia you dui ce*). When the central government later began to regulate environmental issues, local governments thus rarely followed in lockstep (Child *et al*., 2007).

Irrespective of these differences, there is also consistency within the administrative system. The state categorically uses a variety of policy instruments, implemented through local ministerial branches, to achieve its environmental protection targets. The local Environmental Protection Bureaus (EPBs, branches of the MEP) and the local Development and Reform Bureaus (DRBs, branches of the National Development and Reform Commission) use rules to enhance the environmental performance of local firms. They set targets for emission reduction and energy conservation, and apply administrative penalties. Local DRBs, together with the local Bureaus of Economy and Information Technology and with branches of the Ministry of Industry and Information Technology at the central level, also grant subsidies to local firms for clean production, energy saving, and emission reduction. In 2012, subsidies amounting to RMB 200 billion (about USD 32 billion) were allocated to energy saving and environmental protection purposes (National Bureau of Statistics of China, 2012). The EPBs also use environmental performance disclosure to create public reputational impact. Saving face (*mian zi*) is crucial for firms, as reputation is a major social currency in Chinese society (Park and Luo, 2001). An overview of the Chinese environmental governance structure is presented in Figure 2.3.

**Figure 2.3 The Chinese environmental governance structure**[2]




## 2.3 Government Influence on Corporate Environmental Practices

Firms adopt environmental strategies to maintain legitimacy in light of compliance pressures from the government, local communities, and the market (Delmas and Toffel, 2011; Henriques and Sadorsky, 1999). Cited as the greatest source of pressure on firms (Henriques and Sadorsky, 1996), government influence manifests itself in a variety of ways (Kemp *et al*., 2012), including the enforcement of regulation (Russo, 1992; Delmas and Montes-Sancho, 2011) and signaling desired behaviors (Marquis and Qian, 2014). As firms seek to reduce uncertainty and advance private ends (Hillman *et al.*, 2004), they must meet governmental expectations.

The Chinese case offers an extraordinary opportunity to investigate how firms use corporate environmentalism as a political strategy, through which they respond to the multifaceted demands of the state (Marquis and Qian, 2014). Corporate political strategies

[2] For the sake of simplicity, we do not distinguish between municipalities, districts, and towns that are at or under subprovincial municipality levels in Figure 2.3.

are complex in China, where grassroots movements without official supervision are restricted (Spires, 2011), the administrative hierarchy is rife with struggles (Carter and Mol, 2006), and multiple policy instruments are used in conjunction but not always in concert (Shi and Zhang, 2006). We develop new arguments on how Chinese firms respond to multiplicitous government demands.

### *2.3.1 Hierarchical government influence*

Two concurrent, opposing forces drive the cumulative impact of all administrative hierarchical layers on corporate environmental practices. We label the first *mounting pressure*. Firms feel pressed to increasingly engage in environmental practices as administrative hierarchical distance rises, although additional pressure will accumulate at a diminishing rate. As distance from the central government grows, a larger number of governmental bodies at different hierarchical levels are simultaneously involved in firm supervision (Xu, Tihanyi, and Hitt, 2014). Firms that are controlled directly by the central government only face a singular set of compliance pressures, leading to fewer constraints on corporate behavior (Gedajlovic and Shapiro, 1998). Many firms in China, however, are controlled by local governments, which serve as delegates (Qi *et al.*, 2008) or agents (Wong, 2000) of their superior authorities. The central government delegates power and responsibilities to the provincial governments, requiring the latter to implement centrally formulated targets and plans in all policy areas, including environmental management. Seen from the perspective of firms controlled directly by the provinces, however, provincial governments add a layer of environmental compliance pressure, cumulating on top of the central government's dictums (Marquis and Qian, 2014; Luo *et al.*, 2016). These pressures keep mounting with additional administrative hierarchical distance, as provincial governments, in their turn, delegate power to municipal governments, and so on. Delegating governmental bodies retain the right to intervene in lower-order affairs and continue to regulate the relevant larger policy areas. Compliance pressures cumulate at a decreasing rate, however, because in China's centralized political system (Lin, 2011), higher-level agencies are primarily rule makers and lower-level bodies are mostly rule takers. Since governmental bodies at very decentral levels hardly add any environmental regulation of their own, the mounting pressure effect eventually levels off.

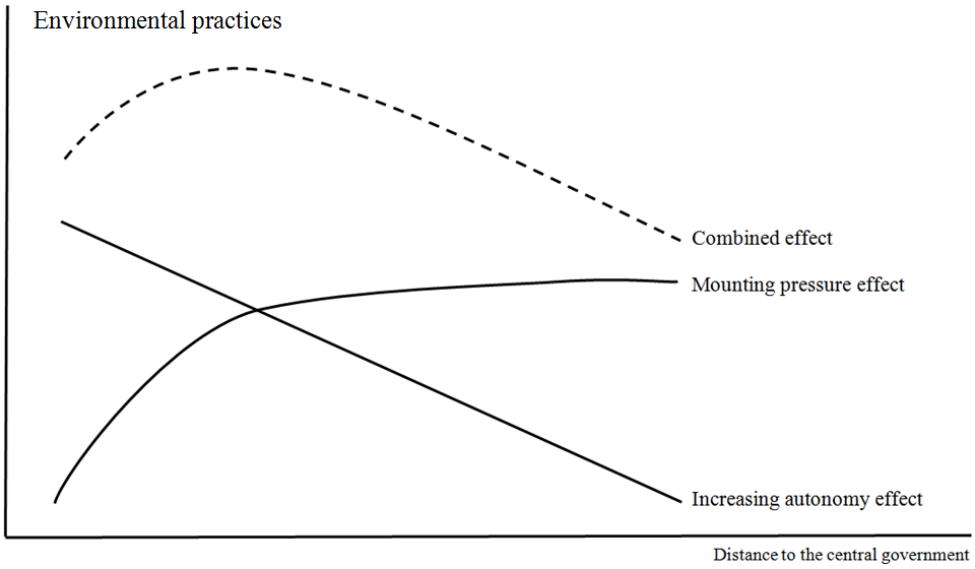
The second, opposing force we identify is *increasing autonomy*, which captures the effect that local governments tend to wield their discretionary power to prioritize economic growth over environmental conservation. With increasing administrative hierarchical distance, the central government becomes less able to oversee the extent to which local governments enforce its intentions rigorously. Governmental pressure to conduct environmental practices will thus be lower for firms operating at greater administrative hierarchical distance from the central government, also because the governmental agencies controlling them acquire more autonomy themselves (Qi *et al.*, 2008). Centrally developed environmental regulations are often intentionally crafted in ambiguous terms to offer discretion to local governments, and the latter use this power pragmatically (Ma and Ortolano, 2000). When lower-level governments control firms, environmental policy instruments tend to be implemented only partially to favor local employment, boost fiscal revenues, and advance lower-tiered magistrates' careers, which heavily rely on economic performance (Morduch and Sicular, 2000; Qi *et al*., 2008; Zheng, Singh, and Mitchell, 2015). When profitable firms display environmentally disruptive behavior, local governments often avoid taking measures that would lead to environmental compliance at the expense of tax revenues (Morduch and Sicular, 2002; Shi and Zhang, 2006). The increasing autonomy effect continues to augment with administrative hierarchical distance, because decentrally controlled firms enjoy greater bargaining power vis-à-vis local governments. The latter depend on income from local businesses (Ma and Ortolano, 2000) and are therefore susceptible to firms threatening to shift their activities to localities with more lenient environmental regimes (Kalamova and Johnstone, 2012). This allows firms to co-opt officials (Zheng *et al.*, 2015) and circumvent environmental regulations (Child and Tsai, 2005).

While the mounting pressure effect increases yet levels off, firms' autonomy vis-à-vis local governments thus keeps growing. We therefore expect that these two forces will jointly produce an inverted U-shaped relationship (Haans, Pieters, and He, 2016) between administrative hierarchical distance and corporate environmental practices. Figure 2.4 plots this combined effect. The first part of the curve is dominated by the mounting pressure effect, inducing firms to increasingly conduct environmental practices. At higher levels of administrative hierarchical distance, however, the cumulative pressure levels off and is

overtaken by the increasing autonomy effect, resulting in decreasing environmental practices pressure. See Hypothesis 2.1.

> *Hypothesis 2.1: Administrative hierarchical distance has an inverted U-shaped effect on corporate environmental practices.*

**Figure 2.4 Combined effect of hierarchical distance and environmental practices**




### *2.3.2 Moderating effects on hierarchical influence*

To further probe into the influence of the state, we explore how several government-related factors moderate the impact of administrative hierarchical distance on corporate environmental practices. Drawing on insights from corporate political strategies (Hillman *et al*., 2004) and corporate environmentalism (Delmas and Montes-Sancho, 2011; Marquis and Qian, 2014), we argue that the focal relationship is likely to be moderated by two contextual factors: regulatory stringency and the state's financial participation in the ownership structure of the focal firm.

***Regulatory stringency***

Governments frequently rely on regulation to promote, facilitate, or enforce environmentally benign corporate behavior (Kemp *et al.*, 2012). We expect that both the mounting pressure and increasing autonomy effects associated with environmental

practices will intensify with regulatory stringency, resulting in a steepened inverted U-shaped relationship (cf. Jourdan and Kivleniece, 2016). Regulation intensifies the mounting pressure effect, as governments use regulation to control inputs (e.g. banning toxic substances), production (e.g. requiring cleaner production technologies), and outputs (e.g. establishing bounds on pollution levels). Certain sectors are more stringently regulated than others, because their activities are perceived to be more environmentally disruptive (Hoffman and Ocasio, 2001; Fiorino, 1996). Firms facing more stringent environmental regulations suffer from a lack of legitimacy, as they are considered to adversely affect the natural environment. They therefore tend to engage proactively in environmental practices (Jaffe and Palmer, 1997; cf. Marquis and Qian, 2014). With the central government becoming increasingly aware of the severity of environmental issues (Child *et al*., 2007; Luo *et al*., 2016), it has allocated more resources to the monitoring of the environmental compliance of more disruptive sectors and it has urged local governments to enforce environmental regulations more tightly (Lo and Tang, 2006; Shi and Zhang, 2006). Consequently, firms in stringently regulated sectors experience greater pressure to carry out their environmental actions. As a political strategy, environmental practices are instrumental for firms in environmentally disruptive sectors, as they signal their compliance with stringent requirements and help them acquire, retain, or regain their legitimacy (Banerjee, 2002; Marquis and Qian, 2014; Porter and Van der Linde, 1995).

We similarly expect the increasing autonomy effect to be amplified in more regulated sectors. Traditional sectors have majorly contributed to the Chinese economy's sustained growth (Li and Leung, 2012). Industries like basic metals, chemicals, coal, and consumer goods have generated employment, income, and tax revenues. Since China's fiscal and investment policies were decentralized (Oi, 1995), local governments have been the primary beneficiaries of this economic expansion (Morduch and Sicular, 2000; Qi *et al*., 2008; Zheng *et al*., 2015). Given their higher level of vested interests in traditional sectors, lower-tiered magistrates will make every effort to protect these activities. While these sectors are environmentally demanding, high economic stakes make local governments relatively lenient when it comes to issuing and implementing environmental regulations—also to avoid firms relocating towards more lenient regions (Kalamova and Johnstone,

2012). In total, the opposing effects of mounting pressure and increased autonomy are both magnified in highly regulated sectors. See Hypothesis 2.2.

> *Hypothesis 2.2: The inverted U-shaped relationship between administrative hierarchical distance and corporate environmental practices is steepened by regulatory stringency.*

***State financial participation***

We expect the state's financial participation in the ownership structure of firms to attenuate the focal relationship. As an insider, the state will mitigate the mounting pressure effect due to the presence of mixed motives. When the government is more involved in the immediate environment of a corporation, corporate strategies are more likely to be influenced by the quest for political legitimacy (Marquis and Qian, 2014). Bureaucratic embeddedness not only facilitates corporate access to critical information and resources such as capital, business licenses, and information (Li and Zhang, 2007; Lu and Yao, 2006), but also enhances government control over the implementation of environmental policies (Dickson, 2003; Tsui-Auch and Lee, 2003). At the same time, the state also expects to extract dividends from the firms in which it has invested. It will therefore be reluctant to stringently implement environmental policies that might adversely affect the profitability of state-owned firms. In combination, these two conflicting motives produce mitigated environmental policy enforcement.

State financial participation also attenuates the increasing autonomy effect. Whereas the career prospects of lower-tiered magistrates used to depend solely on their ability to realize economic growth, environmental performance has recently become part of the criteria by which they are evaluated, due to the increased attention the Chinese central government is paying to environmental degradation (Marquis and Qian, 2014). Magistrates with corporate connections, such as those representing governmental bodies investing in firms, are publicly scrutinized over corporate social and environmental performance (Piotroski, Wong, and Zhang, 2015). Civil servants charged with controlling state-owned firms are also personally liable for severe environmental accidents (Environmental Protection Law of the People's Republic of China, 2014: article 63), making them less tolerant of corporate non-compliance. The additional scrutiny of lower-

tiered magistrates involved with firms in which the state participates financially thus ensues a weakened increasing autonomy effect. In combination, these weaker mounting pressure and increasing autonomy effects attenuate the focal relationship. See Hypothesis 2.3.

> *Hypothesis 2.3: The inverted U-shaped relationship between administrative hierarchical distance and corporate environmental practices is attenuated by state financial participation.*

## 2.4 Methodology

### *2.4.1 Sample and data*

We chose China as our research setting for three reasons. First, the country is highly dependent on (heavy) industrial production, meaning that it will have to address difficult environmental challenges while working on its economic development. Unlike Western countries, China cannot postpone dealing with environmental issues until its industrialization process is completed (Cole and Neumayer, 2005). Second, the power of the state is pervasive in China, as it permeates nearly all economic, political, and cultural institutions (Child *et al*., 2007). Third, China is a transitioning economy. The structural transformations of most sectors in the past few decades have profoundly impacted industrial dynamics and corporate behavior (Luo, 2003).

To test our hypotheses, we developed a longitudinal dataset on Chinese listed firms covering the period between 2008 and 2012. The year 2008 marks a turning point for the Chinese political system in terms of environmental protection, as the former SEPA was transformed into the MEP. This promotion to ministerial agency entitled the MEP to draft laws and make top decisions for the country, which gave a major impetus to the planned restructuring of key sectors such as iron and steel, petrochemicals, textiles, nonferrous metals, and equipment manufacturing. Furthermore, the development of Strategic Emerging Industries, many of which were involved with environmentally friendly technologies, became a national strategic priority in 2008 (Report on the Work of the Government, 2010). Moreover, under the supervision of the China Securities Regulatory Commission (CSRC), the Shenzhen Stock Exchange (SZSE) and the Shanghai Stock

Exchange (SSE) issued notices and guidelines on corporate social responsibility and environmental information disclosure for listed firms in the years 2006 and 2008, respectively, which made corporate environmental reports much more detailed from 2008 onwards.

We compiled our sample from the 1425 firms listed on the Main Boards of both SSE and SZSE for the following reasons. First, as listed firms are larger than their non-listed counterparts, they have a greater impact on the economy and the natural environment, thus attracting more governmental scrutiny (Edelman, 1992). Second, being exposed to society at large, listed firms have to respond to institutional pressures if they are to maintain their societal license to operate. Third, because the SSE only has a Main Board, whereas the SZSE also has two other boards (Growth Enterprises Market and Small and Medium Enterprises Boards), we selected Main Board firms to ensure comparability. We excluded firms that received a 'Special Treatment' (ST) tag from the stock exchanges, which is given in response to irregularities such as reporting financial losses for two consecutive years, or failing to provide an audit report from a certified accounting firm (China Stock Market Handbook, 2008). We did this because ST firms face various trading and financial restrictions (such as suspension of trading, losing their right to issue new shares, and even getting delisted; Peng, Wei, and Yang, 2011) that may incentivize them to manipulate their reports to come out of the designation (Firth, Rui, and Wu, 2011; Jiang and Wang, 2008).

To ensure that our sample covered all relevant sectors of firms listed on Chinese stock exchanges, we identified three groups. First, firms manufacturing products that protect the natural environment and/or save energy. Second, firms employing environmentally demanding core technologies or being listed as major polluters. Third, firms that do not belong to either of the aforementioned sectors. To identify the sectors included in the first group, we used the CNI TEDA Environmental Protection Index issued in 2008. These sectors comprise sewage disposal, emission reduction equipment, energy saving equipment and material, and recycling and renewable energy (wind, hydro, and biomass). This first group consisted of 36 listed firms in total. Due to the intensive nature of our data collection strategy, we used random sampling to select firms in the other two groups (Feldman, Amit, and Villalonga, 2016; Philippe and Durand, 2011). We identified

the sectors included in the second group using the Directory of Industrial Classifications for Listed Firms Subject to Environmental Protection Inspections, issued by the MEP in 2008. These sectors consisted of thermal power, iron and steel, cement, electrolyzed aluminum, coal, metallurgy, construction materials, mining, chemicals, petrifaction, pharmaceuticals, light industry, textiles, and leather goods. This second group consisted of 388 listed firms in total, which we reduced to 36 (equivalent amount to the first group) using systematic sampling, a random sampling technique that uses a constant interval, *k*, on a criterion variable to compile a sample (Bellhouse, 1988). In our case, we set *k* at $388/36 \approx 10.78$ and rank-ordered the group-2 firms in terms of annual turnover. Starting with the $11^{th}$-ranked firm, we collected our remaining observations by selecting firms at the next integer position rounded up from 2*k*, 3*k*, and so forth. We used the same sampling criterion to select 36 firms for group 3, which spanned sectors like information technology, financial institutions, and media companies.

We dropped observations in case firm-level strategic restructuring decisions caused major changes in a firm's product portfolio, resulting in firms initially included in one group migrating to one of the two others. This winnowing procedure reduced our final sample size to 480 firm-year observations involving 107 unique firms (group 1: 151 firm-year observations, 36 firms; group 2: 159 firm-year observations, 35 firms; group 3: 170 firm-year observations, 36 firms).

### *2.4.2 Variables and measures*

#### *Dependent variable*

*Corporate environmental practices.* We measured corporate environmental practices by exploring detailed descriptions of actual corporate environmental actions. Eligible actions include specific efforts to save energy and decrease pollution, as well as activities aimed at propagating environmental protection concepts. We conducted a content analysis of firms' annual financial reports and corporate social responsibility (CSR) reports (sometimes also called 'sustainability reports' or 'environmental responsibility reports'), as obtained from CNINFO and firms' official websites. The annual reports are consistent and standardized among all listed firms. SZSE and SSE both issued guidance for listed firms to refer to when reporting their CSR performance, environmental performance included, covering specific types of issues that should be addressed. The triangulation of annual and CSR

reports has a number of advantages in terms of identifying corporate environmental actions. First, annual reports are widely acknowledged as the major channel through which firms disclose important information (Wiseman, 1982; Sharma and Henriques, 2005). Second, annual reports may provide a more accurate picture of environmental activities than data obtained from surveys (Bansal, 2005), especially because these official statements are subject to third-party verification. Third, we included CSR reports as they disclose more fine-grained environmentally relevant information than financial reports.

Illustrative sentences include: "our firm reduced X tons of sulfide in the past year"; "we organized environmental protection activities Y times in our district" and "Z RMB were spent to reduce emissions and energy consumption". To avoid the inclusion of greenwashing instances in our analysis, we only included substantively specified actions into our counts of corporate environmental practices. The variable was coded in several steps, using the qualitative data analysis software NVivo 10. First, we engaged in an open coding process by reading through ten randomly selected annual reports issued by firms in our sample, noting the environmental issues firms focused on. Second, we labeled the aspects identified in the first step. Additional labels were added during the coding process, when new aspects were found in other firms. Third, we calculated the total number of words covered by each label. To correct for the fact that some firms' reports are wordier than others, we calculated the percentage of words related to corporate environmentalism out of the total words in the relevant annual financial reports and CSR reports. To reduce heteroskedasticity, we log-transformed the variable. Table 2.1 presents the list of final labels used to assess corporate environmental practices.

**Table 2.1 Labels used to measure corporate environmental practices in Chinese listed firms**

| **Corporate environmental practices** |
|---|
| 1. Corporate focus on environmental protection |
| 1.1 Alternative resources or power, healthy materials |
| 1.2 Actual emission amount or emission reduction amount |
| 1.3 Actual energy consumption amount or energy saving amount |
| 1.4 Contribution to the community as to environmental issues |
| 1.5 Environmental protection project tracking |
| 1.6 Energy saving and emission reduction amount (ESER) |
| 1.7 Execution of the environmental protection system |
| 1.8 Expenditures on environmental performance |
| 1.9 Meeting certain environmental standards or regulations |
| 1.10 Participation in events, organizing one-off or routine events for popularizing ESER |
| 1.11 Paperless office |
| 1.12 Recycling |
| 1.13 Relevant equipment used for ESER |
| 1.14 Requirements for corporate actors as to environmental issues |
| 1.15 Welcoming supervision from the community |
| 1.16 Waste disposal amount |
| 2. Requirements vis-à-vis business partners |
| 2.1 Green supply chain |
| 2.2 Green distribution and/or transportation |
| 2.3 Green after-sales service |

***Independent variables***

*Administrative hierarchical distance*. To test Hypothesis 2.1, we calculated the administrative hierarchical distance from the firm to the central government. It reflects the number of governmental levels separating the central government from the level of government that holds the monitoring and/or control rights of a given firm, and thus is responsible for implementing environmental policy for that specific firm. This variable was computed differently for state-owned enterprises (SOEs) than for non-SOEs, because SOEs in China have a political status comparable to governmental organs. A firm located in a town might be governed directly by the State Council, making it difficult for the local government to exert influence over its activities. Lower-level governmental bodies thus can hardly influence firms with a higher political status. We therefore calculated the administrative hierarchical distance for SOEs as the number of tiers separating the

controlling governmental organ (the ultimate owner) and the central government. As non-SOEs do not have political status, we computed their score on the administrative hierarchical distance variable by adding an additional tier to the distance score of the nearest and lowest governmental jurisdiction in which they were embedded (i.e., the ultimate monitor) to capture their subordinate status. Larger values on this variable thus represent greater administrative hierarchical distance. For SOEs, ultimate owner data was obtained from annual reports. For non-SOEs, the relevant jurisdiction was taken from the annual report, which specifies the corporate working address and the governmental body responsible for monitoring the firm. The distance variable was calculated according to the scale captured in Table 2.2. In Appendix 1, we provide two examples of how this measure was computed for SOEs and non-SOEs.

**Table 2.2 Hierarchical distance to the central government**

| | **SOE** | **Non-SOE[a]** |
|---|---|---|
| **Village** | 5 | 6 |
| **Town** | 4 | 5 |
| **Town under subprovincial municipality** | 3.5 | 4.5 |
| **District/county** | 3 | 4 |
| **District/county under subprovincial municipality** | 2.5 | 3.5 |
| **Municipality** | 2 | 3[c] |
| **Subprovincial municipality[b]** | 1.5 | |
| **Province** | 1 | |
| **Central state** | 0 | |

[a]The value of hierarchical distance is one unit more in non-SOEs than in SOEs because there is also one unit of distance from a firm to its nearest local government for non-SOEs.

[b]Subprovincial municipalities are those cities that are designated to be at the same level as a province when economic development and social development are prioritized by the central government.

[c]Private firms are not directly owned by municipalities, provinces or the central state. Therefore, they are under the control of all levels, the highest of which is the region/county in a municipality. Such a region or county has an equivalence level with municipality. This is why the distance of non-SOEs starts at value 3.

*Regulatory stringency.* To test Hypothesis 2.2, we calculated the percentage of waste gas emission reduction over the past five years by industry to indicate the level of regulatory stringency faced by a firm. We opted for emission reductions, as prior studies have found this variable to be a useful and sector-specific proxy for regulatory stringency (Brunel and Levinson, 2016; Javorcik and Wei, 2004). We opted for waste gas emissions in particular, because these are the main target of environmental regulation in China, given the high degree of air pollution (Zhang, He, and Huo, 2012). Sectorial emission data was collected from the Environmental Statistics Dataset disclosed annually by the National Bureau of Statistics of People's Republic of China on its official website. The variable was log-transformed.

*State financial participation.* To test Hypothesis 2.3, we calculated the percentage of shares held by state legal persons in a listed firm. These legal persons not only include the state itself, but also other institutions and state-owned firms. The variable was retrieved and calculated from the table specifying "the ten largest shareholders" that is mandatorily provided in firms' annual reports and was log-transformed.

***Control variables***

*Environmental subsidies.* We calculated the log-transformed ratio of governmental environmental subsidies received divided by the firm's revenues in a focal year. The variable was retrieved and calculated from the table specifying "details for subsidies from the government", which is mandatorily provided in firms' annual reports.

*Environmental malpractice disclosure.* We counted the number of times a firm was disclosed by the EPBs or MEP to have violated environmental regulations. We collected the data from the website of the Institute of Public and Environmental Affairs (IPE), an environmental NGO that collects and discloses governmental environmental penalty reports.

*Political connections.* We used two variables to control for the effect of political connections on the environmental practices of a listed firm. First, we log-transformed the percentage of top management team (TMT) members of the focal firm who also work for a governmental organ or who are members of the National People Congress (NPC) or the Chinese People's Political Consultative Conference (CPPCC) to create the variable *TMT political connections*. Second, if the CEO/chair of the firm also works for a governmental

organ, or is a member of the NPC/CPPCC (Marquis and Qian, 2014), the dummy variable *CEO political connections* equals 1, and 0 otherwise. The two variables were collected from the TMT profiles that are mandatorily provided in the annual reports of listed firms.

*Local government fiscal power.* Total provincial government revenue, obtained from the National Bureau of Statistics of the People's Republic of China, was used to measure the fiscal power of the local government. The variable was log-transformed.

*Provincial GDP per capita.* The data for this variable was annually derived from the China Statistical Yearbook, and was log-transformed.

*State ownership.* When a firm was specified to be state-owned in the mandatory figure detailing ultimate ownership in its annual report, the value for this variable is 1, and 0 otherwise.

*Firm size.* We used annual turnover to measure firm size. The variable was collected from the CSMAR dataset, and was log-transformed.

*Export percentage.* We used the amount of revenues a firm obtains from exports as a percentage of total sales to capture its dependence on international markets. The variable was collected from the firms' annual reports and was log-transformed.

*Years in the field.* To capture experience effects, we computed the number of years a firm had been operative in its current field. This variable was manually collected from firms' annual reports and official websites.

*Free float percentage.* We used the measurement specified by CSINDEX (2010) to calculate the free float percentage (i.e., the share of freely tradable equity) to capture capital market influences. Two types of shares were excluded from the free float due to their restricted trading status: initial public offering shares that are in the official lock-up period, and shares falling under the Equity Division Reform regime which restricts trade in substantial blocks of recently privatized SOE shares to prevent market shocks. The variable was collected from annual reports and log-transformed.

*Environmental quality.* We took the average concentration of particulate matter 10 pollutants (i.e., noxious solid or liquid particles with a diameter of 10 micrometers or less) in the air of the capital city of the province in which a firm is headquartered to measure regional environmental quality. The data was annually derived from the China Statistical Yearbook, and was log-transformed.

*CSR report.* We used a dummy variable to capture this effect, assigning a value of 1 when a firm issued a CSR and/or environmental report, and 0 if not. When such a report was integrated into the annual report, we also assigned a value of 1. But when the financial report only contained CSR or environmental paragraphs, we attributed a value of 0.

### *2.4.3 Regression method*

We analyzed our panel data using Stata 14.1. Since the main boards of SZSE and SSE only contain 36 group-1 firms, creating panel data enhances the size and richness of the dataset. We used random effects models because we analyzed several variables that describe the intrinsic, time-invariant properties of firms or industries, such as administrative hierarchical distance or the sector to which a firm belongs. Using a fixed effects model would eliminate these time-invariant effects, as the impact of variables with a constant value over time would be eliminated by the fixed effects transformation (Wooldridge, 2008). The Hausman (1978) specification test confirmed that a random effects model was more appropriate than a fixed effects model ($p$ = 0.64). The Breusch and Pagan (1979) Lagrangian multiplier test confirmed that a random effects model yields better results than a pooled regression model ($p$ = 0.00).

