Changing institutional environment, Chinese company characteristics, and climate-change reporting

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Abstract

The objective of this thesis is to investigate how China's country-specific context influences climate-change reporting by Chinese companies. Specifically, the thesis theoretically and empirically examines factors that influence climate-change reporting in China's changing political and economic institutional environment. The thesis addresses how the political ideology of the ruling Communist Party of China (CPC) has driven the changing institutions in the field of climate-change reporting, and the impact on Chinese company characteristics and reporting practice. The thesis includes Chinese literature in evaluating the adaptability of theories originating in the West to the Chinese context. It identifies institutional theory as the preferred basis for developing an extended model to explain the homogeneity and heterogeneity of climate-change reporting by Chinese companies. The model developed, which incorporates multiple levels of institutional analysis, was then tested empirically. From 100 leading listed Chinese companies, 471 reports (Annual Reports and Corporate Sustainability Reports) were examined across three key reporting years between 2006 and 2010, using content analysis. Multivariate regression and logit analyses were then used for further analysis.

A statistically significant difference was found between each of the reporting years in overall reporting, category reporting, reporting medium and the number of specific individual reporting items. The findings strongly support the impact of institutional change of information transparency in China, marked by the release of OGI 2007 and OEI 2007, on Chinese company environmental reporting behaviour. Reporting in the form of Corporate Sustainability Reports (CSR) has increased since 2008. The shift in the balance between Annual Reports (AR) and CSR suggests that basing research solely on AR or CSR will provide only a partial picture of corporate environmental reporting and result in inconclusive and misleading results.

The moderating effect of company characteristics relevant to the Chinese context explains how changing institutional influences lead to homogeneity and heterogeneity in climate-change reporting. Organisational populations formed by

CPC affiliation, size, industry, Shenzhen Stock Exchange, and international operation magnify the effect on reporting. Results give reasonable support to ownership identity and limited support to Big Four international auditor as magnifying or diminishing factors on climate-change reporting by Chinese companies. Findings suggest that the political influence of the CPC persists in Chinese companies. Findings indicate that climate-change reporting by Chinese companies reflects its country-specific reporting context. There are signs of alignment with international reporting guidelines regarding environment reporting in 2010. Companies with international operations are more aligned with international climate-change reporting practice.

The thesis makes the following contributions to the current literature on corporate environmental reporting:

First, it expands the explanatory power of institutional theory via an extended model which explains reporting behaviour by explicitly incorporating the moderating effect of company characteristics on institutional influences in China's context.

Second, it explicitly identifies and recognises the impact of Chinese political ideology as a key driver of changing institutions, which has influenced climate-change reporting by Chinese companies.

Third, it provides timely empirical findings regarding climate-change reporting by Chinese companies in the context of China's changing institutional environment. It uses CSR reports in addition to AR reports, develops a Chinese-specific research instrument to recognise the Chinese reporting environment explicitly, includes a wider range of industries, engages with the Chinese context in selecting relevant company characteristics, and undertakes extensive empirical analysis.

Fourth, it has practical implications for policy development in corporate environmental transparency in developing countries.

Fifth, this thesis provides a meta-analysis of the important field of Chinese corporate environmental reporting and integrates both Chinese and English language studies. It contributes to future environmental accounting researchers wanting to explore Chinese CER.

Student declaration

I, Hong Yang, declare that the PhD thesis entitled 'Changing institutional environment, Chinese company characteristics and climate-change reporting' is no more than 100,000 words in length including quotes and exclusive of tables, figures, appendices, references. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signature: Date 14 March 2014

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List of Abbreviations

AC	Both ‘AR’ and ‘CSR’
ACCA	Association of Chartered Certified Accountants
ADB	Asian Development Bank
AR	Annual reports
CAPM	Capital Assets Pricing Model
CASS	Chinese Academy of Social Science
CER	Corporate Environmental Report
CDM	Clean Development Mechanism
ConD	Consumer Discretionary
ConS	Consumer Staples
CSC	Central state controlled company
CSI	China Securities Index
CSR	Corporate Sustainability Reports
CPC	Chinese Communist Party
EMH	Efficient Market Hypothesis
F-Banking	Financials-Banking
F-NB	Financials-non-banking
GDP	Gross Domestic Product
GRI	Global Reporting Initiative
HK	Hong Kong
INDCG	Industrials-Capital Goods
INDTran	Industrials-Transport
IPIECA	International Petroleum Industry Environmental Conservation assessment
LSC	Local state controlled corporations
MNC	Multinational corporations
MOEP	Ministry of Environmental Protection of China
MOFCOM	Ministry of Commerce of the People’s Republic of China
OEI 2007	Measures for Environmental Information Disclosure
OFDI	Outbound foreign direct investment

OGI 2007	Regulations of the People's Republic of China on Open Government Information
PAT	Positive Accounting theory
SOE	State owned enterprises
SSE	Shanghai Stock Exchange
SZSE	Shenzhen Stock Exchange
UNFCCC	United Nations Framework Convention on Climate Change
US	United States of America
UK	United Kingdom
WWF	World Wildlife Fund for Nature

Chapter 1: Introduction

1.1 Background and motivation

Theoretical perspectives and empirical analysis of climate-climate change reporting by Chinese companies, in the context of China's changing institutional environment, are under-studied. China's economic reform in the late 1970s and associated accounting reforms have led to the emerging use of Western theories to explain decisions made regarding corporate reporting, including environmental reporting. However, because of fundamental differences in the social, economic and political contexts between the West and the East (Scott, 2002), Western incentive-based theories of agency and positive accounting theory – which are pervasive in the Chinese language corporate environmental reporting literature – do not hold up well in the context of China's changing institutional environment (Li et al., 2009; Sun & He, 2008). There has been a growing concern by local Chinese accounting scholars that adopting Western theories without considering the Chinese context is dangerous and potentially misleading (see Fang, 2009; Geng & Pang, 2004; Li et al., 2002). As Scott (2002) argued, given the differences in economic development and guiding philosophies separating China and the West, concepts and models of economic systems originating in the West will need to be translated and modified substantially to fit China's circumstances.

Studies published in the English language also express a similar concern. They call for greater engagement with China's context when applying Western theories to China (see Scott, 2002; Yang, 2011; 2012). It is instructive to examine to the extent to which studies based in Western countries have been applied to Chinese corporate environmental research; and to explore what factors influence Chinese company reporting, and why. Examination of these under-researched questions will help to develop a suitable theoretical framework that can then be used to interpret climate-change reporting by Chinese companies in the Chinese context.

Empirical findings (informed by diverse theoretical perspectives) about general corporate environmental reporting published in the English literature indicate that the political and economic environment, company characteristics, and internal decision

making processes have influenced corporate reporting behaviour. However, no comprehensive theoretical framework has been proposed in the social and environmental accounting literature to integrate these three broad categories of factors in order to explain corporate environmental reporting (Aerts et al., 2006; Gray et al., 1995a). Theoretical justification of the relevance of company characteristics in influencing company reporting is lacking.

In contrast to similar studies based in Western developed countries (Brammer & Pavelin, 2006; Roberts, 1992; Trotman & Bradley, 1981), the empirical testing of company characteristics and corporate environmental reporting in China reveals different results (see Chapter 3). Except for consistent support for size and industry as a factor influencing corporate environmental reporting, little support has been reported for other company characteristics commonly identified in Western capital market studies. A problem is that company characteristics are often used with only limited theoretical justification of why they are likely to influence reporting (Gray et al., 1995a). Variables that characterise companies in Western developed countries may not best characterise Chinese companies that operate in the Chinese political and economic environment. This increases the need to identify company characteristics relevant to the Chinese context.

Unlike companies in Western developed countries who operate in a relatively mature market economy, Chinese companies operate in an era of political and economic institutional transition from a planned economy to a market economy. Public ownership is dominant, and the Chinese government controls the majority of listed Chinese companies. The ruling Communist Party of China (CPC) is politically unchallengeable. Its influence on Chinese company behaviour is widely acknowledged in the literature (Ezzamel et al., 2007; Lin, 2001; Scott, 2002; Yang, 2011; Zhang et al., 2007). However, how the CPC's changing political ideologies influenced the political and economic environment, the formation of Chinese company characteristics, and climate-change reporting behaviour, have received little attention in the current literature.

1.2 Research objectives and research questions

The central objective of this thesis is to investigate how China's country-specific characteristics influence Chinese company reporting behaviour in the area of climate-change reporting. The overarching research question is 'How can we theoretically and empirically determine and explain factors that influence climate-change reporting in the Chinese context?' More specifically, this thesis addresses the following four research objectives and eight research questions.

Research objective 1: To discover the pattern of climate-change reporting by Chinese companies in China's changing institutional environment

This addresses important aspects of the under-researched climate-change reporting by Chinese companies in the context of China's changing institutional environment. Previously, study of environmental and climate-change reporting has focused overwhelmingly on Western developed countries (ACCA & Global Reporting Initiative (GRI), 2009; Freedman & Jaggi, 2005; KPMG & GRI, 2007; Rankin et al., 2011). There has been little research focus on climate-change reporting in China. An exception is ACCA & GRI (2009): findings of that study provide partial evidence of climate-change reporting by Chinese companies. However, the small sample size of eight company reports, and the descriptive nature of the study, limits its authority and reliability.

The lack of research into climate-change reporting in China contrasts with the increasingly important role that China is playing in international climate-change issues politically and economically (Heggelund, 2007). Politically, China is leading developing countries in global climate-change talks. China's standing in the developing world is unique. The country has a strong administrative capacity to formulate policies that are particularly adapted to local conditions (Hubbard, 2008). Economically, China's fast economic growth was achieved at the cost of a deteriorating environment and greater social inequity (World Bank, 2007). China's growth path has been resource-intensive and has drawn increasing global attention to its actions to mitigate and adapt to climate-change. China's economic policies for the 11th Five-year National Program (2006–2010) set the first binding target for energy savings of 20 per cent and

emission reductions of 10 per cent by 2010 (base year 2005). As key elements in China's economy, Chinese companies and industries account for nearly 70 per cent of environmental pollution (Zou, 2009). Hence, research into climate-change reporting by Chinese companies will enable a better understanding of Chinese companies' response to climate change.

Research into corporate disclosure by Chinese companies in the past was limited by the difficulty of accessing data (Xiao, 1999). Prior to 2006, open environmental reporting by Chinese companies barely existed, except for a few monolithic central-state controlled enterprises with international operations, and a few foreign multinational companies with operations in China (KPMG, 2005; Syntao, 2007). This was caused partly by the lack of an institutional environment for open information disclosure. This lack of openness stemmed from China's traditional norm of official (state) secrecy throughout the long history of Chinese bureaucracy (Finamore, 2010; Horsley, 2007). Hubbard (2008) explains the motivators for state secrecy in China at both institutional and individual levels. Institutionally, an information asymmetry between the ruling bureaucracy and the subjects made it easier to maintain authoritarian political control. For individual officials, control over information translated into power. The ability to control the flow of this scarce resource was an extremely valuable tool for Chinese bureaucracy. This old institution of bureaucratic secrecy suited a centrally planned economy. However, it has led to inefficiency and corruption with China's institutional transition to a market-oriented economy.

Since China's economic reform, local state governments have received more autonomy in local economic management. They are no longer a simple extension of the administrative functions of the central-state government, as was the case in a planned economy. The delegation of power to local government results in an agency relationship between the local and the central-state government. This has led to opportunistic behaviours from some local state government officials. There has been growing discontent among the general public with the levels of environmental pollution. This has been manifest in increased demand for environmental transparency in China (Pan, 2007). Such discontent exerts pressure on the ruling CPC and Chinese central government to take actions to promote transparency and public awareness of the environmental mitigation activities of Chinese companies.

China's first nationwide government information disclosure regulation, *The Regulation of the People's Republic of China on Open Government Information* (OGI 2007), was promulgated by the State Council of China on 27 April, 2007 (effective on 1 May 2008). OGI 2007 marked a significant institutional change to the old institution of bureaucratic secrecy in China. China Ministry of Environmental Protection (MOEP) became the first central government body to implement OGI 2007. They issued *Measures for Environmental Information Disclosure* (OEI 2007) for trial implementation in April 2007 (effective on 1 May 2008). OEI 2007 outlined specific environmental information disclosure obligations. These apply to state environmental protection administration departments and some business enterprises (particularly heavily polluting companies that breach environmental regulations). OEI 2007 encouraged Chinese business enterprises to report environmental information voluntarily (MOEP, 2007).

China's institutional transition to government and environmental transparency has led to a rapid growth in voluntary reporting of social and environmental information in the form of a designated Corporate Sustainability Report (CSR). This development provides a timely opportunity to investigate the content and pattern of climate-change related environmental information through a comprehensive analysis of Chinese companies' annual and CSR reports. The findings will help to address the following research questions.

> **Research question 1**: What information do Chinese companies disclose in reports about climate change?
>
> **Research question 2**: Did the level of climate-change reporting change after the release of national guidelines on open environmental information in OEI 2007?
>
> **Research question 3**: How has the pattern of reporting on climate change altered over time?

Research objective 2: To develop a conceptual framework that will enhance understanding of the specific context in which climate-change reporting is situated in China.

This specific objective is promoted by currently under-developed theoretical arguments presented to explain corporate environmental reporting by Chinese companies. Chinese accounting reform occurred concurrently with China's economic reform. Former Chinese socialist accounting theories and practice could not fit market oriented economy. A leading Chinese scholar, Ge (1981), published a seminal paper (in China) calling for the introduction of Western accounting theories and research methodologies to Chinese accounting research. Some American accounting textbooks were translated into Chinese and adopted as prescribed textbooks or references by Chinese universities. In the meantime, the Chinese government encouraged Chinese universities to become involved in cultural exchange programs with foreign (mostly North American) universities during the late 1970s and 1980s to modernise Chinese universities in accounting research (Yang, 2012). Chinese scholars who were sent to North American universities, either for scholarly exchange programs or PhD study, were exposed to then current research methodologies and theories in business studies. Upon return, they introduced them to their Chinese peers and PhD students. As a result, mostly North American Western accounting literature began to appear in Chinese language accounting literature. A pivotal marker of the emergence of research enquiry into environmental accounting in China was the publication (in Chinese) of 'A new school of thought on Western accounting theories in the 1990s: Green accounting theory,' by Ge and Li (1992). This paper highlighted theories and research approaches used in Western-based CER studies.

However, there have been practical barriers for Chinese scholars to truly appreciate the spirits of Western theories and engage with Chinese context of CER research (as with Western scholars who try to explore Chinese CER research). This is because the fundamental institutional differences between the West and China; and the loss of meaning of Western theories when translated into Chinese. A Chinese scholar Xu's (2009) comments on environmental accounting (in Chinese) are useful. While recognising the advances of Chinese environmental accounting research and the progress in catching up with Western CER research, Xu argues Chinese CER research needs more innovation. He points out the problem with current CER theoretical study (in Chinese CER literature) is that research

> … lacks focus and in-depth analysis; and lacks good connection between environmental accounting research and accounting practice ... A majority of Chinese environmental accounting research still relies on theoretical perspectives used in traditional financial accounting research (p. 42).

It is instructive to examine the adaptability of Western theories used in CER research. This is important to develop a suitable theoretical framework for use to interpret climate-change reporting by Chinese companies. Hence, this thesis will address the following question.

> **Research question 4:** To what extent have Western theories been applied in Chinese CER research?

Most theories used in Western countries assume a pluralist society with a mature market economy (Deegan 2009; Gray et al., 1995a; Owen 2008; Parker 2005; 2011). Such assumptions are inappropriate in the Chinese context (see Chapter 4). China differs from Western developed countries in the political and economic institutional environment. China is experiencing institutional transitions that are 'fundamental and comprehensive changes introduced to the rules of the game that affect organisations as players' (Peng, 2003). Peng and Heath (1996) provide a useful summary of institutional frameworks *before* and *during* the transitions:

> Before the transition, a national plan was developed by the central government and then was incrementally decomposed into a set of target and orders for specific (state owned) firms (p.501)
>
> …
>
> During the transition, the state gradually relinquishes its role in policing economic exchanges, state firms are granted more autonomy… however, the lack of an adequate legal framework to define and protect property rights has resulted in a sharp rise in opportunistic behaviour (p.503)

When applying the above description to institutional frameworks in China, one finds the coexistence of *before* transition and *during* transition institutional frameworks. China's economic reform from 1978 has occurred 'in the form of fundamental changes to its economic systems in ways that do not undermine its centrist political regime' (Scott,

2002, p. 59). Although China has moved towards a more market-oriented economy, central planning still plays an important role in the country's economic development under the ruling of the CPC. This is evident in China's 'Five-year national social and economic development plan'[1] charged by the National Development and Reform Committee (NDRC), an influential government agency that leads China's economic reform and policy development on climate change.

Since the People's Republic of China was established in 1949, the ruling CPC's political ideology has played a significant role in China's economic, political and social policies. The CPC's political ideology has been transformed by four CPC leaders: Mao Zedong (1949–1976), Deng Xiaoping (1978–1989, whose influence continued until 1997), Jiang Zemin (1989–2002), and Hu Jintao (2002–2012). The supreme authority of the CPC and state government means it is important to appreciate the political ideology of the leaders of the CPC in order to understand Chinese companies' response to climate change.

The conceptual framework developed in this thesis (in Chapter 4) integrates political and economic contexts, company characteristics and report decision-making to explain factors that influence corporate reporting behaviour. In doing so, this thesis integrates both Chinese and English language studies. The thesis reviews the adaptability of Western theories to the Chinese context. It conducts an extensive literature review of the conventional economic theoretical perspective (decision usefulness, agency theory and/or Positive Accounting Theory) and social and political economy theoretical perspective (legitimacy theory, stakeholder theory, and institutional theory) used in corporate environmental reporting research (see Chapter 2), and explores those theories empirically in corporate environmental reporting (CER) studies (see Chapter 3). The extensive literature review is drawn from three principal sources: English language accounting literature, English language organisational study and management literature, and Chinese language CER literature. Organisational study and management literature is reviewed because it includes some Chinese studies which complement the lack of English language studies in conventional social and environmental accounting literature. The literature study also explores CER literature published in the Chinese language.

[1] The term 'plan' was changed to 'program' in 2006 in the 11th Five-Year National Development Program to distinguish it from the former planned economy.

This is because Chinese studies published in China are not available readily to Western researchers due to language barriers and the difficulty of accessing data. The review of literature in both languages provides a meta-analysis of the important area of Chinese CER. It informs future CER researchers who are interested in exploring Chinese climate-change and environmental disclosures.

The review of theoretical perspectives and empirical findings in CER research has identified institutional theory as the most suitable potential analytical framework to use. Institutional theory allows the conduct of multiple levels of institutional analysis: from broader political and economic contextual factors to management perceptions of institutional pressures and internal decision-making processes. Chapter 3 argues that an integrated consideration of the macro-environmental and micro-environmental factors influencing CER have been underdeveloped in the previous literature. Most importantly, Chinese-specific social, political and economic contextual characteristics are not well captured in theoretical arguments and empirical analyses underlying Chinese CER studies.

Using institutional theory, this thesis develops an extended model (see Chapter 4) that addresses the following research question

> **Research question 5**: How can factors influencing climate-change reporting by Chinese companies in the Chinese context be explained theoretically?

Research objective 3: To advance empirical analysis underlying Chinese CER research.

The review in Chapter 3 highlights the limitations of existing literature on Chinese companies' environmental reporting. Most current literature uses small samples, often a case study or data collected primarily from company annual reports (AR). Although AR provide the major source of information to stakeholders, the literature highlights that it can be misleading to evaluate CER behaviour solely on the basis of information disclosed in AR (Cowen, et al., 1987; Guthrie et al., 2008; Parker, 1982; Preston, 1981; Zeghal & Ahmed, 1990). Despite the need to complement AR with an alternative reporting medium to achieve a better understanding of environmental disclosure (and

more specifically, climate-change related reporting) by Chinese companies, to date no known study published in English language literature has done so. This will thesis will address this need.

Commonly research instruments used for CER content analysis in prior studies are under-specified and Chinese contextual environmental reporting is not captured effectively (see Chapter 3). This raises the problem of subjectivity and the likelihood that findings will become inconsistent and non-comparable. Because Chinese domestic environmental reporting guidelines (although voluntary) are relatively new, there has been no known development of a research instrument that draws on international reporting guidelines and Chinese domestic reporting guidelines to measure climate-change reporting in China. Nor has there been any reported investigation of the influence of Chinese domestic reporting guidelines and international reporting guidelines on Chinese company climate-change reporting (see Chapter 5). This thesis will present a methodology to address these issues.

Findings of the study will help to address the following research questions:

> **Research question 6**: Did the release of Chinese guidelines marked by OEI 2007 influence the *content* of reporting as opposed to the *level* of reporting?
>
> **Research question 7**: To what extent have Chinese guidelines and international guidelines influenced climate-change reporting by Chinese companies?
>
> **Research question 8**: What factors influence the changing pattern of climate-change reporting by Chinese companies? To what extent do those factors influence reporting?

Research objective 4: To promote transparency and accountability in environmental and climate-change reporting by Chinese companies.

Disclosure of environmental and climate change information provides a channel for public supervision and can encourage environmentally sound practices (Finamore, 2010). Communication of corporate actions on climate-change is vital for Chinese

companies' future competitiveness in the domestic market (with increasing domestic public pressure for environmental transparency to maintain and repair legitimacy), as well as the global capital market (with the growing number of Chinese companies operating internationally). As a relatively new entrant to international markets, Chinese companies are under pressure to establish their international reputation for environmental responsibility and legitimacy.

Domestically, prior to OGI 2007 and OEI 2007, there were no consistent guidelines or institutional requirements for open government and environmental information. The public experienced difficulty in accessing information. However, increasing public demand for Chinese company open environmental transparency arose from increasing environmental pollution incidents and weak enforcement of environmental law. Polluting enterprises often received administrative punishment instead of legal prosecutions for environmental pollution offences (Pan, 2007). However, pollution fines and penalties only count for a fraction of operating incomes. Companies are not motivated to control environmental pollution during production. Add to this, foreign companies from developed countries transferred polluting manufacturing processes to China (which turned China into a world factory) because of less compliance costs in China due to China's weak environmental regulations and enforcement compared to their home country (SustainAbililty, 2007; Xiao and Mi, 2004). Because most polluting enterprises contributed to growth in local gross domestic product (GDP), their business activities were supported by their local government. Local government often compromised environmental protection and social justice in pursuit of GDP growth – the latter was directly relevant to their political performance appraisal (CASS, 2007; SustainAbility, 2007). The legitimacy of Chinese companies' business activities was challenged due to growth in environmental disputes and a lack of transparency in environmental information provided to the local government.

According to Hubbard (2008), China's nationwide OGI 2007 and OEI 2007 represent a genuine political commitment to expose bureaucracy to public scrutiny. They are built on coherent policy foundations with a high level of political support. Positive innovations and successful models at the local level might be replicated. In the same vein, successful models of environmental and climate-change reporting by international and Chinese companies might be disseminated among Chinese companies.

Findings of this study should assist policy makers in developing environmental reporting guidelines and policies that promote transparency and accountability of Chinese companies in environmental protection and achieve a healthy balance between economic development, social stability and environmental protection.

1.3 Theoretical framework

This study develops a conceptual framework (an extended model, see Chapter 4) that builds on conceptual frameworks and empirical studies in institutional theory as proposed by leading institutional scholars. The study extends and further develops institutional theory on the topic of climate-change reporting in a developing country's context. Although institutional theory was developed in the West, an extensive review (see Chapters 2 and 3) of literature published in the English language (for example, Firth, 1996; Hilmy, 1999; Lin, 2001; Peng, 2003; Scott, 2002; Walder, 1986; 1995; Yang & Modell, 2012) reveals the theory is the most common theoretical approach used to explain the behaviour of Chinese companies (where climate-change reporting is a part of organisational behaviour).

Scott (2002) has justified the use of institutional theory as an analytical framework in organisational studies of Chinese enterprises. He argues that an institutional perspective to study Chinese companies could support a broader and longer view of organisational and social change in China. Scott (2002) applies institutional theory to explain changes in Chinese enterprise at institutional levels: the societal (institutional differences and connections between the West and the East); the organisational field-level change of former Chinese state-owned enterprises; and individual organisational level change of the relationship between Chinese managers and employees. Scott (2002) calls for more research using institutional theory as an analytical framework to study Chinese company characteristics in the context of China's institutional transition.

The relevance of institutional theory to corporate environmental management and reporting in the organisational study literature (Jennings & Zandbergen, 1995; Hoffman, 1999, 2001; Hoffman & Ventresca, 2002) and accounting literature (Larrinaga, 2007) is well documented. Institutional theory has provided important insights for understanding the processes and motivations of corporate environmental responsiveness. As Meyer

(2002, p. xv) states, the theory is 'especially useful in analysing the interrelations of organisations with modern environmentalism'. Already some studies (Branzei & Vertinsky, 2002; Rowe & Guthrie, 2010; Yang, 2011; Zeng et al., 2012) explicitly take an institutional perspective to Chinese corporate environmental and sustainability management. However, in general, Chinese-specific social, political and economic contextual characteristics are not captured in the theoretical arguments driving Chinese CER studies. None of studies listed in this paragraph attend specifically to corporate climate-change reporting. Nor do those studies analyse China's radical institutional change to information transparency, marked by the promulgation of OGI 2007 and OEI 2007 and associated impacts on climate-change reporting.

The extended model presented in Chapter 4 undertakes three interrelated levels of institutional analyses to develop arguments that will allow researchers to understand the specific context in which company reporting occurs in China. The model adopts the view of Hoffman (1999) and considers the organisational field as an issue based. It is an evolving empirical process. Climate-change reporting, as an issue-based organisational field, comprises a multiplicity of constituents (or actors) who exert influence in the form of institutions arising from the changing political and economic environment at national and global levels. To conceptualise the moderating effect of company characteristics on institutions in the organisational field, this study reintroduces the concept of 'organisational population' (Hoffman, 1999; Hoffman & Bertels, 2007; Scott, 1991, 1998, 2002) from the organisational study literature to explain the complexity of field level interaction.

At the societal level, the model undertakes a historical analysis of the changing political ideology of the ruling CPC over the past six decades and how that ideology has influenced changing Chinese company characteristics and the creation of new institutions of environmental transparency in China.

At the organisational field level, the model describes and evaluates the regulative, normative and cognitive institutions in the field of environmental and climate-change reporting. The model analyses how multiple institutional actors operating in the field of climate-change reporting have exerted institutional influences on the environmental transparency of Chinese companies.

At the organisational level, the model draws on the concept of *organisational population* in institutional theory to analyse how individual organisational populations formed by Chinese company characteristics moderate institutions in the organisational field. Seven hypotheses are formed, as follows.

Hypothesis 1: Being a member of the organisational population of companies with CPC affiliations among senior management influences climate-change reporting.

Hypothesis 2: Being a member of the organisational population of a particular ownership type influences climate-change reporting.

Hypothesis 3: The size of a company influences climate-change reporting.

Hypothesis 4: Being a member of the organisational population representing a specific industry influences climate-change reporting.

Hypothesis 5: Being a member of the organisational population of companies audited by a Big Four accounting firm influences climate-change reporting.

Hypothesis 6: Being a member of the organisational population of companies listed on a particular stock exchange influences climate-change related environmental items.

Hypothesis 7: Being a member of the organisational population of companies with international operations influences climate-change reporting.

This thesis takes a conservative position to form non-directional (two-tailed) hypothesis tests. This is because the moderating role of organisational populations represented by company characteristics can either magnify or diminish the level of reporting. Section 4.3.3 provides further justification for the use of non-directional hypotheses in this thesis.

The extended model provides a theoretical justification for the relevance of company characteristics in corporate reporting studies. It extends and modifies institutional theory to fit China's country-specific context. The extended model is further enhanced by the mathematical representation developed in Chapter 5, to justify the research approach used, and to explain the homogeneity and heterogeneity of climate-change reporting over time and at any point of reporting time.