### *2.4.4 Supplementary interviews*

To triangulate our quantitative data and to facilitate the interpretation of our statistical results, we conducted 56 in-depth interviews, amounting to over 60 hours of conversations, with key informants in 2013 and 2014[3]. Interviewees included representatives of 15 major Chinese firms, 3 different levels of government, and 2 environmental NGOs. Interview locations ranged from the Eastern coastal cities to the Western inland cities in Mainland China. Interviews were conducted on the premises of the interviewees' organizations and lasted between 45 minutes and 2.5 hours, with a median of approximately one hour. All but one of the interviews were recorded and transcribed in Mandarin. We then read the transcripts, retrieved excerpts relevant to our three hypotheses, translated them into English, and added examples to our description of the results.

[3] See Appendix 2 for the respondents' profiles and places of the interviews.

## 2.5 Results

### *2.5.1 Statistical results*

***Hypothesized results***

Table 2.3 reports descriptive statistics and correlations. Table 2.4 presents our regression results. Model 1 contains control variables. Model 2 adds the linear and squared terms of the administrative hierarchical distance variable (pertinent to Hypothesis 1). Models 3 and 4 contain separate regressions involving the interactions of regulatory stringency and state financial participation with administrative hierarchical distance and its square term (relevant to Hypotheses 2 and 3). Model 5 contains the full model. Year effects are included in all models.

As shown in Model 2, *Hypothesis 2.1 was supported*. We found an inverted U-shaped effect of administrative hierarchical distance on environmental practices. Mounting pressure due to the involvement of multiple governmental bodies initially leads to more extensive practices. However, this accumulation effect is eventually outweighed by the increasing autonomy mechanism, resulting in reduced enforcement of centrally developed environmental policies by lower-tiered local governments. The coefficient for the linear term is positive and significant ($b$ = 0.10, s.e. = 0.04, $p$ = 0.02), whereas for the squared term it is negative and significant ($b$ = -0.02, s.e. = 0.01, $p$ = 0.03), implying an inverted U-shape. The turning point of the curvilinear relationship is situated at an administrative hierarchical distance value of 2.5 (i.e., -0.10 divided by 2*(-0.02)). Table 2.2 shows what this means: firms — both SOEs and non-SOEs — controlled by governmental bodies below the district/county level engage less in environmental practices as the hierarchical distance between the central government and the controlling body increases. In contrast, firms that are supervised by governmental bodies above the district/county level become increasingly responsive to the central government's environmental policies as the distance from their controlling organs to the central state increases.

**Table 2.3 Descriptive statistics and correlations**

| Variables | Mean | s.d. | Min. | Max. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1. Environmental practices** * | 0.20 | 0.27 | 0.00 | 1.49 | | | | | | | | | |
| **2. Distance to central** | 2.00 | 1.56 | 0.00 | 5.00 | -0.12 | | | | | | | | |
| **3. State financial participation*** | 2.91 | 1.54 | 0.00 | 4.44 | 0.13 | -0.77 | | | | | | | |
| **4. Regulatory stringency*** | 0.22 | 0.71 | -3.88 | 4.97 | -0.02 | -0.04 | 0.02 | | | | | | |
| **5. Subsidy** * | 0.11 | 0.32 | 0.00 | 2.22 | 0.11 | 0.04 | -0.05 | 0.00 | | | | | |
| **6. Malpractice** | 0.68 | 2.25 | 0.00 | 31.00 | 0.14 | -0.12 | 0.06 | 0.02 | 0.01 | | | | |
| **7. TMT political connections** * | 2.16 | 1.22 | 0.00 | 4.04 | -0.05 | -0.24 | 0.23 | -0.01 | -0.02 | 0.10 | | | |
| **8. CEO political connections** | 0.42 | 0.49 | 0.00 | 1.00 | 0.04 | -0.11 | 0.07 | -0.04 | 0.10 | 0.16 | 0.58 | | |
| **9. Fiscal power** * | 7.54 | 0.80 | 3.25 | 8.74 | -0.02 | 0.08 | -0.11 | -0.04 | -0.01 | 0.03 | 0.02 | 0.08 | |
| **10. GDP/capita** * | 12.91 | 0.49 | 11.74 | 13.72 | -0.04 | 0.02 | -0.06 | 0.01 | 0.04 | 0.05 | -0.02 | 0.01 | 0.65 |
| **11. State-Owned** | 0.69 | 0.46 | 0.00 | 1.00 | 0.15 | -0.81 | 0.81 | 0.02 | -0.04 | 0.09 | 0.13 | 0.04 | -0.04 |
| **12. Firm size** * | 7.85 | 1.58 | 2.83 | 14.85 | 0.25 | -0.33 | 0.14 | -0.03 | 0.05 | 0.28 | 0.17 | 0.20 | 0.24 |
| **13. Export percentage** * | 1.02 | 1.38 | 0.00 | 4.47 | -0.10 | 0.22 | -0.18 | -0.04 | 0.06 | -0.12 | -0.29 | -0.25 | 0.08 |
| **14. Years in the field** | 21.92 | 18.12 | 0.00 | 109.00 | 0.21 | -0.13 | 0.06 | 0.01 | -0.09 | 0.04 | 0.04 | 0.08 | 0.06 |
| **15. Free float percentage** * | 3.89 | 0.35 | 2.44 | 4.54 | -0.04 | 0.18 | -0.14 | 0.07 | -0.13 | -0.13 | -0.12 | -0.11 | -0.05 |
| **16. Environmental quality** * | -2.39 | 0.22 | -3.22 | -1.90 | 0.00 | -0.18 | 0.06 | 0.01 | 0.11 | 0.12 | 0.09 | -0.01 | 0.02 |
| **17. CSR report** | 0.43 | 0.49 | 0.00 | 1.00 | 0.52 | -0.10 | 0.10 | -0.04 | 0.12 | 0.13 | -0.09 | 0.07 | 0.06 |

| | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|
| **11. State ownership** | -0.08 | | | | | | |
| **12. Firm size** * | 0.26 | 0.15 | | | | | |
| **13. Export percentage** * | 0.02 | -0.14 | -0.04 | | | | |
| **14. Years in the field** | -0.04 | 0.15 | 0.19 | 0.11 | | | |
| **15. Free float percentage** * | -0.20 | -0.11 | -0.33 | 0.15 | 0.06 | | |
| **16. Environmental quality** * | 0.01 | 0.13 | 0.35 | 0.01 | 0.02 | -0.16 | |
| **17. CSR report** | 0.14 | 0.07 | 0.32 | -0.01 | 0.10 | -0.04 | -0.08 |

$N = 480$. Correlations with an absolute value greater than 0.09 are significant at $p < 0.05$. * Log transformed.

**Table 2.4 Random effects regression for corporate environmental practices**

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Distance to central** | | 0.10 | 0.08 | 0.38 | 0.37 |
| | | (0.04) | (0.04) | (0.12) | (0.12) |
| **Distance to central square** | | -0.02 | -0.02 | -0.06 | -0.06 |
| | | (0.01) | (0.01) | (0.02) | (0.02) |
| **Regulatory stringency** | | | -0.05 | | -0.05 |
| | | | (0.02) | | (0.02) |
| **Regulatory stringency * distance** | | | 0.05 | | 0.05 |
| | | | (0.02) | | (0.02) |
| **Regulatory stringency * distance square** | | | -0.01 | | -0.01 |
| | | | (0.00) | | (0.00) |
| **State financial participation** | | | | 0.07 | 0.07 |
| | | | | (0.04) | (0.05) |
| **State financial participation * distance** | | | | -0.09 | -0.09 |
| | | | | (0.03) | (0.04) |
| **State financial participation * distance square** | | | | 0.02 | 0.02 |
| | | | | (0.01) | (0.01) |
| **Environmental subsidies** | 0.13 | 0.14 | 0.14 | 0.13 | 0.13 |
| | (0.03) | (0.04) | (0.04) | (0.03) | (0.04) |
| **Malpractice disclosure** | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| **TMT political connections** | -0.02 | -0.02 | -0.02 | -0.02 | -0.03 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| **CEO political connections** | -0.01 | -0.01 | 0.00 | -0.02 | -0.00 |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) |
| **Fiscal power** | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) |
| **GDP per capita** | -0.08 | -0.09 | -0.08 | -0.10 | -0.09 |
| | (0.05) | (0.05) | (0.05) | (0.05) | (0.05) |
| **State ownership** | 0.04 | 0.03 | 0.04 | 0.17 | 0.19 |
| | (0.04) | (0.07) | (0.07) | (0.09) | (0.10) |
| **Firm size** | 0.02 | 0.03 | 0.02 | 0.02 | 0.02 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| **Export percentage** | -0.02 | -0.02 | -0.01 | -0.01 | -0.01 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| **Years in the field** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| **Free float percentage** | 0.01 | 0.01 | 0.00 | -0.02 | -0.02 |
| | (0.04) | (0.04) | (0.04) | (0.04) | (0.05) |
| **Environmental quality** | 0.03 | 0.05 | 0.04 | 0.05 | 0.04 |
| | (0.07) | (0.07) | (0.07) | (0.07) | (0.07) |

**Table 2.4 (Continued)**

| Variables | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **CSR report** | 0.24 | 0.25 | 0.25 | 0.26 | 0.25 |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) |
| **Constant** | 0.91 | 0.91 | 0.82 | 0.80 | 0.73 |
| | (0.61) | (0.63) | (0.63) | (0.63) | (0.65) |
| **Year effect** | Yes | Yes | Yes | Yes | Yes |
| **Wald Chi square** | 110.66 | 118.12 | 123.01 | 128.76 | 132.48 |

Number of observations = 480, number of firms = 107. Standard errors in parentheses.

*Hypothesis 2.2 was supported,* as shown by the consistent results of the interaction of regulatory stringency and the administrative hierarchical distance variables in Models 3 and 5. The latter shows that the coefficient of the interaction between regulatory stringency and the squared term of administrative hierarchical distance was negative and significant ($b$ = -0.01, s.e. = 0.00, $p$ = 0.05), suggesting a steepening of the effect (Haans *et al*., 2016). Figure 2.5 (a) shows how low, medium, and high degrees of regulatory stringency moderated the distance-practices relationship (Dawson, 2014). Figure 2.5 (a) illustrates that firms in sectors that are subject to stringent regulations experienced a steeper inverted U-shaped effect between administrative hierarchical distance and corporate environmental practices. At the apex of the curve, the effect of administrative hierarchical distance on environmental practices increased by about 30 percent (1.1 vs. 1.4) from firms in relatively lowly to highly regulated sectors.

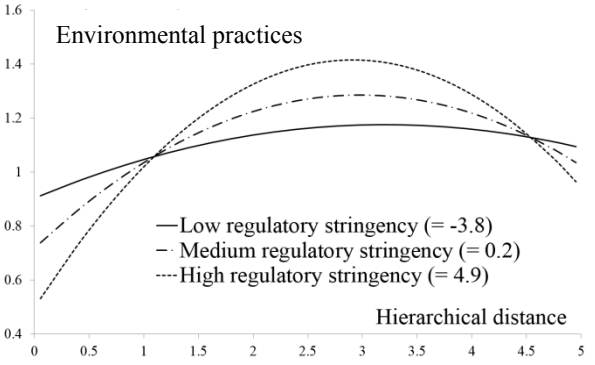
Models 4 and 5 showed *partial support for Hypothesis 2.3*. The coefficient for the interaction between the quadratic term of administrative hierarchical distance and state financial participation was positive and significant ($b$ = 0.02, s.e. = 0.01, $p$ = 0.01). This means that the inverted U-shaped relationship attenuated when the state participated to a greater extent in the ownership structure of the focal firms, supporting the idea that state financial participation negatively moderates the inverted U-shaped effect (Haans *et al*., 2016).

Figure 2.5 (b) shows how the degrees of state financial participation affected the main relation. As hypothesized, the inverted U-shaped curve first became flatter with higher state financial participation, for values in the low to medium (mean) range of participation. However, upon reaching a higher level of state financial participation, the curve experienced a shape flip. From Model 5, we calculated that the shape flip occurred

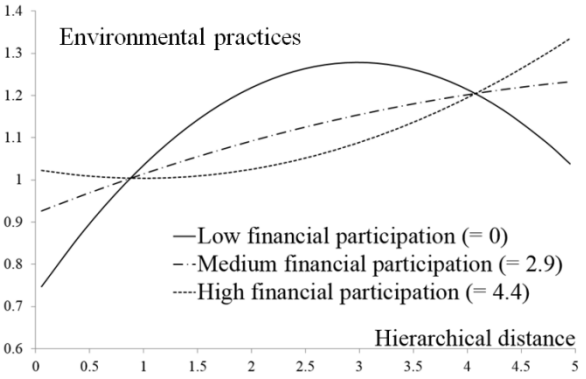
when state financial participation amounted to 3 (i.e., -(-0.06)/0.02; Haans *et al*., 2016). As the variable of state financial participation was log-transformed, its natural value is 0.19. Thus, the inverted-U shaped curve became flatter as state financial participation increased, and the curve flipped when states held more than 19 percent of a firm's shares. At this value, the distance-practices relationship became linear, as the location of the inflection point approached infinity. Below and above this value, the curve took on opposing shapes (Haans *et al*., 2016). While our results are thus consistent with Hypothesis 2.3 for firms with state ownership in the 0–19 percent range, the hypothesis does not hold for firms with very high state financial participation.

**Figure 2.5 Moderating effects of (a) regulatory stringency and (b) state financial participation**[4]

**(a)**




**(b)**




[4] The low, medium, and high values of the moderators were identified according to the min., mean, and max. values of the variables respectively.

***Robustness checks***

Robustness checks are reported in Table 2.5. In Models 1 and 2, we merged the firms under the control of any subprovincial municipality, district under subprovincial municipality, and town under subprovincial municipality with their subordinate levels (i.e., municipality, district, and town, respectively). In Models 3–5, we calculated the percentage of waste gas, water, and solid emission reductions over the past five years by region as alternatives to waste gas emissions when measuring regulatory stringency by sector (Brunel and Levinson, 2016). In Model 6 we replaced the state financial participation variable with another variable capturing the state's financial involvement: governmental environmental subsidies received divided by firm revenues. Most of the ensuing results and significance levels proved robust. One exception involved the results reported in Model 6. When using environmental subsidies as an alternative measure of state financial participation, the flattening effect still held at the same significance level, but we did not observe a flip of the inverted U-shape. Moreover, the effect for regulatory stringency became insignificant when we used solid waste reductions as a proxy variable. This is a plausible outcome, because our qualitative evidence suggested that solid waste lacked an effective monitoring system in China and had received very limited attention from both the government and civil society.

**Table 2.5 Robustness checks**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| **Distance to central** | 0.10 | 0.37 | 0.03 | -0.07 | 0.10 | 0.07 |
| | (0.04) | (0.12) | (0.06) | (0.14) | (0.04) | (0.04) |
| **Distance to central square** | -0.02 | -0.06 | -0.00 | 0.03 | -0.02 | -0.01 |
| | (0.01) | (0.02) | (0.01) | (0.03) | (0.01) | (0.01) |
| **Regulatory stringency** | | -0.05 | | | | |
| | | (0.02) | | | | |
| **Regulatory stringency * distance** | | 0.05 | | | | |
| | | (0.02) | | | | |
| **Regulatory stringency * distance square** | | -0.01 | | | | |
| | | (0.00) | | | | |
| **State financial participation** | | 0.07 | | | | |
| | | (0.05) | | | | |
| **State financial participation * distance** | | -0.09 | | | | |
| | | (0.04) | | | | |
| **State financial participation * distance square** | | 0.02 | | | | |
| | | (0.01) | | | | |
| **Regulatory stringency (region, waste gas) * distance** | | | 0.03 | | | |
| | | | (0.02) | | | |
| **Regulatory stringency (region, waste gas) * distance square** | | | -0.01 | | | |
| | | | (0.00) | | | |
| **Regulatory stringency (region, waste water) * distance** | | | | 0.02 | | |
| | | | | (0.02) | | |
| **Regulatory stringency (region, waste water) * distance square** | | | | -0.01 | | |
| | | | | (0.00) | | |
| **Regulatory stringency (region, solid waste) * distance** | | | | | 0.04 | |
| | | | | | (0.11) | |

**Table 2.5 (Continued)**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| **Regulatory stringency (region, solid waste) * distance square** | | | | | -0.02 | |
| | | | | | (0.03) | |
| **Environmental subsidies * distance** | | | | | | 0.21 |
| | | | | | | (0.07) |
| **Environmental subsidies * distance square** | | | | | | -0.04 |
| | | | | | | (0.01) |
| **Regulatory stringency (region, waste gas)** | | | -0.02 | | | |
| | | | (0.02) | | | |
| **Regulatory stringency (region, waste water)** | | | | -0.01 | | |
| | | | | (0.02) | | |
| **Regulatory stringency (region, solid waste)** | | | | | 0.02 | |
| | | | | | (0.08) | |
| **Environmental subsidies** | 0.14 | 0.13 | 0.10 | 0.12 | 0.14 | 0.01 |
| | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) | (0.07) |
| **Malpractice disclosure** | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| **TMT political connections** | -0.02 | -0.03 | -0.02 | -0.04 | -0.02 | -0.02 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| **CEO political connections** | -0.01 | -0.00 | -0.01 | 0.00 | -0.01 | -0.01 |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) | (0.03) |
| **Fiscal power** | 0.01 | 0.01 | 0.00 | -0.01 | 0.01 | 0.01 |
| | (0.03) | (0.03) | (0.04) | (0.05) | (0.03) | (0.03) |
| **GDP per capita** | -0.09 | -0.09 | -0.07 | -0.06 | -0.09 | -0.07 |
| | (0.05) | (0.05) | (0.05) | (0.07) | (0.05) | (0.05) |
| **State ownership** | 0.03 | 0.19 | 0.07 | 0.08 | 0.03 | 0.04 |
| | (0.07) | (0.10) | (0.07) | (0.08) | (0.07) | (0.07) |

**Table 2.5 (Continued)**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| **Firm size** | 0.03 | 0.02 | 0.02 | 0.03 | 0.03 | 0.03 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| **Export percentage** | -0.02 | -0.01 | -0.02 | -0.02 | -0.02 | -0.01 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| **Years in the field** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| **Free float percentage** | 0.01 | -0.02 | 0.01 | 0.03 | 0.01 | 0.00 |
| | (0.04) | (0.05) | (0.04) | (0.05) | (0.04) | (0.04) |
| **Environmental quality** | 0.05 | 0.04 | 0.04 | 0.03 | 0.05 | 0.05 |
| | (0.07) | (0.07) | (0.08) | (0.08) | (0.07) | (0.07) |
| **CSR report** | 0.25 | 0.25 | 0.25 | 0.21 | 0.25 | 0.26 |
| | (0.03) | (0.03) | (0.03) | (0.04) | (0.03) | (0.03) |
| **Constant** | 0.91 | 0.73 | 0.75 | 0.40 | 0.92 | 0.77 |
| | (0.63) | (0.65) | (0.68) | (0.96) | (0.63) | (0.61) |
| **Year effect** | Yes | Yes | Yes | Yes | Yes | Yes |
| **Wald Chi square** | 118.12 | 132.48 | 105.69 | 90.14 | 119.87 | 134.83 |

Number of observations = 480, number of firms = 107. Standard errors in parentheses.

### *2.5.2 Qualitative evidence*

*General overview.* Our interview data added further insights into our hypothesized relationships. Corporate interviewees recognized the crucial role the Chinese government played in enabling and constraining their business activities. Several interviewees remarked: "You need to get approval from the government for everything you run in the local area" and "As a person or firm in Chinese society, you cannot be independent of the government. Love it or hate it, you have to face it." Respondents also pointed out that both the government and the corporate sector are increasingly addressing environmental challenges: "The effectiveness of the government [in terms of stimulating pro-environmental behavior] has surely improved" and "Environmental issues are getting more attention and more budget in every firm." At the same time, these efforts have not kept up with the deterioration of the natural environment. As the general manager of a refractory firm argued: "Although we are now more developed, pollution has intensified. Our minds are changing against this backdrop. (…) It is, of course, difficult to fix it immediately. (…) More promising outcomes may materialize in three to five, or even ten, years."

*Qualitative evidence for Hypothesis 2.1.* Interviewees echoed that the pressure to engage in environmental practices initially increases with administrative hierarchical distance, but eventually tapers off as this distance becomes larger. The observations that "the higher the governmental level, the more importance is attached to environmental issues" (provincial government official) and "higher-level decisions or policies are extremely impactful on subordinates" (municipal environmental protection bureau chair) suggest that environmental governmental policies are implemented top-down. The mounting pressure mechanism was illustrated by a statement like: "Every lower [government] level implements some part of the policies of superior levels" (CEO of a diversified business group).

However, the evidence also suggests that central government influence dissipates, and even gets challenged, at lower levels. Explanatory factors mentioned include the larger distance from the central government, leading to more perceived autonomy and different policy priorities. Local governments are seen as "small emperors (…) whose local policies trump central ones" (CEO of an environmentally proactive firm). As a municipal EPB chair explained, "at the local level, economic development is for sure prioritized", because

"the local government is evaluated on the basis of GDP". In a similar vein, the CEO of an environmentally proactive firm argued, "looking at GDP growth is much easier and faster for [a local government official's] promotion". This is enhanced by the dependence of the local EPBs on local governments, because the former has to "coordinate with the municipal government on many things." Several interviewees also pointed to the lack of implementation capacity at the local level, as evidenced by such a statement as: "There are so many things [to be monitored at the local level] but so little staff" (provincial government official).

*Qualitative evidence for Hypothesis 2.2.* The idea that regulatory stringency in more polluting sectors enhances the mounting pressure effect on environmental practices was supported by our qualitative evidence. Most firms in the traditional industries, categorized as "heavily polluting", are obliged to adopt online monitoring equipment for waste gas and waste water emissions, from which the EPBS can instantly observe any abnormal emissions. Firms must report excess emissions immediately, explaining the situation and the plan to solve the incident within a day. Firms in sectors characterized as environmentally friendly do not have such obligations, even though they may still harm the natural environment. According to a municipal government official, "the [environmental] awareness is stronger in potentially very polluting firms." In a similar vein, the CFO of an environmentally demanding chemical firm argued that "environmental protection policy is coercive: it is not possible to ignore it because punishment [of non-compliance] is severe." The Vice General Manager of a coal-mining firm said, "Every level of government is watching us". In contrast, firms in sectors that face less regulatory pressure to reduce their emissions are not very concerned over environmental outcomes, as illustrated by the CEO of a garbage disposal firm: "The government is pushing us to develop [without invasive legislation]. (…) We do not address environmental issues in our firms that much as our product already helps [to protect the environment]."

Regulatory stringency also strengthened the increasing autonomy effect. This was especially observable amongst highly polluting firms controlled by lower levels of government. For instance, "When the local environmental protection bureau wants to close our factories because of violation of environmental regulations, the punishment will be waived because [the municipal government] needs our tax revenues" (CEO of a refractory

firm). A manager in a municipal EPB echoed: "I have seen many civil servants at the municipal level making money through channels other than their salaries. They do not run highly polluting firms themselves, such as paper mills. But they get the money through kinship, like from the wife's firm."

*Qualitative evidence for Hypothesis 2.3.* Our interviews suggested that state financial participation attenuated the impact of administrative hierarchical distance on corporate environmental practices. The vice General Manager of a chemical firm affirmed: "We do not get the backing of strong governmental support, as the state is not the largest shareholder in our firm… Thus we need to strictly comply with the environmental regulations; otherwise we will for sure be caught… Firms with higher state ownership, on the other hand, can afford to bend the rules from time to time". The Chair of the Environmental Protection Department of the same firm echoed: "Although in appearance we have the provincial government controlling us, essentially we still believe that we are more of a private firm that needs to address the environmental issues carefully".

We also found evidence of risk-aversive behavior when top management team members were personally liable for corporate misconduct, causing the shape flip at higher values of state financial participation. The Chair of the Environmental Protection Department of a largely state-owned mining firm contended that "Our leaders are in charge of such a large state-owned firm that they would not take the risk of getting a circulated note of criticism in our province [because of environmental malpractice] (…) Why would they take the risk of not spending [state] money to solve pollution problems? In addition, environmental performance will be a part of our leaders' evaluation." In a similar vein, an engineer in charge of chemical emissions and environmental protection of a largely state-owned thermal power firm explained: "There is no need to take such a risk. The money belongs to the state, but the liability is personal [if any accident happens].

## 2.6 Discussion and Conclusion

### *2.6.1 The multifaceted influence of the Chinese state*

The rapidly increasing importance of emerging economies has not only led to a reshuffling of the geo-economic landscape, it has also proliferated important environmental challenges

like increased natural resource depletion, pollution of the natural environment, and greenhouse gas emissions. In our study, we explored how the state seeks to ensure effective environmental governance in the context of the world's largest emerging economy, China. Our quantitative evidence clearly suggests that the Chinese government indeed has a 'green grip' on listed firms.

This grip is not equally strong at all levels of administrative hierarchical distance, however. When the governmental body supervising a company is itself subordinate to higher authorities, the effects of the position in the political hierarchy initially tend to accumulate with distance. This leads to mounting compliance pressures, as manifested in additional corporate environmental activities. However, this effect is countered and eventually overtaken by another effect, the increasing extent of autonomy listed firms enjoy due to the divergent policy priorities of governmental organs operating at a certain distance from the central government. These opposing forces produce an inverted U-shaped relationship between administrative hierarchical distance and corporate environmental practices. Furthermore, we found that regulatory stringency strengthens this curvilinear effect, whereas state financial participation weakens it. Taken together, our study demonstrates the multifaceted influence of emerging market governments on corporate environmental practices.

### *2.6.2 Towards a phenomenological understanding of state influence in China*

Recently, influential scholars have developed a better quantitative understanding of the impact of the Chinese state on local firms' social and environmental behavior (e.g. Luo *et al*., 2016; Marquis *et al*., 2011; Marquis and Qian, 2014). Their studies have enhanced our knowledge of how the Chinese state apparatus responds to social and environmental challenges. We would also make a plea, however, for more qualitative work in the Chinese context, as our phenomenological understanding of the culturally conditioned human motivations behind state influence and firms' compliance behaviors is currently still underdeveloped.

To interpret our own statistical results phenomenologically, we conducted extensive interviews with representatives of major Chinese firms, the Chinese EPB (at different levels), and Chinese environmental NGOs. These interviews taught us that individuals, organizations, and society in general are constantly aware of the influence of

the administrative hierarchy. For example, Chinese managers and officials strive "to avoid troubles whenever possible" (*duo yi shi bu ru shao yi shi*), while they show deferential behavior towards hierarchically superior individuals or organs. Each time the first author, who conducted the interviews, was introduced by the CEO's secretary to an interviewee, he/she would point up and say, "she's arranged by the top (*shang mian)*", and nobody would question the interview process anymore. In a more general sense, and in ways unimaginable in the West, Chinese firms consider themselves to be "grandsons" (*sun zi*, also meaning "being very subordinate") of the government, and therefore subjected to its (paternal) authority. Governmental bodies are considered to be like "parents" (*fu mu guan*), or even "grandfather(s)" (*ye*), who have the authority to decide everything for the local area, much like senior members do for a family in a feudal society. Our interviews similarly suggest that Chinese firms feel they have little influence over the content of new environmental policies by the central government, even though there may be some room to bargain with local governments over the pace and scope of their implementation. Our interviews also taught us that environmental compliance behavior in China occurs in a somewhat superficial and opportunistic (*fu zao*) sphere in Chinese society, in which results are prioritized over due process. Civil servants look for ways of maximizing their political achievements to get personal promotions and benefits, and firms keep a close watch on the consequences of others' compliance behaviors, using these extrinsic cues to decide upon their own level of conformity and commitment.

We would also welcome more qualitative work on the budding NGO sector in China. Slowly but surely, grassroots organizations are becoming increasingly effective in this context. For instance, several civil protests against paraxylene projects have been successful since 2007. However, such events are still being treated as outliers: singular and somewhat extreme cases of how civil society can impact environmentalism in China. Importantly: not a single interviewee saw the pressure emanating from citizens' initiatives as being anywhere near to that coming from the government, which they took as unavoidable and intimidating.

### *2.6.3 Theoretical contributions*

Our study offers several theoretical contributions. First, disentangling the multiple facets of government influence on corporate environmentalism is a novel approach. Existing

studies have acknowledged that different policy instruments may have dissimilar effects on environmental practices (e.g. Kemp *et al*., 2012) or that different stakeholders may express divergent claims (e.g. Delmas and Toffel, 2008; Sharma and Henriques, 2005), but have typically assumed that stakeholders like the government act in coherent and consistent ways. Our study demonstrates that the nature of government influence differs across hierarchical levels, leading governmental bodies at different echelons to prioritize dissimilar policies. This may be counterproductive, in particular when lower tiers in the administrative hierarchy foster unconstrained industrial expansion whereas the upper tiers promote environmental sustainability. Rather than observing decoupling between (government) policy and (corporate) practice (Bromley and Powell, 2012), we gauged a certain degree of environmental '*policy-policy decoupling*' between higher and lower levels of government. Such inconsistencies may also occur in developed countries. For instance, the federal government of the United States seeks to mitigate climate change, whereas states richly endowed with fossil fuels develop conflicting public policies (Vogel, Toffel, Post, and Uludere, 2012). We thus go beyond the view of government as a unitary entity that puts forth consistent environmental policies, and move towards an understanding of government influence as being contingent on the divergent interests of governments at different hierarchical levels. China might even be a conservative case in this respect: if we already found multifaceted state influences in a one-party autocratic state, the degree of heterogeneity and complexity is likely to be even more pronounced in pluralistic federal states like the United States and Germany. It is of great theoretical and empirical importance that this complexity is explored further in future research.

Second, our research is one of the few large-scale, cross-sectorial empirical studies of corporate environmentalism in an emerging economy. Most studies of government influence on corporate environmental practices focus on developed countries (Bansal and Hoffman, 2012; Wijen *et al*., 2012), or offer only anecdotal evidence on specific emerging market cases (e.g. Child and Tsai, 2005). Gauging the influence of the government on the environmental practices of listed firms in China has helped us develop a deeper understanding of how grave environmental challenges can be contained more effectively. However, we have also shown that the simultaneous pursuit of economic growth and environmental protection straddles governmental policy, with different

priorities attributed at different administrative levels. This suggests that environmental protection in this emerging economy is only semi-institutionalized (Marquis and Raynard, 2015; Child *et al*., 2007), situated at the stages of regulatory compliance and strategic environmentalism (Bansal and Hoffman, 2012). We thus contribute to the corporate environmentalism literature by assessing the contemporary impact of government intervention on the corporate environmental practices in the world's largest emerging economy.

### *2.6.4 Limitations*

Our study has some limitations, the first of which involves our reliance on publicly disclosed information. We relied on annual reports for information about environmental practices. While we made an effort to triangulate this information with other sources, we did not have access to intrafirm data (Branzei, Ursacki-Bryant, Vertinsky, and Zhang, 2004), such as emissions at the plant level (Delmas and Toffel, 2008). When environmental policies have more firmly taken root in China, more fine-grained data will likely become available. Second, some of our evidence is indirect. In the absence of a direct measure, we took changes in sectorial emissions as a proxy for regulatory stringency (Brunel and Levinson, 2016). Future research may shed more light on the corporate perception of regulatory stringency (Kalamova and Johnstone, 2012). Third, heavily regulated companies may report their environmental practices more ostentatiously to demonstrate compliance (Bansal and Clelland, 2004; Reid and Toffel, 2009). This may have biased our observations somewhat, although we have sought to mitigate this effect by holding as many other factors as possible in our regression models. Finally, our study was situated in the world's largest emerging economy. While other economies with underdeveloped institutional capacity (Guillén and Capron, 2015) may share a number of characteristics with China, the idiosyncratic political system of the latter may limit the generalizability of our findings to other emerging economies.

### *2.6.5 Conclusion*

Our study shows the 'green grip' of the Chinese government to be multifaceted. This may be indicative of how governments of emerging economies have to make difficult policy choices to reconcile the objectives of sustaining economic growth and prioritizing

environmental sustainability. Our findings have several public policy implications. Since both very low and very high administrative hierarchical distance yield relatively low levels of corporate environmental practices, (central) governments eager to enhance environmental performance should focus their efforts more on companies supervised by governmental bodies situated at the extremities of the administrative hierarchy spectrum. Furthermore, our findings show that as long as environmental protection is only semi-institutionalized in China, governments may wish to tighten their environmental regulations across sectors and regions. This may entail revising the processes of performance assessment of and resource allocation to lower-level governmental bodies. Finally, the central government should keep a closer eye on firms with a medium degree of state financial participation, as such firms are more prone to pursuing economic objectives at the expense of environmental performance.

# Chapter 3. Differences in Environmental Management System Adoption among Chinese Business Group Affiliates[5]

**Abstract**

We investigate differences in environmental management system adoption among business group affiliates in China. We propose a theory suggesting that affiliated firms are either sensitive or resistant to environmental compliance pressures, based on their strategic characteristics. Using a panel dataset of Chinese listed firms observed between 2008 and 2012, we examine a variety of characteristics that affect business group affiliates' decisions to adopt an environmental management system. We find that being affiliated to a family-owned business group and having a business model centered on business-to-consumer markets increase the sensitivity of affiliated firms to societal pressures that favor the adoption of formal environmental management systems such as ISO 14001. Conversely, being a core member of a business group and being shielded by corporate political connections make affiliated firms more resistant to environmental compliance pressures. Our study contributes to the literature on business group strategy, strategic corporate environmentalism, and China studies.

[5] This study is conducted in collaboration with Pursey Heugens and Frank Wijen.

## 3.1 Introduction

The recent shift from developed economies to emerging markets as the primary drivers of global economic growth has brought with it an increasingly challenging set of environmental issues. A particular issue is the importance of heavy industry to emerging economies, and the development of the world's economy more generally. Due to the high dependence on heavy industries for economic growth (Child and Tsai, 2005; Govindaraju and Tang, 2013) as well as institutional voids in the market and governing systems (Khanna and Rivkin, 2001; Li, Meng, and Zhang, 2006) in emerging markets, tremendous greenhouse gas emissions and extremely high energy consumption have accompanied this dramatic shift in the global economy. In 2014, China singlehandedly generated 17 percent of the world's GDP based on purchasing power parity, while the sum of the contributions of all 26 major developed economies totaled 40 percent (World Bank, 2015). Meanwhile, over the past decade, China has surpassed the United States in terms of $CO_2$ emissions and energy usage and is now responsible for over 20 percent of global emissions (World Bank, 2015). As such, China's obviously significant role, both in terms of its contribution to the global economy and to greenhouse gas emissions, warrants increased scholarly attention. What is more, the prominent role of the state in China and differences between the institutional environments in China and Western industrialized nations challenge conventional wisdom on environmental management practices (Child *et al.*, 2007; Marquis and Qian, 2014).

The shift in global industrial production from the West to China in particular has also been accompanied by a less readily observable transition, notably a shift in organizational forms responsible for production tasks. In the West, industrial production is largely the purview of standalone firms and their wholly owned subsidiaries, whereas in China, business group affiliates account for the bulk of industrial production. Thus far, the implications of this shift in organizational form in terms of corporate management practices have been largely overlooked. Scholarly neglect of this subject is somewhat surprising, as it has long been noted that business groups are prevalent in emerging economies (Khanna and Rivkin, 2001), despite the fact that there is variation in terms of shareholder control over such groups. Controlling shareholders range from the government in China (Zhang, Sjögren, and Kishida, 2016), to entrepreneurial families in Argentina and

India (Lamin, 2013) and major commercial banks in Thailand (Wailerdsak and Suehiro, 2012). In China, the total sales revenues of the largest 1000 registered business groups in 2013 reached 90.25% of the Gross Domestic Product (GDP; 86.25% of the Gross National Product), up from 36% in 1997 (China Enterprise Evaluation Association, 2014; National Bureau of Statistics of China, 2014). If we seek to understand the growing environmental issues created by China, we need to understand how Chinese business group affiliates respond to mounting societal pressure for environmental accountability.

To date, very little attention has been paid to any form of strategic heterogeneity among business group affiliates. Instead, studies of business groups have focused largely on the financial consequences of business group affiliation (e.g. Khanna and Rivkin, 2001; Luo and Chung, 2005; Vissa *et al.*, 2010; Lamin, 2013; Manikandan and Ramachandran, 2015; Yiu, Bruton, and Lu, 2005), affiliates' characteristics in relation to observed differences in performance (Keister, 1998; Chang and Hong, 2000; Carney, Shapiro, and Tang, 2009), and in organizational practices related to within-group profit redistribution, such as propping and tunneling (Bae, Kang, and Kim, 2003; Bertrand, Mehta, and Mullainathan, 2002; Chung and Luo, 2008). Much less attention has been paid to explaining the heterogeneity of strategic choices made by business group affiliates (Carney, Gedajlovic, Heugens, Van Essen, and Oosterhout, 2011), despite the fact that variance in terms of strategic decision-making among affiliates is considerable. For example, the expansion strategy employed by affiliates has been shown to be affected by the characteristics of the business group a focal firm belongs to and by its prominence within the business group (Dau, Ayyagari, and Spencer, 2015). To date, however, the types of factors that drive the heterogeneous strategic decisions made by business group affiliates have been largely glossed over.

Our paper seeks to unpack the sources of strategic variance among business group affiliates. Specifically, we focus on a single strategic decision, the adoption of a formal environmental management system (EMS) in a single national context, China. Due to a combination of increasingly stringent legislation, government pressure and concerns at the level of civil society, firms, particularly listed firms in China, are under significant pressure to take visible action in the area of environmental protection (Child *et al*., 2007; Marquis and Qian, 2014). We investigate the extent to which firms experience the pressure

to take action to protect the environment. Our key research question is: '*how do pressure sensitivity and pressure resistance affect the strategic adoption of environmental management systems by listed business group affiliates in China*?' To explore this question, we draw on an existing typology of pressure-sensitive versus pressure-resistant actors (Brickley, Lease, and Smith, 1988; Kochhar and David, 1996), in which business-related and other actors attempt to influence managerial actions.

In our theorizing, affiliates' *pressure sensitivity* to environmental compliance pressures emanates from their social need to establish and maintain corporate social and reputational capital. We explore affiliates' pressure sensitivity in terms of their: (a) being affiliated with a family-owned business group; (b) being the 'downstream' part of the business group that has a business model centered on business-to-consumer deliveries; and (c) being affiliated with a more visible business group. In contrast, affiliates' *pressure resistance* derives from the privileges they enjoy as a result of their shielded status in the business groups to which they belong. We explore affiliates' pressure-resistance in terms of their: (a) being a core member of a group; (b) being associated with a highly diversified and informationally opaque business group; or (c) being shielded from environmental pressures by political ties connecting the business group to the ruling political elite. We test our argument empirically in our analysis of a panel dataset consisting of data on 169 Chinese listed firms, covering the period between 2008 and 2012.

Our study makes several novel theoretical and empirical contributions to the relevant literature. First, it unpacks the drivers of strategic heterogeneity among business group affiliates. Existing studies have devoted sufficient attention to the comparison between business group affiliates and stand-alone firms (Khanna and Rivkin, 2001; Vissa *et al*., 2010; Lamin, 2013) and the relevant driving forces behind affiliate performance (Luo and Chung, 2005; Yiu *et al*., 2005). We offer fresh insights including an exploration of the drivers behind the heterogeneous strategic decisions made by the affiliates. In treating business group affiliates as a unique unit of analysis, we aim to set the stage for future within-group analyses of strategic behavior. Second, our study sheds light on the adoption of environmental strategies in a critical organizational form, the business group, in China, the world's largest emerging economy. The aforementioned shift in global production has brought about contextual and institutional changes that include a change in

the organizational forms that account for global production (i.e. a shift from standalone firms to business group affiliates, as the latter are prevalent in emerging economies). Our study sheds new light on the way in which pressure sensitivity and pressure resistance in the area of environmental protection efforts shape Chinese affiliate firms' impact on global energy consumption, pollution reduction and economic development (International Monetary Fund, 2015; World Bank, 2015). Third, our research enriches the existing body of work on environmental management and Corporate Social Responsibility (CSR) in China by moving beyond a sole focus on the role of government in these areas (Child *et al.*, 2007; Luo *et al.*, 2016; Marquis and Qian, 2014). While the government undeniably plays an important role in the Chinese context, we show that corporate attributes at both the group and organizational levels are also important predictors of the adoption of environmental protection measures by corporations in China. This helps us understand differences in environmental performance across corporations in the world's most environmentally taxing economy and allows for a more comprehensive understanding of corporate environmental behavior in the Chinese context (Marquis and Raynard, 2015).

### 3.2 Business Group Prevalence and Strategy

The shift in global economic growth from Western countries to emerging markets has brought to light the prevalence and influence of the business group as an organizational form in these markets. Business groups, originally referred to as economic groups (Leff, 1978), are collections of legally independent firms that enjoy a high level of informal cooperation (Granovetter, 1995). Within these groups, the affiliates share similar interests and engage in joint strategic decision-making and take joint strategic actions (Khanna and Rivkin, 2001). Business groups are distinct from the multidivisional corporations that appear in the West (cf. Chandler, 1962; Mahoney, 1992) in that affiliates are not wholly-owned subsidiaries. Affiliates are incorporated separately and constitute legally independent businesses, despite the fact that they may have (minority) equity ties to other firms in the business group (Gedajlovic and Shapiro, 2002; Granovetter, 1995; Vissa *et al.*, 2010). In spite of their legal independence, affiliates are also different from strategic alliances, in that they are subject to the governance of a core unit, which, depending on the context, is usually made up of entrepreneurial families (Lamin, 2013), banks (Boehmer,

2000), or the state (Zhang *et al*., 2016). The core unit governs via formal or informal hierarchical structures (Vissa *et al*., 2010).

In China, the core unit is usually the state. While the number of private business groups has expanded in recent years, the state-owned groups are still economically dominant (Lee and Kang, 2010). In 2012, the ten largest business groups in China were all state-owned enterprises, and accounted for 20.6% of the country's GDP (China Enterprise Evaluation Association, 2014). In addition, of the 69 enterprises from mainland China that were listed on the Fortune Global 500 list, 64 were or were affiliated with state-owned business groups, compared to only five privately owned ones (Fortune, 2016).

So why are business groups so prevalent in China? What essential functions do they fulfill in the contemporary Chinese economy? While these questions have been addressed about business groups in a variety of other national settings, in the context of a variety of different disciplinary paradigms (Guillén, 2000; Yiu, Lu, Bruton, and Hoskisson, 2007), we explore the essential functions of business groups in emerging economies below, using *Chinese* cases for illustration.

*Reducing transaction costs.* Business groups are relatively efficient vehicles in terms of reducing the transaction costs of preventing or circumventing market failure (Khanna and Palepu, 2000a; Lamin, 2013). In emerging markets that are informationally opaque, the costs associated with access to technology and labor, contract enforcement and financing for trade are often quite high (Khanna and Rivkin, 2001). Under these conditions, business groups outcompete stand-alone firms by making use of their internal markets to enhance contractual enforcement and reduce transaction costs (Leff, 1978; Keister, 1998). As a result, while conglomerates have largely disappeared in developed economies due to the unwieldiness of this organizational form, business groups serve to alleviate systemic uncertainty and financing costs of integration and thus remain crucial in the context of emerging markets such as China (Ahlstrom, Bruton, and Lui, 2000; Khanna and Palepu, 1997; Ma, Yao, and Xi, 2006).

For example, the New Hope Group, a front-runner in the agriculture sector in China and Asia, has branched out into the financial, real estate and investment sectors, the profits from which are used in large part to support their core business. In the meantime, the integration of upstream and downstream aspects of the feed industry, from agriculture

technology to food processing, channel construction and facility building, reduces transition costs and affords the group increased pricing and bargaining power in the global marketplace (Guo and Lin, 2005; New Hope Group, 2016). This case illustrates that in emerging economies, business groups facilitate the allocation of capital and resources through the integration of industries, thereby reducing the cost of the related internal transaction (Ma *et al.*, 2006).

*Substituting for institutional intermediaries.* Scholars in this stream link the 'reduction of transaction costs' argument to the inefficiency and high costs observed in emerging markets such as China as a result of institutional voids. The ability of business groups to efficiently mobilize resources makes them a possible substitute for institutional intermediaries and suggests that they may contribute to the improved performance of their affiliates (Chittoor, Kale, and Puranam, 2015). In the event that institutional voids are present in capital, labor, production and technology markets due to lack of sufficient financial or regulatory institutions in emerging markets (Khanna and Palepu, 2000b), business groups compensate by collecting and pooling resources internally among their affiliates (Carney *et al.*, 2011; Manikandan and Ramachandran, 2015).

Consider, for example, the role of an internal capital market in providing a substitute for the lack of a sound venture capital system in China. With overall investor protection in mainland China among the weakest in the world (Allen, Qian, and Qian, 2005), external financing is generally very scarce and expensive to acquire (He, Mao, Rui, and Zha, 2013). The internal capital market within a business group enables self-financing. The investment-cash flow sensitivity of business group affiliates in China is dramatically lower than that of unaffiliated corporations, indicating that affiliates are substitutes for costly external financing and are, therefore, subject to far fewer financial constraints (He *et al.*, 2013).

*Developing and leveraging unique capabilities.* A third line of research explores the mechanisms underlying the emergence of business groups from a resource-based standpoint (Barney, 1991; Guillén, 2000). Business groups are better able to maintain their valuable and inimitable skills than non-diversified stand-alone firms because of their sustained access to crucial resources (Guillén, 2000). Studies in this stream contend that business group affiliation bolsters the use of critical resources, tangible or intangible, in

emerging markets that are undergoing dramatic market-oriented institutional changes. These critical resources include information sharing within the group and reputation signaling vis-à-vis potential clients (Chang and Hong, 2000; Lamin, 2013).

Haier Group in China, for instance, the world's biggest player in the realm of major appliances since 2009 (Euromonitor International, 2014), has shared its experience and reputation as being highly committed to quality with all of its branches beyond just its original core business of fridge production (The Economist, 2013a). Being service oriented, one of the most important and enduring contributors to Haier group's success, has facilitated the domestic and even global expansion of the group, as Haier Group better identifies and satisfies customer needs than its competitors (Subhadra, 2003), especially in the Chinese context with its low corporate orientation towards service quality.

*State cooptation and state capitalism.* In addition, state activism theorists view the formation of business groups not just as an organizational response to the environment, but as an organizational device used to achieve economic and political objectives specified by autonomous states (Amsden, 1992; Lee, 2012), or as a means of clarifying issues related to ambiguous ownership in emerging economies (Ma *et al.*, 2006; Morck, 2012). Governments guide and facilitate the growth of markets and business groups by increasing the availability of critical resources (Lee and Jin, 2009; Zhang *et al.*, 2016) and harnessing cultures and institutions (Tsui-Auch and Lee, 2003). The close control of resources enables the state to strategically manipulate the behavior of business groups to its advantage (Kim, Hoskisson, Tihanyi, and Hong, 2004; Sutherland and Ning, 2015; Yiu *et al*., 2007). This is particularly evident in the case of China, as the government enjoys primary control of most business groups. After China opened and restructured its economy after the Second World War and endured a civil war and a long Cultural Revolution, the state was eager to rejuvenate the economy by establishing state-controlled business groups as a testing ground in which to experiment with various reform policies including importing and exporting, mergers and acquisitions and foreign investment (Zhang *et al.*, 2016). Business groups have greater access to financial resources in China not only because the big commercial banks are state-controlled, but also because private and institutional investors are confident that state-owned business groups will not go bankrupt (Zhang *et al*., 2016).

The petrochemical industry has been an important pillar of the Chinese economy, contributing more than five percent to the national GDP every year in the past three decades (Ministry of Industry and Information Technology of the PRC, 2016). Sinopec, for example, was founded in 1983 and reformed into a giant business group. When the 1998 financial crisis stroke Asia, the petrochemical industry in China experienced its first deficit. In order to sustain the steady economic growth in China, the State Council urged the establishment of the Sinopec Group, during which the integration of upstream and downstream, supply-production-sale, and domestic and foreign trade in the petrochemical industry was facilitated with the help of the state (State-owned Assets Supervision and Administration Commission of the State Council, 2013). Ranked fourth in the Fortune 500 in 2016, Sinopec Group is a strong arm of the state that singlehandedly contributes three percent to the national GDP (National Bureau of Statistics of China, 2016).

In addition to the fact that business groups form and are maintained as a result of contextual factors present in emerging economies, scholars have also identified differences in terms of strategy between business groups and standalone firms that were revealed by the shift in organizational form, away from the standalone firm in the West toward the business group. Scholars have attempted to examine the effects of the different strategic decisions made by business groups, such as financial decisions (Khanna and Palepu, 2000a), foreign expansion decisions (Dau *et al.*, 2015), and diversification decisions (McGuire and Dow, 2009). However, studies in this field most of the times compare business group affiliates with standalone firms, even when exploring strategic behavior (Lamin, 2013; an exception being Dau *et al*., 2015). They are also based on the assumption that the principal source of variance in enacted strategy patterns and, ultimately, corporate performance, is the distinction between affiliation and independence. While this type of comparative research design can yield important insights, it also tends to overlook important strategic heterogeneity within the group of affiliated firms and tends to ignore the diverse underlying mechanisms through which business groups exert influence on the strategic behavior of their affiliates (Carney *et al*., 2011).

Moreover, despite their importance in emerging or imperfect markets, the questions of whether and how business groups and their affiliates strategically exert societal influence remain unanswered. As emerging markets have become the engine of the

global economic growth (Marquis and Raynard, 2015), scholarly neglect of the most important organizational form in this setting, the business group, and its role in addressing the increasingly serious social issues at play must be addressed. In this study, we focus on one important strategic decision business group affiliates face: whether or not to adopt an environmental management system.

### 3.3 Strategic Importance of Environmental System Adoption

Over the past few decades, integrating socially responsible activities, in particular those related to protecting the environment, into business activities has become a priority (Flammer, 2015; Russo and Fouts, 1997; Starik, Throop, Doody, and Joyce, 1996). Certain business activities have led and continue to lead to systematic degradation of the natural environment. Phenomena such as climate change and air pollution and the overuse of energy threaten humankind's continued existence and endanger the planet (Odum, 1989; UNEP, 2016). Over time, improving corporate performance in the area of the environment has become more than just an obligatory financial or regulatory burden to be dealt with. It is becoming a competitive advantage to be able to meet growing human need with limited resources (Rosen, 2001; Russo, 2009). Consequently, long-term environmental strategies that seek to manage the interface between the natural environment and business activities (Sharma, 2000) have been developed to capitalize on upside opportunities like improved financial performance (Klassen and McLaughlin, 1996) and social legitimization (Westley and Vredenburg, 1991).

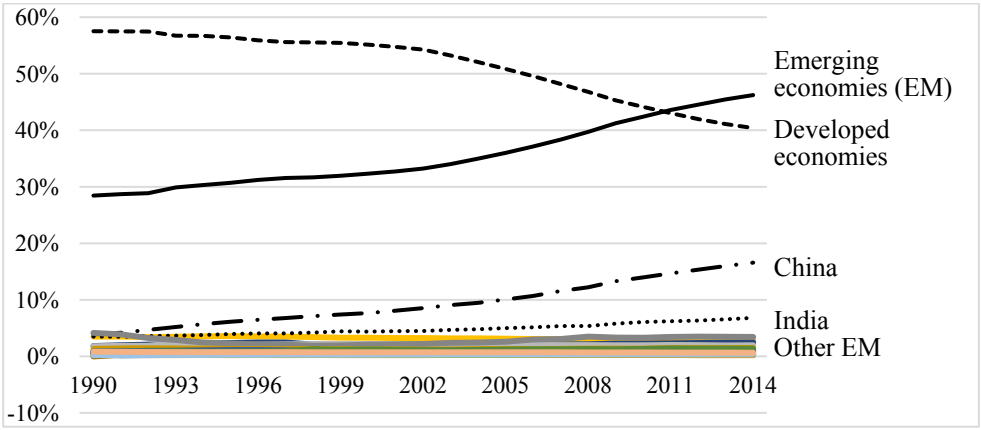
Third party evaluation and/or certification have played a role as long-standing indicators of the effort that firms have made in order to address their environmental challenges (Toffel, 2000). Environmental management systems (EMS) are formal systems with voluntary ecological standards that cover dimensions such as "articulating goals, making choices, gathering information, measuring progress, and improving performance" and are regularly audited by a professional third party (Florida and Davison, 2001: 64). On the one hand, some studies have shown that international environmental management systems (EMS) have a positive influence on corporate environmental performance (Montabon, Melnyk, Sroufe, and Calantone, 2000), as they require formal systems that included clearly articulated goals, credible information, as well as provisions for standard

evaluation and regular auditing (Russo, 2009). Under stakeholder and institutional pressures from governmental actors, customers, competitors and the community (Delmas and Toffel, 2004), firms adopt these systems out of strategic self-interest (Rosen, 2001). In other studies, international standards on EMS bring about paradoxical consequences including the inability to initiate additional environmental activities that extend beyond the original system (De Colle, Henriques, and Sarasvathy, 2014); the superficial or temporary adoption of an EMS as a "signal" to external parties (Johnstone and Labonne, 2009); or the generation of a "reverse decoupling" effect such that firms seek international certification to improve their reputation in spite of the fact that they have already established strong environmental performance (King, Lenox, and Terlaak, 2005). As most of the corporate environmentally friendly actions in China are generally only advocated, instead of strictly implemented or monitored at present (Luo *et al*., 2016), the adoption of EMS in Chinese firms appears a relatively *proactive* environmental strategy in terms of corporate environmental performance. For one thing, establishing a sound environmental system that ought to be regularly audited requires Chinese firms to engage in a series of costly and comprehensive fundamental environmentally friendly activities (Florida and Davison, 2001). For the other, it represents a comparatively direct, authentic, and observable environmental effort a firm makes, in response to the ever-growing expectation from the Chinese government on corporate environmental performances (Marquis and Qian, 2014).

The shift in contribution to world GDP based on purchasing power parity by percentage from developed to emerging economies has been caused in large part by the rise of China (World Bank, 2015, see Figure 3.1). This shift has led to increased environmental concerns in emerging economies and sharp criticism directed at them as a result (e.g. The Economist, 2013b). Figure 3.2 shows the change in share of the world's total $CO_2$ emissions and energy usage of the two largest economies, China and the US, over the past 50 years. The overwhelming pressure from civil society, and political agreements on environmental issues in emerging economies have triggered the wider adoption of EMS, particularly in China, as elaborated above. Figure 3.3 shows the number of firms that have opted for an international EMS, the ISO 14001, in both major developed and emerging economies in the world between 1996-2012 (World Bank, 2015). The exponential increase in adoption among Chinese firms is noteworthy. As business groups

are the major organizational form in emerging markets, of which China is a prime example, in this study, we explore the strategic heterogeneity among Chinese business group affiliates by investigating the adoption of the several most-widely-adopted international and national EMS certifications in China as evidence of the manifestation of corporate environmental strategy.

**Figure 3.1 Contribution to World GDP Based on PPP by Percentage**
(Source: World Bank, 2016)[6]




[6] 'Other' emerging economies as identified by key market actors including the Dow Jones, FTSE, IMF, MSCI, Russell, and S&P listed in Marquis and Raynard (2015). These emerging economies are Bangladesh, Brazil, Chile, Colombia, Czech Republic, Egypt, Hungary, Indonesia, Iraq, Morocco, Mexico, Malaysia, Nigeria, Peru, Philippines, Poland, Russia, Saudi Arabia, Thailand, Turkey, Vietnam, and South Africa.