1.4 Research methodology

The research approach responds to the critical need for larger and richer data sets to inform corporate environmental management studies. This is consistent with Ehrenfeld's (2002) argument that 'without large data we cannot explicate finer structure in the institutional context of environmental or sustainability behaviours of firms. We must have larger, richer sets of data than are now available' (p. 449). As Chapter 3 notes, some organisational study literature applies more advanced forms of institutional theory and uses diverse research approaches (Dacin et al., 2002; Scott, 2008). However, the application of institutional theory to study environment and sustainability matters is narrow and dominated by qualitative research methodologies. Although qualitative research is important and useful, the small number of qualitative case studies presents the possibility that results are atypical. This thesis adopts a quantitative research approach which analyses a larger and richer data set to investigate the moderating effect of Chinese company characteristics on institutional pressures. This approach complements qualitative studies because it allows the analysis of 'on average' influence of multiple factors.

To test the conceptual framework (presented in Chapter 4) empirically, and to further justify the quantitative approach adopted, this thesis develops a mathematical representation of the model. In doing so, the concept of 'propensity to report' is introduced in Chapter 5. This concept represents the extent to which perceived institutional pressures translate into pressure to report climate-change related information. The assumption underlying the framework is that for each item reported by a given company, at a point in time, there will be a critical level of pressure to report, above which reporting will occur. Hence, as the 'propensity to report' increases, a company not reporting a specific item will move closer to deciding to report that item.

Across multiple companies it will lead to an increase in the number of companies reporting the item. A full explanation of the mathematical representation is provided in Chapter 5.

To address research objectives 1 and 3, the data analysed draws on AR and CSR of 100 leading companies (see Appendix 4) across ten industries listed on the China Securities Index (CSI) 100 on 30 December 2007 from China's Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE). A total of 471 reports are analysed. AR were collected from SSE and SZSE. Standalone CSR were downloaded from the websites of sample companies.

Three reporting years were chosen for analysis: 2006, 2008 and 2010. Each is a year of significance as follows:

- 2006 was the beginning year of China's 11th Five-Year Development Program when there were no national level corporate voluntary reporting guidelines

- 2008 was the year the Chinese government's OGI 2007 and OEI 2007 both became effective

- 2010 was two years after the effective implementation of the OGI 2007 and OEI 2007 in 2008. It allows sufficient time for Chinese companies to embed national guidelines in their reporting. The year 2010 is also final year of the 11th Five-Year Development program. It was the latest reporting year available at the time of the study (Note: there is time lag in publishing AR and CSR reports by listed companies in China. For example, an AR report for the reporting year 2010 is not available until the end of April 2011).

The years 2006 and 2010 were chosen because they straddle the implementation of OGI 2007 and OEI 2007. This makes this study an event study (Hoffman, 1999), at least in part. The cross-time analysis over a five-year span fits the institutional analysis of the changing reporting pattern over time.

This thesis conducts a quantitative content analysis of sample Chinese companies' reports. Content analysis method analyses text in a manner that is systematic, valid and replicable (Breuning, 2010, p. 492; also see Krippendorff, 1980). The method is used widely by researchers in CER studies (Guthrie et al., 2008; Milne & Adler, 1999; Unerman, 2000). A distinctive benefit of content analysis is its 'unobtrusiveness'. It does not require cooperation of the subject under investigation; nor will it alter the subject's behaviour' (Babbie, 2004). Content analysis can involve either qualitative or quantitative methods. Compared to qualitative content analysis, quantitative content analysis has the advantage of transparency and allows replication of research design (Breuning, 2010). Content analysis can accommodate cross-time analysis of reporting behaviour and facilitate the analysis of the changing process of corporate climate-change reporting over time.

To identify Chinese company climate-change reporting, this thesis develops a research instrument that integrates international reporting guidelines and China's domestic guidelines (see Table 5-2). Using combined global and Chinese domestic reporting guidelines has the benefit of better capturing climate-change reporting in a developing country's context. It can also distinguish the level of impact of Chinese national guidelines on environmental transparency, marked by *OEI 2007*, from the impact of international reporting guidelines on the content of climate-change reporting by Chinese companies.

Data are analysed using descriptive statistics, logistic analysis and multivariate regression. Details of the research methodology are elaborated in Chapter 5.

1.5 Structure

This thesis consists of eight chapters. Chapter 2 provides an overview of different theoretical perspectives on corporate reporting behaviour. The objective is to identify a suitable theoretical perspective to explain corporate climate-change reporting. Chapter 3 critiques the theoretical arguments and empirical findings that underlie CER research published in English and Chinese literature. The objective is two-fold: first, to identify gaps in the literature about Chinese CER research. Second, to evaluate empirical findings (informed by diverse theories) of factors that have influenced corporate

environmental reporting. These factors are the external social, political and economic context; corporate characteristics; and the internal decision-making processes. Chapter 4 develops a conceptual framework for the interpretation of climate-change reporting by Chinese companies from the institutional theoretical perspective. This chapter develops a model which extends institutional theory to capture the Chinese contextual characteristics of climate-change reporting. The model engages in multi-level institutional analyses by integrating China's changing political and economic environment (i.e. societal level) with the evolving issue of climate-change reporting (i.e. organisational field level) and the role of Chinese company characteristics (organisation level) to explain the homogeneity and heterogeneity of climate-change reporting by Chinese companies. Chapter 5 explains the research methodology applied to test the extended model in Chapter 4 empirically. This chapter presents a mathematical representation of the model. The chapter also presents a research instrument that draws on international reporting guidelines and Chinese reporting guidelines to undertake content analysis of climate change reporting in the Chinese context. Chapter 6 presents descriptive results. Chapter 7 presents multivariate results. Chapter 8 draws conclusions, addresses the implications and limitations of the study, and suggests directions for further research.

1.6 Definitions

Annual report: AR issued by listed Chinese companies are prepared in accordance with information disclosure provisions under China's Companies Act, Securities Law. The mandatory information disclosure in an annual report is specified in China Securities Regulatory Commission's *Guidelines for Contents and Formats for Information Disclosures by Companies that Offer Securities to the Public (No.2): Contents and Format of AR (2005 Revision).* Listed companies are required to issue the annual report in the CSRC's designated newspapers and websites within four months after the financial year.

Climate-change reporting: reporting on climate-change related environmental information, including policy, governance and strategy, financial implications

and other risks and/or opportunities associated with climate change; performance and targets; climate-change mitigation and adaptation actions.

Corporate sustainability report: this voluntary report is issued annually by a Chinese entity on its economic, environmental and social activities. Such reports are also known as corporate social responsibility reports, or corporate citizenship reports. Unlike the annual report, there is no mandatory reporting requirement regarding the content and the format of the report for listed companies, other than the government's call for listed companies to issue such report. General guidelines on the format and the content are provided by the two mainland China stock exchanges SZSE (2006) and SSE (2008).

Organisational population: are aggregates of organisations that are alike in some respect (Scott, 1998, p.125).

Political ideology: ideas about power and how it should be distributed, organised and used, including the goals to which it is directed. Ideology has active consequences, and shapes political behaviour, particularly of leaders who have the power to translate ideology into policy (Joseph, 2010, p.129).

1.7 Summary

This introduction has outlined the background and motivation of the thesis, its central purpose, theoretical framework and methodology. The major purpose is to theoretically and empirically examine factors that influence the pattern of climate-change reporting in the particular institutional context of China. Four specific objectives and eight research questions pursued in the thesis were presented. Justifications for the theoretical framework and the research approach were provided, together with key definitions.

This thesis adds to the prior literature by justifying for the use of institutional theory in the Chinese context, by incorporating Chinese language literature into literature review, and by exploring the changing political and economic environment. It is also distinctive in using CSR reports in addition to AR, a Chinese-specific research instrument, and in

studying a wider range of industries, and considering the Chinese context in selecting relevant company characteristics.

Theoretically, this thesis develops an extended model which facilitates understanding of the specific context in which climate-change reporting occurs in China. This model integrates the political and economic environment, company characteristics and internal decision-making. The model provides theoretical justification for the moderating role of company characteristics in company reporting behaviour. The model expands the explanatory power of institutional theory to the area of climate-change reporting in a developing country's context.

Empirically, this study tests the extended model presented in Chapter 4 to identify factors that potentially explain the reasons for climate-change reporting (or lack of reporting) in China. This study enhances understanding of Chinese companies' response to climate-change through empirical investigation of a larger sample over three significant years (before and after China's institutional change of environmental transparency in 2007). The empirical test of the model adopts an alternative quantitative research design: data are sourced from AR and CSR of large Chinese listed companies. A research instrument drawn from both Chinese national guidelines and international guidelines is developed to capture China country-specific reporting environment. The findings complement the dominant qualitative studies of corporate environmental accounting literature that are informed by institutional theory. The findings (see Chapters 6 and 7) are directed to promote better understanding of corporate climate-change reporting in a developing country's context. They will also help to identify an institutional theoretical perspective to inform future research and development in this area.

The results should be beneficial to policy makers in developing climate-change reporting guidelines and in promoting environmental transparency and accountability of Chinese companies.

Chapter 2 presents an overview of the key theoretical perspectives used in CER research.

Chapter 2: Theoretical frameworks in corporate environmental reporting research: An overview

2.1 Introduction

Theoretical arguments regarding motivations for CER are evolving. Diverse theoretical perspectives derived from two broad schools of thought have been used in CER literature. One perspective is informed by conventional economic theories, including the decision-usefulness theory, agency theory and positive accounting theory (PAT). The other perspective is informed by social and political theories, including political economy theory, legitimacy theory, stakeholder theory, and institutional theory. The objective of this chapter is to identify suitable theoretical perspectives for application in the analysis of this thesis. This is done by revisiting seminal papers that have informed theoretical development in their primary field and were later adopted by researchers in CER literature. A review of the empirical application of those theories in CER studies follows (Chapter 3).

To be consistent with prior literature (such as Gray et al., 1995a; Parker, 2005), and for analytical purposes, the theoretical perspectives are considered from the two broad theoretical frameworks. In general, the two broad theoretical perspectives, and each of individual theories derived from them, differ from each other in various aspects. They are assumptions about human nature, perceptions regarding the role of organisations in society, the role of corporate disclosure, the unit of analysis, conflict of interest resolution, the interpretation of legitimacy, a company's external institutional environment, and the resultant different perspectives on motivations for CER. However, these individual theoretical perspectives are not mutually exclusive. They are complementary in explaining CER (Eisenhardt, 1989; Hirsch et al., 1987). A convergence of the theories of traditional economics and social and political theory promotes a better understanding of CER in general.

The remainder of this chapter is organised as follows, Section 2.2 reviews theories developed from conventional economic theory. Section 2.3 reviews theories developed

from political and economic theory. Section 2.4 engages in discussion. Section 2.5 presents a summary of the chapter.

2.2 Theories developed from conventional economic theory

The explanation for, and prediction of, CER under the approach developed from conventional economic theory adopts the same assumptions as those in economics-based studies (that is, self-interest drives human behaviour and wealth maximisation). Corporate disclosure (of which social and environmental disclosure is one part) is a means to reduce agency costs (Gray et al., 2001). The 'agency costs' were elaborated as 'contracting costs', a result of the development of PAT (which recognised the potential for many contracts to play a role in explaining organisational choice) in Watts and Zimmerman (1990, pp. 134-135). The purpose of CER is to minimise future agency/contractual costs that could arise from regulation or legislation. Thus, CER is often regarded as an addition to conventional accounting activity (Gray et al., 1995a; Parker, 2005). Three popular perspectives developed from conventional economic theory have been used in CER studies. They are decision-usefulness, agency theory and PAT. Each is discussed below.

2.2.1 Decision-Usefulness

The decision-usefulness theory adopts an efficient capital markets view. It considers corporate social and environmental reporting as a means to satisfy the information needs of financial stakeholders (Parker, 2005). This approach was popular in Western countries in the 1970s and 1980s when theories about motivations for corporate social and environmental reporting were underdeveloped (Mathews, 1997). Gray et al. (1995a) outlines two types of research under the decision-usefulness approach: 'ranking' studies and the investigation of information effects on share price behaviour. In 'ranking' studies, financial analysts, bankers and others rank various accounting data in order of perceived importance. The other type of research investigates whether the disclosure of corporate social and environmental information influences share price fluctuations.

In general, the decision-usefulness approach to investigating CSR has been unsatisfactory due to inconsistent and inconclusive results. Nevertheless, Gray et al.

(1995a) argue that despite its limitations, this approach helps contribute to CER research by raising the 'visibility of non-financial, non-economic factors in organisational reporting and accountability'. Hence, this kind of research adds diversity to the traditional accounting research.

2.2.2 Agency theory

Agency theory centres on the agency relationship. This is defined by Jensen and Meckling (1976) as:

> …a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent (p. 5)

Because the unit of analysis is the contract governing the relationship between the principal and the agent, agency theory focuses on 'determining the most efficient contract governing the principal-agent relationship', given assumptions about people (e.g. self-interest, bounded rationality, risk aversion), organisations (e.g. goal conflict among members), and information (e.g. information as a commodity which can be purchased) (Eisenhardt, 1989, p.57). Developed from information economics, agency theory has two major perspectives: positivist and principal-agent. The former emphasises how capital markets can affect companies. The latter does not refer to capital markets at all. However, Eisenhardt (1989) argues that the two streams are convergent in terms of the unit of analysis (agency relationship and the assumption about human behaviours, organisations, and information, and hence they are complementary. A positivist perspective identifies various contract alternatives. A principal-agent perspective indicates which contract is the most efficient under varying levels of outcome uncertainty, risk aversion, information and other variables.

Agency theory provides a positivist perspective in accounting research. It regards the motivation for corporate social and environmental reporting as increasing management welfare (Ness & Mirza, 1991), or forestalling future agency costs arising from legislation or regulation (Gray et al., 1995a). Jensen and Meckling (1976) describe agency costs as the 'sum of monitoring expenditures by the principal, bonding

expenditures by the agent, and residual loss'. They argue that organisations serve as a nexus for a set of contracting relationships among individuals and that the agency costs exist for all the contractual relations in an organisation, not only with employees but with suppliers, customers, creditors, too.

Agency theory is popular in business analysis. However, it is still controversial (Eisenhardt, 1989). Proponents claim that agency theory provides a framework that explicitly incorporates conflicts of interest, incentive problems, and mechanisms for controlling incentive problems into analysis (Ness & Mirza, 1991). Opponents argue that agency theory is morally wrong and inconsistent with the agenda of corporate social and environmental accounting, whose objective is to achieve accountability and transparency for social wellbeing (Gray et al., 1995a). Jensen and Meckling (1976) contend a serious limitation of agency theory is its application to the very large modern corporation whose managers own little or no equity.

2.2.3 Positive Accounting Theory (PAT)

PAT is a theory:

> …concerned with explaining accounting practice. It is designed to explain and predict which firms will and which firms will not use a particular method of valuing assets, but it says nothing as to which method a firm should use (Watts & Zimmerman, 1986, p.7)

PAT adopts the concept of positive theory commonly used in economic theory of property rights, the agency relationship, and regulation that assumes non-zero information, lobbying, and coalition costs (Watts & Zimmerman, 1986, pp. 220–222). The Efficient Market Hypothesis (EMH) and Capital Assets Pricing Model (CAPM) have had a strong influence on the development of PAT. The theory assumes there are efficient capital markets which react in an efficient and unbiased manner to publicly available information. Security prices reflect the information content of publicly available information. This information is not restricted to accounting disclosures. Valuing the firm requires estimates of the firm's expected future cash flows and risk. PAT also views the firm as a nexus of contracts between self-interested individuals who seek to maximise their own welfare but who also recognise that their own welfare

depends on the survival of the firm. Thus, firms organise themselves in the most efficient manner, to maximise their survival prospects (Scott, 2009). However, management's discretion to choose from a set of accounting policies opens the possibility of opportunistic behaviour.

PAT developed three of hypotheses (Watts and Zimmerman, 1986, 1990), namely the bonus plan hypothesis, the debt/equity hypothesis, and the political cost hypothesis to explain and predict management's incentives to choose accounting methods.

The bonus plan hypothesis is 'that managers of firms with bonus plans are more likely to choose accounting procedures that shift reported earnings from future periods to the current period' (Watts & Zimmerman, 1986, p. 208). Such selection will presumably 'increase the present value of bonuses if the compensation committee of the board of directors does not adjust for the method chosen' (Watts & Zimmerman, 1990, p.138).

The debt/equity hypothesis states that 'the larger a firm's debt/equity ratio, the more likely the firm's manager is to select accounting procedures that shift reported earnings from future periods to the current period' (Watts & Zimmerman, 1986, p. 216). That is, to avoid the probability of a covenant violation and of incurring costs from technical default, managers exercise discretion by choosing income–increasing accounting methods to 'relax debt constraints and reduce the costs of technical default' (Watts and Zimmerman, 1990, p.139).

The political cost hypothesis states that 'the larger the firm, the more likely the manager is to choose accounting procedures that defer reported earnings from current to future periods' (Watts & Zimmerman, 1986, p. 235). Size is often used as a proxy variable for political attention. This hypothesis borrows the concept of political process in economic theories of regulation (Peltzman, 1976; Stigler, 1971): That is, it adopts the assumption of positive information costs and lobbying costs and of self-interest driving an individual's behaviour. These political costs are a function of reported profits and are part of the costs of contracting in the political process. The extent and form of wealth transfers created by the political process are affected by 'contracting costs'. Given the cost of information and monitoring, managers have incentive to exercise discretion over accounting profits and the parties in the political process settle for a rational amount ex

post-opportunism (Watts & Zimmerman, 1990, pp. 133-139). As Watts and Zimmerman (1978) explain, corporations employ several devices, such as 'social responsibility campaigns in the media, government lobbying and selection of accounting procedures' to minimise reported earnings. This helps to 'reduce the likelihood of adverse political actions and, thereby reduce expected costs' (p.115).

PAT, with its origin in agency theory, was developed originally to explain and predict company accounting choices. However, the direct reference to social disclosure by Watts and Zimmerman (1978, 1979, 1986, 1990) themselves, was extremely limited. Exceptions include a general reference to organisational choice (which may implicitly relate to organisational choice of social and environmental reporting activities as in Watts & Zimmerman, 1990, p. 134) and a brief mention of corporate social responsibility campaigns as an example in the discussion of the political costs hypothesis (Watts & Zimmerman, 1978, p.115). However, precisely how social responsibility campaigns in the media accord with Watts and Zimmerman's notion of political costs is unclarified. Except for the political cost hypothesis, direct reference to the other two hypotheses of PAT in CER studies is rare. This has led to criticism of applying a PAT perspective to explain CER (such as Gray et al., 1995a; Milne, 2002).

2.3 Social and political theories

In contrast to studies informed by conventional economic theory, research informed by social and political theories addresses 'the need for the balance of power relationships between organisations, and for their interested groups and communities to be changed radically and systematically' (Parker 2005, p.847). The intended outcome is a radically transformed transparency and accountability. Theoretical perspectives in corporate social and environmental accounting research that fall into this broad category include: political economy theory (for example, Guthrie & Parker, 1990; Tinker et al., 1991; Puxty, 1991; Williams, 1999), stakeholder theory (see, for example, Deegan & Blomquist, 2006; Roberts, 1992; Ullmann, 1985), legitimacy theory (for example, Chen & Roberts, 2010; Deegan, 2002; de Villiers & van Staden, 2006; Freedman & Jaggi, 2005; O'Donovan, 2002; Patten, 1991) and recently, institutional theory (for example, Aerts et al., 2006; Ball & Craig, 2010; Bebbington et al., 2009; Jennings & Zandbergen,

1995; Hoffman, 1999; Larrinaga, 2007; Rahamana et al., 2004; Rowe & Guthrie 2010). Each will be discussed below.

2.3.1 Political economy theory

Jackson (1982, p. 74) defines 'political economy theory' as:

> …the study of the interplay of power, the goals of power wielders and the productive exchange system (Zald, 1970, p. 233). As a framework, political economy does not concentrate exclusively on market exchanges. Rather it first of all analyses exchanges in whatever institutional framework they occur and, second, it analyses the relationships between social institutions such as government, law and property rights, each fortified by power and the economy, i.e. the system of producing and exchanging goods and services.

The above definition indicates that economic issues cannot be studied in isolation from the political, social and institutional framework within which the economic activity takes place. Studies informed by political economy theory are discussed from a classical (Marxist, critical perspective) and a bourgeois (pluralistic, procedural liberal) perspective in CER literature.

2.3.1.1 Classical political economy theory

Classical political economy theory centres on class interests, conflicts, structural inequality and the role of the state (Gray et al., 1996, p. 47). Under this perspective, social accounting is a rationalisation of the capitalist process and results in the commoditisation of labour power (Lehman, 2001; Tinker et al., 1991). Thus, corporate social and environmental reporting justifies the accumulation of assets to satisfy the demands of elites (who control scarce resources and power) and their social position at the expense of the community (Puxty, 1991, Tinker et al., 1991). They exploit the proletariat (who have scarce resources and power). Thus, classical political economy theory maintains that corporate social and environmental reporting fails to challenge capitalist institutions. This is alleged to have led to a male-dominated and environmentally destructive society (Cooper, 1992; Puxty, 1986, 1991).

Classical political economy suggests the study of accounting (of which CER is one part) should focus on the effects of accounting reports on the distribution of income, wealth and power in society (Cooper & Sherer, 1984). This branch of political economy theory was later developed into critical accounting perspectives which 'tend to be extremely critical of current accounting and reporting techniques' (Deegan, 2009, p. 323). In contrast, another perspective of political economy theory adopts a pluralistic view of the world in which corporate social and environmental reporting is an outcome of negotiations by the actors in society.

2.3.1.2 Bourgeois political economy theory

Bourgeois political economy theory, incorporating notions of social justice and community harmony, adopts a pluralistic world view. It assumes that many classes of stakeholders have the power to influence decisions by corporations, government and other entities (Gray et al., 1995a, 1995b). Bourgeois political economy concentrates on the interactions of actors within a pluralistic world and considers the role of government when markets fail (Clark, 1991). The theory recognises the right to pursue individual or organisational goals and self-interest. However, these rights are moderated by the social environment in which they exist (Gray et al., 1996, William, 1999).

Within this perspective, accounting does not favour the specific interests of the elites. Rather, accounting is perceived as a social, political and economic document. It serves as a medium for 'contracting, sustaining and legitimising economic and political arrangements, institutions, and ideological themes' which contribute to the corporation's self-interest. Disclosures have the capacity to 'transmit social, political, and economic meanings for a pluralistic set of report recipients' (Guthrie & Parker, 1990, p. 166).

Bourgeois political economy centres on the concept of a 'social contract' (Ramanathan, 1976; Williams, 1999, pp. 211–212). This suggests that an organisation's existence relies on the support of society in general. If it is perceived that a company is engaging in undesirable social activities, then it is likely that society will withdraw its endorsement of the company, leading to its demise. To avoid this situation, and to maintain their position in society, management releases information related to their

environmental and social activities. Williams (1999) explains two motivators for CER. First, to protect company's private interests in order to foster, sustain and legitimise relationships by presenting an 'image of supporting society' in general. Second, to avoid possible regulatory intervention.

The bourgeois political economy perspective regarding CER has been criticised by classical political economy theorists (e.g. Cooper 1992; Tinker et al. 1991). They contend that it does not explore Marxist dialectics. Further, it fails to 'justify why they accept the pluralism of the status quo and capitalist society in the first place'. Thus, it supports the institutions of modernity (Lehman, 2001), (arguably) contributing to environmental pollution and moral degradation. Instead, classical political economy theorists argue that Marx's dialectical logic reconsiders the relationships between civil society and the state, which can be used to explore reform of accounting. However, classical political economy theorists do not prescribe how reform is to be conducted. The distinction of two approaches to political economy theory is useful for analytical purposes. Combining the two approaches to CER would be helpful in interpreting CER practice.

2.3.2 Legitimacy theory

A commonly cited definition for legitimacy is that it is 'a generalised perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions' (Suchman, 1995, p. 574). This concept is shared by theories developed from political economy theory, including stakeholder theory (see Mitchell et al., 1997), Legitimacy theory (Deegan, 2002; van de Laan, 2009), and institutional theory (Scott, 1995), although the interpretation of legitimacy varies between each individual theoretical perspective.

Legitimacy theory asserts that organisations continually seek to ensure that they are perceived as legitimate and as operating within the bounds and norms of their respective societies (Deegan, 2009). These bounds and norms are not static but are subject to change over time. A 'legitimacy gap' will arise if the organisation's performance is perceived by society as being incongruent with social expectations. Thus, organisations attempt to establish congruence between 'the social values associated with or implied

by their activities and the norms of acceptable behaviour in the larger social system of which they are part' (Dowling & Pfeffer, 1975, p. 122).

Legitimacy theory relies on the notion of a 'social contract' which was articulated by Shocker and Sethi (1974, p. 67) as:

> Any social institution-and business is no exception-operates in society via a social contract, expressed or implied, whereby its survival and growth are based on:
>
> (1) the delivery of some socially desirable ends to society in general, and
> (2) the distribution of economic, social, or political benefits to groups from which it derives its power
>
> In a dynamic society, neither the sources of institutional power nor the needs for its services are permanent. Therefore, an institution must constantly meet the twin tests of legitimacy and relevance by demonstrating that society requires its services and that the groups benefiting from its rewards have society's approval.

Ramanathan (1976) extends the notion of 'social contract' to corporate social accounting. He argues that recognition of a 'social contract' between a firm and society indicates the firm has two unique roles: one as an agent of production, and the other as an agent of delivery. In the first role, 'the ultimate test of a firm's success is whether its aggregate contribution to the society is more than its aggregate consumption of the society's resources' (p.519). In the second role, a firm is an agent in the resource sharing and benefit distribution processes in society. Thus, 'the firm's decision process is concerned more with notions of fairness, equity and consistency with social goals than with considerations of optimality' (p. 520).

Legitimacy theory adopts a resource dependence perspective and considers legitimacy to be a resource on which a firm depends for survival (Dowling & Pfeffer, 1975). However, unlike many other 'resources' over which the organisation has little influence, legitimacy is a resource that can be affected by the management of a company through various disclosure-related strategies (Woodward et al., 1996). Thus, disclosures such as corporate social and environmental reporting are part of the legitimation process. They constitute an important strategy in the corporation's gaining, maintaining and repairing

legitimacy. The literature proposes four general legitimation strategies (Dowling & Pfeffer, 1975; Lindblom, 1993), as the means by which an organisation will legitimise their activities when a perceived legitimacy 'gap' is identified:

1. Adapt its operation (changes its actual behaviour) to conform to the general legitimacy expectation of the society
2. Alter the general legitimacy definition through education and communication (without necessarily changing its actual behaviour)
3. Attempt to become identified with symbols, values or institution that have a high legitimate status (attempt to promote a positive publicity through symbolic management)
4. Manipulate the perception of the general society towards the organisation by distracting attention from the issue of concern to other issues.

The above general corporate legitimation strategies rely on corporate disclosure (including social and environmental reporting). Legitimation strategies might differ depending on whether the entity is trying to gain, maintain or repair legitimacy (O'Donovan, 2002; Suchman, 1995). However, the theory is underdeveloped with regard to how to relate the legitimation technique with corporate motives for gaining, maintaining or regaining legitimacy.

Legitimacy theory appears to have dominated CER publication in social and environmental accounting literature (de Villiers & van Staden, 2006; Thomson 2007). Despite its popularity, legitimacy theory has some limitations. For example, legitimation strategies centre on the manipulative behaviour of an organisation in CER in pursuing organisation's collective self-interest. This has led to critique that legitimacy theory privileges financial stakeholders, by ignoring the concepts of accountability and transparency, as argued by Parker (2005). Problematically, legitimacy theory conceptually overlaps with political economy theory, stakeholder theory and institutional theory (Larrigana, 2007). Therefore, it is marked by a lack of specificity and has an uncertain ability to anticipate and explain managerial behaviour .