**Figure 3.2 Comparison of $CO_2$ emissions and energy consumption as a Percentage of Total World Emissions of the US and China**

(Source: World Bank, 2015)

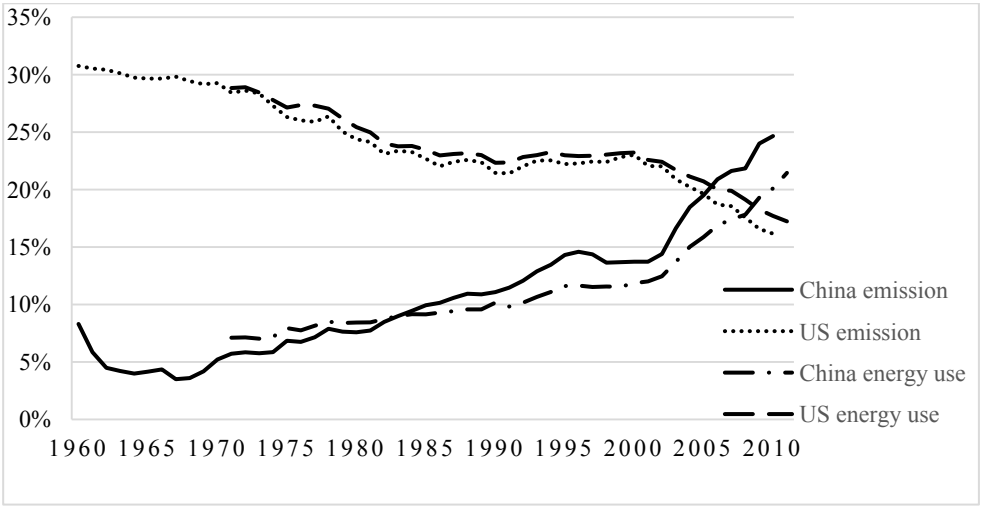
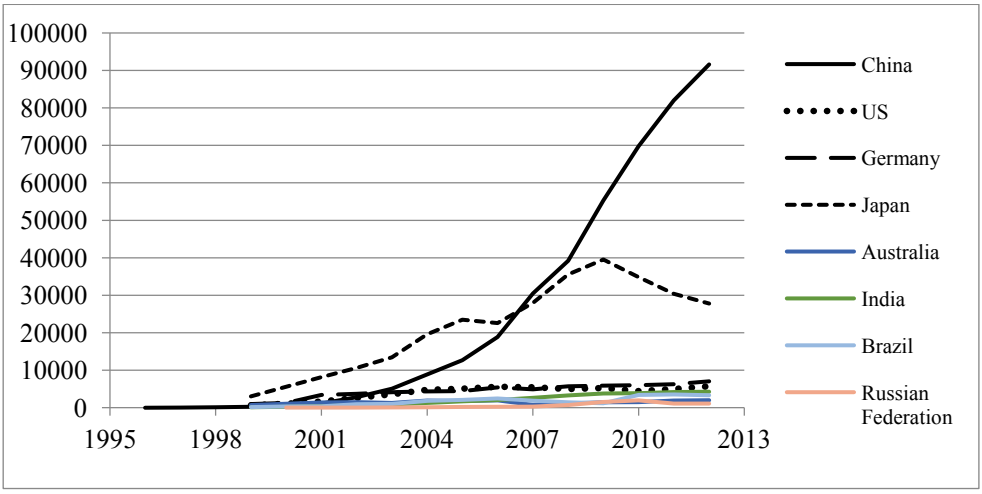



**Figure 3.3 The Number of Firms that have Adopted an ISO 14001 Environmental Management System**

(Source: World Bank, 2015)



## 3.4 Hypotheses: Pressure-Sensitive and Pressure-Resistant Affiliates

In this paper, we probe the strategic decision to adopt corporate EMS to reveal how different factors bring about strategic heterogeneity across business group affiliates. We propose that group membership matters in terms of EMS adoption. We consider two categories of organizational-level characteristics that may influence a business group affiliate's EMS adoption strategy: pressure sensitivity and pressure resistance. *Pressure-sensitive* attributes originate from social needs that make business group affiliates susceptible to exogenous pressures to implement an environmental strategy. *Pressure-resistant* characteristics, on the other hand, are attributable to strong privileges business group affiliates derive from their organizational form, enabling them to withstand environmental pressures.

### *3.4.1 Environmental strategy adoption among group affiliates—drivers of pressure sensitivity*

Studies have suggested that it is rational for firms to adequately address the expectations of legitimate stakeholders in terms of corporate moral duties (O'Riordan and Fairbrass, 2014). Business group affiliates are sensitive to certain institutional pressures, especially those connected to the public good, as affiliates have a social need to sustain their accumulated social capital or established brand images (Delmas and Toffel, 2004). Intangible resources like this are always at risk when firms are dependent on stakeholders that are sensitive to corporate environmental performance. These stakeholders include wealthier communities and concerned customers with higher demands in terms of their living conditions and that have the capacity to have a greater impact on corporate performance (Deng, Kang, and Low, 2013; Kassinis and Vafeas, 2006; Delmas and Toffel, 2004). We consider three characteristics to be indicators of the concept of (environmental) pressure sensitivity among business group affiliates that might make firms more likely to adopt an EMS out of a consideration of eliciting support from stakeholders: family ownership, having a business model centered on business-to-consumer deliveries and exposure to the civil society and investors.

*Family-led business group.* An increasing number of family-operated firms have been listed on stock exchanges and have had an increasing impact on Chinese society

(Ding, Zhang, and Zhang, 2008). Family businesses are more inclined to adopt CSR strategies (and environmental strategies in particular) for several reasons (Déniz and Suárez, 2005). First, due to a strong sense of family obligation to maintain control over successive generations and the fact that major managers in family businesses are also important shareholders (Anderson and Reeb, 2003), family executives have an incentive to make decisions that enhance performance and pay offs in the long run (Steier, 2003). Second, improved standing in the community and a better reputation amount to increased "social insurance" (Hoffman, Hoelscher, and Sorenson, 2006) for family firms, which in turn intensifies the tendency of family-led groups to uphold their social responsibilities (Dyer and Whetten, 2006). Lastly, the alignment of interests between control and ownership (Anderson and Reeb, 2003) and the sense of identity based on common social bonds between group affiliates (Lamin, 2013) reduce internal transaction costs and enable the dominant influence of families to effectively reach out to all affiliates (Dyer, 2006). As such, it is reasonable to expect that affiliation with a family-owned business group would lead firms to be more proactive in terms of the environment than private or state-owned firms in light of increased public attention to environmental protection in China in recent years.

Fuyao Group is a prominent case in point. In 2012, Dewang Cao, founder and current chair of the group, was described as the "most generous philanthropist in China" as he (and his family) donated 3.64 billion RMB (approximately 562 million USD) to public goods, culture and environmental protection that year. After failing to retain two general managers in the group, Mr. Cao realized the importance of sustaining a sense of corporate responsibility in his family business. After he finally persuaded his oldest son who had settled down in the United States to come back to China and take over the company, he passed on his awareness of social responsibility and his desire to make a contribution to society to his son. In addition the firm's pioneering adoption of a series of international EMS, in 2012, the Fuyao Group's production became the most energy efficient among its counterparts. Cao stated, "…in doing so many positive things, I have established sufficient credibility and reputation for my employees and my son (the current General Manager of the group) to build upon" (Chen and Zhang, 2014). This exemplifies the way in which a

business group's family identity has an impact upon its social and environmental stewardship.

*Downstream positioning of the affiliate.* The role an affiliate plays in the upstream and downstream blueprint of a business group determines its CSR strategic positioning. Affiliates in the upstream area, those directly involved in business-to-business, or industrial trade, are not usually confronted with pressures related to environmental activities. The ones in the downstream area, however, are more dependent on consumer approval, as their 'societal obligations (including those related to environmental activities) are more visible to consumers (Brown and Dacin, 1997; Sen and Bhattacharya, 2001). Consumers' purchasing decisions have been linked to companies' CSR records, as environmental issues have become an increasingly salient focus of public concern (for more references, see Russo and Fout, 1997). Damage to the reputation of one affiliate among the consumers could cause a spillover effect, damaging the entire group. Positive responses from consumers, on the other hand, enhance the competitiveness of a CSR strategy in terms of generating corporate revenues in the future (Flammer, 2015; Lev, Petrovits, and Radhakrishnan, 2010). The adoption of an EMS is therefore more strategically proactive (Dupire and M'Zali, 2016) if an affiliate finds itself in the downstream area of a business group geared towards B2C deliveries.

The effort and investment made in the area of environmental performance by Tsingdao Brewery Group, producing one of China's most popular beer brands, illustrate the importance of environmental strategies to a firm running a business-to-consumer (B2C) model. The company's CEO, Kexing Huang, has said that "the value of human beings is greater than that of objects, and therefore society is more important than a single firm". The Chair of the Production Management Section echoed this sentiment when he stated that "as consumers are paying more attention to low-carbon life style, the trend of choosing green and environmentally friendly products is being strengthened. Consumers will decide whether our products satisfy their tastes using the money in their hands. People born in the 1980s and 1990s pay special attention to environmental protection; if we do not perform well environmentally, not only our products, but our brand and whole group will not be popular [any more]. [Now that we take this into account,] I believe our sales data speaks for itself." Tsingdao Brewery Group has kept its growth in sales around 8% per

year while other firms in the brewing sector have seen a 3% growth rate on average (Xinhuanet, 2015).

*Societal visibility.* Firms need social license granted formally and informally by a broad set of external stakeholders to operate (Henisz, Dorobantu, and Nartey, 2014), the importance of which is magnified by their societal visibility. That the media increasingly conveys corporate news to the public brings with it not only commercial opportunity, but also uncertainty from the standpoint of the firm (Kjær and Langer, 2005). The presence of the internet further expedites the transmission of information to and from the public in what may be unpredictable ways (Lee, Oh, and Kim, 2013). Therefore, the more media attention a business group has received, the more likely it is that the group members will be highly sensitive to societal pressures and the unpredictable consequences of media exposure due to the visibility of their business group. Firms, particularly when the chances of being exposed to the public are high, will therefore strive for legitimacy (Bitektine, 2011; Campbell, 2007) and be more likely to integrate *systematic* approaches such as the adoption of an EMS by their core businesses (Zhu and Sarkis, 2004).

A noteworthy example of this was when the Chinese media aggressively increased the visibility of listed firm and MNC donations after the catastrophic earthquake in Wenchuan, China in 2008 (Xu, Xin, and Zhu, 2011; Zhang and Luo, 2013). Wanke, a leading business group in the real-estate industry in China, made a 200,000 RMB donation on the day of the earthquake, which was followed by an immediate and overwhelming onslaught of criticism on the part of the media and civil society that brought the group's commitment to CSR into question. During the shareholders' meeting held about a month later, Wanke decided to donate another 100 million RMB to the recovery effort in Wenchuan (Tencent Culture, 2014). We expect to see a similar effect exerted by increased media attention on a firm on the likelihood of adoption of an EMS.

In summary, we propose that the three aforementioned factors affecting pressure sensitivity, namely, family ownership, B2C business model and societal visibility, have a *positive* influence on the adoption of an EMS:

> *Hypothesis 3.1: Family ownership, downstream positioning, and societal visibility of business group affiliates increase the likelihood of adopting an environmental management system.*

### *3.4.2 Environmental strategy adoption among group affiliates—drivers of pressure resistance*

Business group affiliates tend to resist institutional pressures related to public goods if they experience a high degree of organizational protection attributed to powerful agentic protectors and the privilege they possess as a result of their organizational structure. Such organizational protection shields affiliates from having to assess the severity of profit-unrelated issues such as environmental practices and to perform (in an environmentally friendly way) accordingly. For example, while some studies have confirmed the role of the state in inducing environmentally friendly corporate performance (Delmas and Toffel, 2004; Marquis and Qian, 2014), state ownership also has the potential to open the door to lenient standards to prevent irresponsible activities (Tang and Tang, 2015). Managers of state-owned firms are not faced with an incentive to improve their performance due to the lack of an effective monitoring system (Jiang, Yao, and Feng, 2013). If shareholders become concerned that non-productive social responsible activities might bring about competitive disadvantages to a firm (Deng *et al.*, 2013), they become strong forces of resistance to CSR activities (Lyon, Lu, Shi, and Yin, 2013). We propose a second set of attributes that business group affiliates possess under conditions of informational opacity and patronage by powerful protectors, which empower them to withstand pressures that favor EMS adoption: being core to the group's identity, diversification of the business group, and the presence of potential benefits from political connections.

*Core member of a group.* Business groups tend to fill ownership voids to facilitate economic reform, especially in emerging economies (Ma *et al*., 2006) where the property rights of firms are not clear (Peng, 2000). This brings about a separation of ownership and control in business groups (Morck, Wolfenzon, and Yeung, 2005) or managerial opportunism (Type I) problems. Under these conditions, managers may take actions that benefit them privately (Berle and Means, 1932; Jansen and Meckling, 1976) or may have to deal with high costs due to the divergent interests of dispersed shareholders, both of which lead to inefficiency (Morck, Wolfenzon, and Yeung, 2005). Furthermore, Type 2 agency problems occur when business groups have the unfortunate combination of (a) dominant owners and (b) structures that decouple voting from cash flow rights, such as pyramidal holdings or dual-class shares (Morck and Yeung, 2003; Nicodano, 1998). This

often leads to the expropriation of minority shareholders by dominant ones (Yiu *et al.*, 2007) for private gains or to balance profitability across affiliates (Classens, Fan, and Lang, 2006; Morck *et al.*, 2005). In addition, concentrated ownership is found to be negatively associated with social initiatives, as these initiatives will come at the financial expense of large shareholders while benefitting other stakeholders (Atkinson and Galaskiewicz, 1988; Dam and Scholtens, 2013). We contend that this problem appears more pronounced when there is a separation between ownership and control among affiliates in business groups in emerging economies. Ultimate owners effectively control business groups by strategically assigning themselves to key managerial positions and/or through a corporate pyramidal ownership structure (Yiu *et al*., 2007). In the meantime, these ultimate owners lose a certain amount of control as they indirectly own the group affiliates and thus experience a "wedge" between their degree of control and cash flow rights (Kali and Sarkar, 2011). The smaller the wedge, the more core an affiliate is to the group and the more priority it enjoys in absorbing resources within a group at the expense of more peripheral members (Dau *et al*., 2015). In emerging economies such as China where environmental actions are not strictly monitored, a smaller wedge provides an affiliate more privileges to be shielded from external pressures. Therefore, we hypothesize that a business group affiliate with a smaller wedge, indicating that the affiliate is a core member of a business group, will be more likely to resist the pressures to take action to adopt an EMS.

By July, 2012, four of the top ten business groups listed on the two Chinese stock exchanges whose core business activities are in the iron and steel industry had established an EMS. Of the four, only two of the groups (Baosteel and Tisco) adopted an internationally acknowledged EMS by 2012 (Huang, 2013). The wedges in these affiliates were between zero and 0.16 in the iron and steel industry, indicating a highly core identity, compared with a maximization of 42.35 of the wedge in the whole sample,.

*Group diversification.* Diversification, especially in emerging economies, lowers the risks associated with the absence of institutions in external capital and labor markets by facilitating the exchange of internal resources within a business group (Khanna and Palepu, 2000a; Khanna and Yafeh, 2007). Moreover, the ability of business groups to mobilize resources between affiliates engaged in different production lines serves to relieve pressure from powerful consumers and/or civil society in relation to environmental performance or

social responsibility (Vyakarnam, Bailey, Myers, and Burnett, 1997). Firms associated with more diversified business groups share the risks and pressures with their sister affiliates (Guthrie, 1997) and are thus less likely to play as pivotal a role in terms of safeguarding the future of the business group as those belonging to less diversified groups. Moreover, as diversification makes a business group's information regime more diffuse and opaque, the attribution of responsibility to individual affiliates becomes more complex and difficult (Khanna and Palepu, 2007). When reduced information transparency leads to nebulosity in terms of responsibility a business group's affiliates may tend to act less responsibly. Therefore, we expect affiliates of more diversified business groups to be less pressure sensitive and therefore more likely to resist adopting an EMS.

Hubei Yihua Group, a highly diversified business group whose affiliates are active in eleven different industries, for example, has resisted societal demands for more environmentally friendly practices for a decade (Sina Finance, 2013). The firms in the group, including the ones in and just outside the area where the headquarters is located, have been warned, fined, and even suspended multiple times by the local government to remedy their adverse environmental behavior, yet without promising outcome (Sina Finance, 2016).

*Political connections.* External monitoring of group affiliates is regarded as being more difficult than the monitoring of unaffiliated firms, as close links to the political apparatus of the business group tend to shield affiliates from outside interference (Khanna and Palepu, 2007). Intermingling between the economic and political spheres is especially prevalent in emerging economies in the context of the operation of business groups (Khanna and Palepu, 2000b; Fisman and Khanna, 2004). The state nominates and assigns the executives of large state-owned business groups to people who hold equivalent positions in the political hierarchy in China. Meanwhile, Chinese business groups also have bargaining power in terms of the extent to which they follow the state's guidance or function as "small kingdoms" (Brødsgaard, 2012). Business groups in China tend to be closely intertwined with the state and may therefore be insulated from external pressures and may focus more on maximizing profits, partially for the benefit of the local government (Shi and Zhang, 2006). Consequently, we expect affiliates that are more

politically connected to be more pressure resistant than those that lack such protection from the government on environmental issues.

Executives secure governmental protection of financial investment, property rights and societal legitimacy by means of structural state ownership or the establishment of political connections in China (Xin and Pearce, 1996; Zhou, 2013). If firms and the state cover for each other too often, however, it might jeopardize corporate financial and social performance (Xinhuanet, 2014). Approximately 60% of the top management team of Shenhua, a large mining business group, is made up of ex-civil servants and/or current members of the National People's Congress and/or National Committee of the Chinese People's Political Consultative Conference. Environmental NGOs including Greenpeace have called the business group out for its environmental irresponsibility and have criticized the apparent media blackout, where negative news on Shenhua's environmental malpractices was quickly removed after the state intervened (Greenpeace, 2013).

In summary, we propose that the three factors affecting pressure resistance, namely, core identity to a group, group diversification and political connections, have a *negative* influence on the adoption of an EMS.

> *Hypothesis 3.2: Being a core member, degree of diversification, and political connections in a business group affiliates decreases the likelihood of adopting an environmental management system.*

## 3.5 Methods

### *3.5.1 Sample and data*

We chose China as our research setting for several reasons. First, China is currently the largest emerging economy and has become the world's largest economy in terms of purchasing power parity as of 2014 (IMF, 2015). As such, corporate activities in China have a profound impact on the global economy and society. Second, a substantial portion of long-lasting GDP growth in China can be attributed to the contribution of Chinese business groups (China Enterprise Evaluation Association, 2014). In other words, as China has become a major player in the world, so have Chinese business groups (Lee and Kang, 2010) and given their increasingly important role, this organizational form deserves a

closer look. Third, China has become the world's largest emitter of greenhouse gases and consumer of energy over the past decade, suffering from the consequences of its own air pollution. Therefore, having a better understanding of what prompts Chinese business groups to adopt a system that seeks to enhance the environmental performance is of both theoretical and empirical importance.

In an effort to investigate the different factors that make business group affiliates sensitive or resistant to pressure to adopt an environmentally friendly strategy, as indicated by the adoption of an environmental management system, we developed a longitudinal dataset that provides information on Chinese listed firms between 2008 and 2012. Since 2008, regulatory and societal attention has increasingly focused on social and environmental issues in China. Also in 2008, the former State Environmental Protection Administration (SEPA) was transformed into the Ministry of Environmental Protection (MEP), placed at highest administrative level in the hierarchical Chinese political governing system. The MEP as a ministerial agency has since been tasked with drafting laws and making high-level decisions pertaining to the environment in conjunction with other ministries at the central state level. Furthermore, the China Securities Regulatory Commission (CSRC) and the Shanghai and Shenzhen Stock Exchanges (SSE and SZSE) followed suit and issued guidelines on CSR disclosure for listed firms in 2006 and 2008. These events marked the beginning of the more wide-spread adoption of international standard environmental management systems by Chinese firms (see Figure 3.3) and ushered in a period of increased transparency, comprehensiveness and concreteness in environmental reporting (Luo *et al.*, 2016).

Our sample is based on information from the Main Boards of both the SSE and SZSE. We included all 374 firms (1630 observations) whose primary businesses are in the sectors that are currently being subjected to increased government scrutiny, particularly in the area of environmental performance. As environmental reporting and the adoption of an EMS are not compulsory for Chinese listed firms, we chose to investigate the sectors that are most likely to face pressure to improve environmental performance and take relevant actions. According to the Directory of Industrial Classifications for Listed Firms Subject to Environmental Protection Inspections, issued by the MEP in 2008, these sectors include thermal power, iron and steel, cement, electrolyzed aluminum, coal, metallurgy,

construction materials, mining, chemicals, petrifaction, pharmaceuticals, light industry, textiles and leather goods. We excluded firms that received a 'Special Treatment' (ST) tag from the relevant stock exchange, which is given in response to the detection of financial irregularities, including reporting financial losses for two consecutive years or failing to provide an audit report from a certified accounting firm, etc. (China Stock Market Handbook, 2008). We excluded ST firms from our analysis as they face various trading and financial restrictions that may create an incentive for them to manipulate their reports in an effort to shake the ST designation (Firth *et al.*, 2011).

We identified the business groups the affiliates belong to using the "graph of ultimate owner structure" contained in the annual reports, where the structure of a firm's ownership and control is presented. We verified this information in accordance with the definition of 'business group' provided in the still-valid Provisional Regulations for the Administration of Business Group Registration in China (1998), issued by the State Administration for Industry and Commerce (SAIC). The definition specifies the following: 1) the core company must have registered capital of over 50 million RMB, with at least five affiliated companies; 2) the business group has registered capital (including the core and the affiliated companies) of over 100 million RMB total; and 3) each member company of the business group is a distinct legal entity. After carefully extracting the business group information from the annual reports, our sample included 732 observations from 166 business group affiliates spanning the period of 2008 to 2012.

### *3.5.2 Variables and measures*

#### *Dependent variables*

*Adoption of an environmental management system.* We use a dummy variable to specify the adoption of an EMS by a listed firm and business group affiliate. We assigned a value of 1 if a firm has obtained an international or national EMS certification that is common in China, including the ISO 14001 EMS Standard, GB/T24001 (identical to ISO 14001 in China), certification from the National Occupational Safety Association (NOSA) and/or GAP (good agricultural practices by FAO). A value of 0 is given if the firm has not implemented an EMS. Since the International Organization for Standardization (ISO), the NOSA and the FAO do not provide a complete list of all firms that have adopted an EMS, we used triangulation and mined information from the firms' annual reports and official

websites. We crosschecked this information with data provided on the Certification and Accreditation Unified Business Information Search Platform website (in Chinese).

***Independent variables***

*Family ownership.* We used a dummy variable to indicate family ownership. Based on data from the ultimate ownership graph in annual reports, this variable was marked as 1 if there was a note specifying kinship of the shareholders and 0 otherwise. We crosschecked the data using the online search engine Baidu.com by performing searches of a business group's name with the keyword "family" (*jia zu* in Chinese) to be sure that the annual reports simply did not include this information.

*Business-to-consumer model.* To operationalize the second pressure-sensitive factor, we used affiliate firms' SIC codes specified by the SSE and SZSE to identify whether or not it operated according to a business-to-consumer (B2C) model. We compared the categorization in the two stock exchanges with the categorization used in a study by Srinvasan, Lilien, and Sridhar (2011) and assigned a value of 1 to those that were B2C oriented and 0 otherwise.

*Societal visibility.* To test the third pressure-sensitive factor in the context of Hypothesis 1, we measured the public visibility of a firm on the basis of exposure in the news media. We used Baidu News, the news site of the largest Chinese search engine, to search for mention of focal firms and count how many times the firms were reported on in different news items in each year. To reach this number, we subtracted the number of repeat reports of the same news item from the total stories mentioning the relevant firm.

*Core member of a group.* We used the separation of control rights and ownership rights to measure the degree to which affiliates are 'core' members of their business groups when testing Hypothesis 2. The closer ownership and control are, the greater the chance that the firm will be given priority over other member firms and, as such, be 'core' to the business group. Data for this variable originated from the China Stock Market and Accounting Research Database (CSMAR) and was updated annually.

*Group diversification.* To measure the second factor, group diversification, when testing Hypothesis 2, we measured the number of sectors in which a business group operates. We extracted relevant information from the business groups' official websites

and annual reports, compared the areas of business they conduct to the SIC code specified by the stock exchanges and then used a total count for this variable.

*Political connections*. To establish the extent to which a firm is politically connected, we calculated the percentage of top management team (TMT) members of the focal firm that concurrently work for a government organ or are members of the National People Congress (NPC) or the Chinese People's Political Consultative Conference (CPPCC).

***Control variables***

*Firm size*. We used annual turnover to measure an affiliate's size. Data for this variable was collected from the CSMAR dataset and was log-transformed.

*Export percentage.* We used the revenue an affiliate obtains from exports as a percentage of total sales to capture its dependence on international markets. Data for this variable was collected from the firms' annual reports and was log-transformed.

*Years in the field of an affiliate.* We computed the number of years an affiliate had been operational in its current field. This data was collected manually from firms' annual reports and official websites.

*CSR report.* We used a dummy variable to indicate whether or not a firm had issued a CSR or environmental report. We assigning a value of 1 if CSR and/or environmental report was issued and 0 if not. If a report was integrated into the annual financial report, we also assigned a value of 1. However, when the financial report only contained isolated paragraphs pertaining to CSR or the environment, we assigned a value of 0.

*Registered capital of a business group.* We used the log-transformed registered capital of the business group to which a focal firm belongs. Data for this variable was collected manually from business groups' official websites.

*Years in the field of a business group.* We computed the number of years that had elapsed since the business group was founded. Data for this variable was collected manually from business groups' official websites.

*East China location.* We used a dummy variable to indicate whether or not an affiliate is based in East China. We assigned a value of 1 when the affiliate was located in East China and 0 if not.

*Provincial GDP per capita.* The annual data for this variable was collected from the China Statistical Yearbook, and was log-transformed.

*Environmental NGOS.* We calculated the number of environmental NGOs in the province where the focal affiliate was located. The annual data was taken from the China Statistical Yearbook.

*Environmental quality.* We took the average concentration of particulate matter 10 pollutants (i.e., noxious solid or liquid particles with a diameter of 10 micrometers or less) in the air of the capital city of the province in which the focal affiliate was located. The annual data was taken from the China Statistical Yearbook and was log-transformed.

### *3.5.3 Regression method*

We used STATA 14.0 to analyze the panel data. As we aim to estimate the likelihood of the adoption of a corporate EMS, our dependent variable is measured as a binary variable that captures whether or not there is adoption at the affiliate level. A linear probability model (LPM) using multiple linear regression (OLS) is simple to estimate and use, but it suffers weaknesses like the possibility of generating a predicted probability of less than zero or larger than one (while this should be between zero and one), revealing an unrealistic marginal effect and containing heteroskedasticity (Long, 1997; Wooldridge, 2008). Although weighted least squares (WLS) estimators could solve the heteroscedasticity issues, all observations need to meet strict requirements to fit the model. The limitations of LPM or even WLS could be overcome by using binary response models like probit and logit models, thought they are more difficult to interpret. We used probit random effect models in this study, a model that has been used in other studies that have relied on similar data to ours (e.g. King *et al.*, 2005; Wood, 2009; Stern and James, 2015), and we also applied logit random models as a robustness check. We used random effects models because we analyzed several variables that describe the intrinsic, time-invariant properties of firms, business groups or industries, such as the registered capital of a business group. Using a fixed effects model would eliminate these time invariant effects, as the effects of variables with a constant value over time are swept away by the fixed effects transformation (Greve and Goldeng, 2004; Wooldridge, 2008).

## 3.6 Results

Table 3.1 presents the descriptive statistics and pairwise correlations. Table 3.2 presents our probit regression results. Model 1 includes all the control variables. Models 2-4 are separate regressions for Hypothesis 1, while models 5-7 are for Hypothesis 2. Model 8 is the full model.

### *3.6.1 Hypotheses tests*

As shown in Model 8 in Table 3.2, we find support for both of our hypotheses. Affiliation with a family-owned business group ($b$ = 2.84, $p$ = 0.015) and operating according to a B2C business model ($b$ = 1.70, $p$ = 0.014) are significantly *positively* associated with the adoption of an environmental management system. We also find that the variable 'core member of a group', measured by separation of ownership and control ($b$ = 0.06, $p$ = 0.028, the more core a member, the smaller of the value of the wedge), the diversification of the business group an affiliate belongs to ($b$ = -0.44, $p$ = 0.017) and the political connectedness in top management teams ($b$ = -5.80, $p$ = 0.031) are significantly *negatively* related to environmental management system adoption. As we did not find a significant result in Model 6 (see Table 3.2), the mechanism of diversification of a business group is only partially supported. We did not find strong statistical evidence that societal visibility of a business group ($b$ = 0.00, $p$ = 0.71) exerts any noticeable influence on EMS adoption by business group affiliates. In sum, we found partial support for both Hypotheses 3.1 and 3.2.

**Table 3.1 Descriptive Statistics and Correlations**

| Variable | Mean | S. D. | Min | Max | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1. EMS** | 0.36 | 0.48 | 0 | 1 | | | | | | | | | |
| **2. Family business** | 0.06 | 0.24 | 0 | 1 | 0.03 | | | | | | | | |
| **3. B2C** | 0.18 | 0.39 | 0 | 1 | 0.08 | 0.12 | | | | | | | |
| **4. Societal visibility** | 2411.46 | 8875.66 | 5 | 104000 | 0.13 | -0.04 | -0.04 | | | | | | |
| **5. Core member of a group** | 7.54 | 9.06 | 0 | 42.35 | 0.17 | -0.01 | 0.03 | -0.1 | | | | | |
| **6. Diversification** | 3.3 | 1.66 | 1 | 10 | -0.08 | 0.21 | 0.00 | -0.06 | -0.04 | | | | |
| **7. TMT political connection** | 0.09 | 0.1 | 0 | 0.63 | 0.02 | 0.04 | 0.03 | 0.28 | -0.09 | -0.06 | | | |
| **8. Revenue** * | 22.17 | 1.52 | 18.66 | 28.66 | 0.22 | -0.1 | -0.12 | 0.39 | 0.02 | -0.04 | 0.31 | | |
| **9. East** | 0.48 | 0.5 | 0 | 1 | 0.06 | -0.02 | 0.04 | -0.04 | 0.05 | -0.06 | -0.18 | -0.13 | |
| **10. Export percentage** | 0.02 | 0.07 | 0 | 0.59 | 0.03 | 0.07 | 0.13 | -0.04 | 0.04 | -0.03 | -0.02 | -0.10 | 0.12 |
| **11. Year in the field firm** | 38.95 | 53.31 | 1 | 43 | 0.03 | -0.08 | 0.00 | -0.03 | 0.00 | 0.01 | 0.00 | -0.06 | -0.10 |
| **12. Year in the field group** | 30.5 | 34.42 | 0 | 34 | -0.09 | -0.09 | 0.1 | 0.00 | -0.05 | -0.10 | 0.04 | 0.07 | 0.02 |
| **13. Group reg. capital*** | 2.98 | 1.76 | 0.1 | 7.75 | 0.07 | -0.15 | -0.13 | 0.15 | -0.05 | 0.14 | 0.07 | 0.45 | -0.18 |
| **14. GDP per capita*** | 12.82 | 0.51 | 11.61 | 13.72 | 0.17 | -0.02 | 0.08 | 0.14 | -0.01 | -0.08 | 0.05 | 0.25 | 0.36 |
| **15. Number of ENGO** | 288.86 | 239.09 | 26 | 1032 | -0.08 | 0.08 | 0.12 | -0.1 | -0.10 | 0.13 | 0.04 | -0.19 | 0.02 |
| **16. Environmental quality*** | 0.09 | 0.02 | 0.05 | 0.15 | -0.13 | -0.08 | -0.13 | -0.02 | -0.03 | 0.03 | 0.04 | 0.04 | -0.19 |
| **17. CSR report** | 0.45 | 0.5 | 0 | 1 | 0.49 | -0.06 | -0.04 | 0.13 | 0.10 | -0.08 | 0.18 | 0.36 | 0.00 |

| | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|
| **11. Year in the field firm** | 0.07 | | | | | | |
| **12. Year in the field group** | 0.08 | 0.43 | | | | | |
| **13. Group registered capital*** | -0.13 | -0.15 | -0.13 | | | | |
| **14. GDP per capita*** | 0.07 | -0.05 | 0.06 | 0.11 | | | |
| **15. Number of ENGO** | -0.01 | -0.02 | -0.04 | -0.12 | -0.28 | | |
| **16. Environmental quality*** | -0.08 | 0.05 | 0.02 | 0.02 | -0.26 | 0.25 | |
| **17. CSR report** | -0.01 | 0.05 | -0.01 | 0.14 | 0.15 | -0.05 | -0.12 |

$N = 732$, Correlations with an absolute value greater than 0.07 are significant at $p < 0.05$.
* Log transformed.

**Table 3.2 Influence of Pressure-Sensitive and Pressure-Resistant Factors on the Adoption of an EMS**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| **Family business** | | 2.27 | | | | | | 2.84 |
| | | (1.30) | | | | | | (1.17) |
| **B2C business model** | | | 1.97 | | | | | 1.70 |
| | | | (0.69) | | | | | (0.69) |
| **Societal visibility** | | | | 0.00 | | | | 0.00 |
| | | | | (0.00) | | | | (0.00) |
| **Core member of a group** | | | | | 0.07 | | | 0.06 |
| | | | | | (0.04) | | | (0.03) |
| **Diversification of the group** | | | | | | -0.13 | | -0.44 |
| | | | | | | (0.17) | | (0.18) |
| **TMT political connection** | | | | | | | -4.77 | -5.80 |
| | | | | | | | (1.84) | (2.69) |
| **Revenue** | 0.40 | 0.32 | 0.47 | 0.34 | 0.51 | 0.35 | 0.54 | 0.63 |
| | (0.28) | (0.25) | (0.24) | (0.21) | (0.28) | (0.21) | (0.15) | (0.24) |
| **East** | 0.55 | 0.86 | 0.73 | 0.74 | 0.98 | 0.75 | 0.65 | 0.66 |
| | (0.73) | (0.71) | (0.66) | (0.60) | (0.82) | (0.61) | (0.37) | (0.67) |
| **Export percentage** | -0.56 | -2.23 | -0.93 | -0.56 | -0.30 | -0.60 | 0.19 | -1.42 |
| | (4.41) | (6.15) | (4.40) | (5.19) | (4.50) | (5.14) | (2.80) | (4.92) |
| **Year in the field firm** | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.00) | (0.00) |
| **Year in the field group** | -0.03 | -0.07 | -0.03 | -0.02 | -0.03 | -0.02 | -0.02 | -0.03 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| **Group registered capital** | -0.15 | -0.03 | -0.11 | -0.12 | -0.16 | -0.06 | -0.09 | -0.06 |
| | (0.25) | (0.21) | (0.20) | (0.18) | (0.26) | (0.17) | (0.10) | (0.18) |
| **GDP per capita** | 1.99 | 0.99 | 2.40 | 0.80 | 1.61 | 0.77 | 1.05 | 1.09 |
| | (1.11) | (0.70) | (0.79) | (0.64) | (0.96) | (0.63) | (0.40) | (0.72) |
| **Number of environmental NGO** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| **Environmental quality** | -18.02 | -9.14 | -13.64 | -10.73 | -14.80 | -11.52 | -15.70 | -8.87 |
| | (19.80) | (17.38) | (18.05) | (16.29) | (19.66) | (15.75) | (10.65) | (14.66) |
| **CSR** | 7.38 | 9.22 | 7.33 | 7.92 | 7.37 | 7.93 | 4.93 | 5.40 |
| | (0.84) | (0.71) | (0.67) | (0.59) | (0.73) | (0.58) | (0.37) | (0.59) |
| **Year effect** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Constant** | -38.20 | -25.84 | -46.12 | -23.52 | -37.29 | -22.80 | -27.15 | -32.34 |
| | (16.65) | (9.49) | (11.43) | (8.57) | (13.67) | (8.54) | (5.64) | (9.45) |
| **Observations** | 754 | 754 | 754 | 753 | 732 | 754 | 754 | 731 |
| **Number of idcode** | 169 | 169 | 169 | 169 | 166 | 169 | 169 | 166 |
| **Wald chi square** | 144.99 | 325.90 | 228.99 | 271.17 | 149.93 | 284.39 | 235.42 | 153.42 |

Standard errors in parentheses.

The interpretation of the results of a probit model is not as straightforward as it is of LPM or OLS estimations as probit models use maximum likelihood estimation (MLE) to measure non-linear relationships (Wooldridge, 2008). To interpret effect sizes, we used the *margins* command in Stata 14 to see how the likelihood of EMS adoption is influenced by the independent variables. The results of this analysis are presented in Table 3.3. We use Model 7 in Table 3.3 to interpret the effect size below. The likelihood of adopting an EMS is increased by 22 percent ($p$ = 0.018, s.e. = 0.09) if an affiliate belongs to a family-owned business group as compared to an affiliate of a non-family-owned business group. The likelihood is increased by 13 percent ($p$ = 0.017, s.e. = 0.05) if an affiliate operates according to a B2C model as compared to one that operates according to a B2B model. A one-unit change in the degree of separation of control and ownership increases the likelihood of EMS adoption by 0.4 percent ($p$ = 0.025, s.e. = 0.002), a one-unit change in the degree of diversification of the group decreases this likelihood by three percent ($p$ = 0.021, s.e. = 0.01), and a one-unit change in the degree of political connectedness of the top management team decreases the likelihood of EMS adoption by 44 percent ($p$ = 0.03, s.e. = 0.20). Consistent with the results shown in Models 3 and 7 in Table 3.2, public visibility of a business group and diversification of the group in Model 5 in Table 3.3 does not exert a significant marginal influence on the adoption of an EMS.

**Table 3.3 Marginal Influences of Pressure-Sensitive and Pressure–Resistant Factors on EMS Adoption**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| **Family business** | 0.10 | | | | | | 0.22 |
| | (0.53) | | | | | | (0.09) |
| **B2C business model** | | 0.10 | | | | | 0.13 |
| | | (0.03) | | | | | (0.05) |
| **Societal visibility** | | | 0.00 | | | | 0.00 |
| | | | (0.00) | | | | (0.00) |
| **Core member of a group** | | | | 0.003 | | | 0.004 |
| | | | | (0.002) | | | (0.002) |
| **Diversification of the group** | | | | | -0.01 | | -0.03 |
| | | | | | (0.01) | | (0.01) |
| **TMT political connection** | | | | | | -0.36 | -0.44 |
| | | | | | | (0.14) | (0.20) |
| **Revenue** | 0.01 | 0.02 | 0.01 | 0.03 | 0.02 | 0.04 | 0.05 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.02) |
| **East** | 0.04 | 0.04 | 0.02 | 0.05 | 0.04 | 0.05 | 0.05 |
| | (0.03) | (0.03) | (0.03) | (0.04) | (0.03) | (0.03) | (0.05) |
| **Export percentage** | -0.10 | -0.05 | -0.04 | -0.02 | -0.03 | 0.01 | -0.11 |
| | (0.26) | (0.21) | (0.20) | (0.23) | (0.26) | (0.21) | (0.38) |
| **Year in the field firm** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| **Year in the field group** | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 | -0.00 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| **Group registered capital** | -0.00 | -0.01 | -0.01 | -0.01 | -0.00 | -0.01 | -0.00 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) |
| **GDP per capita** | 0.04 | 0.12 | 0.04 | 0.08 | 0.04 | 0.08 | 0.08 |
| | (0.03) | (0.04) | (0.04) | (0.05) | (0.03) | (0.03) | (0.06) |
| **Number of environmental NGO** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | (0.000) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) |
| **Environmental quality** | -0.39 | -0.66 | -0.63 | -0.74 | -0.58 | -1.19 | -0.68 |
| | (0.75) | (0.88) | (0.84) | (1.02) | (0.80) | (0.80) | (1.13) |
| **CSR** | 0.39 | 0.35 | 0.38 | 0.37 | 0.40 | 0.38 | 0.41 |
| | (0.03) | (0.03) | (0.05) | (0.05) | (0.03) | (0.02) | (0.04) |
| **Observations** | 754 | 754 | 754 | 732 | 754 | 754 | 732 |

Standard errors in parentheses.

### *3.6.2 Robustness checks*

We performed several robustness checks. First, we limited the adoption of an EMS, the dependent variable, to only the ISO 14001. Almost all of the results remained the same (diversification of the group continues to be significant at $p = 0.003$), while political connectedness becomes insignificant and its effect remains negative. This strengthens our argument that political connectedness may shield firms and prevent them from adopting domestic standards in the absence of strong pressure to adopt international standards. Second, we used logit random effect models as an alternative to regression and the results were consistent with the probit estimation. Third, we dropped all the firm-year observations after the year in which a firm had adopted an EMS, which left us with 605 observations and 161 firms in our sample. B2C business model, core to group identity and political connectedness remained significant, while family business and diversification of the group did not. This implies that the variables in the pressure-resistant category are slightly more robust than the ones in the pressure-sensitive category. This is somewhat intuitive as the power of civil society in China is relatively weak compared to that of the state (Child *et al*., 2007).

## 3.7 Discussion

### *3.7.1 Summary of main findings*

The environmental challenges that have accompanied the increase in economic development in emerging markets, especially in China, have attracted considerable scholarly attention (e.g. Child *et al*., 2007; Luo *et al*., 2016; Marquis and Qian, 2014). This paper sets out to explore a few attributes that business group affiliates possess that shape the strategies they employ in the area of environmental protection in China. On the one hand, we found that business group affiliates are sensitive to pressures to adopt environmental strategies when social capital and/or brand image are at stake. We found that being a part of a family-run business group and being largely dependent upon consumers as primary stakeholders make affiliates more likely to adopt an environmental management system. On the other hand, organizational privileges created by organizational protections, namely, being core to group identity, diversification in

operating industries and strong political connectedness, shield affiliates from the pressure to adopt an EMS.

### *3.7.2 Implications*

This article makes several important contributions in relation to research on the adoption of environmental protection strategies in emerging markets. First, as ubiquitous as they are in emerging markets, our knowledge of how affiliates differ in their strategies while maintaining a unified identity in the context of a business group remains quite limited (Chittoor *et al*., 2015; Dau *et al*., 2015; Manikandan and Ramachandran, 2014). Thus far, studies of business groups have thoroughly explored the financial performance of group affiliates, especially in comparison to stand-alone firms. Our focus, however, is on the business group affiliates, as our unit of analysis and, as such, we have found that differences exist between business group affiliates in terms of their environmental strategies. This finding enriches and verifies the claim by Dau *et al*. (2015) and Chittoor *et al*. (2015) that the heterogeneity among business group affiliates is so important that merely comparing the differences between business group members and standalone firms cannot reveal a complete picture. We thus contribute to the business group literature by arguing that different attributes of the business group form create different types of organization-specific pressure, leading to differences in strategy. Using business group affiliate as the unit of analysis, our paper has pushed the envelope of a more fine-grained analysis of heterogeneous strategies within business groups.

Second, as we shift our focus on corporate environmental protection efforts from developed economies to emerging ones, we also have to address the different organizational forms that exist. The dramatic reshuffling of the geo-economic landscape has made it necessary to conduct more context-specific studies that investigate the organizational form most prevalent in emerging markets, namely the business group. The literature on corporate environmentalism has treated environmental performance as being the product of organizational responses to regulatory and/or political pressure. However, variance in the adoption of EMS is also expected to be closely associated to the corporate structures (Delmas and Toffel, 2008). The organizational form of and the attributes related to business groups have been largely overlooked in the corporate environmentalism literature, in spite of their clear importance in the context of emerging economies (Chittoor

*et al*., 2015; Guthrie, 1997; Khanna and Palepu, 2000a). By conceptually unearthing different categories of organization-specific pressures faced by business group affiliates and their impact on corporate responsiveness to environmental challenges, we contribute to the field of corporate environmentalism with a categorization of the environmental behavior of business group affiliates.

Third, the paper makes an important contribution to China studies by offering a novel standpoint from which to investigate the pressure that Chinese firms face in this era beyond those stemming from the well-researched influence of the autocratic Chinese state (Shi and Zhang, 2006; Luo *et al*, 2016; Marquis and Qian, 2014). As firms in China have undergone structural transformations with more independence in terms of corporate governance (Luo, 2003), studies exploring firm- and group-level variables are timely. We have mapped out different types of factors that may make Chinese business group affiliates more pressure sensitive or pressure resistant with regard to the adoption of an environmental strategy. Our study flags the importance of diving deeper into the characteristics of affiliates of business groups, the leading organizational form, to account for corporate environmentalism in China, thereby going beyond the often-studied role of the Chinese state.

### *3.7.3 Limitations and future research*

A limitation of our study is that we did not have access to official channels through which to receive detailed lists on the adoption of corporate environmental management systems like the ISO 14001 system. To address this, we did our utmost to triangulate data using corporate reports, corporate official websites and an official online platform for certification of Chinese firms. Future studies could focus on the adoption of one particular type of certification should any official organization release a comprehensive list of firms that have adopted that specific standard. Second, our results might be biased, as we were not able to include the business group affiliates that are not listed on the Chinese stock exchanges. Therefore, our results might only be applicable to firms that are subject to greater public exposure. Future research may also shed more light on whether or not heterogeneity exists in terms of the adoption of EMS by business group affiliates that are and are not listed on the stock exchanges. Future research could also investigate whether or not there is heterogeneity among affiliates in the same business group. This would be

contingent on more data becoming available. In addition, future studies may also update the factors investigated in this study in the next ten years. Since the Chinese civil society, plagued by heavy smog in winter, rapidly gains environmental awareness, we expect that societal visibility of a business group will soon start to positively influence corporate environmental efforts, while the pressure-resistant factors might gradually lose their muscle. In-depth qualitative studies are also called for to reveal the precise mechanisms underlying the factors we identified in this study.

### *3.7.4 Conclusion*

This study enables us to better understand the factors that influence the adoption of certain environmental strategies by a major actor, the business group affiliate in China, that has been a driver of the global shift in economic and energy consumption away from the West, toward emerging economies. It is noteworthy that the need to sustain intangible assets and the organizational privileges a business group affiliate enjoys exist widely and simultaneously in China. Our findings have several public policy implications. Business group affiliates are worthy of special attention as they have grown into a major organizational form in emerging economies such as China. In addition, since large business group affiliates are very sensitive to certain factors related to their intangible assets, it is advisable that governments should promote efforts to the increase environmental awareness of the public. Moreover, the government should take more responsibility for keeping a closer eye on firms that are stronger and have organizational privileges that may facilitate their resistance to environmental pressures from society.

**References**


Ahlstrom, D., Bruton, G., and Lui, S. 2000. Navigating China's changing economy: Strategies for private firms. *Business Horizons*, 43(1): 5-15.

Allen, F., Qian, J., and Qian, M. 2005. Law, finance, and economic growth in China. *Journal of Financial Economics*, 77(1): 57-116.

Amsden, A. H. 1992. *Asia's Next Giant: South Korea and Late Industrialization*. Oxford University Press: NY.

Anderson, R. C., and Reeb, D. M. 2003. Founding-family ownership and firm performance: evidence from the S&P 500. *The Journal of Finance*, 58(3): 1301-1328.

Atkinson, L., and Galaskiewicz, J. 1988. Stock ownership and company contributions to charity. *Administrative Science Quarterly*, 82-100.

Bae, K. H., Kang, J. K., and Kim, J. M. 2002. Tunneling or value added? Evidence from mergers by Korean business groups. *The Journal of Finance*, 57(6): 2695-2740.

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.

Banerjee, S. B. 2002. Corporate environmentalism: the construct and its measurement. *Journal of Business Research*, 55(3): 177–191.

Bansal, P. 2005. Evolving sustainably: a longitudinal study of corporate sustainable development. *Strategic Management Journal,* 26(3): 197–218.

Bansal, P., and 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., and Hoffman, A. (eds). 2012. *The Oxford Handbook of Business and the Natural Environment.* Oxford University Press: Oxford.

Barney, J. 1991. Firm resources and sustained competitive advantage. *Journal of Management*, 17(1): 99-120.

Beeson, M. 2010. The coming of environmental authoritarianism. *Environmental Politics*, 19(2): 276–294.

Bellhouse, D. R. 1988. Systematic Sampling. In *Handbook of Statistics*, Krishnaiah, P.R., and Rao, C. R. (eds), vol 6. Elsevier: 125–145.

Berle, A. A., and Means, G. C. 1932. *The Modern Corporation and Private Property*. New York: Macmillan Company.

Berry, M. A., and Rondinelli, D. A. 1998. Proactive corporate environmental management: A new industrial revolution. *The Academy of Management Executive*, *12*(2): 38-50.

Bertrand, M., Mehta, P., and Mullainathan, S. 2002. Ferreting out tunneling: An application to Indian business groups. *The Quarterly Journal of Economics*, 117(1): 121–148.

Bitektine, A. 2011. Toward a theory of social judgments of organizations: The case of legitimacy, reputation, and status. *Academy of Management Review*, 36(1): 151-179.

Boehmer, E. 2000. Business groups, bank control, and large shareholders: An analysis of German takeovers. *Journal of Financial Intermediation*, 9(2): 117-148.

Branzei, O., Ursacki-Bryant, T. J., Vertinsky, I., and Zhang, W. 2004. The formation of green strategies in Chinese firms: Matching environmental responses and individual principles. *Strategic Management Journal*, 25: 1075–1095.

Bremmers, H., Omta, O., Kemp, R., and Haverkamp, D. J. 2007. Do stakeholder groups influence environmental management system development in the Dutch agri-food sector? *Business Strategy and the Environment*, 16(3): 214-231.

Breusch, T. S., and Pagan, A. R. 1979. A simple test for heteroskedasticity and random coefficient variation. *Econometrica*, 47(5): 1287–1294.

Brickley, J. A., Lease, R. C., and Smith, C. W. 1988. Ownership structure and voting on antitakeover amendments. *Journal of Financial Economics*, 20: 267-291.

Bromley, P., and Powell, W. 2012. From smoke and mirrors to walking the talk: Decoupling in the temporary world. *Academy of Management Annals*, 6(1): 483–530.

Brunel, C., and Levinson, A. 2016. Measuring the stringency of environmental regulations. *Review of Environmental Economics and Policy,* 10(1): 47–67.

Brown, T. J., and Dacin, P. A. 1997. The company and the product: Corporate associations and consumer product responses. *The Journal of Marketing*, 68-84.

Brødsgaard, K. E. 2012. Politics and business group formation in China: the Party in control? *The China Quarterly*, 211: 624-648.

Campbell, J. L. 2007. Why would corporations behave in socially responsible ways? An institutional theory of corporate social responsibility. *Academy of Management Review*, *32*(3): 946-967.

Carney, M., Gedajlovic, E. R., Heugens, P. P., Van Essen, M., and Van Oosterhout, J. H. 2011. Business group affiliation, performance, context, and strategy: A meta-analysis. *Academy of Management Journal*, 54(3): 437-460.

Carney, M., Shapiro, D., and Tang, Y. 2009. Business group performance in China: Ownership and temporal considerations. *Management and Organization Review*, 5(2): 167-193.

Carter, N., and Mol, A. 2006. China and the environment: Domestic and transnational dynamics of a future hegemon. *Environmental Politics*, 15(2): 330–344.

Chandler, A. D. 1962. *Strategy and Structure: Chapters in the History of the American Enterprise.* Massachusetts Institute of Technology Cambridge.

Chang, S. J., and Hong, J. 2000. Economic performance of group-affiliated companies in Korea: Intragroup resource sharing and internal business transactions. *Academy of Management Journal*, 43(3): 429-448.

Chen, L., and Zhang, W. 2014. Fuyao Group: family business and corporate social responsibility. *Zhejiang University case study*. Hangzhou, China.

Child, J., Lu, Y., and Tsai, T. 2007. Institutional entrepreneurship in building an environmental protection system for the People's Republic of China. *Organization Studies*, 28(7): 1013–1034.

Child, J., and 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.

China Development Brief. 2013. Mapping China's Public Interest NGOs. Available at http://chinadevelopmentbrief.cn/publications/ [January 20, 2017].

China Enterprise Evaluation Association. 2014. *Annual Report on the Development of China's Large Enterprise Groups.* China Development Press.

*China Stock Market Handbook*. 2008. Javvin Press: Saratoga; 38.

Chittoor, R., Kale, P., and Puranam, P. 2015. Business groups in developing capital markets: Towards a complementarity perspective. *Strategic Management Journal*, 36(9): 1277-1296.

Chrun, E., Dolšak, N., and Prakash, A. 2016. Corporate environmentalism: Motivations and mechanisms. *Annual Review of Environment and Resources*, 41: 341-362.

Chung, C. N., and Luo, X. 2008. Institutional logics or agency costs: The influence of corporate governance models on business group restructuring in emerging economies. *Organization Science*, 19(5): 766-784.

Claessens, S., Fan, J. P., and Lang, L. H. 2006. The benefits and costs of group affiliation: Evidence from East Asia. *Emerging Markets Review*, 7(1): 1-26.

Cole, M., and Neumayer, E. 2005. Environmental policy and the environmental Kuznets curve: can developing countries escape the detrimental consequences of economic growth? In *Handbook of Global Environmental Politics*, Dauvergne, P. (ed). Edward Elgar: Cheltenham; 298–318.

Dam, L., and Scholtens, B. 2013. Ownership concentration and CSR policy of European multinational enterprises. *Journal of Business Ethics*, 118(1): 117-126.

Darnall, N., Henriques, I., and Sadorsky, P. 2010. Adopting proactive environmental strategy: The influence of stakeholders and firm size. *Journal of Management Studies*, *47*(6): 1072-1094.

Dau, L., Ayyagari, M., and Spencer, J. 2015. Strategic responses to FDI in emerging markets: Are core members more responsive than peripheral members of business groups? *Academy of Management Journal*, 58(6): 1869-1894.

Dawson, J. F. 2014. Moderation in management research: What, why, when, and how. *Journal of Business and Psychology*, 29(1): 1–19.

De Colle, S., Henriques, A., and Sarasvathy, S. 2014. The paradox of corporate social responsibility standards. *Journal of Business Ethics*, 125(2): 177-191.

Delmas, M., and Montes-Sancho, M. 2011. US state policies for renewable energy: Context and effectiveness. *Energy Policy*, 39(5): 2273–2288.

Delmas, M., and Toffel, M. 2004. Stakeholders and environmental management practices: an institutional framework. *Business Strategy and the Environment* ,13(4): 209–222.

Delmas, M., and Toffel, M. 2008. Organizational responses to environmental demands: opening the black box. *Strategic Management Journal,* 29: 1027–1055.

Delmas, M., and Toffel, M. 2011. Institutional pressures and organizational characteristics: implications for environmental strategy. In *The Oxford Handbook of Business and the Natural Environment*, Bansal, P., and Hoffman, A. (eds). Oxford University Press: Oxford; 231–247.

Deng, X., Kang, J. K., and Low, B. S. 2013. Corporate social responsibility and stakeholder value maximization: Evidence from mergers. *Journal of Financial Economics*, 110(1): 87-109.

Déniz, M. D. L. C. D., and Suárez, M. K. C. 2005. Corporate social responsibility and family business in Spain. *Journal of Business Ethics*, 56(1): 27-41.

Dickson, B. J. 2003. *Red Capitalists in China: The Party, Private Entrepreneurs, and Prospects for Political Change*. Cambridge University Press.

Ding, Y., Zhang, H., and Zhang, J, Z. 2008. The financial and operating performance of Chinese family-owned listed firms. *Management International Review*, 48(3): 297-318.

Dupire, M., and M'Zali, B. 2016. CSR strategies in response to competitive pressures. *Journal of Business Ethics*, 1-21.

Dyer, W. G. 2006. Examining the "family effect" on firm performance.*Family business review*, *19*(4): 253-273.

Dyer, W. G., and Whetten, D. A. 2006. Family firms and social responsibility: Preliminary evidence from the S&P 500. *Entrepreneurship Theory and Practice*, 30(6): 785-802.

Earnhart, D.H., Khanna, M., and Lyon, T.P. 2014. Corporate Environmental Strategies in Emerging Economies. *Review of Environmental Economics and Policy Advance*, 8(2): 164–185.

Edelman, L. B. 1992. Legal ambiguity and symbolic structures: Organizational mediation of civil rights law. *American Journal of Sociology*, 97(6): 1531–1576.

Egri, C. P., and Herman, S. 2000. Leadership in the North American environmental sector: Values, leadership styles, and contexts of environmental leaders and their organizations. *Academy of Management Journal*, *43*(4): 571-604.

Environmental Protection Law of the People's Republic of China. 2014. https://www.chinadialogue.net/ [9 August, 2016].

Etzion, D. 2007. Research on organizations and the natural environment, 1992-present: A review. *Journal of Management*, 33(4): 637-664.

Euromonitor International. 2014. Haier group in consumer appliances. Available at http://www.euromonitor.com/haier-group-in-consumer-appliances/report [25 July, 2016].

Feldman, E. R., Amit, R. R., and Villalonga, B. 2016. Corporate divestitures and family control. *Strategic Management Journal,* 37(3): 429–446.

Fiorino, D. J. 1996. Toward a new system of environmental regulation: the case for an industry sector approach. *Environmental Law*, 26: 457.

Firth, M., Rui, O. M., and Wu, W. 2011. Cooking the books: Recipes and costs of falsified financial statements in China. *Journal of Corporate Finance*, 17(2): 371–390.

Fisman, R., and Khanna, T. 2004. Facilitating development: The role of business groups. *World Development*, *32*(4): 609-628.

Flammer, C. 2015. Does corporate social responsibility lead to superior financial performance? A regression discontinuity approach. *Management Science*, *61*(11): 2549-2568.