2.3.3 Stakeholder theory

Stakeholder theory conceptualises firms as part of a broader social system. It has impacts on, and is affected by, other groups within society. Following Freeman (1984), a stakeholder is defined as 'any group or individual who can affect or is affected by the achievement of the organisation's objectives' (p. 46). Stakeholder theory assumes that because different stakeholder groups will have different views about how an organisation should conduct its operations, 'a major objective of the firm is to attain the ability to balance conflicting demands of various stakeholders in the firm' (Roberts, 1992, p. 597). Unlike legitimacy theory which considers the 'social contract' between the firm and the society in general, stakeholder theory posits there will be various social contracts 'negotiated' with different particular stakeholder groups (Deegan, 2009).

Stakeholder theory refers to both a normative theory of business ethics (i.e. it explains logically why managers should consider certain classes of entities as stakeholders) and the descriptive theory of stakeholder salience, to explain the conditions under which managers consider certain classes of entities as stakeholders (Hasnas, 1998; Mitchell et al., 1997).

The normative perspective of stakeholder theory argues that management must give equal consideration to the interests of all stakeholders and, when these interests conflict, they should manage the business so as to attain the optimal balance between them. Under this perspective, a firm is viewed not as a mechanism for increasing stockholders' financial returns, but as a vehicle for coordinating stakeholder interests. Management is regarded as having a fiduciary relationship not only to the stockholders, but to all stakeholders (Hasnas, 1998). This perspective is consistent with the notion of the right to information and the 'accountability model' in Gray, et al., (1991), which argues that the role of a corporate report is to 'provide society-at-large with information about the extent to which the organisation has met the responsibilities imposed upon it' (p.15).

The managerial branch of stakeholder theory refers explicitly to issues of stakeholder power, and how stakeholders' relative power affects their ability to 'coerce' the organisation into complying with stakeholders' expectations (Deegan, 2009, p. 346). This managerial perspective of stakeholder theory takes a pragmatic view of the motives

for CER behaviour. It argues that an organisation will not respond to all stakeholders' expectations. Rather, the organisation will attend to those stakeholders who are more critical to the survival and continuance of the organisation (for example, shareholders, creditors, regulators etc). That is, stakeholders are structured according to their level of importance to the organisation. Mitchell et al., (1997) propose three attributes to identify a stakeholder's importance to an organisation. They are (1) the stakeholder's power to influence the firm. It refers to the extent to which a party has or can gain access to 'coercive, utilitarian, or normative means to impose its will in the relationship'. This access to means is 'a variable, not a steady state, which means power is transitory: it can be acquired as well as lost'. (2) The legitimacy of the stakeholder's relationship with the firm. Legitimacy refers to the concept developed in Suchman (1995, p. 574), described earlier in this chapter (that is shared by legitimacy theory), and (3) the urgency of the stakeholder's claim on the firm, which refers to the degree to which stakeholder claims call for immediate attention (pp. 854-868).

Legitimacy theory and stakeholder theory are derived from bourgeois political economy theory (Deegan, 2009; Gray et al., 1995a). These theories share the key concepts of 'legitimacy' and 'social contract'. However, stakeholder theory is more specific than legitimacy theory in explaining and predicting how legitimacy is managed by a firm because it identifies the specific interest groups with whom a firm deals. The manager's perception of a stakeholder's attributes is critical to the manager's view of stakeholder salience. Therefore, managerial characteristics are regarded as an important moderator of the stakeholder-manager relationship (Mitchell et al., 1997). However, stakeholder theory fails to explain the source of pressures exerted on a firm by stakeholders. Discussions of stakeholder theory tend to distinguish the normative (ethical) perspective from the managerial perspective. In practice, there is likely to be a continuum of possible positions between these two points. Managers of many companies will be driven by ethical considerations and performance-based decisions—not just by one or the other (Deegan, 2009). Wicks (1996) also argues that such a distinction is unrealistic as it implies that ethical (normative) considerations and market (managerial) considerations are mutually exclusive.

A combination of the two stakeholder theory perspectives is suggested by Deegan (2009). He contends that 'stakeholder theory' should be regarded as 'a broad term

covering a number of alternative theories that address various issues associated with relationships with stakeholders, including considerations of the rights of stakeholders, the power of stakeholders or the effective management of stakeholders' (p. 345).

2.3.4 Institutional theory

Institutional theory (in its various forms), integrates classical (Marxist critical) and bourgeois (pluralist) perspectives of political economy theory, and originates in organisational studies. According to Dillard et al. (2004), the theory is concerned primarily with an organisation's interaction with the political and economic institutional environment, the effects of institutional pressures on the organisation, and the incorporation of these expectations into organisational practices and characteristics.

An 'institution' is defined in Scott (1995, p. 33) as:

> … social structures that have attained a high degree of resilience. They are composed of cultural–cognitive, normative, and regulative elements that, together with associated activities and resources, provide stability and meaning to social life. Institutions are transmitted by various types of carriers, including symbolic systems, relational systems, routines, and artefacts. Institutions operate at different levels of jurisdiction, from the world system to localized interpersonal relationships. Institutions by definition connote stability but are subject to change processes, both incremental and discontinuous.

According to Scott (2008), institutional theory considers the processes by which regulative, normative and cultural cognitive structures are established as 'authoritative guidelines' for social behaviour (where corporate reporting is a part). The theory explains how these elements are created, diffused, adopted and adapted over space and time (i.e. institutionalised); and how they fall into decline and disuse (i.e. deinstitutionalised).

DiMaggio and Powell (1983) embraced perspectives drawn from Gidden's (1979) structuration theory, which posits that organisations compete not just for resources and customers, but also for political power and institutional legitimacy, as well as social and economic fitness. As Larrinaga-Gonzalez (2007) argues, unlike studies based on traditional economic theory that consider CER as the outcome of a rational process of

decision-making by an organisation acting independently, institutional theory suggests reporting could become institutionalised. To some extent, this would determine an organisation's choice regarding whether to publish a social and environmental report, and if so, how to do it.

The institutional mechanisms referred to as coercive, normative and mimetic in DiMaggio and Powell (1983) will drive organisations towards homogeneity (isomorphism) in organisational practice in an 'organisational field'. An organisational field is defined as:

> … a community of organisations that partakes of a common meaning system and whose participants interact more frequently and fatefully with one another than with actors outside the field (Scott, 1995, p.56)

An 'organisational field' includes constituents who impose a regulative (coercive), normative (social) or cultural (cognitive) influence on a given individual organisation or 'organisational population' in the field (DiMaggio & Powell, 1991; Hoffman 1999; Scott, 1991). Organisational populations (this concept will be extended to represent company characteristics in the conceptual framework in Chapter 4) are defined as 'aggregates of organisations that are alike in some respect' (Scott, 1998, p.125).

Scott (1995) further elaborates the three institutional mechanisms mentioned earlier (developed in DiMaggio & Powell, 1983) as three distinct pillars of the institutional context: regulative (corresponding to coercive pressures), normative (related to normative pressures), and cognitive (elaboration of the concept of mimetic pressures). Through responding to coercion, expectations of norms and imitation, organisations demonstrate structural and procedural isomorphism, which is defined as 'a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions' (DiMaggio & Powell, 1983, p.149). That is, organisations embedded in the same environment are believed to become similar as they respond to similar institutional conditions. The constraining process reflects the adaptation of an institutional practice by the organisation (Dillard et al., 2004). Institutional isomorphism leads to the acquisition of legitimacy; and in that way, promotes the survival and success of organisations (Ang & Michailova, 2008). Institutional theory does not

consider legitimacy as a commodity to be possessed or exchanged, as is its interpretation in the bourgeois perspective of political economy theory. Instead, legitimacy is regarded as a condition reflecting compliance with regulations or market competition, normative support, and cultural alignment (Scott, 1995, p.45).

2.3.4.1 Regulative (Coercive) institutions

Regulative (coercive) institutions result from formal and informal pressures exerted on organisations by other organisations they depend on and by cultural expectations in the society within which organisations function. Such pressures may be felt as coercive, persuasive or as invitation to collude (DiMaggio & Powell, 1983, p. 150). Scott (1995) asserts coercive institutional pressure is based on rule setting, monitoring, recompense and punishment. In the context of CER, regulative structures (coercive pressure) and activities would include reporting regulations and their enforcement, as well as the threat of regulation of reporting. Larrinaga-Gonzalez (2007) explains coercive mechanisms can be in the form of regulation enforcement, market discipline or the exercise of power. Those coercive mechanisms lead the organisation, in order to gain legitimacy and survive, to comply and align its structures with the dominant rules. Coercive institutional pressure is consistent with a resource dependence view (Oliver, 1991). The underlying logic followed is based on the interests of the organisation (or that of the leading actors in the organisation), in terms of acquiring or maintaining organisational resources. This is consistent with theoretical perspectives based on conventional economic theory in which the motivations for CER include the mitigation of agency costs through legislation or regulation.

2.3.4.2 Normative institutions

Normative institutions arise from group norms to adopt particular institutional practices. Normative pressure is not exercised by coercion or imposition (as is the case in coercive pressure), but through a legitimate authority of norms and values (Scott, 1987). Normative (or social) institutions rely on mutually enforced complexes of prescriptions, obligations, and expectations (Scott, 2002, p.61). Generally, they take the form of ‘common professional practice, standards in operating procedures and occupation, and educational curricula. Organisations comply with them from professional ethical

obligation in order to align with norms established by educational institutions, professional accreditation bodies and industry associations' (Hoffman, 1999, p. 352).

2.3.4.3 Cognitive (Cultural) institutions

Cognitive (cultural) institutions derive from what DiMaggio and Powell (1983) termed 'mimetic isomorphism', which occurs when organisations model themselves on other organisations as a strategic response to an uncertain environment. Scott (1995) examines mimetic isomorphism as a cognitive (or cultural) aspect of institutions that embody symbols (such as words, signs, and gestures), as well as cultural principles (context) that guide an understanding of the nature of reality and the context through which meaning is developed. Organisations will often abide by them 'without conscious thought'. Cognitive institutional aspects form a 'culturally supported and conceptually correct basis of legitimacy that becomes unquestioned' (Hoffman, 1999, p. 353). When the legitimised course of action is not followed, this is likely to result in the perception of a company as less responsive or less effective (DiMaggio & Powell, 1983).

Traditionally, institutional theory embraced a top-down model which had a broad emphasis on passive conformity by companies to the institutional pressures on structural conformity and isomorphism of reporting (although the decoupling of organisational structure and practice is recognised in DiMaggio & Powell, 1983). This has led to increasing critique of the theory in downplaying the role of the bottom-up influence of individual organisations. In particular, the theory attended little to the role of organisational characteristics in organisational adaptation to institutional environments. Consequently, the theory had its weakness in explaining variation and change in organisational response to institutional influences (Ball & Craig, 2010; Hoffman, 1999; Goodstein, 1994; Greenwood & Hinings, 1996; Oliver, 1991; Powell, 1991; Scott, 2008). Institutional theory is limited also by the 'problem of broad disagreement over the theoretical definition and empirical measurement of core concepts such as organisational fields and institutions' (Hoffman 1999, p. 364).

Advances in institutional theory in organisational studies (discussed further in Chapter 4) have seen a convergence of old and new institutional concepts in explaining the

variation and change in institutions (Greenwood & Hinings, 1996; Scott, 2008). For example, Hoffman (1999) states:

> Ideas drawn from the old institutional theory about change, agency, politics, and interests can fit with neo-institutional ideas about inertia and resistance to change. This adjustment breaks neo-institutional theory free from the strict notion that social conformity will yield only predictable and isomorphic structures (p.367).

Hoffman (1999) suggests the analysis of an organisational field should be issue-based, and not be based on common technology or markets. He argues that environmental problems must be solved through changes in the institutional arrangements that govern industry and social action. An 'issue-based field is consistent with the notion that the organisational field is the centre of common channels of dialogue' through which institutional influence is exerted on organisations (Hoffman, 1999, p. 367). Issue-based organisational field analysis can be identified analytically through an increase in the extent to which certain organisations interact and engage in a common debate (DiMaggio, 1983).

Institutional theory in organisational studies embraces a converging view of classical and bourgeois approach to political economy. 'Legitimacy' in institutional theory is regarded as reflecting an organisational response to regulative (coercive), normative and cognitive (cultural) institutional influences. This differs from the interpretation of legitimacy in the bourgeois political economy perspective which commonly assumes a resource-based manipulative logic. The bourgeois political economy perspective sees legitimacy as a resource that enables organisations to attract resources that are then employed in pursuit of the self-interest of organisational goals (Tilling, 2004).

2.4 Discussion

2.4.1 Theoretical perspectives derived from the conventional economics theory

The perspectives (decision usefulness, agency theory and PAT), based on conventional economic theory, are dominated by a single paradigm–price theory, a single view of human nature (self-interest, wealth maximisation), and positive information costs (Eisenhardt, 1989). The unit of analysis is the contractual relationship between individuals. The external environment, where CER is based, is the theorists' belief in an

efficient capital market and the private ownership economic system. The firm is comprised of a 'nexus of contracts' between individuals in society who pursue different interests. This results in conflicts of interest at the organisational level. Conflicts of interest are resolved 'through the co-alignment of incentives—the price mechanism of economics' (Eisenhardt, 1989, p.63). The perceived legitimacy of a firm is wealth maximisation and reduction of contracting costs (including agency costs) in negotiating contracts with individuals. Disclosure of corporate social and environmental information is therefore driven by management's desire to reduce contracting costs to maximise wealth.

One problem with conventional economic perspectives on CER is that such perspectives do not question whether their assumptions fit reality in different historical, cultural, or institutional circumstances. The theory fails to address the influence of the social and institutional environment surrounding a principal-agent relation (Berrone & Gomez-Mejia, 2009). Hirsch et al. (1987, pp. 333-334) explain that the assumption in conventional economic theory is understandable within American individualistic and rationalistic culture—it fits very well with American capitalism and its political and social environment. However, it is questionable whether such assumptions are appropriate in a different cultural context. For example, Chinese culture, influenced by Confucianism, is focused on collectivism, and has a high 'power distance' in contrast to America (Hofstede & Bond, 1988). 'Power distance' is defined as 'the extent to which the less powerful members of institutions and organisations within a country expect and accept that power is distributed unequally' (Hofstede 1997, p. 28). What Western agency theorists take for granted, with regard to the political and social institutional environment, may not exist in China.

To rely heavily on economics, with its restrictive assumptions (such as efficient markets) and its single-perspective style, risks unintended and dysfunctional consequences (Eisenhardt, 1989). For example, as Hirsch et al. (1987) contend, where economics claims universality, it actually remains static and unable to incorporate major social changes into its models. Researchers who adopt a social and political perspective on CER (see Gray et al., 1995a, Hirsch et al., 1987; Milne, 2002) criticise theories (derived from conventional economics) on assumptions such as market efficiency. An exception is Parker (2005). He argues for a more positive view of this group of theories: in

particular, that the 'managerial approach offers an available and arguably feasible, actionable strategy for change' (p. 845). The limitations of the conventional economic theoretical approach to CER led to the prominence of the social and political approach to CER.

2.4.2 Theoretical perspectives derived from social and political theory

Theories derived from the social and political theory (such as classical political economy, bourgeois political economy, legitimacy theory, stakeholder theory and neo-institutional theory) offer an alternative view of the motivations for CER. Unlike conventional economic theory, social and political theories moderate the assumption of rational self-interested human behaviour. Conflicts of interests are considered a collective, interest group of stakeholders in society, and solved through a power mechanism. A firm is seen as a medium for balancing the power of stakeholders. CER is one of a firm's strategies to respond to demands of the external environment.

In contrast to economics theory, social and political informed theories do not limit themselves to the restrictive assumptions of efficient capital markets. Instead, social and political theorists explain the motivators for CER by attending to power, institutional structures, social norms, and cultural values that influence organisational choice. Thus, the motivators for CER are not just rational individual choice, but are socially learnt and changeable (Hirsch et al., 1987, pp. 323-326). Thus, the social and political view on motivators for CER yields a more realistic view of organisations. This allows those theories to capture the greater complexity of organisations than conventional economics.

Perception of legitimacy is different among the individual theoretical perspectives, although they share a common definition of legitimacy. The pluralistic approach of political economy theory discusses legitimacy through the analogy of a 'social contract'. The social contract exists between the firm and society (as proposed in legitimacy theory) or through multiple social contacts between the firm and different interest groups in society (as proposed in stakeholder theory). Instead of focusing on individual self-interest, as studies informed by conventional economics theory, this approach focuses on the collective group interests of the stakeholders in a pluralistic society.

Conflicts of interest are solved through bargaining and negotiating between the organisation and society as a collective, or between the organisation and its stakeholders. However, this pluralistic approach to political economy accepts the existing political and social institutions of capital markets and private ownerships as a given (Ramanathan, 1976) in its analysis of CER. Hence, it is limited, and overlooks the inequality of social classes in society.

A more convergent view of economic, social and political theories has been developed with theoretical advancement. Notably, development of institutional theory in organisational studies has incorporated agency interest in organisational strategic response to institutional pressures (Oliver, 1991; Scott, 2008). Both institutional isomorphism and variations are analysed through combining a view of institutional pressures with an individual organisation's circumstances. The theory focuses on forces that lie beyond the organisational boundary, in the realm of social processes (DiMaggio & Powell, 1991; Scott, 1995). A firm's action is seen not as a choice from an unlimited array of possibilities determined by purely internal arrangements, but rather as a choice among a narrowly defined set of legitimate options determined by the group of actors composing the firm's organisational field, as argued in Hoffman (1999).

2.5 Summary

This chapter has provided an overview of key theoretical perspectives used in CER research. The motivators for CER are examined from theoretical perspectives through their respective disciplinary lenses. Each perspective has contributed to the understanding of CER in its own right, and each has limitations.

Theories informed by conventional economics recognise the importance of incentives and self-interest in organisational thinking. However, this only presents a partial view of the world. It ignores the social and political environment that could exert pressures on organisations, and how those pressures are incorporated into organisational reporting behaviour.

Social and political theories offer an alternative view: that is, that reporting needs to be considered in the social, economic and political context in which an organisation is

operating. However, the issue with classical political economy is that although theorists challenge the status quo of existing political and economic institutions, they do not offer a solution to the problems they question. On the other hand, the problem with the bourgeois political economy perspective lies in its taking for granted of the existing capitalism. This ignores the unequal balance of power in society. Advanced form of institutional theory in the organisation study literature adopts a converging view of agency and institutional perspectives and explain how mechanisms (through which organisations seek to align their perceptions or practices, and characteristics with social and cultural values) has become institutionalised. Institutional theory permits different motives to be explored primarily based on the logics of appropriateness and on the social construction of reality (Larrinaga, 2007, p. 163). It has the potential to enrich understanding of CER from its broader social and economic context and thus provide a broader and longer view of organisational and social change. Chapter 3 examines the empirical application of the theories outlined in this chapter.

Chapter 3: Review of empirical studies in CER research

3.1 Introduction

Chapter 2 provided an overview of key theoretical perspectives used in CER studies, most of which are based in developed countries. As discussed in Chapter 1, due to the language barrier and the difficulty of accessing data, Chinese CER has received relatively little attention in the English language literature. Locally published studies in the Chinese language are not available readily to Western researchers. Exactly to what extent have studies based in Western countries been applied to Chinese CER research? What are the factors influencing CER in the English and the Chinese language literature? It is instructive to examine these under-researched questions to develop a suitable theoretical framework for use in interpreting climate-change reporting by Chinese companies. This chapter will address the above questions.

Accordingly, the principal objectives of this chapter are to combine English language literature with Chinese language studies of CER practice in China; to identify some important inadequacies in extant English and Chinese language studies of CER; to review empirical findings of the factors that influence CER in China; and to discover a suitable theoretical framework with which to analyse climate-change reporting in China. The remainder of this chapter is organised as follows. Section 3.2 describes the sources of the publications reviewed. Section 3.3 provides an overview of Chinese language literature. Section 3.4 examines empirical findings of macro political and economic contextual factors and micro firm level factors that influence CER. Section 3.5 discusses theoretical arguments and empirical analyses in the English and the Chinese language literature. Section 3.6 summarises the chapter.

3.2 Sources of publication

This chapter reviews three publication sources: English language accounting literature, English language organisational study literature, and Chinese language CER literature.

First, this chapter reviews studies published in English language environmental accounting literature. This is consistent with established empirical CER research (for example, Gray, et al., 1995a, 1995b; Parker, 2005, 2011) in the social and environmental accounting literature.

Second, this chapter extends the review to explore studies published in English language organisational study literature (see Appendix 1) on CER and Chinese companies (where climate-change reporting is part of organisational behaviour). This extension is because CER involves cross-disciplinary study. Research published in the organisational study literature can inform CER studies in the accounting literature. Further, organisational study literature has published some Chinese studies, which complement the lack of English language studies in the social and environmental accounting literature.

Third, this chapter explores CER studies published in Chinese language literature (see Appendix 2). In reviewing the Chinese language CER literature, studies were sourced from the Chinese language Academic Journal (CAJ) database (URL: www.cnki.net). This is an online Chinese domestic database, established in 1999, comprising full-text Chinese academic papers. Studies selected for this review cover the publication period 1997 to 2012. This period was selected because the first known empirical Chinese CER study based on a survey with Chinese business managers was published in 1997 by Wang et al. (1997). 2012 was selected because it was the most recent publication year available at the time of the study.

Because the review of Chinese CER research is exploratory, the following criteria were used to select Chinese academic papers. First, a study must address CER practice by Chinese companies. Second, findings of the study should apply to consecutive years of reporting periods from 1992: that is, the early years of the Chinese socialist capital market (marked by the opening of the SSE and Shenzhen Stock Exchange in the early 1990s) through to the most recent reporting year available in the selected Chinese CER. The studies chosen will help to gain a better understanding of how CER practices have evolved in China from 1992. Third, Chinese CER studies must have at least 100 downloads and a minimum of one recorded citation in the CAJ database. The above criteria were used as a measure to assess the popularity of a Chinese language research

papers among domestic researchers in China. This provided a quality control for the Chinese paper selection, and also rendered this review manageable. 28 Chinese CER studies were selected for review (see Appendix 2).

3.3 Overview of Chinese language CER literature

In general, studies published in the Chinese language literature by 2012 attend to general environmental information disclosure. No study has specifically addressed climate-change reporting by Chinese companies. The review indicates the majority of current CER studies conducted outside North America have not been incorporated adequately into Chinese language literature. Most of the English literature cited in the selected Chinese environmental accounting research prior to 2008 was published in the 1980s and 1990s, with some from the 1970s. CER studies published after 2008 show more citations of the English language literature published in the 2000s. Given that earlier Chinese CER studies (Ge & Li, 1992; Wang et al., 1997) drew primarily upon Gray's work (for example, Gray, 1990) in the early 1990s, and that Australia and the UK are currently taking the lead in offering accounting education programs in China (Yang, 2012), one would expect more references from studies conducted outside North America. This finding validates the need for innovation in accounting research and engagement with the Chinese context (Chen, 2007; Li et al., 2009; Sun & He, 2008; Xu, 2009). The lack of inclusion of current corporate environmental accounting literature indicates the need to narrow the gap in Chinese and English literature in respect of CER research.

The review also noted stylistic differences between English and Chinese literature research papers on CER. For example, the average length of a Chinese paper (less than an average of six pages) is usually shorter than that of an English paper (more than ten pages, on average). Chinese language research papers cited fewer references than English language papers. A further examination of the cited Western literature shows the strong influence of leading North American journals and scholars. Except for *Accounting, Organizations and Society*, other commonly referred journals that publish social and environmental reporting studies, such as *Accounting, Auditing & Accountability Journal*, *Critical Perspectives on Accounting* (see Deegan & Soltys,

2007; Gray, 2002; Mathews, 1997; Parker, 2011), and the *Journal of Business Ethics* were cited rarely in the Chinese language literature.

In the Chinese language CER literature, a diverse collection of Chinese language academic journals publish CER (see Table 3-1 for a summary of Chinese journals).

Table 3-1 Summary of Chinese journals publishing CER studies

Chinese Journal	**Count of publications**
会计研究 Accounting Research	9
中国人口, 资源与环境 China Population, Resources and Environment	4
证券市场导报 Securities Market Herald	2
中南财经政法大学学报 Journal of Zhongnan University of Economics and Law	1
中国软科学 China Soft Science	1
会计之友 Friends of Accounting	1
南京审计学院学报 Journal of Nanjing Audit University	1
审计与经济研究 Journal of Audit & Economics	1
当代财经 Contemporary Finance and Economics	1
林业经济 Forestry Economy	1
环境保护 Environmental Protection	1
管理世界 Management World	1
财会月刊 Financial Accounting Monthly	1
财会通讯 Financial Accounting and Communication	1
财经理论与实践 The Theory and Practice of Finance and Economics	1
财贸研究 Finance and Trade Research	1
Total	**28**

There are nine (out of 28) selected Chinese CER studies published in the Chinese academic journal, *Accounting Research* (Kuaiji Yanjiu)). This is regarded in China as a leading academic accounting journal.

3.3.1 Theoretical perspectives

The theoretical perspectives used in empirical Chinese CER research tend to be non existent or poorly explained. Half of the selected studies did not refer to any theoretical perspectives. This indicates most Chinese CER studies are descriptive and lack theoretical underpinnings. Table 3-2 provides a summary of theories used in Chinese language CER studies.

Table 3-2 Theoretical perspectives used in Chinese language CER literature

Theoretical perspectives	**Year of Publication**		**Total**
	1997-2005	2006-2012	
Agency theory	0	10	10
Legitimacy theory	0	4	4
No specific theoretical perspectives	6	8	14
Total	**6**	**22**	**28**

Prior to 2006, there was no theoretical perspective applied in empirical studies published in the Chinese language literature. Between 2006 and 2012, the use of Western agency theory and/or PAT was dominant in Chinese CER literature (10 out of 22). Legitimacy theory (4 out of 22), first introduced by Xiao and Zhang (2008), started to appear in Chinese CER studies published from 2010 (see Chen et al., 2010; Shen & Feng, 2012; Yang et al., 2011). The application of Western theories in Chinese CER research shows the influence of Western CER research on theory and research methodology on Chinese language CER study. The adaptability of the agency theory and/or PAT; and legitimacy theory to Chinese CER research will be further analysed in Section 3.5.

3.3.2 Research design

In the Chinese language CER literature, there are four stages of empirical studies drawing from six different sources of data collection, as shown in Table 3-3.

Table 3-3 Summary of data collection in Chinese language CER literature

Source of data collection	Year of Publication				
	1997-2004	**2005-2009**	**2010-2011**	**2012**	**Total**
AR	0	8	6	2	**16**
AR & CSR	0	0	0	2	**2**
CSR	0	0	3	0	**3**
Internet	0	1	0	0	**1**
IPO	1	1	0	0	**2**
Survey	4	0	0	0	**4**
Total	**5**	**10**	**9**	**4**	**28**

Key: AR=Annual Reports; CSR=Corporate Social/Sustainability Reports; IPO=Initial Public Offering

First, descriptive studies published between 1997 and 2004 used survey questionnaires (for example, Wang et al., 1997, 1998; Li & Xiao, 2002; Xiao & Mi, 2004) to gauge the perceptions of Chinese business managers and accounting professionals on CER in China. An exception is Geng and Jiao (2002). They analysed CER in IPOs.

Second, between 2005 and 2009 studies drawing on company annual reports increased. These studies adopted quantitative approach to testing the causal relationships between firm characteristics and CER in AR (see Li et al., 2008; Tang & Li, 2008; Wang, 2008). Exceptions were the study by Wu et al., (2008) which explored internet disclosure of CER; and the study by Shang et al., (2007) which drew data from IPOs.

Third, between 2010 and 2011 studies started to draw on CSR for data (see He & Hou, 2010; He &Huang, 2011; Wu, 2011) although AR remained the most popular data source.

Fourth, in studies published in 2012, two studies were sourced from data from combined AR and CSR (see Bi et al., 2012; Wang et al., 2012). This shows advances in CER data collection in the Chinese language literature.

In general, Chinese language CER studies (10 out of 28) tended to focus on Chinese companies in polluting industries (as identified by Chinese environmental protection authority: mining; metal and non-metal; petrochemicals; pharmaceutical medicine; electricity, coal and gas; textile, garments and fur; food and drinks; and paper and printing). Banking and financial industries were excluded, even in the studies that cover

non-polluting industries. Given the importance of banking and financial industries in funding business activities, it is important to include these industries in CER analysis. Their exclusion could risk rendering the results being incomplete.