Florida, R., and Davison, D. 2001. Gaining from green management: environmental management systems inside and outside the factory. *California Management Review*, *43*(3): 64-84.

Fortune. 2016. Fortune 500. Available at http://fortune.com/fortune500/2012/ [March 14, 2016].

Freeman, E. R. 1984. *Strategic Management: A Stakeholder Approach*. Pittman Books Limited.

Gedajlovic, E., and Shapiro, D. M. 1998. Management and ownership effects: Evidence from five countries. *Strategic Management Journal,* 19(6): 533–553.

Gedajlovic, E., and Shapiro, D. M. 2002. Ownership structure and firm profitability in Japan. *Academy of Management Journal*, 45(3): 565-575.

Govindaraju, V. C., and Tang, C. F. 2013. The dynamic links between $CO_2$ emissions, economic growth and coal consumption in China and India. *Applied Energy*, *104*: 310-318.

Granovetter, M. 1995. Coase revisited: Business groups in the modern economy. *Industrial and Corporate Change*, 4(1): 93-130.

Greenpeace. 2013. Chinese censorship will fail to hide Shenhua's ruthless water grab. Available at http://www.greenpeace.org/international/en/news/ [22 August, 2016].

Greve, H. R., and Goldeng, E. 2004. Longitudinal analysis in strategic management. *Research Methodology in Strategy and Management*, 1: 135-163.

Guillén, M. F. 2000. Business groups in emerging economies: A resource-based view. *Academy of Management Journal*, 43(3): 362-380.

Guillén, M. F., Capron, L. 2015. State capacity, minority shareholder protections, and stock market development. *Administrative Science Quarterly*, 61(1): 125–160.

Guo, J., and Lin, W. 2005. *Ten Business Models to Make Profit in the Chinese Market.* In Chinese. Tsinghua University Press: Beijing.

Guthrie, D. 1997. Between markets and politics: Organizational responses to reform in China. *American Journal of Sociology*, 102(5): 1258-1304.

Haans, R. F., Pieters, C., and He, Z. L. 2016. Thinking about U: theorizing and testing U- and inverted U-shaped relationships in strategy research. *Strategic Management Journal,* 37(7): 1177–1195.

Hart, S. L. 1995. A natural-resource-based view of the firm. *Academy of management review*, *20*(4): 986-1014.

Hart, S. L., and Milstein, M. B. 2003. Creating sustainable value. *The Academy of Management Executive*, *17*(2): 56-67.

Hausman, J. A. 1978. Specification tests in econometrics. *Econometrica*, 46: 1251–1271.

He, J., Mao, X., Rui, O. M., and Zha, X. 2013. Business groups in China. *Journal of Corporate Finance*, 22: 166-192.

Henriques, I., and Sadorsky, P. 1996. The determinants of an environmentally responsive firm: An empirical approach. *Journal of Environmental Economics and Management,* 30(3): 381–395.

Henriques, I., and Sadorsky, P. 1999. The relationship between environmental commitment and managerial perceptions of stakeholder importance. *Academy of Management Journal* 42(1): 87–99.

Hillman, A. J., Keim, G. D., and Schuler, D. 2004. Corporate political activity: a review and research agenda. *Journal of Management*, 30(6): 837–857.

Ho, P. 2001. Greening without conflict? Environmentalism, NGOs and civil society in China. *Development and Change*, *32*(5): 893-921.

Hoffman, A. J. 2001. *From Heresy to Dogma: An Institutional History of Corporate Environmentalism.* Stanford University Press.

Hoffman, A. J., Hoelscher, M., and Sorenson, R. 2006. Achieving sustained competitive advantage: A family capital theory. *Family Business Review*, 19(2): 135-145.

Hoffman, A. J., and Ocasio, W. 2001. Not all events are attended equally: Toward a middle-range theory of industry attention to external events. *Organization Science*, 12(4): 414–434.

Hoskisson, R. E., Eden, L., Lau, C. M., and Wright, M. 2000. Strategy in emerging economies. *Academy of Management Journal*, 43(3): 249–267.

Huang, T. 2013. Firms in the iron and steel industry: environmental management systems. In Chinese. *Securities Times.* Available at http://news.stcn.com/2013/0111/ [22 August, 2016].

International Monetary Fund. 2015. *World Economic Outlook Database*. Web-based dataset. https://www.imf.org/external/pubs/ft/weo/2015/01/weodata/index.aspx [14 March, 2016].

Jaffe, A. B., and Palmer, K. 1997. Environmental regulation and innovation: A panel data study. *Review of Economics and Statistics*, 79(4): 610–619.

Javorcik, B. S., and Wei, S. J. 2004. Pollution havens and foreign direct investment: dirty secret or popular myth? *Contributions in Economic Analysis and Policy*, 3(2): 1–32.

Jensen, M. C., and Meckling, W. H. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4): 305-360.

Jensen, M. C. 2002. Value maximization, stakeholder theory, and the corporate objective function. *Business Ethics Quarterly*, 12(02): 235-256.

Jiang, G., and Wang, H. 2008. Should earnings thresholds be used as delisting criteria in stock market? *Journal of Accounting and Public Policy*, 27(5): 409–419.

Jiang, C., Yao, S., and Feng, G. 2013. Bank ownership, privatization, and performance: Evidence from a transition country. *Journal of Banking and Finance*, 37(9): 3364-3372.

Johnstone, N., and Labonne, J. 2009. Why do manufacturing facilities introduce environmental management systems? Improving and/or signaling performance. *Ecological Economics*, 68(3): 719-730.

Jourdan, J., and Kivleniece, I. 2016. Too much of a good thing? The dual effect of public sponsorship on organizational performance. *Academy of Management Journal*, forthcoming.

Judge, W. Q., and Douglas, T. J. 1998. Performance implications of incorporating natural environmental issues into the strategic planning process: An empirical assessment. *Journal of Management Studies*, *35*(2): 241-262.

Kalamova, M., and Johnstone, N. 2012. Environmental policy stringency and foreign direct investment. In *A Handbook of Globalisation and Environmental Policy: National Government Interventions in a Global Arena*, Wijen, F., Zoeteman, K., Pieters, J., and Van Seters, P. (eds), Second edition. Edward Elgar: Cheltenham: 34–56.

Kali, R., and Sarkar, J. 2011. Diversification and tunneling: Evidence from Indian business groups. *Journal of Comparative Economics*, 39(3): 349-367.

Kassinis, G., and Vafeas, N. 2006. Stakeholder pressures and environmental performance. *Academy of Management Journal*, 49(1):145-159.

Keister, L. A. 1998. Engineering growth: Business group structure and firm performance in China's transition economy. *American Journal of Sociology*, 104(2): 404-440.

Kemp, R., Soete, L., and Weehuizen, R. 2012. Towards an effective eco-innovation policy in a globalised setting. In *A Handbook of Globalisation and Environmental Policy: National Government Interventions in a Global Arena*, Wijen, F., Zoeteman, K., Pieters, J., and Van Seters, P. (eds), Second edition. Edward Elgar: Cheltenham: 211–240.

Khanna, T., and Palepu, K. 1997. Why focused strategies may be wrong for emerging markets. *Harvard Business Review*, 75 (4): 41-54.

Khanna, T., and Palepu, K. 2000a. Is group affiliation profitable in emerging markets? An analysis of diversified Indian business groups. *Journal of Finance*: 867-891.

Khanna, T., and Palepu, K. 2000b. The future of business groups in emerging markets: Long-run evidence from Chile. *Academy of Management Journal*, 43(3): 268-285.

Khanna, T., and Palepu, K. 2007. Emerging Market Business Groups, Foreign Intermediaries, and Corporate Governance. In *Concentrated Corporate Ownership*. Morck, R. K. (Ed.) 2007. University of Chicago Press.

Khanna, T., and Rivkin, J. W. 2001. Estimating the performance effects of business groups in emerging markets. *Strategic Management Journal*, 22(1): 45-74.

Khanna, T., and Yafeh, Y. 2007. Business groups in emerging markets: Paragons or parasites? *Journal of Economic Literature*, 45: 331-372.

Kim, H., Hoskisson, R. E., Tihanyi, L., and Hong, J. 2004. The evolution and restructuring of diversified business groups in emerging markets: The lessons from chaebols in Korea. *Asia Pacific Journal of Management*, 21(1-2): 25-48.

King, A. A., Lenox, M. J., and Terlaak, A. 2005. The strategic use of decentralized institutions: Exploring certification with the ISO14001 management standard. *Academy of Management Journal*, 48(6): 1091-1106.

Kjaer, P., and Langer, R. 2005. Infused with news value: Management, managerial knowledge and the institutionalization of business news. *Scandinavian Journal of Management*, 21(2): 209-233.

Klassen, R. D., and McLaughlin, C. P. 1996. The impact of environmental management on firm performance. *Management Science*, 42(8): 1199-1214.

Kochhar, R., and David, P. 1996. Institutional investors and firm innovation: A test of competing hypotheses. *Strategic Management Journal*, 17(1): 73-84.

Lamin, A. 2013. The Business Group as an Information Resource: An investigation of business group affiliation in the Indian software services industry. *Academy of Management Journal*, 56(5): 1487-1509.

Lee, K. 2012. Business group as an organizational device for economic catch-up. In *Managing Development: Globalization, Economic Restructuring and Social Policy*, Nakagawa, J. (Ed.). Routledge: 217-233.

Lee, K., and Jin, X. 2009. The origins of business groups in China: An empirical testing of the three paths and the three theories. *Business History*, 51(1): 77-99.

Lee, K., and Kang, Y. 2010. Business groups in China. In *The Oxford Handbook of Business Groups*. Colpan, A. M., Hikino, T., and Lincoln, J. R (eds). Oxford University Press: 210-236.

Lee, K., Oh, W. Y., and Kim, N. 2013. Social media for socially responsible firms: Analysis of Fortune 500's Twitter profiles and their CSR/CSIR ratings. *Journal of Business Ethics*, 118(4): 791-806.

Leff, N. H. 1978. Industrial organization and entrepreneurship in the developing countries: The economic groups. *Economic Development and Cultural Change*: 661-675.

Lev, B., Petrovits, C., and Radhakrishnan, S. 2010. Is doing good good for you? How corporate charitable contributions enhance revenue growth. *Strategic Management Journal*, 31(2): 182-200.

Li, H., Meng, L., Wang, Q., and Zhou, L. A. 2008. Political connections, financing and firm performance: Evidence from Chinese private firms. *Journal of Development Economics*, *87*(2): 283-299.

Li, H., Meng, L., and Zhang, J. 2006. Why do entrepreneurs enter politics? Evidence from China. *Economic Inquiry*, *44*(3): 559-578.

Li, H., and Zhang, Y. 2007. The role of managers' political networking and functional experience in new venture performance: Evidence from China's transition economy. *Strategic Management Journal,* 28(8): 791–804.

Li, H., and Zhou, L. A. 2005. Political turnover and economic performance: The incentive role of personnel control in China. *Journal of Public Economics,* 89(9–10): 1743–1762.

Li, J., and Shui, B. 2015. A comprehensive analysis of building energy efficiency policies in China: Status quo and development perspective. *Journal of Cleaner Production,* 90: 326–344.

Li, R., and Leung, G.C. 2012. Coal consumption and economic growth in China. *Energy Policy*, 40: 438–443.

Lieberthal, K. 1995. *Governing China: From Revolution through Reform*. W.W. Norton and Co: New York.

Lin, N. 2011. Capitalism in china: A centrally managed capitalism (CMC) and its future. *Management and Organization Review*, 7(1): 63–96.

Lo, C. W., and 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.

Long, J. S. 1997. *Regression Models for Categorical and Limited Dependent Variables.* Thousand Oaks, CA: Sage Publications.

Lu, Y., and Yao, J. 2006. Impact of state ownership and control mechanisms on the performance of group affiliated companies in China. *Asia Pacific Journal of Management,* 23(4): 485–503.

Luo, Y. 2003. Industrial dynamics and managerial networking in an emerging market: The case of China. *Strategic Management Journal,* 24(13): 1315–1327.

Luo, X., and Chung, C. N. 2005. Keeping it all in the family: The role of particularistic relationships in business group performance during institutional transition. *Administrative Science Quarterly*, *50*(3): 404-439.

Luo, X. R., Wang, D., and Zhang, J. 2016. Whose call to answer: Institutional complexity and firms' CSR reporting. *Academy of Management Journal,* 59, forthcoming.

Lyon, T., Lu, Y., Shi, X., and Yin, Q. 2013. How do shareholders respond to sustainability awards? Evidence from China. *Ecological Economics*, 94(1):1–8.

Ma, X., and Ortolano, L. 2000. *Environmental Regulation in China: Institutions, Enforcement, and Compliance.* Rowman and Littlefield: Lanham.

Ma, X., Yao, X., and Xi, Y. 2006. Business group affiliation and firm performance in a transition economy: A focus on ownership voids. *Asia Pacific Journal of Management*, 23(4): 467-483.

Mahoney, J. T. 1992. The choice of organizational form: Vertical financial ownership versus other methods of vertical integration. *Strategic Management Journal*, 13(8): 559-584.

Manikandan, K. S., and Ramachandran, J. 2015. Beyond institutional voids: Business groups, incomplete markets, and organizational form. *Strategic Management Journal*, 36(4): 598-617.

Marquis, C., and Qian, C. 2014. Corporate social responsibility reporting in China: symbol or substance. *Organization Science*, 25(1): 127–148.

Marquis, C., and Raynard, M. 2015. Institutional strategies in emerging markets. *The Academy of Management Annals,* 9(1): 291–335.

Marquis, C., Zhang, J., and Zhou, Y. 2011. Regulatory uncertainty and corporate responses to environmental protection in China. *California Management Review*, 54(1): 39–63.

McGuire, J., and Dow, S. 2009. Japanese keiretsu: Past, present, future. *Asia Pacific Journal of Management*, 26(2): 333-351.

Ministry of Industry and Information Technology. 2016. Petrochemical industry and chemical industry in China in 2015. Available from http://www.miit.gov.cn/ [December 25, 2016].

Mol, A., and Carter, N. 2006. China's environmental governance in transition. *Environmental Politics*, 15(2): 149–170.

Montabon, F., Melnyk, S. A., Sroufe, R., and Calantone, R. J. 2000. ISO 14000: assessing its perceived impact on corporate performance. *Journal of Supply Chain Management*, 36(1): 4-16.

Morck, R. 2012. The riddle of the great pyramids. In Colpan, A. M., Hikino, T., and Lincoln, J. R. (eds), *The Oxford Handbook of Business Groups.* Oxford University Press: Oxford.

Morck, R., Wolfenzon, D., and Yeung, B. 2005. Corporate governance, economic entrenchment, and growth. *Journal of Economic Literature*, 43: 655-720.

Morck, R., Wolfenzon, D., and Yeung, B. 2005. Corporate governance, economic entrenchment, and growth. *Journal of Economic Literature*, *43*(3): 655-720.

Morck, R., and Yeung, B. 2003. Agency problems in large family business groups. *Entrepreneurship Theory and Practice*, 27(4): 367-382.

Morduch, J., and Sicular, T. 2000. Politics, growth, and inequality in rural China: does it pay to join the Party?. *Journal of Public Economics*, *77*(3): 331-356.

Morduch, J., and Sicular, T. 2002. Rethinking inequality decomposition, with evidence from rural China. *The Economic Journal,* 112(476): 93–106.

National Bureau of Statistics of China. 2012, 2014, 2016. Web-based dataset. Available at http://data.stats.gov.cn/ [10 June 2015].

New Hope. 2016. Corporate website. http://www.newhopegroup.com/.

Nicodano, G. 1998. Corporate groups, dual-class shares and the value of voting rights. *Journal of Banking and Finance*, 22(9): 1117-1137.

O'Riordan, L., and Fairbrass, J. 2014. Managing CSR stakeholder engagement: A new conceptual framework. *Journal of Business Ethics*,125(1): 121-145.

Odum, E. P. 1989. *Ecology and Our Endangered Life-support Systems*. Sinauer Associates, Sunderland.

Oi, J. C. 1995. The role of the local state in China's transitional economy. *The China Quarterly,* 144(1): 1132–1149.

Park, S. H., Luo, Y. 2001. Guanxi and organizational dynamics: organizational networking in Chinese firms. *Strategic Management Journal*, 22: 455–477.

Peng, M. W. 2000. The development of corporate governance in China. *The Academy of Management Executive,* 14(1): 155-156.

Peng, W. Q., Wei, K. C. J., and Yang, Z. 2011. Tunneling or propping: Evidence from connected transactions in China. *Journal of Corporate Finance*, 17(2): 306–325.

Philippe, D., and Durand, R. 2011. The impact of norm-conforming behaviors on firm reputation. *Strategic Management Journal*, 32(9): 969–993.

Piotroski, J. D., Wong, T. J., and Zhang, T. 2015. Political incentives to suppress negative information: evidence from Chinese listed firms. *Journal of Accounting Research*, 53(2): 405–459.

Porter, M., and Van der Linde, C. 1995. Toward a new conception of the environment-competitiveness relationship. *Journal of Economic Perspectives*, 9(4): 97–118.

Qi, Y., Ma, L., Zhang, H., and Li, H. 2008. Translating a global issue into local priority China's local government response to climate change. *The Journal of Environment and Development*, 17(4): 379–400.

Reid, E., and Toffel, M. 2009. Responding to public and private politics: corporate disclosure of climate change strategies. *Strategic Management Journal*, 30: 1157–1178.

Report on the Work of the Government. 2010. *The Eleventh National People's Congress of PRC.* http://www.gov.cn/english/official/2010–03/15/content_1556124.htm [14 March, 2016].

Rosen, C. M. 2001. Environmental strategy and competitive advantage: An introduction. *California Management Review*, 43(3): 8-15.

Russo, M. V. 1992. Power plays: regulation, diversification, and backward integration in the electric utility industry. *Strategic Management Journal*, 13(1): 13–27.

Russo, M. V. 2009. Explaining the impact of ISO 14001 on emission performance: a dynamic capabilities perspective on process and learning. *Business Strategy and the Environment*, 18(5): 307-319.

Russo, M. V., and Fouts, P. A. 1997. A resource-based perspective on corporate environmental performance and profitability. *Academy of Management Journal*, 40(3): 534-559.

Sen, S., and Bhattacharya, C. B. 2001. Does doing good always lead to doing better? Consumer reactions to corporate social responsibility. *Journal of Marketing Research*, 38(2): 225-243.

State-owned Assets Supervision and Administration Commission of the State Council. 2013. Sinopec 30 years. In Chinese. Available at http://www.sasac.gov.cn [November 23, 2016].

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., and Henriques, I. 2005. Stakeholder influences on sustainability practices in the Canadian forest products industry. *Strategic Management Journal*, 26(2): 159–180.

Sharma, S., and Vredenburg, H. 1998. Proactive corporate environmental strategy and the development of competitively valuable organizational capabilities. *Strategic Management Journal*, 19(8): 729-753.

Shi, H., and Zhang, L. 2006. China's environmental governance of rapid industrialisation. *Environmental Politics,* 15(2): 271–292.

Sina Finance. 2013. Deep in an environmental mojo: the everlasting complaints on pollution. In Chinese. Available at [22 August, 2016] http://finance.sina.com.cn/chanjing/gsnews/20131011/021416952285.shtml.

Sina Finance. 2016. Sued for destroying the forest. Available at http://finance.sina.com.cn/chanjing/gsnews/2016-06-01/doc-ifxsqxxu4912442.shtml, in Chinese [22 August, 2016].

Spires, A. J. 2011. Contingent symbiosis and civil society in an authoritarian state: understanding the survival of China's grassroots NGOs. *American Journal of Sociology*, 117(1): 1–45.

Srinivasan, R., Lilien, G. L., and Sridhar, S. 2011. Should firms spend more on research and development and advertising during recessions? *Journal of Marketing*, 75(3): 49-65.

Starik, M., Throop, G. M., Doody, J. R., and Joyce, M. E. 1996. Growing an environmental strategy. *Business Strategy and the Environment*, 5(1): 12-21.

Steier, L. 2003. Variants of agency contracts in family-financed ventures as a continuum of familial altruistic and market rationalities. *Journal of Business Venturing*, 18(5): 597-618.

Stern, I. and James, S. D. 2016. Whom are you promoting? Positive voluntary public disclosures and executive turnover. *Strategic Management Journal*. 37(7):1413-1430.

Subhadra, K. 2003. Haier group's strategies in US market. *ICMR Center for Management Research*, Hyderabad, India.

Sutherland, D., and Ning, L. 2015. The emergence and evolution of Chinese business groups: Are pyramidal groups forming? In *State Capitalism, Institutional Adaptation, and the Chinese Miracle.* New York: Cambridge University Press: 102-153.

Tang, Z., and Tang, J. 2015. The influence of stakeholder-firm power difference on corporate social responsibility of Chinese small and medium-sized enterprises. *World Review of Entrepreneurship, Management and Sustainable Development*, *11*(4): 414-428.

Tencent Culture. 2014. Wangshi: the "Donation Gate" in 2008. In Chinese. Available at http://cul.qq.com/a/20140220/019496.htm [October 27, 2016].

The Economist. 2013a. Chinese Industry: Haier and higher. October 12, 2013.

The Economist. 2013b. The world's worst polluter: Can China clean up fast enough? August 10, 2013.

The Guardian. 2016. Breakthrough as US and China agree to ratify Paris climate deal. September 3, 2016.

Toffel, M. W. 2000. Anticipating Greener Supply Chain Demands. ISO 14001: 182-199.

Tsang, S., and Kolk, A. 2010. The evolution of Chinese policies and governance structures on environment, energy and climate. *Environmental Policy and Governance*, *20*(3): 180-196.

Tsui-Auch, L. S., and Lee, Y. J. 2003. The state matters: Management models of Singaporean Chinese and Korean business groups. *Organization Studies*, 24(4): 507–534.

UNEP. 2012. *Global Environment Outlook 5: Environment for the Future We Want*. United Nations Environment Programme: Nairobi.

UNEP. 2016. *Global Environment Outlook 6: Regional Assessments.* United Nations Environment Programme: Nairobi.

Vissa, B., Greve, H. R., and Chen, W. 2010. Business group affiliation and firm search behavior in India: Responsiveness and focus of attention. *Organization Science*, 21(3): 696-712.

Vogel, D., Toffel, M., Post, D., and Uludere, N. 2012. Environmental federalism in the European Union and the United States. In *A Handbook of Globalisation and Environmental Policy: National Government Interventions in a Global Arena*, Wijen, F., Zoeteman, K., Pieters, J., and Van Seters, P. (eds), Second edition. Edward Elgar: Cheltenham: 321–361.

Vyakarnam, S., Bailey, A., Myers, A., and Burnett, D. 1997. Towards an understanding of ethical behaviour in small firms. *Journal of Business Ethics*, 16(15): 1625-1636.

Wailerdsak, N., and Suehiro, A. 2012. Business groups in Thailand. In *The Oxford Handbook of Business Groups.* Colpan, A. M., Hikino, T., and Lincoln, J. R. (Eds.). Oxford University Press Inc.: New York.

Westley, F., and Vredenburg, H. 1991. Strategic bridging: The collaboration between environmentalists and business in the marketing of green products. *The Journal of Applied Behavioral Science*, 27(1): 65-90.

Wijen, F., Zoeteman, K., Pieters, J., and Van Seters, P. 2012. *A Handbook of Globalisation and Environmental Policy: National Government Interventions in a Global Arena*. Edward Elgar: Cheltenham.

Wiseman, J. 1982. An evaluation of environmental disclosures made in corporate annual reports. *Accounting, Organizations and Society*, 7(1): 53–63.

Wong, C. P. 2000. Central-local relations revisited: the 1994 tax-sharing reform and public expenditure management in China. *China Perspectives*, 52–63.

Wood, A. 2009. Capacity rationalization and exit strategies. *Strategic Management Journal*, 30(1): 25-44.

Wooldridge, J. M. 2008. *Introductory Econometrics: A Modern Approach*. Fourth edition. South-Western College: Chula Vista, CA.

World Bank. 2015. World development indicators. *Web-based dataset.* http://data.worldbank.org/data-catalog/world-development-indicators [10 June 2015].

World Resource Institute. Annual Report for 2014. Available at wri.org/annualreport/2014/[January 20, 2017].

Xin, K. K., and Pearce, J. L. 1996. Guanxi: Connections as substitutes for formal institutional support. *Academy of Management Journal*, 39(6): 1641-1658.

Xinhuanet. 2015. Tsingdao Brewery: winning the future with sustainable development. Available at http://news.xinhuanet.com/food/2015-01/09/c_127373816.htm, in Chinese [April, 2016].

Xinhuanet. 2014. Corruptions in top management teams: how to cure the "SOE disease"? Available at http://news.xinhuanet.com/lianzheng/2014-07/03/c_1111438900.htm, in Chinese [22 August, 2016].

Xu, K., Tihanyi, L., and Hitt, M. A. 2014. Firm resources, governmental power, and privatization. *Journal of Management,* forthcoming.

Xu, L., Xin, Y., and Zhu, J. 2011. The close attention given by the media, and listed companies' performance of social responsibility. In Chinese. *Management World*, 3: 135-143.

Yaziji, M., and Doh, J. 2009. *NGOs and Corporations: Conflict and Collaboration*. Cambridge University Press.

Yiu, D., Bruton, G. D., and Lu, Y. 2005. Understanding business group performance in an emerging economy: Acquiring resources and capabilities in order to prosper. *Journal of Management Studies*, 42(1): 183-206.

Yiu, D. W., Lu, Y., Bruton, G. D., and Hoskisson, R. E. 2007. Business groups: An integrated model to focus future research. *Journal of Management Studies*, 44(8): 1551-1579.

Zhang, Q., He, K., and Huo, H. 2012. Policy: Cleaning China's air. *Nature*. 484(7393): 161–162.

Zhang, J., and Luo, X. R. 2013. Dared to care: Organizational vulnerability, institutional logics, and MNCs' social responsiveness in emerging markets. *Organization Science*, 24(6): 1742-1764.

Zhang, L., Sjögren, H., and Kishida, M. 2016. The emergence and organizational persistence of business groups in China, Japan, and Sweden. *Industrial and Corporate Change,* dtw006.

Zheng, W., Singh, K., and Mitchell, W. 2015. Buffering and enabling: The impact of interlocking political ties on firm survival and sales growth. *Strategic Management Journal*, 36: 1615–1636.

Zhou, W. 2013. Political connections and entrepreneurial investment: Evidence from China's transition economy. *Journal of Business Venturing*, *28*(2): 299-315.

Zhu, Q., and Sarkis, J. 2004. Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises. *Journal of Operations Management*, 22(3): 265-289.

## Appendix 1 Measuring the Administrative Hierarchical Distance

The construct of "administrative hierarchical distance to the central government" was computed differently for SOEs than for non-SOEs. It was calculated for SOEs as the hierarchical distance from the controlling governmental organ (the ultimate owner) to the central government. For the non-SOEs, it is the distance from the level of the administratively nearest and lowest governmental organ to the central government, plus one unit from a firm to its administratively nearest and lowest monitoring government. We offer two examples using Figure A.1 to illustrate how the variable is computed.

**Figure A.1 Examples of structural relations between a firm and its controlling governmental body**


(a) SOE


Haodangjia 2011 Annual Report

(三) 基本情况简介

| | |
|---|---|
| 注册地址 | 山东省威海荣成市虎山镇沙咀子 |
| 注册地址的邮政编码 | 264305 |
| Working address | Shandong Prov., Rongcheng city, Hushan Town |
| 办公地址的邮政编码 | 264305 |
| 公司国际互联网网址 | http://www.sdhaodangjia.com |
| 电子信箱 | ehaodangjia@sdhaodangjia.com |

(b) non-SOE

Qingdao Beer listed at the Shanghai Stock Exchange, serves to illustrate the measurement of the distance variable for SOEs. Figure A.1(a), positioning the structure of a firm's ultimate controller in Qingdao Beer's annual report, shows that "Qingdao State-owned Assets Supervision and Administration Commission" (Qingdao SASAC) is its ultimate controller. As the firm has an equivalent hierarchy as its controller in the Chinese bureaucratic system, the distance from Qingdao Beer to the central government is measured as the distance from Qingdao SASAC to the central government. As Qingdao SASAC is a department of Qingdao Municipality, which is a subprovincial municipality, we can deduct from Table 2.2 that the administrative hierarchical distance to the central is 1.5 for Qingdao Beer.

Haodangjia, listed at the Shanghai Stock Exchange, illustrates our measurement of the distance variable for non-SOEs. We used the location of their registered working address to identify the distance between the body implementing the state's environmental policy and the central government. From Haodangjia's annual report (see Figure A.1(b)), we see its working address is "Shandong Province, Rongcheng City, Hushan Town", indicating the nearest and administratively lowest level of government supervising Haodangjia is Hushan Town. From Table 2.2 we see that there are 4 steps for SOEs from township to the central government. As we add another unit from a firm to its nearest and lowest controlling government, given the fact that they do not have an equivalent hierarchy in the political system, the administrative hierarchical distance from Haodangjia to the central government amounts to 5.

**Appendix 2 Interviewee List**

| Respondent ID | Organization ID | Respondent information | Organization information | Time |
|---|---|---|---|---|
| 1 | Firm A | CEO | Steel slag recycling firm | 9:00-10:00 Aug. 6, 2014 |
| 2 | Firm A | Chief Engineer | Steel slag recycling firm | 10:00-11:30 Aug. 6, 2014 |
| 3 | Government B | Dept. chair | Provincial EPB | 16:00-17:30 Aug. 6, 2014 |
| 4 | Business Group C | Chair | Business group | 9:30-10:30 Aug. 7, 2014 |
| 5 | Business Group C | Chief Manager | Affiliate: waste solid recycling | 10:30-11:30 Aug. 7, 2014 |
| 6 | Business Group C | Chair assistant | Business group | 11:30-13:30 Aug. 7, 2014 |
| 7 | Business Group C | Employee | Affiliate: waste solid recycling | 13:30-14:30 Aug. 7, 2014 |
| 8 | Firm D | Chair | Agricultural water conservation company | 14:30-16:30 Aug. 8, 2014 |
| 9 | Business Group E | CFO | Chemical business group | 14:00-14:40 Sep. 1, 2014 |
| 10 | Business Group E | Employee | Chemical business group | 14:50-16:30 Sep. 1, 2014 |
| 11 | Business Group E | Head of Dept. of Environmental Protection | Chemical business group | 16:35-17:15 Sep. 1, 2014 |
| 12 | Business Group E | Head of Section of Environmental Protection and Safety | Chemical business group | 17:20-18:00 Sep. 1, 2014 |

| | | | | |
|---|---|---|---|---|
| 13 | Business Group E | Head of Dept. of Environmental Protection | Affiliate: thermo power plant | 8:30-9:30 Sep. 2, 2014 |
| 14 | Business Group E | Worker | Affiliate: thermo power plant | 9:30-10:00 Sep. 2, 2014 |
| 15 | Business Group E | Vice General Manager | Chemical business group | 14:30-15:30 Sep. 2, 2014 |
| 16 | Business Group F | Head of Section of Environmental Protection and Safety | Coal and chemical group | 8:30-9:30 Sep. 3, 2014 |
| 17 | Business Group F | Head of Dept. of Environmental Protection | Affiliate: chemical firm | 10:30-11:30 Sep. 3, 2014 |
| 18 | Business Group F | Head of Section of Planning and Development | Coal and chemical group | 14:00-15:00 Sep. 3, 2014 |
| 19 | Business Group F | Chief of Chair's office | Coal and chemical group | 15:00-16:00 Sep. 3, 2014 |
| 20 | Firm G | CFO | Coal company | 8:30-9:30 Sep. 5, 2014 |
| 21 | Firm G | Chief Engineer | Coal company | 9:30-10:30 Sep. 5, 2014 |
| 22 | Government H | Civil servant | Human Resources and Social Security Bureau | 8:30-9:30 Sep. 10, 2014 |
| 23 | Government I | Vice Chair | Municipal EPB | 10:00-11:30 Sep. 10, 2014 |
| 24 | Firm J | General Manager | Refractories firm | 15:00-16:30 Sep. 10, 2014 |
| 25 | Firm K | Head of Dept. of Environmental Protection | Car manufacturer | 10:30-11:30 Sep. 11, 2014 |

| | | | | |
|---|---|---|---|---|
| 26-27 | Firm K | Two employees at Dept. of Public Relations | Car manufacturer | 14:00-15:00 Sep. 11, 2014 |
| 28 | Firm K | Head of Dept. of Energy Saving | Car manufacturer | 15:00-16:00 Sep. 11, 2014 |
| 29 | Firm K | Employee at Dept. of Environmental Protection | Car manufacturer | 16:00-17:00 Sep. 11, 2014 |
| 30 | Business Group L | Two Chair assistants | Coal and chemical group | 17:30-21:00 Sep. 14, 2014 |
| 31 | Business Group L | Chair assistant | Coal and chemical group | 8:30-9:00 Sep. 15, 2014 |
| 32 | Business Group L | Vice General Manager | Coal and chemical group | 9:00-9:30 Sep. 15, 2014 |
| 33 | Business Group L | General Manager | Coal and chemical group | 9:30-9:45 Sep. 15, 2014 |
| 34-35 | Business Group L | Two managers together | Affiliate 1: thermo power plant | 14:00-15:30 Sep. 15, 2014 |
| 36-39 | Business Group L | Four managers together | Affiliate 2: coal firm | 8:30-11:30 Sep. 16, 2014 |
| 40-41 | Business Group L | Two managers together | Affiliate 3: coal firm | 14:00-16:00 Sep. 16, 2014 |
| 42 | Business Group M | Employee at Dept. of Environmental Protection | Affiliate 1: Thermo power plant | 9:00-10:00 Sep. 17, 2014 |
| 43 | Business Group M | Chief Engineer | Affiliate 1: Thermo power plant | 10:00-12:00 Sep. 17, 2014 |
| 44 | Business Group M | Engineer at Dept. of Environmental Protection | Affiliate 1: Thermo power plant | 14:00-15:00 Sep. 17, 2014 |

| | | | | |
|---|---|---|---|---|
| 45-46 | Business Group M | Two managers | Affiliate 1: Thermo power plant | 16:00-17:30 Sep. 17, 2014 |
| 47 | Business Group M | Head of Dept. of Environmental Protection | Affiliate 1: Thermo power plant | 10:00-11:00 Sep. 18, 2014 |
| 48 | Business Group M | Chief Engineer | Affiliate 2: Thermo power plant | 14:00-15:00 Sep. 19, 2014 |
| 49 | Business Group M | Chair assistant | Affiliate 2: Thermo power plant | 15:00-16:00 Sep. 19, 2014 |
| 50 | Business Group M | Engineer in charge of energy saving | Affiliate 2: Thermo power plant | 8:30-9:30 Sep. 22, 2014 |
| 51 | Business Group M | Engineer at Dept. of Environmental Protection | Affiliate 2: Thermo power plant | 9:30-10:30 Sep. 22, 2014 |
| 52-53 | Business Group M | Two managers | Affiliate 2: Thermo power plant | 10:30-12:00 Sep. 22, 2014 |
| 54 | Business Group M | Head of Dept. of Environmental Protection | Affiliate 3: Thermo power plant | 14:00-15:00 Sep. 23, 2014 |
| 55 | Business Group M | Engineer in charge of energy saving | Affiliate 3: Thermo power plant | 15:00-16:00 Sep. 23, 2014 |
| 56 | Business Group M | Engineer in charge of emission reduction | Affiliate 3: Thermo power plant | 16:00-17:00 Sep. 23, 2014 |
| 57 | Business Group N | Chief Engineer | Affiliate: Food and beverage firm | 8:00-8:30 Sep. 24, 2014 |

| | | | | |
|---|---|---|---|---|
| 58 | Business Group N | Engineer in charge of emission reduction | Affiliate: Food and beverage firm | 8:30-10:00 Sep. 24, 2014 |
| 59 | Business Group N | Chair | Affiliate: Food and beverage firm | 10:00-11:00 Sep. 24, 2014 |
| 60 | Business Group N | Head of Dept. of Environmental Protection | Affiliate: Food and beverage firm | 14:00-15:30 Sep. 24, 2014 |
| 61 | Business Group N | Employee at Dept. of Environmental Protection | Affiliate: Food and beverage firm | 15:30-16:30 Sep. 24, 2014 |
| 62 | Firm O | Employee | Waste solid disposal company | 8:30-9:30 Sep. 25, 2014 |
| 63 | Firm P | Chair | Waste solid disposal company | 9:30-11:00 Sep. 25, 2014 |
| 64 | Firm Q | Industry analyst | Security company | 11:00-12:00 Mar. 16, 2013 |
| 65 | Firm R | CEO | Fertilizer company | 14:00-15:00 Mar. 16, 2013 |
| 66 | Government S | Vice Head | Municipal EPB | 9:00-9:50 May 2, 2013 |
| 25 | Firm K | Engineer | Car manufacturer | 12:00-13:00 May 2, 2013 |
| 67 | NGO T | Chief Secretary | Environmental NGO | 17:00-18:00 May 15, 2013 |
| 68 | Firm U | Industry analyst | Security company | 15:30-16:30 Jun. 15, 2013 |
| 69 | Firm V | Head of Dept. of Environmental Protection | Car manufacturer | 10:00-11:00 Jun. 17, 2013 |
| 70 | Firm W | Industry analyst | Security company | 15:00-16:00 Jun. 20, 2013 |

| | | | | |
|---|---|---|---|---|
| 71 | Firm X | Chair assistant | Garbage disposal company | 17:00-18:00 Jun. 28, 2013 |
| 72 | Firm Y | Head of Dept. of Environmental Protection | Iron and steel company | 11:30-12:30 Jul. 1, 2013 |
| 73 | Government Z | Vice Head | County EPB | 14:20-15:10 Jul. 2, 2013 |

**Summary**

China has accomplished remarkable economic achievement during the past several decades. Yet, it has been confronted with unprecedented, overwhelming pressures to address its severe environmental challenges, both from domestic and international societies—all the more since the world has become increasingly critical on non-sustainable developmental strategies. While the corporate environmentalism literature has shed light on how different stakeholders such as government, industry, and civil society can exert their influences on corporate environmentalism in developed economies, there is a dearth in both theories and empirics that explain (1) the complexity within a single constituent that could be impactful through multiple and sometimes contradictory expectations on firm behaviors, (2) the environmental strategies in the business group form that is prevalent in Asian and emerging economies, and (3) how the world's largest emerging economy, China, is addressing its environmental problems in an almost utterly different context than what has been explored in the developed western countries.

In this dissertation, I build on corporate environmentalism, business group, and China studies literatures in an attempt to reveal a comprehensive picture of how different external and internal forces jointly influence the corporate environmental strategies in the emerging economy of China. The *first* study probes into the complex impact exerted by the multiple levels of the Chinese state on corporate environmental practices in Chinese listed firms. We argue that different parts of a constituent, such as the different levels of the Chinese state in the political bureaucratic structure, do not necessarily align their demands when pursuing economic and sustainable development goals. Results from both statistical analysis and in-depth interviews show that a firm's administrative hierarchical distance to the central government has an inverted U-shaped effect on corporate environmental practices. Such a curvilinear relationship is positively moderated by sectoral or regional regulatory stringency a focal firm resides in, and negatively by state financial participation in the ownership structure of the listed firms.

In the *second* study, I investigate the factors that result in the differences in environmental management system adoption by business group affiliates in China. We propose and explore two divergent types of mechanisms, pressure sensitivity and pressure

resistance, through which business group affiliates respond to environmental compliance pressures according to their group-related characteristics. Results from panel data analysis reveal that being affiliated with a family-owned business group and having a business model centered on business-to-consumer markets renders business group affiliates more sensitive to environmental issues, inducing them to adopt formal environmental management systems. On the other hand, being a core member of a business group and being shielded by corporate political connections make affiliated firms more resistant to adopting such systems.

In sum, findings from these two empirical studies exploring corporate environmental strategies in Chinese firms suggest that (1) the Chinese state has multiple faces at different levels in the political hierarchy, exerting non-concerted influences on corporate environmental practices, (2) there is heterogeneity among Chinese business group affiliates on environmental strategies caused by their pressure sensitive and pressure resistant attributes. Jointly, these two studies offer a novel, more nuanced understanding of the mechanisms that impact corporate environmentalism. The policies at lower state levels are more likely to be decoupled from policies issued at higher levels because of different interests and development agendas. Furthermore, business group affiliates can be simultaneously sensitive and resistant to environmental compliance pressures, depending on the types of group-related attributes. The findings from this dissertation are not only applicable to China but also to other settings, including developed federal states where decentralized autonomy prevails as well as other emerging economies where the business group is an important economic force.

**Samenvatting**

In de afgelopen decennia heeft China indrukwekkende economische ontwikkelingen bewerkstelligd. Het land werd echter geconfronteerd met een ongekende, overweldigende druk om aandacht te besteden aan de enorme ecologische uitdagingen, zowel vanuit binnenlandse als internationale gemeenschappen—des te meer omdat de wereld steeds kritischer wordt op het inzetten van niet-duurzame ontwikkelingsstrategieën.

Hoewel de literatuur op het gebied van milieugedrag van bedrijven duidelijkheid biedt over hoe verschillende belanghebbende partijen, zoals overheid, industrie en het maatschappelijk middenveld, hun invloed uitoefenen op milieuverantwoord ondernemen in ontwikkelde landen, is er een theoretische en empirische schaarste bij de verklaring van (1) complexiteit ten gevolge van verschillende en soms tegenstrijdige verwachtingen binnen één en dezelfde partij ten aanzien van ondernemingsgedrag, (2) de milieustrategieën in bedrijfsgroepen, die veel vóórkomen in Azië en opkomende economieën, en (3) hoe de grootste opkomende economie in de wereld, China, haar mileuproblematiek benadert op basis van een vrijwel compleet andere context dan die van eerder onderzochte, ontwikkelde westerse landen.

In deze dissertatie gebruik ik de literatuur op het gebied van milieugedrag van bedrijven, bedrijfsgroepen en studies over China om te pogen een compleet beeld te scheppen van hoe verschillende externe en interne krachten samen invloed uitoefenen op milieustrategieën van bedrijven in de opkomende economie van China. De eerste studie onderzoekt de complexe invloed die uitgeoefend wordt door diverse niveaus van het Chinese overheidssysteem op de milieupraktijken van beursgenoteerde Chinese bedrijven. We betogen dat verschillende onderdelen van een belanghebbende, zoals de verschillende niveaus van de Chinese overheid in de politiek-bureaucratische structuur, niet zonder meer hun aanspraken stroomlijnen bij het nastreven van economische en duurzame ontwikkelingsdoelstellingen. Resultaten van zowel statistische analyse als diepte-interviews laten zien dat de administratief-hiërarchische afstand van een bedrijf tot de centrale overheid het effect van een omgekeerde U-vorm heeft op de milieupraktijken van bedrijven. Deze curvilineaire relatie wordt positief gemodereerd door de sectorale of

regionale striktheid van relevant regelgeving en negatief gemodereerd door financiële staatsparticipatie in de eigendomsstructuur van beursgenoteerde bedrijven.

In de tweede studie onderzoek ik de factoren die resulteren in de verschillen in adoptie van milieuzorgsystemen door leden van bedrijfsgroepen in China. We onderscheiden en onderzoeken twee verschillende soorten mechanismen, gevoeligheid voor druk en weerstand tegen druk, die verklaren hoe leden van bedrijfsgroepen reageren op druk om milieuregelgeving na te leven. De resultaten van paneldata-analyse onthullen dat het gerelateerd zijn aan een bedrijfsgroep met familiebedrijven en het hebben van een ondernemingsmodel dat gericht is op de consumentenmarkt de leden van een businessgroep gevoeliger maakt voor milieu-gerelateerde onderwerpen, waardoor zij geneigd zijn om formele milieuzorgsystemen in gebruik te nemen. Aan de andere kant leiden een kernpositie binnen een bedrijfsgroep en politieke connecties tot meer weerstand bij leden van een bedrijfsgroep ten aanzien van de adoptie van zulke systemen.

In conclusie, de bevindingen van deze twee empirische studies, waarin de milieustrategieën van Chinese bedrijven centraal staan, impliceren dat (1) de Chinese overheid op verschillende niveaus in de politieke hiërarchie verschillende gezichten heeft, die op een niet-gestroomlijnde manier invloed uitoefenen op de milieupraktijken van bedrijven, (2) er bestaan verschillen tussen leden van Chinese bedrijfsgroepen inzake milieustrategieën ten gevolge van eigenschappen op het gebied van gevoeligheid voor en weerstand tegen druk. Samen bieden deze twee studies een vernieuwend, meer genuanceerd begrip van de mechanismen die invloed hebben op milieupraktijken van bedrijven. Het beleid op lagere overheidsniveaus is eerder losgekoppeld van het beleid op hogere niveaus vanwege verschillende belangen en ontwikkelingsagenda's. Daarnaast kunnen leden van bedrijfsgroepen tegelijkertijd gevoelig zijn voor druk als hiertegen weerstand bieden, afhankelijk van het type groep-gerelateerde attributen. De bevindingen van dit proefschrift zijn niet enkel toepasbaar op China maar ook op andere situaties, waaronder ontwikkelde federale staten met hun decentrale autonomie alsmede opkomende economieën met hun belangrijke bedrijfsgroepen.

## 概要 (Summary in Chinese)

在过去的几十年里，中国经济完成了跨越式的发展。然而，在世界日益难以容忍不可持续发展的经济模式的当代，中国也因此正在面临从国际社会到国内社会在环境保护领域所施与的前所未有的压力。现有文献已完整地研究了诸如政府、行业、民众等利益相关者在发达国家中如何影响企业环境行为。但我们在理论上和实证上都还欠缺对以下一系列问题的理解：（1）一个相关者主体内部的复杂结构和其对企业行为的不一致预期具有何种影响力；（2）亚洲和发展中国家盛行的组织模式—商业集团—中的企业环境决策；以及（3）在几乎完全不同于西方发达国家的情境中，世界最有影响力的发展中的经济体—中国—如何处理它的环境问题。

本论文基于公司环境主义、企业集团以及对中国的以往研究，试图全面展现在发展中的经济体—中国，外部和内部的诸多因素如何同时影响公司环境决策。**研究一**探索中国政府的多层级结构对中国上市公司的企业环境行为的复杂影响。该研究的主要论点是，在考虑经济发展和可持续发展二者如何平衡的时候，一个利益相关者主体内的多个部分—诸如组成中国政府的多个政治层级—未必有着一套统一且单一的主张和需求。本研究的统计分析和深层次的访谈结果都显示，中国上市公司与中央政府在政治结构中的距离对企业环境行为的影响呈现倒 U 型。这种倒 U 型影响会被企业所在地方或行业法规执行的严厉程度正向调节，而被政府控制企业股份的程度负向调节。

**在研究二**中，我考察影响中国企业集团的附属子公司做出是否采用环境管理体系的不同决策的多种因素。我们提出并探究两种不同的机制：对压力敏感机制、对压力抵制机制。这两种机制使得企业集团的附属子公司根据自身所具有的商业集团的相关属性对环境保护带来的压力做出不同的应对决策。面板数据结果显示，作为家族企业的商业集团的一员、商业模式集中于企业对消费者（B2C），这两者会让附属子公司对环境类压力更加敏感，从而采用环境管理体系。另一方面，作为一个商业集团的核心企业、拥有多个政治关联，这两者会使得商业集团子公司抵制采用环境管理体系。

综上所述，本论文中针对中国企业的环境决策的两个实证研究说明：（1）中国政府在不同的政治层级有不同的主张和需求。这些主张和需求对企业环境行为施加了各自的、有分别的影响。（2）中国的商业集团附属子公司的环境决策有差异。这些差异来自于商业集团以及其子公司的对压力敏感和抵制的多个属性。这两个研究共同提供了一个更复杂、更新颖的视角来研究对公司环境主义的重要影响机制。在不同的利益和发展策略的影响下，较低层级的政府更有可能与高层级政府不一致。另外，商业集团的附属公司可以同时既是对环境压力敏感的，又是对环境压力抵制的—取决于它们的商业集团属性。本论文的研究结果不仅仅适用于中国，也可以扩展到其他地方政府具有高度自主性的发达联邦制国家，并且对一些商业集团在经济中占据主导地位的经济体也具有推广意义。

**About the author**

Ruxi Wang (1987) received a Master degree in Applied Economics from Jinhe Center for Economic Research in 2012 and a Bachelor degree in Information Engineering from the School of Electronic and Information Engineering in 2009, both with honor, from Xi'an Jiaotong University, China. In 2012, she started her PhD at the Department of Strategy and Entrepreneurship, Rotterdam School of Management (RSM), working together with Professor Dr. Pursey Heugens and Dr. Frank Wijen. As part of her PhD trajectory, she was also a visiting scholar at Guanghua School of Management, Peking University, China.

Ruxi's general research interests center around corporate social responsibility, political strategies, business groups, institutional theory, and China studies. Specifically, her Phd project investigates how the effectiveness of the environmental institution could be achieved in the context of China. She is also enthusiastic about how social interpretation and social pressure of political connection can affect corporate and individual behaviors in firms. She has expertise in mixed research methods including panel data analysis, content analysis, and case studies. Her studies have been presented at several international conferences including Academy of Management (AoM) Annual Meeting, European Group of Organizational Studies (EGOS) Colloquium, Alliance for Research in Corporate Sustainability (ARCS) Annual Conference, and Strategic Management Society (SMS) Annual Meeting, and are under review at top-tier journals.

**Portfolio**

***Publications***

Wang, R. and Wijen, F. 2015. Responding to Complexity within a State Logic: Environmental Responsibility Reporting in China. Best Paper Proceedings of the 2015 Academy of Management Meeting.

Li Guoping, and Wang Ruxi. 2014. Empirical Study of the Mineral 'Resource Curse' in China: From the Perspective of Ecological Footprint, Statistics and Decision, in Chinese.

***Working papers:***

Wang, R., Wijen, F., and Heugens, P. Government's Green Grip: Multifaceted State Influence on Corporate Environmental Practices in China.

Wang, R., Heugens, P, and Wijen, F. Differences in Environmental Management System Adoption among Chinese Business Group Affiliates.

Benischke, M., Doh, J., and Wang, R. CSR Status and Acquisition Outcomes.

Wang, R., and Zhang, J. Political Connections and CSR performances.

Wang, R., Wijen, F, and Heugens, P. Rule of People versus Rule of Law: the Effectiveness of Environmental Institutional Work in China.

Wang, R., and Wang, P. Social Pressures and Disrupting Work: Dynamics in the Political Connections in Chinese Listed Firms.

***Research visit***

From October 2016 to May 2017, research visit to the Guanghua School of Management, Peking University, invited by Professor Jianjun Zhang.

***Teaching and supervising activities***

2016 Sustainable Strategies, MSc. Elective, Rotterdam School of Management, Erasmus University. Number: 42.

2015 Strategic Management, MSc. student thesis, Rotterdam School of Management, Erasmus University. Number of students: 19.

2015 Strategic Management, BSc. student internship, Rotterdam School of Management, Erasmus University. Number of students: 3.

2014 Strategic Business Plan, BSc. students, Rotterdam School of Management, Erasmus University. Number of students: 64.

***Conference presentations***

2016 Wang, R. and Heugens, P. Strategic Heterogeneity in environmental management system adoption amongst Chinese business group affiliates. SMS (Berlin, Germany).

2015 Wang, R. and Wijen, F. Responding to Complexity within a State Logic: Environmental Responsibility Reporting in China. AOM (Vancouver, Canada).

2015 Wang, R. and Wijen, F. Multifaceted State Influence on Corporate Environmentalism in China. Annual Meeting of the Academy of Management (Vancouver, Canada); Alliance for Research on Corporate Sustainability 7th Annual Research Conference (Chicago, IL).

2015 Wang, R. The Effectiveness of the Environmental Institutions in China. 31st European Group of Organizational Studies Pre-colloquium Workshop (Athens, Greece).

2014 Wang, R. and Wijen, F. Complexity within Logics: The Multiple Influences of the Chinese State on Corporate Environmentalism. 30th European Group of Organizational Studies Colloquium (Rotterdam, the Netherlands).

2013 Wang, R. The Diffusion of the Environmental Logic in the Hybrid Organizations. Dutch Institutional Theorists Meeting (Tilburg, the Netherlands).

***PhD course***

Scientific Integrity

English

Advances in the Economics of Entrepreneurship

Institutional Advantage

Social Networks and Market Competition

Applied Econometrics

Statistical Methods

Event History & Survival Analysis

Advanced Qualitative Methods

Case Studies in Management and Business Research

***Language***

Chinese Mandarin: native
English: proficient
French: preliminary

## The ERIM PhD Series

The ERIM PhD Series contains PhD dissertations in the field of Research in Management defended at Erasmus University Rotterdam and supervised by senior researchers affiliated to the Erasmus Research Institute of Management (ERIM). All dissertations in the ERIM PhD Series are available in full text through the ERIM Electronic Series Portal: http://repub.eur.nl/pub. ERIM is the joint research institute of the Rotterdam School of Management (RSM) and the Erasmus School of Economics at the Erasmus University Rotterdam (EUR).