English language CER research studies relating to China revealed a wide variety of research methods, including interviews (see Rowe & Guthrie, 2010; Yang, 2011, WWF China, 2010), surveys (Branzi & Vertinsky 2002), descriptive reports based on content analysis of a standalone CSR (for example, ACCA & GRI, 2009; Kolk et al., 2008; Syntao, 2007, 2009), quantitative research that examines the influence of company characteristics on Chinese CER (Zeng et al., 2012) in AR, and content analysis of Chinese companies CER on their websites (Zhang et al., 2007).

In contrast to the Chinese language literature, data collection in the English language literature was less current: no study published in the English language literature by 2012 had covered reporting years after 2008, nor was analysis drawn from data sourced in AR and CSR. Section 3.6.2 will further analyse the application of content analysis method in the Chinese language literature.

3.3.3 Evolution of CER reporting in China

The review of Chinese language literature shows that CER reporting by Chinese companies is an evolving process. It can be classified into three stages based on years of analysis: the first stage is 1992 to 2005; the second stage is 2006 and 2007; and the third stage is 2008 to 2010. Reported findings show inconsistent disclosures of corporate environmental information by Chinese companies. There are concerns that such inconsistent disclosures would result in reporting companies being selective in CER (Lu & Li, 2010).

In the first stage (1992 to 2005), there was a slow increase in corporate environmental information disclosed in the AR by Chinese listed companies. However, the overall level of disclosure was low (Geng & Jiao, 2002; Xiao & Hu, 2005; Wang, 2008). The survey by Li and Xiao (2002) offers useful insight to this issue. Their findings are summarised in Table 3-4.

Table 3-4 Chinese CER in 2001

Expenditure associated with environmental activities	**Survey findings (n=124)**	
	Actual occurrence %	Recognised separately in an individual account %
Overhaul or replacement of existing equipment as required by current legislation on environmental protection	93	34
Environmental protection facilities in new investment projects	89	45
Pollution emission fees	89	71
Environmental protection division (including employees' salaries)	61	11
Contingent expense on environnemental emergencies	75	18
Penalties/fines resulting from non-compliance with environmental legislation/regulations	40	34
Compensation for employees working in a special environment	56	21
Legal proceedings and compensation on environmental issues	31	18
Expenditure on community activities on environmental protection (e.g. donations)	50	16
Other	7	0
Income generated by environmental activities		
Income from recycling of wastes	82	24
Tax deduction on recycling of wastes	66	24
Prize awarded by the state for outstanding environmental performance	61	28
Compensation received for the loss caused by pollution by other enterprises	31	28
Trading of pollution emission permits	31	3
Government special grant on environmental management	60	30
Income generated from reduced interest rate on loans for environmental management	44	18
Donations received on environmental protection	52	7
Reduced payment for pollution emission fees resulting from implementation of clean production	52	14

Source: Li and Xiao (2002, p. 44)

Three survey studies (see Li & Xiao, 2002; Wang et al., 1997; 1998) reported what environmental information was considered important by respondents and hence was deemed to be reported: corporate environmental management policy; business activities and their environmental impact; waste and recycling; emission and pollution;

environmental management measures; and financial information related to environmental management activities, including investment, expenses, income, and provisions. This desired corporate environmental information indicates a balance of qualitative and quantitative CER. However, as Table 3-4 shows, the desired corporate environmental information was not recorded adequately and reported by Chinese companies in 2001.

Survey study findings of revealing low CER are consistent with the findings of a local Chinese CER study by Xiao and Hu (2005). They reported that 37 per cent of 1195 Chinese listed companies disclosed some kind of environmental information in annual reports in 2003, compared to 34 per cent in 2002. Table 3-5 summarises the environmental information identified in their study.

Table 3-5 Chinese CER 2002–2003

Corporate environmental disclosure items	**Disclosing companies (n=1195)** Reporting Year			
	2003		2002	
	Incidence	%	Incidence	%
Investment in environmental protection	184	15.40	159	13.31
Government grants, subsidies, and tax cuts associated with environmental protection	125	10.46	101	8.45
Pollution fees	120	10.04	96	8.03
Resources tax and resources compensation surcharge	88	7.36	80	6.69
ISO environmental management accreditation	44	3.68	41	3.43
Plantation fees	40	3.35	37	3.10
Government policy impact on business	37	3.10	37	3.10
Other	31	2.59	35	2.93
Other income and expenses associated with environment	15	1.26	18	1.51
Environmental protection loan	7	0.59	11	0.92
Legal proceedings, fines and awards associated with environmental activities	4	0.33	7	0.59

Source: Xiao and Hu (2005, p. 45)

The corporate environmental disclosure items identified in Xiao and Hu (2005) have been used widely in the Chinese language literature. Later studies (for example, Li et al., 2008; Zhou and Sun, 2006) have reported similar findings to that of Xiao and Hu (2005).

The low level of CER reported for the study period from 1992 to 2005 in the Chinese language literature is consistent with the findings of studies of Chinese CER published in the English language literature (Guo, 2005; KPMG 2005; SustainAbility, 2007; Syntao, 2007). It is notable that CER (in the form of CSR) prior to 2005 was almost non-existent in China. Exceptions include less than ten foreign multinational companies and several large Chinese state-owned companies with overseas operations. The low level of CER during this period reflects the institutional environment of a preference for secrecy regarding environmental information disclosure in China. According to Guo (2005), Chinese business enterprises were required to provide an environmental report (using a prescribed form) to local environmental protection authorities. Such information was unavailable to the public. In the context of authoritative Chinese political institutions, the lack of government guidelines (or encouragement of open environmental information) discouraged Chinese enterprises from engaging in CER.

The second stage (study period from 2006 to 2007) saw the emergence of CSR (where CER is part of the report) issued by large Chinese state-owned companies, in particular those with international operations (Syntao, 2007; 2009). Although Chinese researchers refer the use of content analysis to measure the level of CER, very few studies report what was reported. Instead, Chinese language CER studies published from 2008 shifted to a quantitative approach involving statistical testing of company characteristics and the level of CER reporting. An exception was the study by Wu et al. (2008).

The third stage (study period from 2008 to 2010) witnessed the rapid growth of public disclosure of environmental information, as part of CSR. This was stated in recent Chinese studies (see section 3.3.2). A particular focus was applied to different polluting industries (exceptions are Sun & Zhang, 2010; Wang, 2008 which involved cross-industry analysis). A study by Lu and Li (2010) is among the few that have reported some details of CER in AR by Chinese companies for reporting years 2007 and

2008. However, their study was limited to drawing on AR of listed companies in the manufacturing industry only. Table 3-6 summarises their findings.

Table 3-6 Chinese CER in 2007–2008

	Corporate environmental disclosure items	**Disclosing Companies (n=442)**			
		Reporting Year			
		2007		**2008**	
1	Qualitative description	Incidence	%	Incidence	%
1.1	Risks associated with environmental protection	53	11.99	50	11.31
1.2	Environmental protection measures	136	30.77	237	53.62
1.2.1	Environmental protection policy and strategies	49	11.09	83	18.78
1.2.2	Environmental protection targets and plan for next year	46	10.41	69	15.61
1.2.3	Environmental measures taken in the reporting year	107	24.21	219	49.55
1.3	Awards	25	5.66	82	18.55
1.4	ISO environmental management accreditation	46	10.41	102	23.08
1.5	Environmental performance	53	11.99	78	17.65
1.6	Non-compliance of environmental law or regulations	5	1.13	4	0.90
2	Quantitative description				
2.1	Environmental protection target	49	11.09	93	21.04
2.1.1	Including environmental performance target	41	9.28	77	17.42
2.2	Environmental protection investment	66	14.93	108	24.43
2.3	Government environmental protection grants and subsidies	45	10.18	93	21.04
3	Others	34	7.69	30	6.79

Source: Lu and Li (2010, p. 65)

Table 3-6 shows that except for a slight decrease in reporting 'Risks associated with environmental protection' (item 1.1) and 'non-compliance of environmental law or regulations' (item 1.6), the level of reporting of other qualitative and quantitative items experienced rapid growth in 2008 compared to 2007. Lu and Li (2010) explain the increase in the level of CER by Chinese manufacturing companies as reflecting the influence of corporate social responsibility reporting guidelines issued by the Shanghai Stock Exchange for its listed companies in May 2008 (SSE 2008). SSE 2008 on environmental reporting mirrored China's first nationwide environmental reporting guidelines−OEI 2007 (effective on 1 May 2008), which was not analysed in their study.

3.4 Empirical findings on factors that influence CER

Consistent with the review approach in Adam (2002), but with some modifications, the empirical findings on factors that influence CER are classified into three broad categories: first, the macro political and economic contextual factors; second, company characteristics; and third, an individual company's internal decision-making process. Findings in the English language and the Chinese language literature are discussed separately under each category.

3.4.1 The macro environment−the political and economic context

3.4.1.1 Findings in the English language literature

Empirical English language studies reveal that macro political and economic contextual factors influence CER. Williams' (1999) study, based on the general principles of modern liberalism embodied in bourgeois political economy theory, suggests country-level characteristics shape the social, political and economic systems of respective countries. This results in variation in cross-national differences in the level of corporate social and environmental information disclosure. This view is supported by Escobar and Vredenburg (2011), through a combined institutional theory and resource dependence theoretical perspective. They argue that the divergence of strategic responses of multinational corporations (MNCs) to the issue of sustainable development pressures (including climate change issues) resulted from the variation in host country interpretation of sustainable development issues. Aligned with the above arguments, Holland and Boon Foo (2003) examined CER within UK and US. They suggest that elements of the legal and regulatory framework of each country (which regulate environmental activity and influence environmental performance) determine the types of disclosures made. The study (informed by legitimacy theory) by de Villiers and van Staden (2006) reveals how the lack of support from powerful stakeholders for environmental issues has influenced the reduction in environmental reporting by South African companies after an initial period of increase. The above studies indicate the pattern of CER is influenced by a country-specific context.

As an important aspect of political and economic contextual factors, the role and influence of government on CER is debated in the CER literature. Proponents argue that

governments play an important part in protecting the interests of individuals as they seek to achieve their objectives (Gillroy & Shapiro, 1986; Okun, 1970). Clark (1991) argued that government intervention is particularly advantageous in the face of market failures (such as imperfect competition, externalities, instability, inequality and socially undesirable outcomes). If the activities of an organisation impinge on, or are perceived to impinge on the wider community, governments may intervene to protect individual rights within the community (Gray et al., 1995a). However, Coriado-Jimenez et al. (2008) use an impression management perspective (Neu et al., 1998) and legitimacy theory to present mixed arguments regarding the role of government regulation. Their study reveals progressive and improved government regulation could increase the quantity and the quality of CER, despite non-compliance persisting. They also suggest manipulative behaviour results in some firms engaging in more complex concealment strategies to attain corporate legitimacy, thereby depriving stakeholders of regulatory information. It becomes more difficult to dismiss compulsory reporting norms as regulation improves and enforcement expectations rise. Such argument aligns the strategic institutional perspective on the manipulative role of agency in response to institutional pressures (Oliver, 1991). Oliver argues that government regulation is a form of regulative institution exerted on a firm. In turn, the firm responds strategically to the institutional influence, based on its own circumstances.

By adopting a combined institutional and stakeholder theoretical perspective, Lee (2011) explicitly connects macro environmental factors (institutional forces affecting firms' social behaviour by shaping the macro-level incentive structure and sources of legitimacy) with micro-level factors (stakeholders of the firm can amplify or buffer the institutional forces by acting as mediators). Lee (2011) argues that the divergence in firms' CSR strategy (which CER can be part of) results from variability in the configuration of external influences, and that this consists of institutional and stakeholder pressures. External institutional influences and company-level factors are interdependent: firms characterised by these factors draw legitimacy and power from institutions, and institutions are often actualised through company characteristics. Together, they form a particular configuration of external influences that shape how focal firms construct their CSR reports. These arguments clearly indicate the two-way interaction of institutional influence and individual firm characteristics in response to CSR.

3.4.1.2 Findings in the Chinese language literature

Despite the prevalent suggestion of enhancing government regulations on corporate environmental information disclosure, very few studies published in the Chinese language literature explicitly addressed the political and economic context of China and the influence of context on Chinese CER reporting. In general, discussions of changes in reporting behaviour by Chinese companies are limited to speculative statements regarding the possible influence of China's political and economic environment. Three studies (Lu & Li, 2010; Shen & Feng, 2012; Wang, 2008) have attended to the external influence of environmental legitimations on the level of CER. They found government regulation influenced the level of environmental information disclosed by Chinese companies. However, there has been no rigorous examination of the changing political and economic environment, nor any investigation of how the changes have shaped Chinese company characteristics. How Chinese companies respond to changing institutions remains under-researched.

3.4.2 Company characteristics

3.4.2.1 Findings in the English language literature

There are abundant empirical findings on the relevance of company characteristics to CER (Cowen et al., 1987). For example, Gray et al. (2001) state that if social and environmental disclosures are manifestations of systematic behaviour by companies, then those manifestations could be expected to relate to company characteristics. There have been consistent findings regarding the relationships of company characteristics: for example, in respect of company size, industry, ownership and CER. Diverse theoretical perspectives occur in those empirical studies: for example, agency theory (Belkaoui & Karpik, 1989; Ness & Mirza, 1991; Trotman & Bradley, 1981), legitimacy theory (Aerts et al., 2009; Patten, 1991), stakeholder theory (Roberts, 1992), institutional theory in its various forms (Berrone & Gomez-Mejia, 2009; Zeng et al., 2012). Despite an abundance of empirical findings regarding company characteristics, justification of the relevance of these characteristics to CER is limited. Studies by Delmas and Toffel (2004; 2011) and González-Benito and González-Benito (2010) are the exception. These studies provide an innovative approach to explaining the role of company characteristics in corporate environmental management decision making.

Delmas and Toffel (2004, 2011) draw on institutional theory to propose that diverse institutional constituents (including governments, regulators, customers, competitors, community and environmental interest groups and industry associations) impose coercive and normative pressures on firms. However, the way in which managers perceive and act upon these pressures at the company level depends upon company-specific factors represented by company characteristics. Delmas and Toffel (2004) contend that company characteristics have a modifying effect on institutional pressures in corporate responses to environmental management (which can also be extended to decisions about climate change reporting). Another study by González-Benito and González-Benito (2010) provides useful analyses on how variables (size, internationalisation, location of manufacturing activities, position in the supply chain, industrial sector, and managerial values and attitudes) that characterise companies (and which are relevant to the context in which they compete) can influence managers' perceptions of stakeholder environmental pressure and the decision making process. However, there are very few such studies in the CER literature. More research is required into theoretical justifications for the modifying role of company characteristics in CER.

3.4.2.2 Findings in the Chinese language literature

Some studies, informed by Western agency theory and PAT (Watts & Zimmerman, 1978), have attempted to test the causal relationships between firm characteristics and overall levels of disclosure of CER (for example, He & Hou, 2010; Li et al., 2008; Tang, et al., 2006; Tang & Li, 2008; Sun & Zhang, 2010). In contrast to similar studies based in Western developed countries (Brammer & Pavelin, 2006; Roberts, 1992; Trotman & Bradley, 1981), the empirical testing of firm characteristics and CER in China has revealed different results. Apart from consistent support for size as a factor influencing CER, and some support for industry effects, there was limited support for the other firm characteristics identified in Western capital market studies, such as debt to equity ratio, ownership concentration, location of headquarters, profitability (although see Li et al., 2008), firm age, growth, an independent director, dual CEO–chairman role. Tang and Li (2008) and Xiao and Zhang (2008) suggest the underdeveloped and inefficient Chinese capital market is responsible for these differing results. In part, the problem lies in the selection of company characteristics that are irrelevant to Chinese companies. Variables

that characterise companies in Western developed countries may not best characterise Chinese companies operating in the Chinese political and economic environment. Identifying company characteristics relevant to the Chinese context is necessary.

3.4.3 Management perceptions and decision making process

3.4.3.1 Findings in the English language literature

Prior literature (primarily adopting a qualitative case study approach), exploring the internal organisational and contextual factors that influence CER, has investigated managerial perception of pressures exerted on organisations, along with decision making processes in CER. Managerial perceptions of different types of stakeholder influence are associated with different types of corporate environmental strategy (Sharma & Henriques, 2005). Larrinaga et al. (2001) found that nine Spanish companies disclosing a large amount of environmental information, were using their reporting to control the national environmental agenda and perceptions of corporate environmental performance. O'Dwyer (2002) found the prime motive for sustainability reporting by senior managers (in 27 Irish companies) was to enhance corporate legitimacy. He noted that while some managers alluded to concerns about accountability in the wider society, there was little in the perspectives that suggested motives other symbolic self-interest (p. 427).

Adams (2002) examined the influence of internal contextual factors on CER by conducting interviews with seven companies in the chemical and pharmaceutical industry. She found that the process of reporting and decision-making appears to be influenced by the country of origin, corporate size and culture. Her study also found public pressure was the driving force behind reporting, and for developments and changes in reporting practice. The model presented in Adams (2002) highlights influential macro environmental (political and economic context) and firm level factors (company characteristics and internal decision-making process) and the relationships between them. A case study by Adams and McNicholas (2007) found company characteristics (represented by the nature of state ownership, the personal perspective of the CEO, industry affiliations and the reporting by industry leaders) influence management decision making in reporting.

However, as Adams (2002) acknowledged, the qualitative case study method is limited by small sample sizes. Her study was unable to predict which would be the most important factors under different circumstances. The issue also lies with the loose discussion of three broad categories of factors that influence company reporting behaviour. Integrated consideration of CER-related interaction between broad social and economic factors, company characteristics, and organisational context is lacking. This includes both the reporting process itself, as well as attitudes influencing decision-making about the reports.

3.4.3.2 Findings in the Chinese language literature

Early Chinese empirical studies (published before 2005) revealed that, in general, Chinese business managers were reluctant to disclose environmental information publicly. This was despite surveyed companies recognising the importance of CER, and reporting such information to their local government (although not disclosed publicly) and internal management. The reported disincentives for CER were Chinese business managers' concerns about political uncertainty, and potential negative political and economic impacts of voluntary CER on Chinese companies (Wang et al., 1997; Zhou & Sun, 2006). There were no government guidelines on open CER. Wang et al.'s (1998) study also reported the technical difficulty in measuring environmental activities in financial reports, due to the lack of a designated financial reporting standard on environmental activities. There were consistent findings that only a small fraction of income and expense associated with corporate environmental activities was recognised separately as an individual account (Li & Xiao, 2002; Wang et al., 1998; Xiao & Mi, 2004).

Although the findings suggest passive compliance with Chinese government regulations and a low level of open CER, Wang et al. (1997, p.45) noted that some Chinese managers took a more proactive attitude towards CER—one that regarded environmental disclosure as a means to build a positive image and enhance market position. Syntao (2009) revealed that government and investors remained the primary drivers for Chinese companies to release CSR. Also influential were Chinese companies' expanding internationalisation, media reporting and non-government organisations

(NGOs). Domestic pressures from the Chinese public also influenced the need to report environmental information.

3.5 Adaptability of Western theories to Chinese CER research

Table 3-7 summarises the theoretical perspectives applied in Chinese organisational studies (including CER) in the English and the Chinese language literature.

Table 3-7 Theoretical perspectives in English and Chinese language literature

Theoretical perspectives	**English language literature**	**Chinese language literature**
Conventional economic theory perspective		
Agency theory and/or PAT	0	10
Social and political theoretical perspectives		
Institutional theory	15	0
Legitimacy theory	0	4
Multi-theoretical perspectives (combined legitimacy theory, stakeholder theory and accountability theory)	2	
No specific theoretical perspectives	8	14
Total	**25**	**28**

As indicated in more than 60 per cent of the studies published in the Chinese language literature, and more than 30 per cent of studies published in the English language literature, no specific theoretical perspective was used in study of Chinese CER. The lack of theoretical debate in study of CER resonates with prior literature that has argued for further exploration of theoretical perspectives on organisation sustainability and environmental reporting practice (see Gray et al., 1995a; Roberts, 1992; Sharma & Starik, 2002; Thomson, 2007). It reveals the urgent need to advance the theoretical underpinnings of Chinese CER (as is the case with CER study in developed countries).

English language literature on Chinese organisational studies adopts social and political perspectives of Chinese organisational behaviour in the Chinese setting. Institutional theory is the most popular theoretical perspective used to study Chinese company

behaviour (15 out of 25). There are a limited number of studies drawing on the combined theoretical perspectives of legitimacy theory and stakeholder theory.

The following subsections will evaluate the adaptability of each theoretical perspective (see Chapter 2) to the study of Chinese CER.

3.5.1 Agency theory and/or PAT

Studies published in Chinese language from 2005 appear to draw primarily upon conventional agency theory and/or PAT to explain Chinese CER practice by testing the relationships between firm characteristics and CER. The theoretical perspectives applied the same assumptions as those in agency theory and Western capital markets research (for example, Bi et al., 2012; Wang et al., 2012; He & Hou, 2010; Li et al., 2008; Sun & Zhang, 2010; Tang et al., 2006; Tang & Li, 2008, Wang, 2008). However, why and how company characteristics are relevant in CER were not addressed. Results provide very limited support for the hypotheses. This raises the issue of the adaptability of the conventional agency theory and/or PAT to Chinese CER study.

A problem lies in the assumptions held by conventional agency theory and Western capital markets research regarding self-interest driven human behaviour, and the EMH. Such assumptions are based on the Western (the United States in particular) political and economic context, where proprietary ownership prevails and capital markets are well established. The assumptions also align with the individualist culture of the United States (Hirsch et al., 1987). However, those assumptions oppose the traditional Chinese Confucian culture represented by collectivism (Hofstede & Bond, 1988; Hofstede, 1991), and contrast with the reality of the Chinese political and economic environment.

China is in transition from a planned to a market economy. Public ownership is the primary form of ownership. The meaning of corporatisation of state-owned enterprises (SOEs) in China differs from that held in Western capitalist countries: it does not result in privatisation of former SOEs, as in the West (Hilmy, 1999; Xu & Uddin, 2008; Yang, 2011). The Chinese government controls the majority of listed companies, and management is government appointed. China's economic transition, and the changing political ideology of the ruling CPC, have influenced the formation of the characteristics

of Chinese companies (Lin, 2001; Scott, 2002). China's collectivist culture, coupled with the Chinese command and control political power of the ruling CPC, means the role of Chinese companies is not the 'nexus of contracts' assumed in agency theory informed Western studies (Watts & Zimmerman, 1978). Rather, the role of Chinese companies is an extension of the Chinese political and economic system.

In the English language literature, application of agency theory and/or PAT to CER study is critiqued strongly by Gray et al. (1995a) and Milne (2002). For example, Gray et al. (1995a) argue that the central assumption of agency theory that 'all actions are motivated by a morally degenerate form of short-term self-interest seem not only empirically implausible but also highly offensive' (p. 52). Business operations cannot be solely for economic efficiency, nor are they driven by individual self-interest (as would be argued in conventional agency theory or PAT). At best, the Chinese government and its controlled publicly listed companies are agents of the general public. Managers of listed companies are agents of government. However, the dilemma is that state ownership often imposes a social responsibility upon Chinese listed companies (most are still controlled by the state).

Thus, application of Agency Theory and/or PAT without modifications to fit Chinese social, political and economic contexts in order to explain Chinese CER, is highly contestable (Li et al., 2009; Sun & He, 2008). This partly explains why those studies that directly apply corporate characteristics used in Western capital markets research to the study of Chinese CER have, in general, failed to explain the reporting behaviour of Chinese companies. The relevant Chinese company characteristics are not selected in those studies. A more flexible theoretical perspective that allows integrated analyses of macro and micro environmental factors would be more suitable for analysing Chinese company behaviour.

3.5.2 Legitimacy theory and the stakeholder theory

Studies that have applied legitimacy theory and stakeholder theory (commonly referred to as social and environmental accounting: for example, in Deegan, 2002; de Villiers & van Staden, 2006; Freedman & Jaggi, 2005; González-Benito & González-Benito, 2010; Roberts, 1992) to CER in the context of China, either could not find support for the theory

(for example, in Taylor & Shan, 2007; Zhang et al., 2007) in English language literature or limited to the inefficient Chinese capital market in Chinese language literature (for example, in Xiao & Zhang, 2008), although Chinese language studies published in recent years (see, for example, Chen et al., 2010; Shen & Feng, 2012; Yang et al., 2011) have found some support for legitimacy theory. Partly this is because of problems with the two theories (discussed in Chapter 2). The focal point of stakeholder theory and legitimacy theory is the individual organisation's legitimacy management through the concept of 'social contract'. Although the two theories recognise external influences on the organisation, they fail to address the processes driving the change in CER at the macro environmental level. Both theories adopt a pluralist assumption: that is, various stakeholders in society are assumed to be equal, to have the right to pursue self-interest, and to interact with each other in status quo institutional arrangements (i.e. the established capitalist economic system and Western democracy political system). However, they fail to recognise that not all stakeholders in a society have equal influence on an organisation (Lehman, 2001).

The pluralistic assumptions of legitimacy theory and stakeholder theory also are conflicting with the high 'power distance' dimension of Chinese culture (influenced by Confucianism), that is power is centralised in the authoritative Chinese government through the ruling CPC's unchallengeable position. Although China's economic reforms aim to move towards a market-oriented economy, the political regime remains unchanged. The influence of the Chinese government through the CPC pervades Chinese organisations (Opper et al., 2002; Rowe & Guthrie, 2010; Scott, 2002; Walder, 1995; Yang, 2011). Thus, application of the bourgeois political and economy theoretical perspective (the derivation of legitimacy and stakeholder theory) is limited when applied to the political and economic context of China.

3.5.3 Institutional theory

Review of English language organisational study literature reveals institutional theory persuasively seeks explanations of Chinese organisational behaviour (for example, Firth, 1996; Hilmy, 1999; Lin, 2001; Peng, 2003; Scott, 2002; Walder, 1986; 1995; Yang, 2011; Yang & Modell, 2013). Scott (2002) has justified the use of institutional theory as an analytical framework in the organisational studies of Chinese enterprises (where

climate-change reporting is a part of organisational behaviour). For example, Scott (2002) states:

> China, for its part, is attempting to introduce basic changes in its economic systems in ways that do not undermine its centrist political regime. This development has both encouraged and challenged scholars working to advance understanding of large-scale institutional change (p.60).

Scott (2002) applies institutional theory to explain changes in Chinese enterprises at institutional levels: the societal level (institutional differences and connections between the West and the East); the organisational field level change of former Chinese SOEs; and individual organisation level change of the relationship between Chinese managers and employees. Scott (2002) calls for more research using institutional theory as an analytical framework to study Chinese company characteristics in the context of China's institutional transition.

As discussed in Chapter 2, institutional theory permits different motives to be explored, including moral obligation and cultural cognition in environmental reporting. It has potential applications for CER research in different political and economic institutional contexts. The relevance of institutional theory to corporate environmental management and reporting is well documented in organisational study literature (see Jennings & Zandbergen, 1995; Hoffman 1999, 2001) and accounting literature (see Larrinaga, 2007). Institutional theory has provided important insights to understanding the processes and motivations of corporate environmental responsiveness. As Meyer (2002, p. xv) states, the theory 'is especially useful in analysing the interrelations of organisations with modern environmentalism'. Already some studies (Branzei & Vertinsky, 2002; Rowe & Guthrie, 2010; Yang, 2011; Zeng et al., 2012), published in the English language, explicitly take an institutional perspective regarding Chinese corporate environmental and sustainability management. Potentially, institutional theory is the most suitable analytical framework for adaption to the Chinese context. However, none of these studies specifically attends to corporate climate-change reporting, nor give specific consideration to China's radical institutional change to general and environmental information transparency. That change was marked by the promulgation of *Open Government Information 2007* (effective on 1 May 2008) and *Open*

Environmental Information 2007 (effective on 1 May 2008), with resultant impacts on climate-change related environmental reporting.

In the English language literature, current applications of institutional theory in the environmental accounting literature have not incorporated the advances in institutional theory in the organisational study literature. This is in contrast to the wide applications of institutional theory, and the diverse research methods applied, in the organisational study literature (Dacin et al., 2002). There are several typical limitations.

First, as discussed in Chapter 1, empirical studies informed by institutional theory have been dominated by qualitative studies with relatively small sample sizes. Only a few large sample studies have been conducted (for example, Aerts et al., 2006; Cormier et al., 1999; Zeng et al., 2012). Although qualitative research is important and useful, small sample sizes risk atypical results. Larger and richer data sets have more impact and legitimacy. They complement qualitative studies because they allow analysis of an 'on average' influence of multiple factors. Ehrenfeld (2002) highlights a critical need for an alternative research approach (in institutional theory–informed corporate environmental management studies) with larger and richer data to explicate finer structure in the institutional context of company environmental or sustainability behaviours (p.449).

Second, CER studies tend to focus on the effects of institutional environments on the structural conformity and isomorphism of CER, while institutional process changes are under-studied (Ball & Craig, 2010).

Third, CER studies focus on a single institutional aspect, for example, normative institutional pressure (Ball, 2005); the over-socialised focus on the 'taken-for-granted' cultural cognitive institutions (Rahamana et al., 2004); or government-driven coercive institutions (Rowe & Guthrie, 2010). Integrated consideration of regulative (coercive), normative and cultural (cognitive) institutions is lacking.

Fourth, the role of an organisation's influence on its environmental conditions and institutional change processes has been overlooked (Oliver, 1991; Hoffman, 1999). Only recent studies (for example, Collin et al., 2009; Tagesson et al., 2009) in the

accounting literature have attended to the bottom-up influence of individual organisations on the variation of CER by integrating an agency perspective with institutional theory. This has appeared in organisational studies much earlier (for example, Oliver, 1991).

Development of institutional theory in the organisational study literature has established a tight link between the institutional environment and organisational characteristics in organisational strategic responses to environmental issues (which can extend to climate-change related environmental reporting).

3.6 Advance empirical analyses in Chinese CER research

3.6.1 Theoretical justification for the relevance of company characteristics in CER

There are many empirical studies in the English and Chinese language literature of company characteristics in general corporate and environmental reporting. Company characteristics are often treated as directly driving the level of company reporting behaviour (in agency theory and/or PAT informed studies). Consideration of how the political and economic environment shapes organisational characteristics and behaviour is absent, as is consideration of how relevant company characteristics influence reporting behaviour. The comment of Gray et al. (1995a) regarding the absence of a theoretical justification for the relevance of company (organisational) characteristics in corporate reporting is still pertinent.

Chinese language literature also experiences this problem when it applies those company characteristics used in the Western capital markets research to Chinese CER research. This resonates with Chen's (2007) review of the contemporary accounting research in China: current empirical analyses in accounting 'lack innovation'. Most studies 'simply mimic the North American research approach, with few studies capturing the unique contextual characteristics of China' (p. 3).

Theoretical justification for the relevance of company characteristics to CER is underdeveloped. This situation can be resolved from an institutional perspective. Delmas and Toffell (2004) examined how organisational characteristics affect the extent

of institutional pressures exerted on an organisation, and the resulting variation in CER. Their subsequent study offers a 'fresh look' at the relevance of organisational characteristics to divergent environmental management strategies for companies who are facing similar institutional pressures (Delmas & Toffell, 2011). They explain that organisational characteristics have moderating effects on institutional pressures exerted on an organisation. Zeng et al. (2012) adopt an institutional theoretical perspective to examine company characteristics and Chinese CER. However, there appear to be no institutional theory studies that have examined the moderating effect of company characteristics on institutional influences relating to climate-change related environmental reporting by Chinese companies in the context of China's changing institutional environment. Advancement of institutional theory in the organisational study literature is underway (for example, Scott, 2008; Tagesson, 2009). More study is necessary to develop the explanatory power of the theory in CER accounting literature in the Chinese context (this will be addressed in Chapter 4).

3.6.2 Integrating qualitative and quantitative data analysis

There is a need to integrate qualitative and quantitative data analysis into CER study. In general, empirical analyses published in both languages on Chinese CER are limited. No study has specifically addressed climate-change reporting by Chinese companies, drawing from a combined analysis of AR and CSR. Although there are a few studies published in the Chinese language literature in 2012 drew data from reporting year 2010, those studies didn't provide detailed information regarding what was reported.

Research published in the English language literature also has limitations. Empirical analyses are of small qualitative samples, or data are taken from the AR alone (as is the case for most prior research on corporate environmental disclosure). Although the annual report provides the primary source of information to stakeholders (including investors), those reports are not the only source of information by which to undertake environmental disclosure. Much disclosure is voluntary, and companies can choose many alternative communication media (Frost et al., 2005; Unerman, 2000). In recent years, with the development of international standards on social and environment reporting practice (e.g. the *GRI*, the *Global Compact*, and the *Equator Principles*), large companies have used annual and standalone reports to communicate with stakeholders.

Indeed, recent research in Chinese and English language literature has seen an increase in the use of AR and CSR to analyse corporate environmental disclosure practice (see, Guthrie et al., 2008, for a review of the growing evidence regarding the use of alternative disclosure media). More studies with data drawn from AR and CSR are needed in order to gain a better understanding of CER.

Content analysis has been a popular method in the English and Chinese language CER literature. Chinese language CER studies published from 2008 tend to use unequal weighting to measure the quality and the quantity of CER. Quantitative information tends to gain more weighting than qualitative information. Such studies risk subjectivity because qualitative information (such as policy in respect of environmental protection) is equally important (see Chapter 5 for further analysis). Research instruments, used in content analyses, are under-specified and Chinese contextual environmental reporting is not adequately captured in the research instrument. There was no focus in the CER studies. Most studies published in the Chinese language literature don't provide details of how the coding of large samples of company reports was conducted. The lack of systematic theoretical arguments and justifications of empirical design in some Chinese language CER research risk CER findings published in the Chinese language being incomparable and unreliable.

Despite the limitations of Chinese language CER research, it would be wrong to dismiss the findings of CER research as reported in the Chinese language literature, because those studies offer valuable insights to the evolving process of CER in China.

3.7 Summary

This chapter has reviewed English and Chinese language CER literature. It has made the case of using institutional theory to interpret climate-change reporting by Chinese companies, because of its capacity to integrate macro political and economic contextual factors and firm level factors. In general, Chinese CER studies (in both languages) are descriptive. There is a lack of rigorous examination of the changing political and economic environment, relevant Chinese company characteristics, and decision making in CER behaviour. Specific analysis of climate-change reporting was not addressed in the Chinese language literature.

Improved dialogue between Western and Chinese CER researchers is vital. The review of English and Chinese literature argues for a more critical evaluation of theoretical adaptability, as applied in developed countries, to the Chinese context of CER research. The chapter argues that there is a critical need for more sophisticated empirical analyses in Chinese CER research than are now available in English and the Chinese language literature in integrating Chinese political and economic contextual factors with micro firm level analyses.

In Chapter 4, an extended model will be built based on advances in institutional theory in organisational study literature. This will undertake three interrelated levels of institutional analysis, with explicit attention to climate-change reporting in China's changing institutional environment. The model will then be tested empirically in Chapter 5, incorporating a further developed research design and empirical analysis. Chapter 5 will also adopt an alternative quantitative research approach with larger and richer (and more current) data to investigate factors influencing climate-change reporting by Chinese companies.

Chapter 4: Conceptual framework

4.1 Introduction

The review of theoretical perspectives (Chapter 2) and empirical analyses (Chapter 3) in CER research identified institutional theory as a potential analytical framework to apply to Chinese CER studies. Institutional theory allows for multiple levels of institutional analyses, from broader political and economic contextual factors to the management perceptions of institutional pressures and internal decision-making processes. Chapter 3 argued that an integrated consideration of the macro and micro environmental factors influencing CER had been underdeveloped in previous literature. Most importantly, Chinese-specific social, political and economic contextual characteristics were not captured in the theoretical arguments and empirical analyses underlying Chinese CER studies.

The objective of this chapter is to develop an extended model which builds on and extends institutional theory to capture the Chinese contextual characteristics of climate-change reporting. The model engages multi-level institutional analyses to integrate China's changing political and economic environment (i.e. societal level), evolving climate-change reporting issues (i.e. organisational field level) and the role of Chinese company characteristics (organisation level) to explain the homogeneity and heterogeneity of climate-change reporting by Chinese companies.

The remainder of this chapter is organised as follows: Section 4.2 revisits advances in the organisational study literature. Section 4.3 presents the model via three integrated institutional analyses: at political and economic environment level, organisational field level and at the organisational level. Section 4.4 presents the chapter summary.

4.2 Advances in the organizational study literature

This section revisits the advances in institutional theory that have been made in the organisational study literature. It is motivated to do so because the organisational study literature has widely applied institutional theory for more than 30 years, and has made

significant progress theoretically (Scott, 2008). Several approaches in organisational studies attempt to bridge organisational field level and organisational level analysis in order to explain variations in organisational response to institutional pressures. For example, Oliver (1991, p.146) argues that institutional theory accommodates interest seeking, active organisational behaviour when organisational responses to institutional pressures and expectations do not assume passivity and conformity across all institutional conditions. Organisations respond strategically to those pressures and manage legitimacy in the interests of continuity and prosperity (Oliver, 1991; Suchman, 1995).

Empirical studies testing Oliver's ideas have considered company characteristics including: size, industry, ownership identity, professional membership, and inter-company connections as the measure of institutional factors that influence company decision-making (Clemens & Douglas, 2005; Goodstein, 1994; Ingram & Simons, 1995). Those studies provide early empirical support to the bottom-up influence of company characteristics on institutional pressures on a company. The limitations of those studies are evident in the under-specification of field level processes, and in the separation of individual organisation and orgnisational field as distinct entities (Levy & Rothenberg, 2002). However, interpretation of the concept of orgnisational field in general is vague (Scott, 2002).

Hoffman (1999) developed institutional theory by proposing that an organisational field can form around a central issue (environmental/climate-change reporting). This brings together various field constituents (actors) with disparate purposes. Individual organisational populations (or classes of constituencies) exist within an organisational field and hence interact with institutions in the field. Individual organisational populations (or classes of constituencies) may have differing positions on the three aspects of institutional elements—regulative, normative and cognitive (see Chapter 2). Scott (1991) explained this influence of individual organisational populations manifests in institutions including rules (regulative), norms (normative) and beliefs (cultural cognitive) that describe the organisation's 'perceived reality' and explain individual organisation's choice. Thus, a firm's action is a choice from a narrowly defined set of legitimate options determined by the group of actors (constituents) comprising the firms' organisational field.

According to Hoffman (1999), field formation is not a static process; new forms of debate emerge in the wake of triggering events that cause a reconfiguration of field membership and/or interaction patterns. An event that instigates institutional change can potentially take different forms (including: milestones, catastrophes and legal/administrative incidents). The 'uncertainties created by these events lead organisations to experiment and to go beyond established practice', which may eventually lead to new institutional arrangements. Hoffman (1999) argues, and empirically examines, the coevolving nature of the organisational field centred on corporate environmentalism and institutions. The evolving organisational fields result in changing configurations of institutions at the organisational field level, which has led to the situated institutions. Thus, organisational fields are richly contextualised spaces where disparate organisations involve themselves with one another to develop collective understandings regarding matters of importance (Jamali & Neville, 2011; Wooten & Hoffman, 2008). The three institutional aspects—regulative, normative and cognitive—are connected, and are empirically indistinct from one another (Hoffman, 1999; Scott, 2008; Zeng et al., 2012).

To address the under-specification of field level process, Hoffman and Ventresca (2002) further develop the concept of an issue-based organisational field. They explain that a field is an 'empirical trace' that can include 'constituents such as government actors, critical exchange partners, intermediaries in the value chain, professional and trade associations, policy entrepreneurs, regulatory bodies, and organised public opinion evident in consumer or other organised interests'. All of these constituents 'interact and contend in the definition of the broader field logic'. To understand company heterogeneity within an institutional context, organisational level analysis 'complements and extends field level analysis. The value of such dual specification is clear'—it directly redresses the over-socialised view that depicts recipients of field level influence as a homogenous collection of organisational actors, each behaving according to a social script designed by the social environment (pp. 5–10). Hoffman and Ventresca (2002) argue that the interaction between a firm and field is neither unidirectional nor separate from interpretation and enactment processes. Field influences are not uniformly understood by participants within the field; organisational level dynamics can filter and alter institutional demand (pp. 11–12).

Organisational level dynamics point to the moderating role (Delmas & Toffel, 2011) of individual organisational populations (see Chapter 2 for the definition of 'organisational population') formed by company characteristics interacting with the field level influences. Many individual populations (or classes of constituencies) exist within an organisational field. Hence, one way of identifying differing positions on the three aspects of institutional elements—regulative, normative and cognitive—is by company characteristics. Field level competition influences institutional beliefs and perceptions, but these are situated within individual organisations or populations of organisations (Scott 1998; Hoffman, 1999). Therefore, 'the form of organisational response is as much a reflection of the institutional pressures that emerge from outside the organisation as it is the form of organisational structure and culture that exist inside the organisation' (Hoffman, 2001, p. 137).

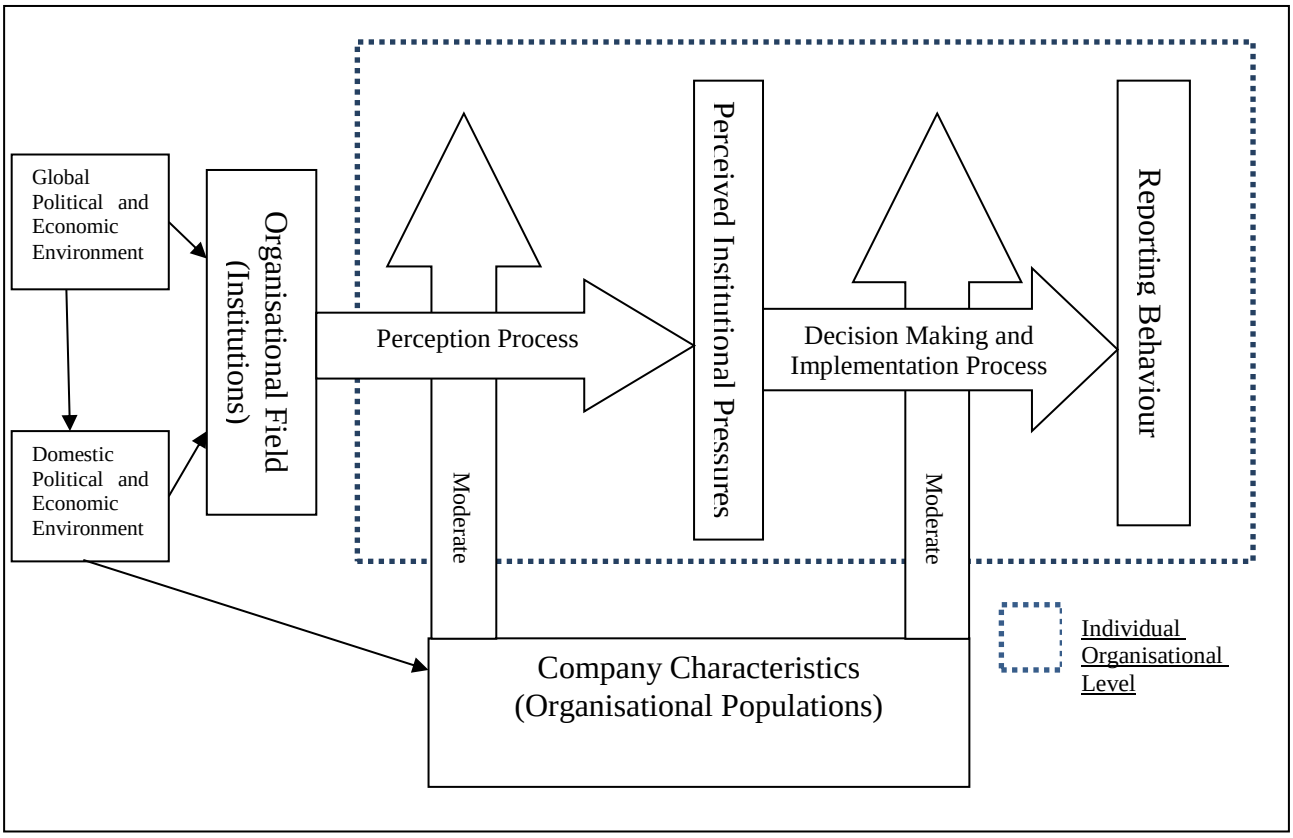
Jamali and Neville (2011) extend institutional theory to analyse convergence versus divergence of CSR in a developing country (Lebanon). Their findings highlight the usefulness of multi-level institutional analyses. Levy and Rothenberg (2002) adopt Hoffman's (1999) view on the issue-based organisational field. They develop three explanations for variations in corporate responses to climate change: first, institutional discourses and practices do not pass across organisational boundaries undisturbed. Each company interprets the institutional environment through a unique lens, a product of its history, organisational culture and market positioning. Second, organisations often operate within 'multiple, overlapping institutional fields'. They belong to various industry associations or national cultural and regulatory contexts, which create divergent pressures on organisations. Organisations are situated in complex, fragmented fields with 'imprecise boundaries, providing repertoires of practices and discourses within which they can exercise some agency and choice'. Third, even a single organisational field can sustain multiple competing discursive forms (pp. 176–177).

The above arguments support the bottom-up influence of individual organisations on institutions at organisational field level.

4.3 The extended model

Consistent with advances in institutional theory, the extended model considers climate-change reporting as an issue-based organisational field, composed of a multiplicity of constituents (or actors) who exert institutional influences in the context of China's institutional transitions. At the societal level (political and economic environment), this thesis undertakes a historical analysis of changing political ideology of the ruling CPC, its impact on changing Chinese company characteristics and the creation of new institutions of environmental transparency in China (Section 4.3.1). At the organisational field level, the study describes and evaluates the changing yet converging institutions on environmental transparency of Chinese companies exerted by multiple institutional actors operating in the field of climate-change reporting (Section 4.3.2). At organisational level, the study analyses how individual organisational populations formed by Chinese company characteristics interact with institutions in the organisational field (Section 4.3.3).

Figure 4-1 Conceptual framework: The extended model



4.3.1 Political and economic environment

Figure 4-1 presents the political and economic environment at the global and domestic level. Such distinction better illustrates how a country's specific institutional environment shapes company characteristics and the role of the country-specific context. This study analyses China's political and economic environment through the ruling CPC's changing political ideologies over the past six decades. They are the driving force behind China's institutional transitions.

The CPC's political ideology has been transformed through four generations of the Party's leadership over 60 years: Mao Zedong (1949–1976), Deng Xiaoping (1978–1989, who continued his influence until 1997), Jiang Zemin (1989–2002), and Hu Jintao (2002–2012). CPC's political influence, through the Chinese government, on Chinese enterprises is evident (Opper et al., 2002; Scott, 2002; Xiao et al., 2004). Studies consistently find that enforced Chinese government requirements are the main driver behind company environmental management and sustainability practices (Rowe & Guthrie, 2010; Wang et al., 1998; World Wide Fund for Nature China, 2010; Yang, 2011). Ezzamel et al., (2007) have studied the CPS's changing political ideology from Mao's era to Deng's era, and their influences on China's accounting regulation. Scott (2002) also analyses Deng's economic reforms and the impact on the changing characteristics of former SOEs. Inspired by prior literature, the model developed in this thesis extends the analysis of the CPC's political ideology to the recent generation of CPC leaders (Hu's era), and their political ideology (current at the time of this study), known as 'Scientific Approach to Development', along with institutional changes in government and environmental information transparency. This historical review of political ideologies provides a context for understanding the changing organisational field of environmental transparency, Chinese enterprises and their characteristics.

4.3.1.1 Mao's era

Marxism influenced Mao's era. The era focused on 'class struggle, public ownership, and central planning'. An SOE was not an independent entity in the modern sense, because it lacked the rights, interests and scope to determine its own fate. The relationship between the enterprise and the state was one of submission and allocation

(Ezzamel et al., 2007). This was partly because the then Chinese organisational forms were based on translations of documents and manuals rather than on direct knowledge of social practice. The Chinese version of Stalinist economic organisation was more rigid and uncompromising than the system being modelled. One of the key characteristics of Chinese enterprises is CPC control over management. This includes economic decisions at all levels, from society-wide to the workplace (Scott, 2002, pp. 64-65). Property rights relations were unclear and the concept of economic agency was ill-defined, or even absent, as lines of responsibility were blurred (Lin & Tan, 1999, cited in Ezzamel et al., 2007, p. 681). Words like 'capital' and 'company' were seen as tools for capitalists to exploit the working class, and thus were eliminated in Chinese accounting practice and business operation. Following Mao's death in 1976, the political ideology under Mao's era (i.e. Maoism) transitioned to Deng's position (see Ezzamel et al, 2007 for detailed analysis of the relationships and distinctions involved, the nature of the change, and how the change impacted accounting practice in China).

4.3.1.2 Post-Mao era

Since Deng Xiaoping started economic reform in 1978, known as 'open up and reform', the CPC's political ideology has shifted towards 'economic development primacy'. This was further enhanced by the third generation of CPC leadership, Jiang Zemin. Deng's reforms were aimed at promoting rapid economic growth without weakening the Party's control of the political system (Scott, 2002, p. 67). The central-state delegated more autonomy to SOEs and local state governments. This was necessary for China's economic reform in the 1980s and 1990s. CPC leaders started SOE reforms with the aim of establishing a modern enterprise system (MES). The MES models organisational forms in Western market economies (Scott, 2002).

The establishment of the SZSE and the SSE in late 1990 marked the institutional transition to a central planned economic system. In contrast to Western capital markets, where ownership is predominantly proprietary, a majority of Chinese listed companies have been transformed from former SOEs, with governments at different levels holding the controlling ownership. In 1993, the first Company Law of the People's Republic of China (*China Company Law* 1993) was passed by the National People's Congress Standing Committee. This was the first application of the term 'company' to Chinese

enterprises. This gave legal recognition to the separation of SOEs from government. However, the CPC's influence through government persists. For example, the listing procedure in China was tightly administered by a quota system until 2000. Successful listing applications usually reflected a degree of political favouritism (Opper et al., 2002, p. 107).

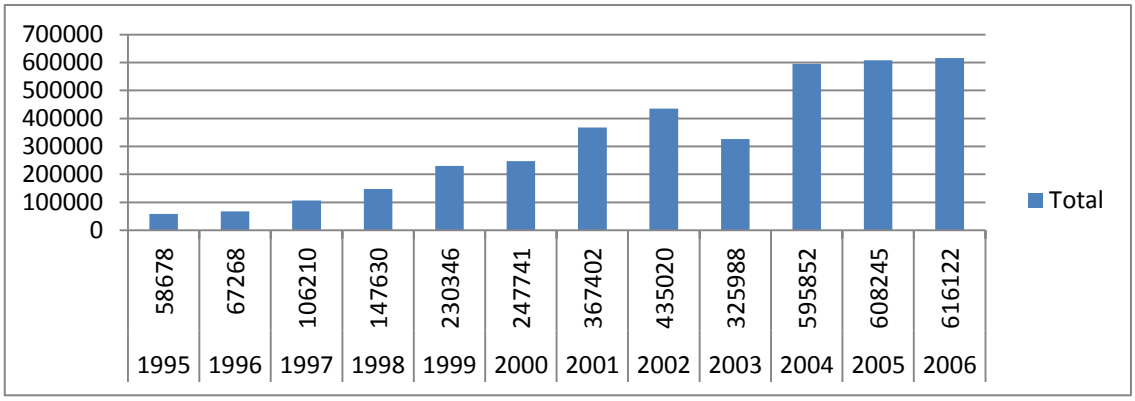
Since China's economic reform, large state-controlled companies, with the support of the central-state government (especially in natural resources, infrastructure, and logistics sectors), began investing overseas (outbound foreign direct investment, OFDI) as early as the 1980s. The process was reinforced after years of continuous implementation of the CPC's 'going-global' policy initiated by Jiang in 1996 as a national strategy (Chen, 2008). This was driven by China's desire to improve its international competitiveness and to complement the shortage of domestic resources. This shortage resulted from China's 'factory role' on the lower end of the global industrial value chain, where high technology and value are still largely controlled by foreign companies (WWF, 2010). China's entry to the World Trade Organisation in 2001 resulted in an accelerated OFDI.

According to the Ministry of Commerce of the People's Republic of China's (MOFCOM) report (2011), China's OFDI went from less than US$100 million in the 1980s to US$68.81 billion in 2010. There were 13,000 Chinese companies that had established 16,000 overseas operations across 178 countries, making China the fifth largest originator of OFDI by volume by 2010 (pp. 79–81). Notably, in recent years large Chinese companies have started to shift toward commercial operations in developed economies rather than their traditional focus on resource-extraction in developing countries. The acceleration of China's integration with the global economy presents new challenges to Chinese companies. In particular, this includes a shortage of accounting professionals with international business management experience, and requirements in developed countries for more transparent regulations (Rosen & Hanemann, 2009).

China's political and economic institutional transition has led to the delegation of power to the management of SOEs and local government. Rapid economic growth measured by GDP was used as a performance appraisal measure for government officials. This

has contributed to the rapid economic growth of GDP of over ten per cent per annum over the past three decades (International Monetary Fund, 2011). However, it also creates powerful incentives for local governments to pursue their own interests independently of central government. According to Ministry of Environmental Protection of China (MOEP)'s official statistics, complaint letters received about environmental disputes increased nearly 9.5 times from 59,678 in 1995 to 616,122 in 2006 (see Figure 4-2).

Figure 4-2 **Complaint letters on environmental disputes received 1995–2006**



Source: National Environmental Statistics Annual Reports 2002-2006 by Ministry of Environmental Protection of the People's Republic of China (formerly State Environmental Protection Bureau. Information about complaint letters after 2006 is no longer published in MOEP annual reports)

Figure 4-2 indicates the increasing discontent of Chinese people with the deteriorating environment. This presented a legitimacy threat to the ruling CPC, and exerted urgency for the CPC through the Chinese central government to take action regarding environmental pollution concerns.

The rule of law in China is in an early stage of development. Prosecution for environmental pollution by means of criminal charges was not as effective as government administrative tools. Table 4-1 summarises environmental pollution incidents and legal charges for the period 2002 to 2008, according to official statistics published by the Chinese government.

Table 4-1 Summary of environmental pollution accidents and legal prosecutions during 2002–2008

Year	Reported environmental incidents	Legal charges
2002	1921	4
2003	1843	1
2004	1441	2
2005	1406	2
2006	842	4
2007	462	3
2008	474	2
Total	8389	18

Source: National Environmental Statistics Annual Reports 2002-2008 by Ministry of Environmental Protection of the People's Republic of China. Information after 2008 could not be found in MEP 2009 and 2010 annual reports

Table 4-1 shows that between 2002 and 2008, only 18 cases have been prosecuted by criminal charges, less than one per cent of the total environmental incidents. Polluting enterprises often receive administrative punishment instead of legal prosecutions for environmental pollution offences. However, the penalty usually constitutes only a fraction of their operating income. Companies are not motivated to control environmental pollution during production. The role of the state government as both regulator and business owner of SOEs creates potential conflicts of interests (Fryxell & Lo, 2003; Xu & Uddin, 2008). In fact, most of those polluting enterprises contributed to local GDP growth, and local governments supported business activities. Local government often compromised environmental protection in pursuit of GDP growth (SustainAbility, 2007), as the latter was directly relevant to government officials' performance appraisal.