### Dissertations in the last five years

Abbink, E.J., *Crew Management in Passenger Rail Transport*, Promotors: Prof. L.G. Kroon & Prof. A.P.M. Wagelmans, EPS-2014-325-LIS, http://repub.eur.nl/pub/76927

Acar, O.A., *Crowdsourcing for Innovation: Unpacking Motivational, Knowledge and Relational Mechanisms of Innovative Behavior in Crowdsourcing Platforms*, Promotor: Prof. J.C.M. van den Ende, EPS-2014-321-LIS, http://repub.eur.nl/pub/76076

Akin Ates, M., *Purchasing and Supply Management at the Purchase Category Level: Strategy, structure and performance*, Promotors: Prof. J.Y.F. Wynstra & Dr E.M. van Raaij, EPS-2014-300-LIS, http://repub.eur.nl/pub/50283

Akpinar, E., *Consumer Information Sharing*, Promotor: Prof. A. Smidts, EPS-2013-297-MKT, http://repub.eur.nl/pub/50140

Alexander, L., *People, Politics, and Innovation: A Process Perspective*, Promotors: Prof. H.G. Barkema & Prof. D.L. van Knippenberg, EPS-2014-331-S&E, http://repub.eur.nl/pub/77209

Alexiou, A. *Management of Emerging Technologies and the Learning Organization: Lessons from the Cloud and Serious Games Technology*, Promotors: Prof. S.J. Magala, Prof. M.C. Schippers and Dr I. Oshri, EPS-2016-404-ORG, http://repub.eur.nl/pub/93818

Almeida e Santos Nogueira, R.J. de, *Conditional Density Models Integrating Fuzzy and Probabilistic Representations of Uncertainty*, Promotors: Prof. U. Kaymak & Prof. J.M.C. Sousa, EPS-2014-310-LIS, http://repub.eur.nl/pub/51560

Bannouh, K., *Measuring and Forecasting Financial Market Volatility using High-frequency Data*, Promotor: Prof. D.J.C. van Dijk, EPS-2013-273-F&A, http://repub.eur.nl/pub/38240

Ben-Menahem, S.M., *Strategic Timing and Proactiveness of Organizations*, Promotors: Prof. H.W. Volberda & Prof. F.A.J. van den Bosch, EPS-2013-278-S&E, http://repub.eur.nl/pub/39128

Benschop, N, *Biases in Project Escalation: Names, frames & construal levels*, Promotors: Prof. K.I.M. Rhode, Prof. H.R. Commandeur, Prof. M. Keil & Dr A.L.P. Nuijten, EPS-2015-375-S&E, http://repub.eur.nl/pub/79408

Berg, W.E. van den, *Understanding Salesforce Behavior using Genetic Association Studies*, Promotor: Prof. W.J.M.I. Verbeke, EPS-2014-311-MKT, http://repub.eur.nl/pub/51440

Beusichem, H.C. van, *Firms and Financial Markets: Empirical Studies on the Informational Value of Dividends, Governance and Financial Reporting*, Promotors: Prof. A. de Jong & Dr G. Westerhuis, EPS-2016-378-F&A, http://repub.eur.nl/pub/93079

Bliek, R. de, *Empirical Studies on the Economic Impact of Trust*, Promotor: Prof. J. Veenman & Prof. Ph.H.B.F. Franses, EPS-2015-324-ORG, http://repub.eur.nl/pub/78159

Boons, M., *Working Together Alone in the Online Crowd: The Effects of Social Motivations and Individual Knowledge Backgrounds on the Participation and Performance of Members of Online Crowdsourcing Platforms*, Promotors: Prof. H.G. Barkema & Dr D.A. Stam, EPS-2014-306-S&E, http://repub.eur.nl/pub/50711

Brazys, J., *Aggregated Marcoeconomic News and Price Discovery*, Promotor: Prof. W.F.C. Verschoor, EPS-2015-351-F&A, http://repub.eur.nl/pub/78243

Byington, E., *Exploring Coworker Relationships: Antecedents and Dimensions of Interpersonal Fit, Coworker Satisfaction, and Relational Models*, Promotor: Prof. D.L. van Knippenberg, EPS-2013-292-ORG, http://repub.eur.nl/pub/41508

Cancurtaran, P., *Essays on Accelerated Product Development*, Promotors: Prof. F. Langerak & Prof. G.H. van Bruggen, EPS-2014-317-MKT, http://repub.eur.nl/pub/76074

Caron, E.A.M., *Explanation of Exceptional Values in Multi-dimensional Business Databases*, Promotors: Prof. H.A.M. Daniels & Prof. G.W.J. Hendrikse, EPS-2013-296-LIS, http://repub.eur.nl/pub/50005

Carvalho, L. de, *Knowledge Locations in Cities: Emergence and Development Dynamics*, Promotor: Prof. L. Berg, EPS-2013-274-S&E, http://repub.eur.nl/pub/38449

Cranenburgh, K.C. van, *Money or Ethics: Multinational corporations and religious organisations operating in an era of corporate responsibility*, Prof. L.C.P.M. Meijs, Prof. R.J.M. van Tulder & Dr D. Arenas, EPS-2016-385-ORG, http://repub.eur.nl/pub/93104

Consiglio, I., *Others: Essays on Interpersonal and Consumer Behavior*, Promotor: Prof. S.M.J. van Osselaer, EPS-2016-366-MKT, http://repub.eur.nl/pub/79820

Cox, R.H.G.M., *To Own, To Finance, and To Insure - Residential Real Estate Revealed*, Promotor: Prof. D. Brounen, EPS-2013-290-F&A, http://repub.eur.nl/pub/40964

Darnihamedani, P. *Individual Characteristics, Contextual Factors and Entrepreneurial Behavior*, Promotors: Prof. A.R. Thurik & S.J.A. Hessels, EPS-2016-360-S&E, http://repub.eur.nl/pub/93280

Deng, W., *Social Capital and Diversification of Cooperatives*, Promotor: Prof. G.W.J. Hendrikse, EPS-2015-341-ORG, http://repub.eur.nl/pub/77449

Depecik, B.E., *Revitalizing brands and brand: Essays on Brand and Brand Portfolio Management Strategies*, Promotors: Prof. G.H. van Bruggen, Dr Y.M. van Everdingen and Dr M.B. Ataman, EPS-2016-406-MKT, http://repub.eur.nl/pub/93507

Dollevoet, T.A.B., *Delay Management and Dispatching in Railways*, Promotor: Prof. A.P.M. Wagelmans, EPS-2013-272-LIS, http://repub.eur.nl/pub/38241

Duyvesteyn, J.G. *Empirical Studies on Sovereign Fixed Income Markets,* Promotors: Prof. P.Verwijmeren & Prof. M.P.E. Martens, EPS-2015-361-F&A, hdl.handle.net/1765/79033

Duursema, H., *Strategic Leadership: Moving Beyond the Leader-Follower Dyad*, Promotor: Prof. R.J.M. van Tulder, EPS-2013-279-ORG, http://repub.eur.nl/pub/39129

Elemes, A, *Studies on Determinants and Consequences of Financial Reporting Quality,* Promotor: Prof. E. Peek, EPS-2015-354-F&A, http://hdl.handle.net/1765/79037

Ellen, S. ter, *Measurement, Dynamics, and Implications of Heterogeneous Beliefs in Financial Markets*, Promotor: Prof. W.F.C. Verschoor, EPS-2015-343-F&A, http://repub.eur.nl/pub/78191

Erlemann, C., *Gender and Leadership Aspiration: The Impact of the Organizational Environment*, Promotor: Prof. D.L. van Knippenberg, EPS-2016-376-ORG, http://repub.eur.nl/pub/79409

Eskenazi, P.I., *The Accountable Animal*, Promotor: Prof. F.G.H. Hartmann, EPS-2015-355-F&A, http://repub.eur.nl/pub/78300

Evangelidis, I., *Preference Construction under Prominence*, Promotor: Prof. S.M.J. van Osselaer, EPS-2015-340-MKT, http://repub.eur.nl/pub/78202

Faber, N., *Structuring Warehouse Management*, Promotors: Prof. M.B.M. de Koster & Prof. A. Smidts, EPS-2015-336-LIS, http://repub.eur.nl/pub/78603

Fernald, K., *The Waves of Biotechnological Innovation in Medicine: Interfirm Cooperation Effects and a Venture Capital Perspective,* Promotors: Prof. E. Claassen, Prof. H.P.G. Pennings & Prof. H.R. Commandeur, EPS-2015-371-S&E, http://hdl.handle.net/1765/79120

Fisch, C.O., *Patents and trademarks: Motivations, antecedents, and value in industrialized and emerging markets*, Promotors: Prof. J.H. Block, Prof. H.P.G. Pennings & Prof. A.R. Thurik, EPS-2016-397-S&E, http://repub.eur.nl/pub/94036

Fliers, P.T., *Essays on Financing and Performance: The role of firms, banks and board*, Promotor: Prof. A. de Jong & Prof. P.G.J. Roosenboom, EPS-2016-388-F&A, http://repub.eur.nl/pub/93019

Fourne, S.P., *Managing Organizational Tensions: A Multi-Level Perspective on Exploration, Exploitation and Ambidexterity*, Promotors: Prof. J.J.P. Jansen & Prof. S.J. Magala, EPS-2014-318-S&E, http://repub.eur.nl/pub/76075

Gaast, J.P. van der, *Stochastic Models for Order Picking Systems*, Promotors: Prof. M.B.M de Koster & Prof. I.J.B.F. Adan, EPS-2016-398-LIS, http://repub.eur.nl/pub/93222

Glorie, K.M., *Clearing Barter Exchange Markets: Kidney Exchange and Beyond*, Promotors: Prof. A.P.M. Wagelmans & Prof. J.J. van de Klundert, EPS-2014-329-LIS, http://repub.eur.nl/pub/77183

Hekimoglu, M., *Spare Parts Management of Aging Capital Products,* Promotor: Prof. R. Dekker, EPS-2015-368-LIS, http://repub.eur.nl/pub/79092

Heyde Fernandes, D. von der, *The Functions and Dysfunctions of Reminders*, Promotor: Prof. S.M.J. van Osselaer, EPS-2013-295-MKT, http://repub.eur.nl/pub/41514

Hogenboom, A.C., *Sentiment Analysis of Text Guided by Semantics and Structure,* Promotors: Prof. U. Kaymak & Prof. F.M.G. de Jong, EPS-2015-369-LIS, http://repub.eur.nl/pub/79034

Hogenboom, F.P., *Automated Detection of Financial Events in News Text*, Promotors: Prof. U. Kaymak & Prof. F.M.G. de Jong, EPS-2014-326-LIS, http://repub.eur.nl/pub/77237

Hollen, R.M.A., *Exploratory Studies into Strategies to Enhance Innovation-Driven International Competitiveness in a Port Context: Toward Ambidextrous Ports,* Promotors: Prof. F.A.J. Van Den Bosch & Prof. H.W.Volberda, EPS-2015-372-S&E, http://repub.eur.nl/pub/78881

Hout, D.H. van, *Measuring Meaningful Differences: Sensory Testing Based Decision Making in an Industrial Context; Applications of Signal Detection Theory and Thurstonian Modelling*, Promotors: Prof. P.J.F. Groenen & Prof. G.B. Dijksterhuis, EPS-2014-304-MKT, http://repub.eur.nl/pub/50387

Houwelingen, G.G. van, *Something To Rely On*, Promotors: Prof. D. de Cremer & Prof. M.H. van Dijke, EPS-2014-335-ORG, http://repub.eur.nl/pub/77320

Hurk, E. van der, *Passengers, Information, and Disruptions*, Promotors: Prof. L.G. Kroon & Prof. P.H.M. Vervest, EPS-2015-345-LIS, http://repub.eur.nl/pub/78275

Iseger, P. den, *Fourier and Laplace Transform Inversion with Applications in Finance*, Promotor: Prof. R. Dekker, EPS-2014-322-LIS, http://repub.eur.nl/pub/76954

Jaarsveld, W.L. van, *Maintenance Centered Service Parts Inventory Control*, Promotor: Prof. R. Dekker, EPS-2013-288-LIS, http://repub.eur.nl/pub/39933

Khanagha, S., *Dynamic Capabilities for Managing Emerging Technologies*, Promotor: Prof. H.W. Volberda, EPS-2014-339-S&E, http://repub.eur.nl/pub/77319

Kil, J., *Acquisitions Through a Behavioral and Real Options Lens*, Promotor: Prof. H.T.J. Smit, EPS-2013-298-F&A, http://repub.eur.nl/pub/50142

Klooster, E. van't, *Travel to Learn: the Influence of Cultural Distance on Competence Development in Educational Travel*, Promotors: Prof. F.M. Go & Prof. P.J. van Baalen, EPS-2014-312-MKT, http://repub.eur.nl/pub/51462

Koendjbiharie, S.R., *The Information-Based View on Business Network Performance: Revealing the Performance of Interorganizational Networks*, Promotors: Prof. H.W.G.M. van Heck & Prof. P.H.M. Vervest, EPS-2014-315-LIS, http://repub.eur.nl/pub/51751

Koning, M., *The Financial Reporting Environment: The Role of the Media, Regulators and Auditors*, Promotors: Prof. G.M.H. Mertens & Prof. P.G.J. Roosenboom, EPS-2014-330-F&A, http://repub.eur.nl/pub/77154

Konter, D.J., *Crossing Borders with HRM: An Inquiry of the Influence of Contextual Differences in the Adoption and Effectiveness of HRM*, Promotors: Prof. J. Paauwe & Dr L.H. Hoeksema, EPS-2014-305-ORG, http://repub.eur.nl/pub/50388

Korkmaz, E., *Bridging Models and Business: Understanding Heterogeneity in Hidden Drivers of Customer Purchase Behavior*, Promotors: Prof. S.L. van de Velde & Prof. D. Fok, EPS-2014-316-LIS, http://repub.eur.nl/pub/76008

Krämer, R., *A license to mine? Community organizing against multinational corporations*, Promotors: Prof. R.J.M. van Tulder & Prof. G.M. Whiteman, EPS-2016-383-ORG, http://repub.eur.nl/pub/94072

Kroezen, J.J., *The Renewal of Mature Industries: An Examination of the Revival of the Dutch Beer Brewing Industry*, Promotor: Prof. P.P.M.A.R. Heugens, EPS-2014-333-S&E, http://repub.eur.nl/pub/77042

Kysucky, V., *Access to Finance in a Cros-Country Context*, Promotor: Prof. L. Norden, EPS-2015-350-F&A, http://repub.eur.nl/pub/78225

Lee, C.I.S.G, *Big Data in Management Research: Exploring New Avenues*, Promotors: Prof. S.J. Magala & Dr W.A. Felps, EPS-2016-365-ORG, http://repub.eur.nl/pub/79818

Legault-Tremblay, P.O., *Corporate Governance During Market Transition: Heterogeneous responses to Institution Tensions in China*, Promotor: Prof. B. Krug, EPS-2015-362-ORG, http://repub.eur.nl/pub/78649

Lenoir, A.S. *Are You Talking to Me? Addressing Consumers in a Globalised World,* Promotors: Prof. S. Puntoni & Prof. S.M.J. van Osselaer, EPS-2015-363-MKT, http://repub.eur.nl/pub/79036

Leunissen, J.M., *All Apologies: On the Willingness of Perpetrators to Apologize*, Promotors: Prof. D. de Cremer & Dr M. van Dijke, EPS-2014-301-ORG, http://repub.eur.nl/pub/50318

Li, D., *Supply Chain Contracting for After-sales Service and Product Support*, Promotor: Prof. M.B.M. de Koster, EPS-2015-347-LIS, http://repub.eur.nl/pub/78526

Li, Z., *Irrationality: What, Why and How*, Promotors: Prof. H. Bleichrodt, Prof. P.P. Wakker, & Prof. K.I.M. Rohde, EPS-2014-338-MKT, http://repub.eur.nl/pub/77205

Liang, Q.X., *Governance, CEO Identity, and Quality Provision of Farmer Cooperatives*, Promotor: Prof. G.W.J. Hendrikse, EPS-2013-281-ORG, http://repub.eur.nl/pub/39253

Liket, K., *Why 'Doing Good' is not Good Enough: Essays on Social Impact Measurement*, Promotors: Prof. H.R. Commandeur & Dr K.E.H. Maas, EPS-2014-307-STR, http://repub.eur.nl/pub/51130

Loos, M.J.H.M. van der, *Molecular Genetics and Hormones: New Frontiers in Entrepreneurship Research*, Promotors: Prof. A.R. Thurik, Prof. P.J.F. Groenen, & Prof. A. Hofman, EPS-2013-287-S&E, http://repub.eur.nl/pub/40081

Lu, Y., *Data-Driven Decision Making in Auction Markets*, Promotors: Prof. H.W.G.M. van Heck & Prof. W. Ketter, EPS-2014-314-LIS, http://repub.eur.nl/pub/51543

Ma, Y., *The Use of Advanced Transportation Monitoring Data for Official Statistics,* Promotors: Prof. L.G. Kroon and Dr J. van Dalen, EPS-2016-391-LIS, http://repub.eur.nl/pub/80174

Manders, B., *Implementation and Impact of ISO 9001*, Promotor: Prof. K. Blind, EPS-2014-337-LIS, http://repub.eur.nl/pub/77412

Mell, J.N., *Connecting Minds: On The Role of Metaknowledge in Knowledge Coordination*, Promotor: Prof. D.L. van Knippenberg, EPS-2015-359-ORG, http://hdl.handle.net/1765/78951

Meulen,van der, D., *The Distance Dilemma: the effect of flexible working practices on performance in the digital workplace*, Promotors: Prof. H.W.G.M. van Heck & Prof. P.J. van Baalen, EPS-2016-403-LIS, http://repub.eur.nl/pub/94033

Micheli, M.R., *Business Model Innovation: A Journey across Managers' Attention and Inter-Organizational Networks*, Promotor: Prof. J.J.P. Jansen, EPS-2015-344-S&E, http://repub.eur.nl/pub/78241

Milea, V., *News Analytics for Financial Decision Support*, Promotor: Prof. U. Kaymak, EPS-2013-275-LIS, http://repub.eur.nl/pub/38673

Moniz, A, *Textual Analysis of Intangible Information*, Promotors: Prof. C.B.M. van Riel, Prof. F.M.G de Jong & Dr G.A.J.M. Berens, EPS-2016-393-ORG, http://repub.eur.nl/pub/93001

Mulder, J. *Network design and robust scheduling in liner shipping*, Promotors: Prof. R. Dekker & Dr W.L. van Jaarsveld, EPS-2016-384-LIS, http://repub.eur.nl/pub/80258

Naumovska, I., *Socially Situated Financial Markets: A Neo-Behavioral Perspective on Firms, Investors and Practices*, Promotors: Prof. P.P.M.A.R. Heugens & Prof. A. de Jong, EPS-2014-319-S&E, http://repub.eur.nl/pub/76084

Neerijnen, P., *The Adaptive Organization: the socio-cognitive antecedents of ambidexterity and individual exploration*, Promotors: Prof. J.J.P. Jansen, P.P.M.A.R. Heugens & Dr T.J.M. Mom, EPS-2016-358-S&E, http://repub.eur.nl/pub/93274

Oord, J.A. van, *Essays on Momentum Strategies in Finance*, Promotor: Prof. H.K. van Dijk, EPS-2016-380-F&A, http://repub.eur.nl/pub/80036

Pennings, C.L.P., *Advancements in Demand Forecasting: Methods and Behavior*, Promotors: Prof. L.G. Kroon, Prof. H.W.G.M. van Heck & Dr J. van Dalen, EPS-2016-400-LIS, http://repub.eur.nl/pub/94039

Peters, M., *Machine Learning Algorithms for Smart Electricity Markets*, Promotor: Prof. W. Ketter, EPS-2014-332-LIS, http://repub.eur.nl/pub/77413

Porck, J., *No Team is an Island: An Integrative View of Strategic Consensus between Groups*, Promotors: Prof. P.J.F. Groenen & Prof. D.L. van Knippenberg, EPS-2013-299-ORG, http://repub.eur.nl/pub/50141

Pronker, E.S., *Innovation Paradox in Vaccine Target Selection*, Promotors: Prof. H.J.H.M. Claassen & Prof. H.R. Commandeur, EPS-2013-282-S&E, http://repub.eur.nl/pub/39654

Protzner, S. *Mind the gap between demand and supply: A behavioral perspective on demand forecasting,* Promotors: Prof. S.L. van de Velde & Dr L. Rook, EPS-2015-364-LIS, *http*://repub.eur.nl/pub/79355

Pruijssers, J.K., *An Organizational Perspective on Auditor Conduct*, Promotors: Prof. J. van Oosterhout & Prof. P.P.M.A.R. Heugens, EPS-2015-342-S&E, http://repub.eur.nl/pub/78192

Retel Helmrich, M.J., *Green Lot-Sizing*, Promotor: Prof. A.P.M. Wagelmans, EPS-2013-291-LIS, http://repub.eur.nl/pub/41330

Rietdijk, W.J.R. *The Use of Cognitive Factors for Explaining Entrepreneurship,* Promotors: Prof. A.R. Thurik & Prof. I.H.A. Franken, EPS-2015-356-S&E, http://repub.eur.nl/pub/79817

Rietveld, N., *Essays on the Intersection of Economics and Biology*, Promotors: Prof. A.R. Thurik, Prof. Ph.D. Koellinger, Prof. P.J.F. Groenen, & Prof. A. Hofman, EPS-2014-320-S&E, http://repub.eur.nl/pub/76907

Rösch, D. *Market Efficiency and Liquidity,* Promotor: Prof. M.A. van Dijk, EPS-2015-353-F&A, http://repub.eur.nl/pub/79121

Roza, L., *Employee Engagement in Corporate Social Responsibility: A collection of essays*, Promotor: L.C.P.M. Meijs, EPS-2016-396-ORG, http://repub.eur.nl/pub/93254

Rubbaniy, G., *Investment Behaviour of Institutional Investors*, Promotor: Prof. W.F.C. Verschoor, EPS-2013-284-F&A, http://repub.eur.nl/pub/40068

Schoonees, P. *Methods for Modelling Response Styles*, Promotor: Prof.dr P.J.F. Groenen, EPS-2015-348-MKT, http://repub.eur.nl/pub/79327

Schouten, M.E., *The Ups and Downs of Hierarchy: the causes and consequences of hierarchy struggles and positional loss*, Promotors; Prof. D.L. van Knippenberg & Dr L.L. Greer, EPS-2016-386-ORG, http://repub.eur.nl/pub/80059

Shahzad, K., *Credit Rating Agencies, Financial Regulations and the Capital Markets*, Promotor: Prof. G.M.H. Mertens, EPS-2013-283-F&A, http://repub.eur.nl/pub/39655

Smit, J. *Unlocking Business Model Innovation: A look through the keyhole at the inner workings of Business Model Innovation*, Promotor: H.G. Barkema, EPS-2016-399-S&E, http://repub.eur.nl/pub/93211

Sousa, M.J.C. de, *Servant Leadership to the Test: New Perspectives and Insights*, Promotors: Prof. D.L. van Knippenberg & Dr D. van Dierendonck, EPS-2014-313-ORG, http://repub.eur.nl/pub/51537

Spliet, R., *Vehicle Routing with Uncertain Demand*, Promotor: Prof. R. Dekker, EPS-2013-293-LIS, http://repub.eur.nl/pub/41513

Staadt, J.L., *Leading Public Housing Organisation in a Problematic Situation: A Critical Soft Systems Methodology Approach*, Promotor: Prof. S.J. Magala, EPS-2014-308-ORG, http://repub.eur.nl/pub/50712

Stallen, M., *Social Context Effects on Decision-Making: A Neurobiological Approach*, Promotor: Prof. A. Smidts, EPS-2013-285-MKT, http://repub.eur.nl/pub/39931

Szatmari, B., *We are (all) the champions: The effect of status in the implementation of innovations*, Promotors: Prof J.C.M & Dr D. Deichmann, EPS-2016-401-LIS, http://repub.eur.nl/pub/94633

Tarakci, M., *Behavioral Strategy: Strategic Consensus, Power and Networks*, Promotors: Prof. D.L. van Knippenberg & Prof. P.J.F. Groenen, EPS-2013-280-ORG, http://repub.eur.nl/pub/39130

Tuijl, E. van, *Upgrading across Organisational and Geographical Configurations*, Promotor: Prof. L. van den Berg, EPS-2015-349-S&E, http://repub.eur.nl/pub/78224

Tuncdogan, A., *Decision Making and Behavioral Strategy: The Role of Regulatory Focus in Corporate Innovation Processes*, Promotors: Prof. F.A.J. van den Bosch, Prof. H.W. Volberda, & Prof. T.J.M. Mom, EPS-2014-334-S&E, http://repub.eur.nl/pub/76978

Uijl, S. den, *The Emergence of De-facto Standards*, Promotor: Prof. K. Blind, EPS-2014-328-LIS, http://repub.eur.nl/pub/77382

Vagias, D., *Liquidity, Investors and International Capital Markets*, Promotor: Prof. M.A. van Dijk, EPS-2013-294-F&A, http://repub.eur.nl/pub/41511

Valogianni, K. *Sustainable Electric Vehicle Management using Coordinated Machine Learning*, Promotors: Prof. H.W.G.M. van Heck & Prof. W. Ketter, EPS-2016-387-LIS, http://repub.eur.nl/pub/93018

Veelenturf, L.P., *Disruption Management in Passenger Railways: Models for Timetable, Rolling Stock and Crew Rescheduling*, Promotor: Prof. L.G. Kroon, EPS-2014-327-LIS, http://repub.eur.nl/pub/77155

Venus, M., *Demystifying Visionary Leadership: In search of the essence of effective vision communication*, Promotor: Prof. D.L. van Knippenberg, EPS-2013-289-ORG, http://repub.eur.nl/pub/40079

Vermeer, W., *Propagation in Networks:The impact of information processing at the actor level on system-wide propagation dynamics,* Promotor: Prof. P.H.M.Vervest, EPS-2015-373-LIS, http://repub.eur.nl/pub/79325

Versluis, I., *Prevention of the Portion Size Effect*, Promotors: Prof. Ph.H.B.F. Franses & Dr E.K. Papies, EPS-2016-382-MKT, http://repub.eur.nl/pub/79880

Vishwanathan, P., *Governing for Stakeholders: How Organizations May Create or Destroy Value for their Stakeholders*, Promotors: Prof. J. van Oosterhout & Prof. L.C.P.M. Meijs, EPS-2016-377-ORG, http://repub.eur.nl/pub/93016

Visser, V.A., *Leader Affect and Leadership Effectiveness: How leader affective displays influence follower outcomes*, Promotor: Prof. D.L. van Knippenberg, EPS-2013-286-ORG, http://repub.eur.nl/pub/40076

Vries, J. de, *Behavioral Operations in Logistics,* Promotors: Prof. M.B.M de Koster & Prof. D.A. Stam, EPS-2015-374-LIS, http://repub.eur.nl/pub/79705

Wagenaar, J.C., *Practice Oriented Algorithmic Disruption Management in Passenger Railways*, Prof. L.G. Kroon & Prof. A.P.M. Wagelmans, EPS-2016-390-LIS, http://repub.eur.nl/pub/93177

Wang, P., *Innovations, status, and networks*, Promotors: Prof. J.J.P. Jansen & Dr V.J.A. van de Vrande, EPS-2016-381-S&E, http://repub.eur.nl/pub/93176

Wang, T., *Essays in Banking and Corporate Finance*, Promotors: Prof. L. Norden & Prof. P.G.J. Roosenboom, EPS-2015-352-F&A, http://repub.eur.nl/pub/78301

Wang, Y., *Corporate Reputation Management: Reaching Out to Financial Stakeholders*, Promotor: Prof. C.B.M. van Riel, EPS-2013-271-ORG, http://repub.eur.nl/pub/38675

Weenen, T.C., *On the Origin and Development of the Medical Nutrition Industry*, Promotors: Prof. H.R. Commandeur & Prof. H.J.H.M. Claassen, EPS-2014-309-S&E, http://repub.eur.nl/pub/51134

Wolfswinkel, M., *Corporate Governance, Firm Risk and Shareholder Value*, Promotor: Prof. A. de Jong, EPS-2013-277-F&A, http://repub.eur.nl/pub/39127

Yang, S., *Information Aggregation Efficiency of Prediction Markets*, Promotor: Prof. H.W.G.M. van Heck, EPS-2014-323-LIS, http://repub.eur.nl/pub/77184

Ypsilantis, P., *The Design, Planning and Execution of Sustainable Intermodal Port-hinterland Transport Networks*, Promotors: Prof. R.A. Zuidwijk & Prof. L.G. Kroon, EPS-2016-395-LIS, http://repub.eur.nl/pub/94375

Yuferova, D. *Price Discovery, Liquidity Provision, and Low-Latency Trading*, Promotors: Prof. M.A. van Dijk & Dr D.G.J. Bongaerts, EPS-2016-379-F&A, http://repub.eur.nl/pub/93017

Zaerpour, N., *Efficient Management of Compact Storage Systems*, Promotor: Prof. M.B.M. de Koster, EPS-2013-276-LIS, http://repub.eur.nl/pub/38766

Zuber, F.B., *Looking at the Others: Studies on (un)ethical behavior and social relationships in organizations*, Promotor: Prof. S.P. Kaptein, EPS-2016-394-ORG, http://repub.eur.nl/pub/94388

China has accomplished remarkable economic achievement during the past several decades. Yet, it has been confronted with unprecedented, overwhelming pressures to address its severe environmental challenges, both from domestic and international societies—all the more since the world has become increasingly critical on non-sustainable developmental strategies. While the corporate environmentalism literature has shed light on how different stakeholders such as government, industry, and civil society can exert their influences on corporate environmentalism in developed economies, there is a dearth in both theories and empirics that explain (1) the complexity within a single constituent that could be impactful through multiple and sometimes contradictory expectations on firm behaviors, (2) the environmental strategies in the business group form that is prevalent in Asian and emerging economies, and (3) how the world's largest emerging economy, China, is addressing its environmental problems in an almost utterly different context.

I build on corporate environmentalism, business group, and China studies literatures in an attempt to reveal a comprehensive picture of how different external and internal forces jointly influence the corporate environmental strategies in the emerging economy of China. Findings from two empirical studies exploring corporate environmental strategies in Chinese firms suggest that (1) the Chinese state has multiple faces at different levels in the political hierarchy, exerting non-concerted influences on corporate environmental practices, (2) there is heterogeneity among Chinese business group affiliates on environmental strategies caused by their pressure sensitive and pressure resistant attributes.

Jointly, these two studies offer a novel, more nuanced understanding of the mechanisms that impact corporate environmentalism. The findings from this dissertation are not only applicable to China but also to other settings, including developed federal states where decentralized autonomy prevails as well as other emerging economies where the business group is an important economic force.

**ERiM**

The Erasmus Research Institute of Management (ERIM) is the Research School (Onderzoekschool) in the field of management of the Erasmus University Rotterdam. The founding participants of ERIM are the Rotterdam School of Management (RSM), and the Erasmus School of Economics (ESE). ERIM was founded in 1999 and is officially accredited by the Royal Netherlands Academy of Arts and Sciences (KNAW). The research undertaken by ERIM is focused on the management of the firm in its environment, its intra- and interfirm relations, and its business processes in their interdependent connections.

The objective of ERIM is to carry out first rate research in management, and to offer an advanced doctoral programme in Research in Management. Within ERIM, over three hundred senior researchers and PhD candidates are active in the different research programmes. From a variety of academic backgrounds and expertises, the ERIM community is united in striving for excellence and working at the forefront of creating new business knowledge.

ERiM

ERIM PhD Series
**Research in Management**

**Erasmus University Rotterdam (EUR)**
**Erasmus Research Institute of Management**
Mandeville (T) Building
Burgemeester Oudlaan 50
3062 PA Rotterdam, The Netherlands

P.O. Box 1738
3000 DR Rotterdam, The Netherlands
T +31 10 408 1182
E info@erim.eur.nl
W www.erim.eur.nl