The CPC's authoritative role requires a higher obligation to fulfil its responsibilities: not only raising living standards, but also promoting transparency and public participation in governance (Kuhn, 2011). A mixture of global and domestic political and economic motives compelled the fourth generation of CPC leadership (Hu) to form a populist political ideology, known as 'Scientific Approach to Development' in 2003 (Mohanty, 2003). This political ideology converges substantially with the internationally accepted concept of sustainable development (Yang, 2011). It aims to correct an overemphasis on the pursuit of rapid economic growth, and deal with increasing social and environmental problems and corruption (Fewsmith, 2004). Hu explains the new political ideology focuses on 'people first' and 'a sustainable economic development approach', to build a 'resource-efficient and environment-friendly society' in order to 'achieve harmony

between society, nature and human beings' (Xinhuanet, 2007). To this end, the China State Council (the highest executive organ of Chinese central government) issued *Decisions on Implementing the Scientific Approach to Development and Strengthening Environmental Protection* (*the Decisions* 2005) in 2005. For the first time, environmental protection was placed high on the CPC's agenda. The fourth generation of the CPC leadership's political ideology has influenced China's domestic and international economic policy development. It has also created new Chinese company institutions in environmental pollution control and transparency in information disclosures (to be analysed in Section 4.3.2).

China's political and economic institutional transitions are transforming former SOEs. This has resulted in Chinese company characteristics (Lin, 2001; Scott, 2002) including: the strong influence of CPC on Chinese companies; state-controlled listed companies at central and local state levels; Chinese company size; industry membership; the formation of two mainland stock exchanges; the Big Four international auditors acting as company auditors; and Chinese companies with international operations (to be analysed in Section 4.3.3).

4.3.2 Organisational field

The issue-based organisational field level analysis 'identifies an arena, a system of actors, actions, and relations, whose participants take one another into account as they carry out interrelated activities and allows to view the actors in context' (McAdam & Scott, 2005, p.10). Consistent with prior research (Hoffman, 1999; Jamali & Neville, 2011; Kostova & Roth, 2002; Scott, 2008; Wooten & Hoffman, 2008), the elements of the regulative, normative and cognitive institutions are issue-specific, and are situated in the organisational field. China's changing institutional environment has resulted in changing regulative, normative and cultural institutions in the climate-change reporting field. Drawing on Hoffman (1999), and to fully appreciate the complexity of institutional dynamics, the model developed in this thesis analyses the specific institutions that lie at the centre of the organisational field and those that lie within the individual organisational populations inhabiting that field. While the following discussion of China's changing institutions offers a useful conceptual construct, in

empirical settings, they intermingle and their impact cannot be separated (DiMaggio & Powell, 1983; Hoffman, 1999; Scott, 1995, 2002; 2008; Zeng et al., 2012).

4.3.2.1 Regulative (Coercive) institutions

Regulative (coercive) institutions arise from political influence and the problem of legitimacy. They result from formal and informal pressures exerted on organisations by other organisations upon which they are dependent and by cultural expectations in the society within which organisations operate (DiMaggio & Powell, 1983, p. 150). Regulative institutions rely on rule setting, monitoring and sanctioning activities (Scott, 2002, p. 61). In the Chinese context, the CPC exercises power through its control of human and material resource allocation and through conferring legitimacy to Chinese companies. Elites (CPC leaders) define appropriate organisation structures and policy through changing political ideologies. The 'Scientific Approach to Development' is the guiding ideology of China's significant domestic and international policy developments regarding climate change. The evolving climate change reporting field creates new institutions (discussed below). They set the premises and define the norms of reporting by Chinese companies.

4.3.2.1.1 China's domestic policy response to climate change

China's international policy response to global climate change is closely linked to its domestic social and economic policies. China signed the Kyoto Protocol in 1998, rectified in 2002. The Kyoto Protocol became operative on 16 February 2005 (Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1998). China's domestic policy developments on climate change issues have focused strategies on adjusting the pattern of economic development and energy development. This is evident in the State Council Decision 2005. In 2006, the central-state government set the first binding target to reduce energy consumption by 20 per cent and emissions by 15 per cent by 2010 (base year 2005) in its 11th Five-Year (2006–2010) *National Social and Economic Development Program* (*the 11th Five–Year Program*). In 2009, on the eve of the Copenhagen global climate change summit, China made an international announcement of its intent to cut emissions by 40–45 per cent by 2020 (Jing et al., 2009). '*Energy Saving and Emission Reduction*' became a slogan in government policy

announcements on climate change issues and it has since been reinforced. Responding to the government campaign, known as '*One Thousand Business Enterprises' Energy Saving Actions*' (NDRC, 2006), China's 1008 largest energy consumers signed contracts with the central government to improve energy efficiency.

In 2007, the China NDRC, the most powerful government agency leading China's economic reform and policy development on climate change, published the '*National Plan on China's Response to Climate Change*' (hereafter, the 2007 National Plan). This was the first among developing countries to specify the objectives of China's response to climate change by 2010. *The 2007 National Plan* explicitly states:

> China will implement its fundamental national policy of resources conservation and environmental protection to develop a circular economy, protect ecological environment and accelerate the construction of a resource-conservative and environmentally-friendly society. In order to actively fulfill its international commitments under the UFCCC, China will strive to control its greenhouse gas emissions, enhance its capacity to adapt to climate change and promote the harmonious development between economy, population, resources and the environment (p.24).

According to the 2007 National Plan, China's policy response to climate change are intended to:

- give full effect to the Scientific Approach of Development
- promote the construction of a socialist harmonious society
- advance the fundamental national policy of resource conservation and environmental protection
- control greenhouse gas emissions (GHG) and enhance sustainable development capacity
- secure economic development
- conserve energy, optimize energy structure, and strengthen ecological preservation and construction
- rely on the advancement of science and technology to enhance the capacity to address climate change

The above statement resonates with the CPC's changing political ideology of the 'Scientific Approach to Development' and is consistent with *Decisions 2005*. The

populist political ideology was highlighted in China's policy response to climate change. The 2007 National Plan (p. 26) explains the following principles guiding China's response to climate change, which are to

- operate in the global 'sustainable development' conceptual framework
- take common but differentiated responsibilities of the United Nations Framework Convention on Climate Change (UNFCCC)
- place equal emphasis on both mitigation and adaptation
- rely on the advancement and innovation of science and technology
- participate in international cooperation actively and extensively

The majority of the policies and programs in the 2007 National Plan and its subsequent '*China's Policies and Actions for Addressing Climate Change–The Progress Report*' (*the Progress Report*) released annually from 2008 by NDRC, refer to the direction of China's economic development in adapting to, and mitigating climate change. Key policies include energy saving and emission reduction, renewable energy and industrial policies, and environmental transparency. These policies promoted sustainable economic growth and reductions in greenhouse gas emissions (Lewis, 2007). However, by the end of 2007, China had failed to achieve its set energy saving and emission reduction targets (Zhang, 2008). The central-state government responded by using more coercive administrative tools in subsequent years. The government also introduced market mechanisms that urged local state government and Chinese companies to achieve set targets for the remaining years of *the 11th Five-Year Program*. In 2008, the China State Council issued a '*Notice on energy saving and emission reduction arrangement for 2008*' (hereafter, the 2008 Notice). The 2008 Notice reinforced the government's leading role in implementing its 'energy saving and emission reduction' plans. Coercive pressures on Chinese companies and local government increased. For example, the key performance indicators in local government official and business manager appraisals now included meeting set targets for energy savings and emission reductions. Targeted business enterprises were required to account for energy usage and emissions and were subjected to regular audits to meet the set targets.

4.3.2.1.2 Growing global and domestic carbon trading markets

China began to take a more proactive position in Clean Development Mechanism (CDM) projects from 2004 (World Bank, 2010). This motivated leading Chinese companies (including banks) to participate actively in greenhouse gas emission reductions and carbon financing activities and to account for energy use and greenhouse gas emissions in CDM projects. By the end of October 2010, 2732 CDM projects had been approved by the central Chinese government, accounting for 60.8 per cent of world emissions. The rapid growth of CDM projects in China has contributed to the development of global carbon markets in developing countries. It has motivated participating companies to report on carbon management information (NDRC, 2010; World Bank, 2010).

NDRC (2010) reports that development in the global carbon trading market has influenced China's domestic market. China's pilot domestic carbon emission trading markets emerged in 2008 with the establishment of China's first two environment and energy exchanges in Beijing and Shanghai. In December 2009, the Beijing Exchange and the BlueNext Exchange jointly published China's first voluntary emission reduction standard, the *Panda Standard*, which promoted domestic carbon emission trading by providing transparent and credible carbon credits (NDRC, 2010). Early movers (leading Chinese companies) pursued commercial opportunities by putting more resources into research and development and process management (Jing, 2010). To maximise the economic potential of carbon management, Chinese companies are under pressure to be more transparent in revealing environmental information, in particular to provide greater clarity in disclosing energy efficiency and emission reduction information.

4.3.2.1.3 China's move to environmental transparency and reporting

Open environmental reporting by Chinese companies barely existed prior to 2006 (Guo, 2005; Zeng et al. 2012), except for a few very large central-state controlled enterprises with international operations (like Petro China or Bao Steel) and a few foreign companies (e.g. Shell) with operations in China (Syntao, 2007). The lack of open information disclosure (including environmental reporting) resulted from Chinese bureaucracy and its long tradition of official secrecy (Finamore, 2010; Horsley, 2007).

However, the CPC's new political ideology called for transparent information disclosure. To this effect, the China State Council (2005) announced *Decisions on Implementing the Scientific Approach to Development and Strengthening Environmental Protection (Hereafter the State Council Decision 2005)*. The SZSE issued voluntary social responsibility reporting (including environmental reporting) guidelines in late 2006 (hereafter SZSE Guide 2006). The SZSE Guide 2006 explicitly stated the CPC's political ideology as its guiding principle, and its intent was to model international best practice in corporate reporting.

The new institutional requirement of Chinese companies to report environmental information has been affirmed by the central-state government. On 27 April 2007, China's first nationwide government information disclosure regulation *The Regulation of the People's Republic of China on Open Government Information* (hereafter OGI 2007) was promulgated by the State Council (effective on 1 May 2008). OGI 2007 marks a significant institutional change to the traditional norms of information disclosure in China. The Ministry of Environmental Protection of China (MOEP) became the first central government organ to implement OGI 2007 when it issued '*Measures for Environmental Information Disclosure for Trial Implementation,* (hereafter, OEI 2007, issued in April 2007 and effective in May 2008). Immediately after the release of OEI 2007, Pan Yue (the Deputy Director of then State Environmental Protection Bureau) was interviewed on the Chinese official government website (Gov.cn). Pan explained the OEI 2007 was driven by a need for public participation in environmental protection. According to Pan, prior to the issue of OEI 2007, there were no consistent guidelines regarding responsibility for open environmental information, what information should be disclosed, how that information should be disclosed and what penalty should apply in case of lack of disclosure. Mandatory institutional requirements for open environmental information did not exist. Consequently, the public had difficulty in accessing information. It was difficult to receive support for enforcing environmental laws. Pan's comment reflects the weak law enforcement environment in China (as discussed in Section 4.3.1). The OEI 2007 sets forth specific environmental information disclosure obligations for state environmental protection administration departments and certain business enterprises (heavily polluting companies that breach environmental regulations). It encourages Chinese business enterprises to report environmental information voluntarily (MOEP, 2007).

In the same year, the China State-owned Assets Supervision and Administration Commission also issued *Guidance on Central-SOEs to fulfil social responsibility (2007).* This document encouraged central SOEs to report environmental information. SSE issued guidelines on corporate social responsibility reporting for its listed companies in May 2008 (SSE 2008). SSE 2008 on environmental reporting mirrored OEI 2007.

Between late 2006 and 2008, Chinese central government and mainland stock exchanges exerted convergent institutional influences on Chinese companies regarding environmental disclosure through corporate social responsibility reporting. However, due to the relatively new concept of OGI 2007 and OEI 2007, China's deeply ingrained culture of bureaucratic secrecy could hinder policy implementation, a concern raised in Horsley (2010) and Hubbard (2008).

4.3.2.1.4 International operations

China's rapid OFDI placed Chinese companies in both national and global institutional environments and supernational institutions. As relatively new entrants to international markets, Chinese companies are under pressure to establish their international reputation for environmental responsibility and legitimacy. However, Chinese companies have limited skills in the communication and public relations strategies needed for long term investments abroad (Rosen & Hanemann, 2009). Foreign customers from developed countries exert coercive pressures on multinational companies to report business operations and environmental impacts. This is because environmental damage caused by suppliers (even limited to the exporting country) threatens the social legitimacy of foreign customers (Christmann & Taylor, 2001). With increasing demand from a diversity of stakeholders on transparency in organisational carbon management, Chinese companies are under pressure to communicate their actions on climate-change related issues.

4.3.2.2 Normative (social) institutions

As explained in Chapter 2, normative (or social) institutions rely on mutually enforced complexes of prescriptions, obligations and expectations (Scott, 2002, p. 61). These generally take the form of 'rules-of-thumb', standard operating procedures,

occupational standards, and educational curricula. China's political and economic institutional transitions have led to the following three key sources of normative institutions: CPC Party Schools and Party meetings; supranational non government organisations (NGOs); and industry associations at global and national levels.

First, CPC Party Schools and their affiliated training institutes are influential. They provide political ideology education and training for senior officials and senior management of SOEs. They are major platforms for CPC leaders to establish a cognitive base to legitimise the CPC's political position in China. In recent years, CPC Party Schools opened up more to exchanges with Western developed countries. They promoted the training of CPC members to attain a global vision (Xinhuanet, 2011) by adapting the global discourse of transparency to the Chinese context. The CPC's changing political ideology set normative rules about the attitude and practices CPC members should adopt with respect to transparency in environmental reporting. Ongoing Party meetings reinforce the norms established at Party schools.

Second, supranational NGOs exert normative institutional pressures on Chinese companies by issuing guidelines for climate change and environmental sustainability reporting. These guidelines outline expectations regarding climate change reporting. The GRI has become more active in engaging Chinese companies in the GRI network in recent years (for example, the GRI opened an office in Beijing in 2009 and published a Chinese translation of updated GRI guidelines in 2011). Chinese GRI activities help to promote GRI guidelines among Chinese companies. Because a majority of Global 500 companies have referred to the GRI's guidelines in preparing CSR (KPMG, 2008), it has become an expected practice (and hence institutionalised) by large multinational companies. Following international common practice of climate-change reporting (by referring to GRI guidelines) is an efficient way to establish the legitimacy internationally by Chinese companies.

Third, industry associations at both global and national levels exert a normative influence through issuing industry-initiated reporting guidelines. For example, Petro China, the largest energy company in China, is a member of the International Petroleum Industry Environmental Conservation Association (IPIECA). This is the global oil and gas industry association for environmental and social issues. Petro China (also on the

Global 500 list) was among the first in China to publish environmental reporting, as early as 2002. This was six years earlier than such reporting was taken up more generally in China. Another example is China's domestic banking industry association, which issued industry initiated corporate social responsibility reporting guidelines soon after OGI 2007 and OEI 2007 were announced.

4.3.2.3 Cognitive (cultural) institutions

Studies of cognitive (mimetic) behaviour (see Chapter 2 for definitions of 'cognitive aspects' of institution) of firms operating in other developing countries (e.g., Jamali & Neville, 2011) have found that company corporate behaviour in developing countries is not just a response to global institutional pressures, but also to national institutional pressures. Their findings reveal mixed CSR expressions that combine elements of convergence and divergence.

The review of Chinese literature in Chapter 3 revealed that the early issuers of social and environmental reporting were dominated by foreign MNC operating in China. Later on, large Chinese companies with international operations engaged in this type of reporting (Syntao, 2007). These 'early mover' Chinese companies were new to international markets and faced uncertainty in their reporting. Thus, conformity to international practice through imitation of recognised multinational company reporting behaviour would be an efficient survival strategy to gain legitimacy of Western peers. International accounting firms (for example, Big Four international accounting firms), global industry trade associations (for example, International Finance Corporations, IPIECA), supranational organisations (for example, the United Nations; GRI) and global multinational companies (for example, Global 500) explicitly diffuse reporting models across countries.

The cognitive aspect of institutional influence indicates a learning process involved in climate-change reporting in the Chinese context. Since China's economic reform, modelling behaviour on internationally recognised business practice has become a slogan of the Chinese government and Chinese companies (Chen et al., 2007). The Chinese government has accumulated internationalisation knowledge learnt from foreign multinational companies. It is motivated to internationalise its SOEs to alleviate

domestic institutional constraints, overcome latecomer disadvantages, counter global MNC's major foothold in the home country market, and exploit its own competitive advantages in host countries (Ang & Michailova 2008; Luo & Tung 2007). In turn, those Chinese companies bring back first-hand information and knowledge of expected international business practice to China and its government.

The Chinese government appointed senior management in these pioneer Chinese companies. Therefore, they are almost always CPC members, and members of central or local CPC Party committees which exert influence on government policy making. Their first-hand international experience helps to inform domestic policy making regarding Chinese company reporting. The international demand for Chinese company information transparency aligns with Chinese domestic institutional pressures requiring more transparency to as a way of helping to counter corruption and a deteriorating natural environment. Environmental transparency through CSR fits the CPC's political agenda. Thus, foreign knowledge about issuing CSR, acquired by early movers with international operations, is modified to fit the Chinese context. Further, it is incorporated in Chinese domestic guidelines that inform Chinese domestic companies in issuing environmental information. Hence, it is expected that the content of climate change reporting by Chinese companies is influenced by Chinese and international environmental and climate change reporting guidelines.

The above analyses of regulative, normative and cognitive institutions indicates that the issue-based (climate-change reporting) organisational field is evolving as a result of China's changing political and economic environment. The changing institutions situated in the organisational field of climate change will lead individual organisations to go beyond established practice. It is expected that CER by Chinese companies will reflect the changing institutions in China over time, and that reporting content would be consistent with the CPC's political ideology (there will be reporting on the 'scientific approach to development', 'harmonious society', and 'energy saving and emission reduction'). However, reporting levels by individual Chinese companies can differ due to the moderating effect of company characteristics. Not all individual organisations perceive institutional influences in the same way. This leads to the following organisational level analysis of Chinese companies.

4.3.3 Organisational level

To conceptualise the moderating effect of company characteristics on institutions in the organisational field, this thesis draws on the concept of organisational population (Hoffman, 1999; Hoffman & Bertels, 2007; Scott, 1998, 2002) to explain the complexity of field level interaction. One way of identifying individual populations (or classes of constituencies) within an organisational field is by company characteristics. The individual populations formed by company characteristics have a moderating effect on the institutional influences exerted on them by constituents (institutional actors) in the organisational field. A company can have different characteristics (multiple organisational populations. The interaction between the individual organisational population and the field is an ongoing process that involves two stages: first, the perception process and second, the decision-making and implementation process.

During the perception process, institutional influences translate into perceived and interpreted institutional pressures when they penetrate an organisation (See below for examples). First, in company populations that have a CPC chairman or CEO, the senior management team may experience greater pressure to emphasise political correctness (Opper et al., 2002), leading to a different perception of the institution. Second, within the company populations of one industry, how might an industry-specific policy (as outlined in the 11th Five-Year program) affect the degree of relevant institutional influence on an organisation? Third, in the company populations of the Big Four auditors, additional advice from the auditor may change internal perceptions of international guidelines (Chen et al., 2007; Street and Gray, 2002). Fourth, in the populations of companies with international operations, how does this influence the company to model perceived international best practice in reporting (WWF, 2010). Fifth, how in the population of companies with central-state-ownership, greater importance may be placed on their moral obligations and taking an exemplary role in assuming social responsibility (Yang, 2011). Finally, how the population of companies listed on a specific stock exchange may be influenced by the guidelines of that stock exchange.

With respect to decision-making and implementation, organisational populations formed by company characteristics moderate organisational decision-making and implementation actions. Company characteristics can moderate by magnifying or

diminishing the actions flowing from the influence of institutional pressure (Adams, 2002; Delmas & Toffel, 2004, 2011; González-Benito & González-Benito's, 2010). An example of this is how the size of a company can influence the resources available for developing climate change reports and the level of reporting (WWF, 2010).

The moderating effect on perceived institutional influences and the resulting actions in climate change reporting of organisational populations (formed by Chinese company characteristics) are hypothesised below. The hypotheses are non-directional (two-tailed). Social science research has debated the use of directional (one-tailed) and non-directional hypotheses. Pillemer (1991) argues 'the decision to use one or two-tailed tests can influence substantive conclusions' (p. 14). the study by Rubin (1982, cited in Pillemer, 1991), illustrates how the use of one or two-tailed tests has influenced research outcomes:

> When each of the 136 correlations was tested at the 0.05 level, one-tailed, 39 correlations were statistically significant. Had two-tailed tests been used, a different pattern would have emerged: only 26 of the original 39 significant correlations would have reached significance with the stricter two-tailed criterion (Pillemer, 1991, p. 14)

Rubin's (1982) study revealed the two-tailed hypothesis is stricter than the one-tailed test in research outcomes. It also supports the (extreme) view that one-tailed tests 'generally are considered to be improper' (Gravetter & Wallnau, 1985, p. 273, cited in Pillemer, 1991, p.14). This is because 'the logic underlying one-tailed tests is incompatible with efforts to seek out and learn from unusual and unexpected variation in study outcomes' (Pillemer, 1991, p.15). An earlier study by Hick (1952) propounded a similar view. The modifying role of organisational populations represented by company characteristics can either magnify or diminish the level of reporting. Hence, this thesis takes a conservative position to form two-tailed hypothesis.

4.3.3.1 Affiliation of senior executives with CPC

Senior managers in most large Chinese companies are former government officers, appointed by the CPC (Yang, 2002). The CPC exercises its power at an organisational level through its control over the board of directors. Hence, it exerts influence on the

firm's operation and performance. Opper et al. (2002) argue that Chinese Company Law was unlikely to prevent CPC influence in enterprise decision-making processes. This is because the legal system's ambiguity reflects the CPC's strong sense of stability and power reasoning. Senior management's affiliation with the CPC influences the level of perceived institutional pressures on a company and the process of implementing reporting decisions. Yang's (2011) interviews with senior managers of Chinese SOEs reveal political consideration as one factor that influences their decision making in environmental and sustainability management and reporting. Thus, the following hypothesis is formed:

H1: Being a member of the organisational population of companies with CPC affiliations among senior management influences climate-change reporting

4.3.3.2 Ownership identity

China's economic reform results in former SOEs being controlled by central-state and/or local state government. Central-state-owned listed companies in China are subject to tighter budgetary and production control than those operating under local government ownership. They are required to assume social responsibilities, including environmental responsibilities, to the community. In return, central-state-owned listed companies are often not subject to market pressures. In general, listed companies under local government control are subject to more market exposure and exercise more autonomy. For non-state-controlled companies there is either individual or institutional shareholder control. These companies have even greater autonomy (Scott, 2002). Hence, the following hypothesis is formed:

H2: Being a member of the organisational population of a particular ownership type influences climate-change reporting

4.3.3.3 Size

Prior environmental (and other general corporate disclosure) research has found company size relates positively to disclosure levels (Aerts & Cormier, 2009; Brammer & Pavelin, 2006; Freedman & Jaggi, 2005; Gao et al., 2005). Two perspectives offer

explanations. One is the responsiveness to top-down institutional pressures. Large companies are more visible to the public and tend to be subject to greater scrutiny and more political and legitimacy pressure from external parties (Lioukas et al., 1993). Second, size also influences the level of internal resources available for report preparation. The above perspectives could lead to large companies taking an exemplary role in climate-change reporting.

Hence, the following hypothesis is formed:

H3: The size of a company influences climate-change reporting

4.3.3.4 Industry membership

The industry in which a company operates has been identified as a factor influencing similarities (Chan & Welford, 2005; Gao et al., 2005; Jennings & Zandbergen, 1995; Williams & Pei, 1999) and differences (Delmas & Toffel, 2004; Tagesson et al., 2009) in CER. Studies consistently have found that environmentally-sensitive industries such as energy, materials and utilities disclose more detailed environmental information than other industries. China's policy response to climate change is linked closely with industrial restructure. Targeted industries include energy, materials and utilities. They are under more reporting pressure than other industries due to coercive government pressures and industry self-regulation through global and national associations. Hence, the following hypothesis is formed:

H4: Being a member of the organisational population representing a specific industry influences climate-change reporting.

4.3.3.5 Big Four international accounting firms as auditors

Studies in developed countries (Archambault & Archambault, 2003; Collin et al., 2009) and in China (Xiao et al., 2004) have found that auditing by one of the Big Four international accounting firms relates positively to the level of corporate disclosure. The Big Four (then the Big Eight) entered China's auditing market in 1992. This was a result of a shortage in domestic accounting firms and accounting professionals with

international experience and recognition. Chinese regulators hoped engagement with international accounting firms would help Chinese companies to adopt internationally accepted accounting practices (Chen et al., 2007) and gain legitimacy for state-controlled Chinese enterprises seeking commercial operations overseas. Having a Big Four auditor helped Chinese companies overcome international perceptions relating to their traditional socialist accounting models, and helped them achieve acceptability (legitimacy) in the international investment community (Street & Gray, 2002). Hence, the following hypothesis is formed:

H5: Being a member of the organisational population of companies audited by a Big Four accounting firm influences climate-change reporting.

4.3.3.6 Listing exchange

Prior empirical studies about general disclosure behaviour have reported mixed findings regarding the role of stock listing on information disclosure levels (see Chavent, et al., 2006, pp. 207-214). Ferguson et al.'s (2002) study is one of few to examine disclosure levels in the AR of former SOEs listed on the Stock Exchange of Hong Kong and provides limited evidence of exchange listing effects on information disclosure. Cross-listed companies (listed on mainland home exchanges and in Hong Kong) disclosed significantly more information overall than those listed only on mainland exchanges (pp. 143-144). However, the prior literature treats two domestic listing exchanges as one variable. As discussed earlier, the SZSE was an early mover in issuing voluntary corporate social responsibility reporting guidelines. It is located in the southern city Shenzhen, the pilot city that has led China's economic reform since 1978. Shenzhen is known for its innovation and openness to international business practice. Thus, one would expect the reporting behaviour for companies listed on the SZSE to differ from those of the SSE. This study will test listing exchanges SSE and SZSE separately. Hence, the following hypothesis is formed:

H6: Being a member of the organisational population of companies listed on a particular stock exchange influences climate-change reporting.

4.3.3.7 International operations

The extent of international institutional pressures on an individual company is moderated by the company's stake in being accepted as a legitimate participant in the global economy (González-Benito & González-Benito, 2010). Prior literature on general corporate reporting and disclosure found international operations relate positively to information disclosure levels (Zarzeski, 1996). Christmann and Taylor (2001) argue that the use of environmental regulations in developed countries as protective trade barriers motivates export-oriented Chinese companies to pursue environmental self-regulation. Scott (2002) contends that China's increasing contact with the Western world fuels changes at the organisational field level. This is because relational and symbolic institutional carriers introduce new roles for actors and new logics that expand possibilities for acting (p. 72). The WWF's (2010) survey shows Chinese companies with global vision have adopted the notions of corporate social responsibility and sustainable development as important strategies for long term development. Companies with overseas strategies focus more on sustainable development and support this with related activities, such as donating to environmental protection project and developing innovative solutions to reduce pollution. Therefore, the following hypothesis is formed:

H7: Being a member of the organisational population of companies with international operations influences climate-change reporting.

4.4 Summary

This chapter built on advances in institutional theory in the organisational study literature and developed the conceptual framework (the extended model) in a form closely derived from established work by Scott (2002), Hoffman (1999), and Delmas and Toffel (2011). The model investigated climate-change reporting by Chinese companies through interrelated institutional analyses at societal, organisational field and organisational levels. Such integrated multi-level institutional analysis has allowed researchers to understand the specific contexts of company reporting.

Explicitly the model identified and recognised the impact of under-explored Chinese political ideology as a key driver of change in institutions that influence climate change reporting and Chinese company characteristics. Consistent with established studies informed by institutional theory, the model treats the three aspects of institutions as integrated in institutional analysis. Their impact cannot be separated in empirical settings, although discussion of individual institutions offers a useful conceptual construct. The discussion analysed regulative (coercive), normative and cognitive institutions in the context of institutional theory through the model.

The model extended the explanatory power of institutional theory literature by incorporating Chinese company characteristics into the organisational level analysis. It drew on the concept of organisational populations in institutional theory and offered a theoretical justification for the relevance of company characteristics in company reporting behaviour. The model offered a comprehensive understanding of homogeneity and heterogeneity in climate-change reporting by Chinese companies.

Chapter 5 will explain how the model is tested empirically.

Chapter 5: Research methodology

5.1 Introduction

Chapter 4 presented the extended model that built on advances in institutional theory in the organisational study literature. It used three interrelated levels of institutional analysis with explicit attention applied to climate change in the Chinese context. The present chapter justifies the research methodology used in empirically testing the extended model. To operate the extended model in the empirical setting, this chapter presents a mathematical representation of the model. The chapter will address the key limitations of the current application of institutional theory in CER studies (as discussed in Chapter 3).

Chapter 3 argued that research instruments used for Chinese CER content analyses in previous literature were under-specified; and that the Chinese context of environmental reporting was not captured in those studies. This has led to the risk of subjectivity because findings can be inconsistent and non-comparable. Chinese domestic environmental reporting guidelines are relatively new. Currently, there is no research instrument that uses combined international and Chinese domestic reporting guidelines to measure Chinese climate change reporting behaviour. Nor has there been any reported investigation of the influences of international reporting guidelines and Chinese domestic reporting guidelines on Chinese company climate change reporting behaviour. This chapter will explain the methodology adopted to address these issues.

The remainder of this chapter is organised as follows: Section 5.2 presents the mathematical representation of the extended model. Section 5.3 outlines the data collection procedures. Section 5.4 discusses the measurement of climate change related environmental disclosure. Section 5.5 presents the summary of the chapter.

5.2 Mathematical representation of the extended model

To explore the conceptual framework (Figure 4-1) presented in Chapter 4 empirically, this chapter develops a mathematical representation of the model. In doing so, the

concept of 'propensity to report' is introduced. This represents the extent to which perceived institutional pressures translate into pressure to report climate change related information. The assumption underlying the framework is that for each item reported by a given company, at a point in time, there will be a critical level of pressure to report above which reporting will occur. Hence, as the propensity to report increases, a company not reporting a specific item will move closer to reporting that item. Across multiple companies, the number of companies that report the item will increase.

Define

GEP_t as the Global Economic and Political environment at time *t*
DEP_t as the Domestic Economic and Political environment in China at time *t*
I_t as the set of Institutions that arise in period *t* from the GEP_t and DEP_t
PIP_{jt} as the Perceived Institutional Pressure on company *j* in period *t*
PTR_{jt} as the Propensity of company *j* to Report in period *t*
ε_{kjt} is the random variation associated with company *j*, in time period t, for equation *k*

Then the general model, without the effect of company characteristics, is:

$$I_t = f_0(GEP_t, DEP_t) + \varepsilon_{0t}$$
$$PIP_{jt} = f_1(I_t) + \varepsilon_{1jt}$$
$$PTR_{jt} = f_2(PIP_{jt}) + \varepsilon_{2jt}$$

What the conceptual framework in Figure 4-1 proposes is that company characteristics modify the form of the functions f_1 *and* f_2. Using the Principle of Parsimony, this thesis implements the general model as:

$$PIP_{jt} = a_1 + b_1 I_t + \varepsilon_{1jt}$$
$$PTR_{jt} = a_2 + b_2 PIP_{jt} + \varepsilon_{2jt}$$

To illustrate the impact of a company characteristic as a moderator of this relationship, a simple model is first presented. This involves modelling a translation of the intercept of the function as shown below. The impact of a senior executive with an affiliation to the

CPC is added using a variable, CPC_{jt} that takes the value of 1 if company *j* has a senior executive member with an affiliation to the CPC in period *t*, and zero otherwise.

The revised model, including the moderating effect of a senior executive member with an affiliation to the CPC, gives:

$$PIP_{jt} = a_1^{'} + z_1 CPC_{jt} + b_1 I_t + \varepsilon_{1jt}$$
$$PTR_{jt} = a_2^{'} + z_2 CPC_{jt} + b_2 PIP_{jt} + \varepsilon_{2jt}$$

However, through appropriate substitution this can be reduced to a single equation as follows:

$$PTR_{jt} = \alpha + \beta_1 CPC_{jt} + \beta_2 I_t + \varepsilon_{jt}$$

Where for example $\beta_1 = z_2 + b_2 z_1$

The same logic can be applied to justify the addition of each moderating variable to the linear model as a simple explanatory variable, using some form of 0/1 dummy variable combination.

A key point in these equations is that while *GEP*, *DEP* and *I* are time-dependent, they are not company-dependent: that is, the economic and political environment and set of institutions faced at any point in time is the same for all companies. Differences between companies on *PIP* or *PTR*, at a given point in time, are represented as differences resulting from company characteristics and random variation.

On this basis, the *difference* between the impact of the economic and political environment and resulting institutions at time *t*, and the impact of the different economic and political environment and resulting institutions at time *t+m*, can be represented as $\delta_{t,t+m} T_{t,t+m}$, where $T_{t,t+m}$ is zero if in period *t* and one if in period *t+m* $\delta_{t,t+m}$ is a coefficient to be estimated. It represents the degree of change in PTR that results from the changed economic and political environment and the resulting institutions. The impact of the economic and political environment and resulting

institutions at time *t* then becomes part of α. All impacts of the changing economic and political environment and resulting institutions are then measured relative to the base period. In this way there is no need for measures of *GEP*, *DEP* and *I*. All that is needed are dummy variables to represent time periods. Thus, we have a simple model of the form:

$$PTR_{jt} = \alpha + \Sigma\beta_k M_{kjt} + \Sigma\delta_{t,t+m} T_{t,t+m} + \varepsilon_{jt}$$

where M_{kjt} is the value of moderating variable (company characteristic) k for company j in time period t. The β_k are on average measures of the heterogeneity influence of the company characteristics. The $\delta_{t,t+m}$ are on average measures of the heterogeneity influence of changing institutions over time. The homogenising effect in time period $t+m$ is represented by $\alpha + \delta_{t,t+m}$. This is what companies would tend towards in time $t+m$ if there was no effect of company characteristics.

A further extension of the model is to moderate the slope and the intercept of the PIP relationship. This represents a full moderation model. Again, this is introduced by modelling the impact of senior executive's affiliation with the CPC. The revised full model, including the moderating effect of a senior executive member with an affiliation to the CPC, gives:

$$PIP_{jt} = a_1' + z_1 CPC_{jt} + b_1' I_t + z_1' I_t CPC_{jt} + \varepsilon_{1jt}$$
$$PTR_{jt} = a_2' + z_2 CPC_{jt} + b_2' PIP_{jt} + z_2' PIP_{jt} CPC_{jt} + \varepsilon_{2jt}$$

However, through appropriate substitution this can be reduced to a single equation as follows:

$$PTR_{jt} = \alpha + \beta_1 CPC_{jt} + \beta_2 I_t + \beta_3 I_t CPC_{jt} + \varepsilon_{jt}$$

Where for example $\beta_1 = z_2 + b_2' z_1 + z_2' a_1' + z_2' z_1$

The same logic can be applied to justify the addition of each moderating variable to the linear model as a simple explanatory variable plus a cross product variable with I_t, using some form of 0/1 dummy variable combination.

Using the same logic as applied in the simple moderation model for replacing terms involving I_t with time related dummy variables $T_{t,t+m}$ the full moderation model can be represented as

$$PTR_{jt} = \alpha + \Sigma\beta_k M_{kjt} + \Sigma\delta_{t,t+m} T_{t,t+m} + \Sigma\lambda_{km} T_{t,t+m} M_{kjt} + \varepsilon_{jt}$$

Where the λ_{km} are on average measures of the heterogeneity influence of the interaction of company characteristics with changing institutions over time.

5.3 Sample selection and study period

This study draws on AR and CSR of selected companies listed on the CSI 100 on 30 December 2007. The CSI 100 is comprised of 100 large listed companies from China's SSE and SZSE. They represent 60 per cent of the total market value of the mainland Chinese capital market. The CSI 100 sample represents the following industry sectors: consumer staples, consumer discretionary, energy, financial (sub-classified into financial-banking and financial-non-banking), materials, industrial (sub-classified into industrial-transportation and industrial-capital goods), and utilities (including telecoms). Two industry sectors (health care and information technology) are classified as 'others' due to the small number of companies from those industries. The CSI index industry classification for the study is consistent with the Global Industry Classification Standard that developed jointly by MSCI Barra and Standard and Poor's (S&P). Thus, results can be compared with studies elsewhere. AR were collected from SSE and SZSE. CSR were downloaded from the websites of companies included in the sample.

5.3.1 Justification for the selection of large companies

This study focuses on large companies for three reasons. First, large companies are more visible. Hence, they are likely to disclose more environmental information because of compliance pressures from regulatory organisations (e.g. Freedman & Jaggi,

2005). Second, the results can be compared with extant environmental accounting studies that have used large firms in other countries (e.g. Brammer & Pavelin, 2006). Third, the AR and CSR of large companies are publicly available on company and stock exchange websites (SSE and SZSE) in China. See Appendix 3 for the list of sample companies used in this study.

5.3.2 Justification for the use of AR and CSR in content analysis

As discussed in Chapter 3, empirical analyses of Chinese CER studies published in English and Chinese are limited by data drawn from either AR or CSR reports. Each data source provides only a partial picture of Chinese company environmental reporting. Prior literature concludes that it is misleading to evaluate CER behaviour solely on the basis of information disclosed in AR (Cowen, et al., 1987; Guthrie et al., 2008; Parker, 1982; Preston, 1981; Zeghal & Ahmed, 1990). Despite the need to complement AR with CSR reports to get a better understanding of environmental disclosure (and more specifically, climate-change reporting) by Chinese companies, to date the author has found no published study that has done so. This thesis addresses this limitation by drawing on a combined analysis of AR and CSR reports.

5.3.3 Justification for the study period

Three reporting years were chosen for analysis: 2006, 2008 and 2010. Each year is of significance, as follows:

- 2006 was the beginning year of China's 11th Five-Year Development Program when there were no national level corporate voluntary reporting guidelines
- 2008 was the year the Chinese government's *OGI 2007* and *OEI 2007* became effective.
- 2010 is two years after the implementation of the OGI 2007 and OEI 2007. It allows sufficient time for Chinese companies to embed the national guidelines in their reporting. The year 2010 is the final year of the 11th Five-Year Development program. It is also the latest reporting year available at the time of this study (there is time lag in publishing AR and CSR reports by listed

companies in China. For example, the report for the reporting year 2010 is not available until the end of April 2011)

The choice of years on either side of OGI 2007 and OEI 2007 makes this study an event study (Hoffman, 1999), at least in part. The cross-time analysis over a five-year span fits the institutional analysis of the changing reporting pattern over time.

In 2010, two companies merged during the data collection period, so the sample for 2010 is 99 companies. Table 5-1summarises the 471 reports analysed for this study.

Table 5-1 Summary of reports analysed

Industry	**2006**		**2008**		**2010**		**Total**
	AR	CSR	AR	CSR	AR	CSR	
Consumer Discretionary	12	1	12	8	12	9	54
Consumer Staples	7	1	7	3	7	4	29
Energy	9	2	9	7	9	7	43
Financial-banking	10	2	10	10	10	10	52
Financials-non-banking (including real estate, insurances and securities)	9	1	9	6	9	8	42
Industrial-Transportation	14	0	14	11	14	11	64
Industrial-Capital Goods	4	1	4	3	4	3	19
Materials	18	3	18	15	17	15	86
Utilities (including Telecoms)	14	0	14	12	14	12	66
Others (including Heath Care and Information Technology)	3	1	3	3	3	3	16
Total	**100**	**12**	**100**	**78**	**99**	**82**	**471**

5.4 Measurement of climate-change related environmental reporting

5.4.1 Content analysis

Content analysis is a research technique for making replicable and valid inferences from data to their contexts (Kripendorff, 1980; Weber, 1990). This method analyzes texts in a systematic, valid and replicable manner (Breuning, 2010, p. 492). Researchers in CER studies use this method widely (Guthrie et al., 2008; Milne & Adler, 1999; Unerman, 2000). A distinctive benefit of content analysis is its unobtrusiveness. Cooperation of the subject under investigation is not required; neither will it alter subject behaviour (Babbie, 2004). Content analysis can accommodate cross-time analysis of reporting

behaviour and facilitate analysis of the changing process of corporate climate change reporting over time.

Content analysis can use either qualitative or quantitative methods. Compared to qualitative content analysis, quantitative content analysis has the advantage of transparency and allows research design to be replicated (Breuning, 2010). This study engages in quantitative content analysis of the qualitative data of sample Chinese company reports. The study measures climate-change disclosures on a dichotomous basis: 1 is allocated to a disclosed item; 0 is allocated if there is no disclosure. Such a method avoids consideration of irrelevant and redundant information and is supported by the extant literature (ACCA & GRI, 2009; Brammer & Pavelin, 2006; KPMG & GRI, 2007).

The use of unequal weighting has been debated. Often, quantitative information is awarded higher weighting than descriptive and qualitative information (Aerts et al., 2006; Freedman & Jaggi, 2005; Wiseman, 1982; Zeng et al., 2012). However, information such as policy, governance and strategy are qualitative by nature, and are as equally important as quantitative information. Such information reveals a company's position in dealing with business operations and environmental protection. Therefore, unequal weighting can lead to subjective biases because qualitative information will receive a much lower weight than quantitative information (such as financial performance). Thus, this study uses an equal weighted rating of information.

5.4.2 Research instrument

Consistent arguments in prior studies assert that CER is country-dependent (de Villiers & van Staden, 2006; Gray et al., 1995a; Thomson, 2007; Williams, 1999). Climate change as an important global sustainability issue is evolving, shaped by social and institutional forces (Jennings & Zandbergen, 1995). Chapter 4 argued that changing global and national institutional influences on climate-change issues have led to changing expectations of corporate environmental transparency. Those pioneer Chinese companies operating internationally (discussed in Chapter 4) acted as transmitters of international best practice in corporate reporting (including climate change reporting) in the absence of domestic environmental reporting guidelines. For example, Syntao (2007)

reported early adopters of CSR in China prior to 2007 referred to GRI as their reporting guidelines. Acquired foreign knowledge was translated and modified to adapt to the different Chinese domestic societal scale. This involved unintended and deliberate changes to the Western model (Scott, 2003; Westney, 1987). In the same vein, diffusion of international reporting practice required modification and interpretation of international reporting guidelines to the country-specific context.

This thesis develops criteria to identify Chinese company climate-change reporting. These criteria incorporate international studies, environmental and climate change related reporting guidelines (World Resources Institute and the World Business Council for Sustainable Development: The Greenhouse Gas Protocol: a Corporate Accounting and Reporting Standard (revised edition) (the GHG protocol), 2004; Global Reporting Initiative (G3), 2006; Global Compact, 2011; KPMG & GRI, 2007; Carbon Disclosure Project, 2009; ACCA & GRI, 2009) and China's key domestic guidelines on environmental reporting. These are summarised in Table 5-2 below.

Table 5-2 Chinese CSR reporting guidelines

China State Council (2005): Decisions on implementing the scientific approach to development and strengthening environmental protection
Shenzhen Stock Exchange (2006): Corporate social responsibility guide for companies listed on Shenzhen Stock Exchange
China Ministry of Environmental Protection (2007): Measures for open environmental information disclosure (for trial implementation)
China state-owned Assets Supervision and Administration Commission (2007): Guidance on central-SOEs to fulfil social responsibility
Shanghai Stock Exchange: Guidelines on voluntary disclosure of corporate social responsibility and environmental information (SSE 2008)
Shanghai Stock Exchange: Guidelines on corporate fulfilling social responsibility report (SSE2009)
China Social Science Academy (2010): corporate social responsibility reporting guidelines

These criteria comprise a research instrument of 38 specific individual disclosure items. These are then grouped into the six categories of general disclosure items shown in Table 5-3. The six categories of general disclosure items are: policy; governance and strategy; financial implications and other risks and/or opportunities; performance and targets; climate change mitigation; and adaptation and credibility. Table 5-3 also outlines the criteria mentioned in Chinese guidelines (CN) and international guidelines (INT).

Research instruments used in prior research into Chinese CER study were under-specified. Chinese contextual environmental reporting is not adequately captured those research instruments (see Chapter 3). No Chinese CER research has drawn on reporting items from Chinese domestic environmental reporting guidelines and international guidelines. Inadequacy has the effect of rendering results incomparable. The research instrument developed in this thesis has drawn on global and Chinese reporting guidelines. Chinese specific reporting environment is included in the research instrument (see comparison of reporting items identified in CN and INT in Tables 5-3 and 5-4). This research instrument enables better capture of climate-change reporting in a developing country's context.

Table 5-3 Research instrument

General Disclosure		Specific Disclosure	CN	INT
Policy	1	Mention of 'scientific development'	YES	NO
	2	Mention of 'climate change or global warming'	NO	YES
	3	Mention of 'energy saving and emission reduction'	YES	YES
	4	Mention of 'low carbon economy'	YES	YES
	5	Mention of 'sustainable development'	YES	YES
	6	Mention of 'harmonious society'	YES	NO
	7	Policy statement on operations and environmental protection	YES	YES
	8	Public position on commitment to binding targets(e.g. support the government's call for Emission reduction and energy saving)	NO	YES
	9	Policy on addressing product impacts	NO	YES
Governance and Strategy	10	CEO/Directors articulate views on environmental protection and energy saving and emission reduction	NO	YES
	11	Existence of a board committee with specific responsibility for environmental affairs/energy saving and emission reduction	NO	YES
	12	Remuneration at executive and board level is linked to energy saving and emission reduction	NO	YES
	13	Information about how climate change trends are linked into future company strategy	NO	YES
Financial	14	Risks due to physical changes associated with climate change	NO	YES
Implications and	15	Regulatory risks	YES	YES
other risks/opportunities	16	Opportunities to provide new technologies, products or services to address challenges related to climate change	NO	YES
	17	Potential competitive advantage created for the organisation by regulatory or other technology	NO	YES

General Disclosure		Specific Disclosure	CN	INT
		changes linked to climate change		
	18	Income specifically related to environmental protection activities	NO	YES
	19	Carbon emission trading	NO	YES
Performance and	20	Quantified energy use	YES	YES
Targets	21	Quantified GHG emissions	NO	YES
	22	Targets to reduce energy use	NO	YES
	23	Targets to reduce emissions efficiency	NO	YES
	24	Energy saved and emission reduction achieved	YES	YES
	25	Fines or sanctions for non-compliance	YES	YES
Mitigation and	26	R&D	YES	YES
Adaptation	27	Install cleaner/new technologies	YES	YES
	28	Education and training	YES	YES
	29	External certification of environmental management	NO	YES
	30	Energy efficiency measures	YES	YES
	31	Product innovation and change	YES	YES
	32	Purchase energy from low carbon sources	NO	YES
	33	Renewable energy	YES	YES
	34	New business model	YES	YES
	35	Relocation/restructure	YES	YES
Credibility	36	Independent assurance of disclosure	NO	YES
	37	Use of national/international guidelines to report environmental performance	NO	YES
	38	Awards	YES	NO

5.4.2.1 Policy

The 'policy' disclosure category relates to environmental policies that define an organisation's overall commitment to the compliance, operation (including energy and materials), product impact and approach to binding targets. Content analysis of key Chinese reporting guidelines reveals the CPC's political ideology 'Scientific approach to development' is the driving force behind release of these documents. As discussed in Chapter 4, China's government response to climate change is related closely to government economic policies and is through 'energy saving and emission reduction' campaigns. Chinese domestic environmental reporting guidelines do not mention climate change explicitly. To gauge the influence of international versus domestic reporting guidelines on Chinese company policy statements, the following specific items are included in the policy disclosure category: scientific development, climate change or global warming, low carbon economy, sustainable development, harmonious society.

5.4.2.2 Governance and strategy

The ‘governance and strategy’ disclosure category is concerned with how companies internally manage information disclosure on climate change (or energy saving and emission reduction in the Chinese context), through committees and with senior executive support. It also covers whether the organisation has explained how climate change trends are aligned and integrated with future business strategies (ACCA and GRI, 2009). Specific guidelines on suggested reporting information are outlined in global reporting guidelines; in contrast, reporting information under this category in the Chinese guidelines is not explicitly stated. An exception is a brief statement in SZSE 2006 (Article 27), which suggests companies appoint staff to be responsible for an environmental protection system and provide resources to support the responsible staff. However, the OEI 2007 encourages Chinese enterprises to voluntarily disclose environmental information as appropriate to the enterprise. In addition, Chinese listed companies are required to provide information about general corporate governance and strategy in their annual financial reports. With increased Chinese government regulations on environmental protection, some disclosure in this category is expected. Hence four specific reporting items drawing from international reporting guidelines (items 10–13 in Table 5-3 above) are included in this category.

5.4.2.3 Financial implications and other risks and/or opportunities

The ‘financial implications and other risks and/or opportunities’ disclosure category is concerned with the risks and/or opportunities associated with climate change. It covers physical risks (e.g. extreme weather and storms) and regulatory risks (e.g. increased compliance costs due to the impact of new government regulations). Also included are opportunities to provide products using new technologies, or services to address climate change, potential competitive advantages created for the organisation by regulatory or technological changes linked to climate change, income specifically related to environmental protection, and carbon emissions trading. Except for recommended voluntary reporting on regulatory risks associated with new government environmental regulations, Chinese domestic guidelines do not mention physical risks and opportunities associated with climate change explicitly.

5.4.2.4 Performance and targets

The ‘performance and targets’ disclosure category is concerned with company energy consumption and emissions, targets to reduce energy consumption and emissions, the results of proactive efforts to improve energy-efficiency and emissions reduction, and the fines or sanctions for non-compliance. Except for a general statement on environmental performance and targets (including energy saving and emission reduction) Chinese domestic reporting guidelines do not distinguish energy consumption based on source and direct or indirect consumption, as do international reporting guidelines.

5.4.2.5 Mitigation and adaptation

The ‘mitigation and adaptation’ disclosure category is concerned with actions a company has taken to deal with climate change. According to the Kyoto Protocol (1998), mitigation means ‘taking actions to reduce GHG emissions and to enhance sinks aimed at reducing the extent of global warming’. Adaptation means ‘taking action to adapt to the effects and minimise the risks of global warming’. China’s climate change national plan (the National Plan 2007) points out that for developing counties:

> Mitigation is a long and arduous challenge while adaptation to climate change is a more present and imminent task. China will strengthen its policy guidance for energy conservation and energy structure optimization to make efforts to control its greenhouse gas emissions… adaptation to climate change and mitigation of greenhouse gas emissions involve many aspects of the social and economic policies to address climate change …will only be effective if they are integrated…Therefore, China will give full consideration to climate change issues by integrating the policy of climate change mitigation and adaptation into its national social and economic development program and pushing forward the policy in a coordinated way. Technological advancement and innovation are the effective way to mitigate greenhouse gas emissions and enhance the capacity of adaptation to climate change…China will make great efforts to develop new…technologies…to promote carbon sink technologies and other adaptive technologies, to accelerate scientific and technological innovation and importation, and to provide a strong scientific support to address climate change and promote the capacity of sustainable development (p.26).

China's policy statement on mitigation and adaptation to climate change indicates (while recognising mitigation actions are essential to cope with climate change) that China's response to climate change aligns with adaptation rather than mitigation. The practical measures to mitigate and adapt to climate change in China are effected through implementation of its national social and economic policies, with particular focus on energy efficiency and emissions reduction. China's domestic policy emphasizes innovation and technology (including investment in research and development in environmental technologies and product innovations; education and training) in the campaign for energy efficiency and emission reduction. Hence, mitigation and adaptation actions are grouped into one category as in ACCA and GRI (2009). Except for items 29 and 32, which are more aligned with international reporting guidelines, other specific reporting items under this category are consistent between the Chinese domestic reporting guidelines and the international ones.

5.4.2.6 Credibility

The 'credibility' disclosure category is concerned with the integrity and credibility of a company's reporting. There is no specific guidance on the credibility of environmental reporting in Chinese domestic guidelines. This is in contrast to the international guidelines (e.g. GRI 2006) which suggest disclosure of the independent assurance of reporting (item 36) and the use of national or international reporting guidelines (item 37). However, Chinese domestic guidelines encourage companies voluntarily to report awards received for environmental protection and pollution control activities (e.g. in SSE 2008). Hence, item 38 Award is included in this category.

5.4.2.7 International guidelines versus domestic guidelines

One research objective of this thesis is to examine the extent to which the international guidelines and domestic guidelines have affected Chinese company climate-change reporting. This relates to the following two research questions. First, did the release of OEI 2007 influence the overall level of reporting? Second, did the release of Chinese guidelines influence the content as opposed to the level of reporting? The first question

focuses on the volume of reporting. This is supported by using the time factor as one of the explanatory variables (as explained in Sections 5.2 and 5.4.4).

The second question focuses on reporting content. Analysis is required of whether Chinese companies report items in the Chinese and/or international guidelines with the same frequency as international companies. If Chinese guidelines are influential, then Chinese companies should report items in those guidelines relatively more often than international guidelines. One way to analyse this is to examine average company reporting per individual disclosure item. That is to examine the change of items mentioned in Chinese guidelines only, items mentioned in both Chinese and international guidelines, and those mentioned in the international guidelines only over time and in each observation year. Table 5-4 summarises the number of individual disclosure items based on items mentioned in the Chinese guidelines; items that are mentioned in both Chinese and international reporting guidelines; and items that are mentioned in international guidelines.

Table 5-4 Summary of individual reporting items

Individual reporting item	Specific disclosure items	Total
Chinese guidelines only	1, 6, 38	3
Both Chinese and international Guidelines	3, 4, 5, 7, 15, 20, 24, 25, 26, 27, 28, 30, 31, 33, 34, 35,	16
International reporting guidelines only	2, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21, 22, 23, 29, 32, 36, 37	19
Total specific items		38

Table 5-4 shows that of 19 specific disclosure items mentioned explicitly in Chinese reporting guidelines, 16 are consistent with the international reporting guidelines. There are another 19 items mentioned explicitly in the international guidelines that are not specifically included in the Chinese reporting guidelines.

The research instrument developed in this chapter will examine Chinese company reporting levels and identify the influence of international versus Chinese national guidelines on the content of climate change reporting by Chinese companies. It will identify the commonalities and differences of each individual reporting item in the international reporting guidelines and the Chinese domestic reporting guidelines. Hence,

it will help develop a better understanding of climate change reporting in the Chinese context.

5.4.3 Coding of reports

This study used the Chinese version of reports even where English versions are available. Initial coding was done by the author, who speaks and writes Chinese at a professional level and has translation experience. The author developed a coding sheet to record the 38 reporting items. If an item was reported in AR, '1' was coded in the relevant cell in the column titled 'AR', or '0' if not reported. If an item was reported in CSR, then '1' was coded in the relevant cell in the column titled 'CSR', or '0' if not reported. If an item was reported in both AR and CSR, the item was recorded '1' in each column, and '1' was coded in the relevant cell in the column titled 'Overall'. This ensured that the same information was recorded once for overall disclosure, to avoid the problem of double counting the same item. The coding process enabled analysis of how an item was reported in different reporting medium (AR and CSR). The maximum score for each company was 38, and the maximum score for each individual reporting item in any reporting year is 100 (i.e. all sample companies report the item in the reporting year). Tables 6.4-6.9 present the results from the coding sheet. The author did the initial coding on hardcopy reports, then checked the coding by using the PDF search function on electronic versions of the reports. To ensure consistency across companies, all reports were coded at least three times (following the above coding procedure) by the author between February 2010 and November 2011

Coding for 27 reports was redone by two independent assessors for validation. The similarity of coding was 94.1 per cent. This is an acceptable level of inter-coder reliability (Milne & Adler, 1999).

5.4.4 Description of variables

Company characteristics are represented by dichotomous variables (except for size) as follows.

The affiliation of a senior executive with the CPC is proxied by whether the Chairman and/or the Managing Director is a Party Secretary or Party member (CPC). This is a composite variable that uses self-disclosure from AR, combined with knowledge that this is the case for all central-state controlled companies (Yang, 2002).

Ownership is represented by two variables; one for Central-state-controlled companies (CSC); and the other for Non-government-controlled companies (NonGC).

Measures of size vary in prior literature. Due to the difficulty of measuring assets in the financial industry, size is measured here according to income (INC). As is common, the log of income is used as the size measure (Cho & Patten, 2007; Collin et al., 2009) because of the non-linear relationship between size and reporting. For example, a company that is ten times larger than another company does not experience ten times the effect on reporting. The use of log of income is not due to a lack of normality as argued in some studies (e.g. Gray et al., 2001; Chu, et al., 2013). To ensure the constant purchasing power of Chinese local currency RMB Yuan, income has been adjusted by using China's GDP deflator (data retrieved from Worldbank at http://data.worldbank.org).

Industry is represented by ten dichotomous variables, one per industry (denoted by IND1 to IND10). However, only nine industry variables are included in any one model. An industry at one of the extremes was dropped to allow a test of the greatest industry differences.

The variable for Big Four international accounting firms as auditors (BIG4) is used to distinguish companies audited by any one of the Big Four international accounting firms (i.e. KPMG, PricewaterhouseCoopers (PwC), Ernst & Young (EY), and Deloitte) from those audited by all other auditors.

There are five variables for listing exchange (denoted by EXCH1 to EXCH5); one for each for SZSE, Hong Kong (HK), New York (NY), London (LON), SSE. However, the variables representing SSE are omitted from the model. Hence, in each case, the difference between the quoted exchange and SSE is tested.

The variable for international operation (INT) distinguishes between companies who reported export sales as part of major operating income and/or reported overseas branches, and those who did not.

This study uses two dummy variables representing 2006 (T2006) and 2010 (T2010) to control for changes (Chen et al., 2007) in the climate change reporting environment over the study period. This then tests the changes between 2006 and 2008, and 2008 and 2010 respectively. This differs from the method used in Gray et al., (2001) which did not allow basic year differences; hence they did not allow for macro political and economic contextual factors and institutions to change over time.

5.4.5 Data analysis

Data are analysed through descriptive statistics, logistic analysis and multivariate regression.

5.4.5.1 Logistic regression

To model an individual reporting item across companies and time, a classic logit model can be used with PTR_{jt} represented by $\log(P_{jt}/(1-P_{jt}))$, where P_{jt} is the probability that company *j* will report in time period *t*. This can then be estimated by a logit model because the dependent variable (individual reporting item) is a binary (disclose or not disclose) response. Logistic regression is more suitable for a dependent variable that is categorical and explanatory variables that are continuous or categorical (Agresti & Finlay, 2009).

A separate logit model is used for each reporting item, giving 38 sets of results, using the following general equation:

$$PTR_{jt} = Log\left(\frac{P_{jt}}{1-P_{jt}}\right) = \alpha + \sum_{i=1}^{9}\beta_i IND_{ijt} + \beta_{10}CPC_{jt} + \beta_{11}CSC_{jt} + \beta_{12}LSC_{jt}$$
$$+ \beta_{13}Ln(INC_{jt}) + \beta_{14}BIG4_{jt} + \sum_{i=1}^{4}\beta_{14+i}EXCH_{ijt} + \beta_{19}INT_{jt} + \beta_{20}T_{2006}$$
$$+ \beta_{21}T_{2010} + \sum_{i=1}^{9}\beta_{21+i}T_{2006}IND_{ijt} + \beta_{31}T_{2006}CPC_{jt} + \beta_{32}T_{2006}CSC_{jt}$$
$$+ \beta_{33}T_{2006}LSC_{jt} + \beta_{34}T_{2006}BIG4_{jt} + \sum_{i=1}^{4}\beta_{34+i}T_{2006}EXCH_{ijt}$$
$$+ \beta_{39}T_{2006}INT_{jt} + \sum_{i=1}^{9}\beta_{39+i}T_{2010}IND_{ijt} + \beta_{50}T_{2010}CPC_{jt}$$
$$+ \beta_{51}T_{2010}CSC_{jt} + \beta_{52}T_{2010}LSC_{jt} + \beta_{53}T_{2010}BIG4_{jt}$$
$$+ \sum_{i=1}^{4}\beta_{53+i}T_{2010}EXCH_{ijt} + \beta_{58}T_{2010}INT_{jt} + \varepsilon_{jt}$$

5.4.5.2 Multivariate regression analysis

To model aggregate reporting behaviour across all companies the link between propensity to report and the likelihood of reporting can justify the same set of explanatory variables used to explain the number of companies that report. This can then be estimated using multiple regression because it is a useful way of predicting a cardinal outcome variable from several explanatory variables (Field, 2009). Each of 'total number of items reported', 'number of items reported in each of the six groups', 'percentage of items reported in the AR' and 'percentage of items reported in the SR' are represented by nine separate regressions for which the general equation is given by:

$$Y_{jt} = \alpha + \sum_{i=1}^{9} \beta_i IND_{ijt} + \beta_{10} CPC_{jt} + \beta_{11} CSC_{jt} + \beta_{12} LSC_{jt}$$

$$+ \beta_{13} Ln(INC_{jt}) + \beta_{14} BIG4_{jt} + \sum_{i=1}^{4} \beta_{14+i} EXCH_{ijt} + \beta_{19} INT_{jt} + \beta_{20} T_{2006}$$

$$+ \beta_{21} T_{2010} + \sum_{i=1}^{9} \beta_{21+i} T_{2006} IND_{ijt} + \beta_{31} T_{2006} CPC_{jt} + \beta_{32} T_{2006} CSC_{jt}$$

$$+ \beta_{33} T_{2006} LSC_{jt} + \beta_{34} T_{2006} BIG4_{jt} + \sum_{i=1}^{4} \beta_{34+i} T_{2006} EXCH_{ijt}$$

$$+ \beta_{39} T_{2006} INT_{jt} + \sum_{i=1}^{9} \beta_{39+i} T_{2010} IND_{ijt} + \beta_{50} T_{2010} CPC_{jt}$$

$$+ \beta_{51} T_{2010} CSC_{jt} + \beta_{52} T_{2010} LSC_{jt} + \beta_{53} T_{2010} BIG4_{jt}$$

$$+ \sum_{i=1}^{4} \beta_{53+i} T_{2010} EXCH_{ijt} + \beta_{58} T_{2010} INT_{jt} + \varepsilon_{jt}$$

5.5 Summary

This chapter explains that to operate the extended model developed in Chapter 4, a mathematical representation of the conceptual framework of this thesis is necessary. The important concept 'propensity to report' was explained to further justify the research approach adopted in this thesis. The mathematical representation of the model has potential to apply to qualitative and quantitative institutional analysis of climate change reporting in China. It enables the empirical testing of factors that potentially explain significant differences in climate change reporting practices among companies at a point of time and over time. Empirical tests will help to examine the relevance of the institutional theoretical perspective on the modifying role of company characteristics in climate-change reporting. This can provide a foundation for future research and development in this area.

The chapter has justified the sample selection of 100 leading Chinese listed companies from the SSE and the SZSE and the study period over five years. The data are sourced from AR and CSR reports. Such data significantly advance extant empirical analysis of

Chinese CER study in general, and climate-change reporting in particular, by providing a more comprehensive understanding of the reporting behaviour of Chinese companies.

The research instrument developed incorporates international and Chinese domestic reporting guidelines on climate-change reporting information. This enables a more sophisticated analysis of climate change reporting in the context of China. The research instrument can also allow better analysis of the influence and diffusion of international reporting guidelines on Chinese CER reporting. Descriptive and multivariate statistical results will be reported in Chapters 6 and 7 respectively. Analyses of results will be provided in Chapter 8.

Chapter 6: Descriptive results

6.1 Introduction

This chapter is reports descriptive findings regarding the pattern of climate-change reporting by Chinese companies. More specifically, the chapter presents findings to address the following four questions. First, what information do Chinese companies disclose in reports about climate change? Second, did the quantity of climate-change reporting change after the release of national guidelines on open environmental information in OEI 2007? Third, did the release of Chinese guidelines influence the content of reporting as opposed to the level of reporting? Fourth, to what extent do Chinese and international guidelines influence climate-change reporting by Chinese companies? The findings will be presented in 15 figures and ten tables. Interpretation of the descriptive results is analysed further in Chapter 8.

The rest of this chapter is organised as follows: Section 6.2 reports the changing reporting pattern from 2006 to 2010 with regard to changes in overall reporting and reporting media; Section 6.3 reports the change of reporting per industry; Section 6.4 reports changes in report content with regard to category reporting and specific individual reporting; and Section 6.5 examines the influence of international and domestic guidelines on reporting content. Section 6.6 summarises this chapter.

6.2 Change in overall reporting and reporting medium

6.2.1 Change in overall reporting over time

Table 6-1 (on pages 116 and 117) shows that overall disclosure (in terms of level of reporting in volume) increased by 340 per cent in 2008 compared to 2006. It continued to grow with 14 per cent increase from 2008 to 2010.

Table 6-1 Summary of disclosure in 2006, 2008 and 2010

Category Disclosure	Specific Disclosure	2006	2008	2010
Policy	1. Mention of 'scientific development'	32	74	71
	2. Mention of 'climate change or global warming'	4	15	30
	3. Mention of 'energy saving and emission reduction'	27	91	91
	4. Mention of 'low carbon economy'	1	4	66
	5. Mention of 'sustainable development'	39	93	87
	6. Mention of 'harmonious society'	30	81	78
	7. Policy statement on operations and environmental protection	17	77	80
	8. Public position on commitment to binding targets	23	77	83
	9. Policy on addressing product impacts	4	44	41
	Subtotal	**177**	**556**	**627**
Governance and Strategy	10.CEO/Directors articulate views on environmental protection and energy saving and emission reduction	10	51	52
	11. Existence of a board committee with specific responsibility for environmental affairs/energy saving and emission reduction	6	27	24
	12. Remuneration at executive and board level is linked to energy saving and emission reduction	0	6	4
	13. Information about how climate change trends are linked into future company strategy	3	15	37
	Subtotal	**19**	**99**	**117**
Financial Implications and Other Risks/ Opportunities	14. Risks due to physical changes associated with climate change	1	6	5
	15. Regulatory risks	10	16	19
	16. Opportunities to provide new technologies, products or services to address challenges related to climate change	0	14	22
	17. Potential competitive advantage created for the organisation by regulatory or other technology changes linked to climate change	4	8	9
	18. Income specifically related to environmental protection activities	8	31	49
	19. Carbon emission trading	2	4	10
	Subtotal	**25**	**79**	**114**

Category Disclosure	Specific Disclosure	2006	2008	2010
Performance	20. Quantified energy use	4	39	37
and	21. Quantified GHG emissions	4	27	26
Targets	22. Targets to reduce energy use	2	24	20
	23. Targets to reduce emissions efficiency	2	21	14
	24. Energy saved and emission reduction achieved	9	64	69
	25. Fines or sanctions for non-compliance	0	1	0
	Subtotal	**21**	**176**	**166**
Mitigation and	26. R&D	15	58	72
Adaptation	27. Install cleaner/new technologies	16	77	82
	28. Education and training	5	59	65
	29. External certification of environmental management	7	27	30
	30. Energy-efficiency measures	10	77	85
	31. Product innovation and change	5	55	53
	32. Purchase energy from low carbon sources	0	1	15
	33. Renewable energy	3	26	43
	34. New business model	16	67	69
	35. Relocation/restructure	2	12	17
	Subtotal	**79**	**459**	**531**
Credibility	36. Independent assurance of disclosure	0	12	15
	37. Use of national/international guidelines	4	43	50
	38. Awards	15	72	79
	Subtotal	**19**	**127**	**144**
Overall disclosure		**340**	**1496**	**1699**

Table 6-1 indicates a rapid growth of reporting per company for the year 2008: the average level of reporting was 15 (out of a maximum 38) per company compared to the average of three per company for the year 2006. Reporting continued to increase at a steady rate for 2010 compared to 2008, with an average of 17 items per company. A similar pattern occurred also in the incidence of reporting of specific disclosure items. Figure 6-1 demonstrates the changing reporting pattern with regard to the average disclosure score (out of 38) per company and the average incidence (out of 100 for the years 2006, 2008, out of 99 for the year 2010) of reporting per individual reporting items.

Figure 6-1 Change in reporting pattern from 2006 to 2010

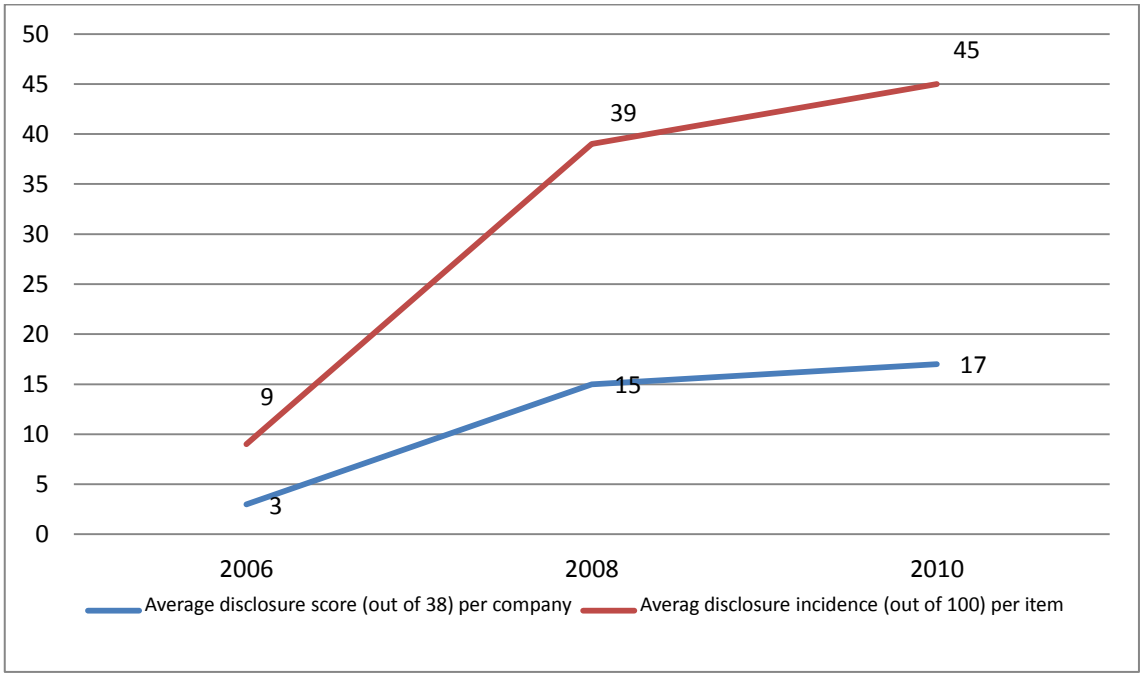


Figure 6-1 shows average disclosure incidence per individual disclosure item increased significantly from 9 in 2006 to 39 in the year 2008 and further up to 45 in the year 2010. This suggests a rapid increase in the number of Chinese companies in disclosing information about environmental information in 2008 compared to 2006, and continued to increase in 2010.

Figure 6-2 shows the change in the level of reporting over the reporting years 2006, 2008, and 2010.

Figure 6-2 Change in the level of reporting from 2006 to 2010

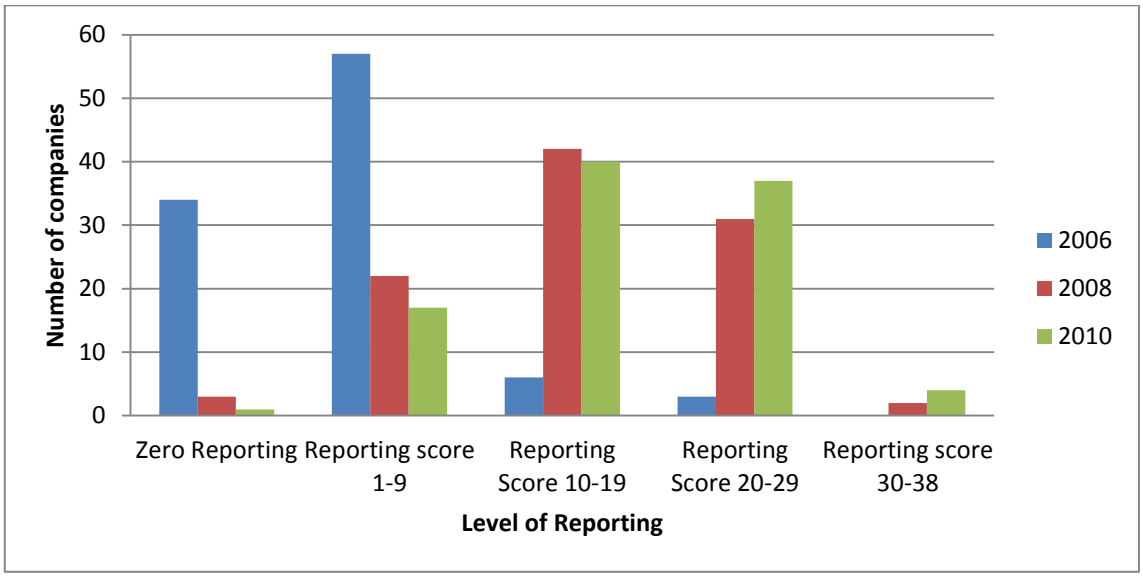


Figure 6-2 shows for reporting year 2006 that 91% sample companies reported less than nine items (out of 38), of which 34 per cent of companies disclosed no reporting items. Nine companies had a disclosure level greater than 10. Three companies (3%) had a disclosure level between 20 and 29, the highest among the sample companies for the year 2006. They are Baoshan Iron & Steel Co Ltd (Baoshan), China Petroleum and Chemical Corp (Sinopec), and Petro China Co Ltd (Petro China). Content analysis of the reports by those three companies reveals they are large companies from environmentally-sensitive industries in materials (Baoshan) and energy (Sinopec and Petro China); companies with overseas operations (and among the Global 500 list). They are the early movers among Chinese companies that issued designated corporate social and environmental reports prior to 2006 in China (except for Sinopec which issued its first CSR report in 2007, for the reporting year 2006). All these companies reported their desire to benchmark the best international practice in corporate sustainable development. For example, Baoshan's CSR 2006 report states the company aims to become a first-class world enterprise. It explains how Baoshan interprets corporate sustainability in the Chinese context:

> Business enterprises… have become the key player in sustainable development. Therefore, they are undertaking the sacred duty of maintaining the harmony of economic development, social progress and environmental protection. Baoshan, as one of the largest modern iron and steel enterprises in China, feels deeply its significant responsibility in China's transition from a 'large' iron and steel country to a 'strong'

> iron and steel country. In 2006, Baoshan joined the World Business Council of Sustainable Development (WBCSD), and became the second Chinese company to join WBCSD. It is also among the first in the global iron and steel industry to join WBCSD (Baoshan CSR 2006, p. 64, in Chinese).

Similarly, Sinopec's 2006 report states the company joined *Global Compact* in 2004. Both Baoshan and Sinopec explicitly mentioned the GRI (G3) in preparing their reports.

In 2008, 73 % companies reported a score between 10 and 29. Notably, the number of companies with no disclosure dropped significantly to three, compared to 34, in 2006. Two companies (Baoshan and China Shenhua Energy Co Ltd) had a reporting score greater than 30. The rapid growth of overall reporting for the year 2008 is consistent with institutional analysis of corporate environmental transparency in China (see in Chapter 4).

The level of overall reporting for 2010 continued to grow steadily at 14 per cent compared to that for 2008. As shown in Figure 6-2, the majority of companies (81 out of 99) reported at least ten items (out of 38). The number of companies with the overall reporting level in the score range between 20 and 29 increased to 37. There were 17 (out of 99) sample companies with a reporting score of less than 10, and one company with zero disclosure. Notably, the number of companies with a reporting score at least 30 increased to four.

6.2.2 Change in reporting medium over time

Climate change reporting by AR and CSR has changed over time. Figure 6-3 shows the change in percentage of information disclosed in reporting medium. Figure 6-4 summarises the overall reporting by AR and CSR for each of three observation years. The analysis calculated the disclosure incidence by AR only, CSR only, and those in both AR and CSR (AC). Table 6-2 summarises the results. Reports of the results for each individual disclosure item under each general reporting category are presented later in Section 6.4.

Figure 6-3 Change in percentage reporting per disclosure medium

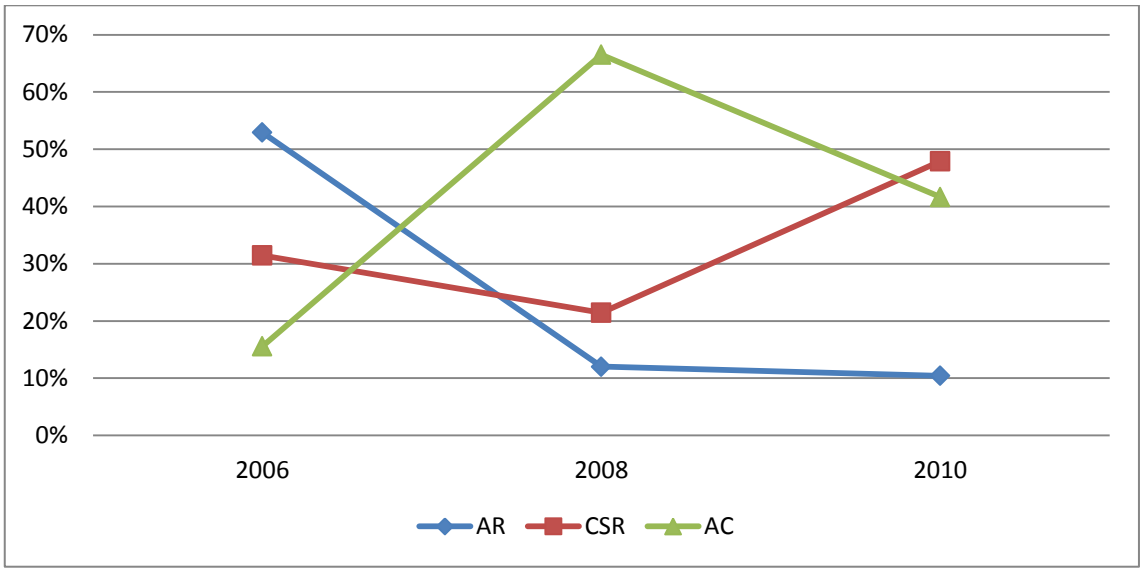
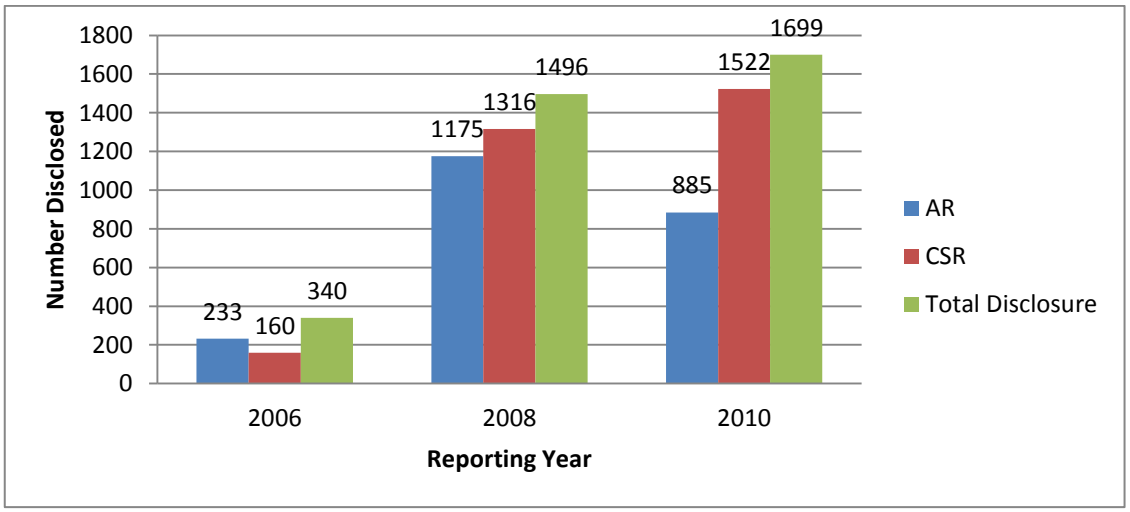


Table 6-2 Reporting medium

	2006	2008	2010
AR only	180	180	177
CSR only	107	321	814
Both AR and CSR (AC)	53	995	708
Overall Disclosure	340	1496	1699

Figure 6-4 Change in overall reporting by AR and CSR from 2006 to 2010



Analysis of the percentage of information disclosed in 'AR only', 'CSR only' and 'AC' shows the changing reporting pattern in terms of disclosure medium. For 2006, of the total disclosure level of 340, 53 per cent of information was reported by 'AR only', 31 per cent of information was reported by 'CSR only' and 16 per cent of information was

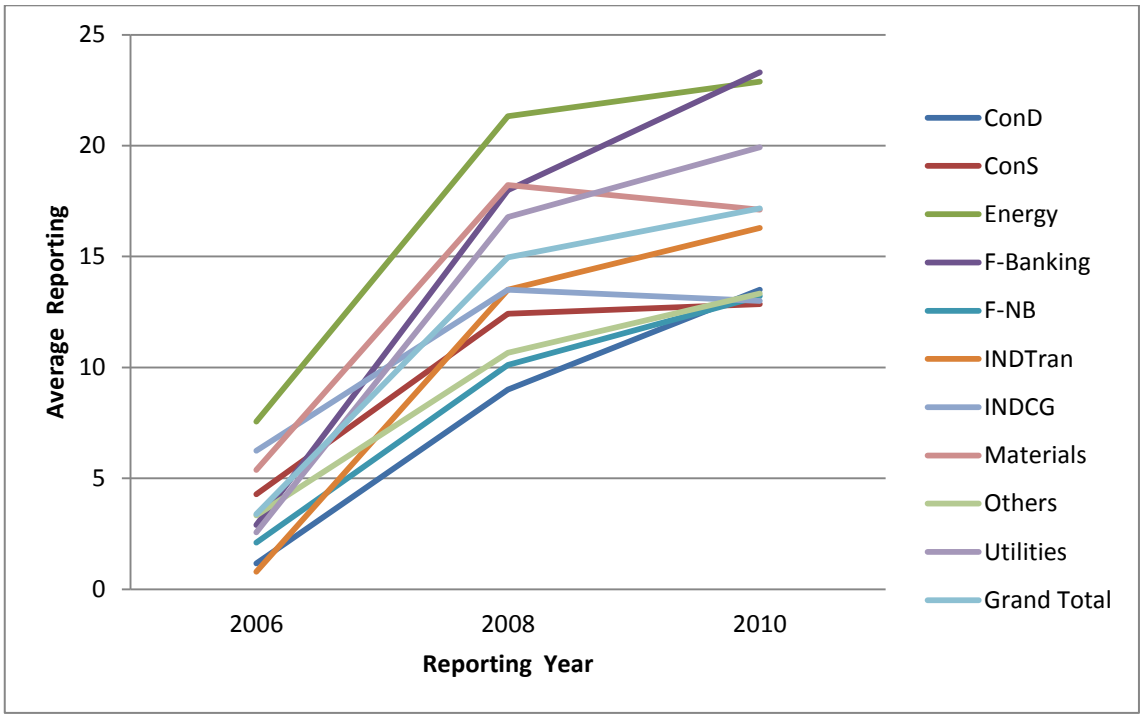
reported in ‘both AR and CSR’. However, reporting by ‘AR only’ dropped with 12 per cent in the year 2008, and continued to drop to 10 per cent in the year 2010. With regard to ‘CSR only’, the percentage dropped to 21 per cent in 2008. However, it increased significantly in the year 2010 with 48 per cent of the reporting disclosed by ‘CSR only’. There was a relatively higher percentage (67%) of information reported by ‘both AR and CSR’ in 2008 compared to 2006 (16%) and 2010 (42%). One possible reason is that the SSE suggested that companies listed on SSE voluntarily disclose CSR reports as part of their AR reports for 2008. However, there was no such guideline for companies listed in SZSE.

There was also a large number of replicated information reported (or not reported) in AR and CSR. As shown in Figure 6-4, there was a continued and significant shift toward greater reporting in CSR compared to AR from 2006 to 2010; there was some information disclosed in AR is replicated in CSR reports. A further analysis was conducted to investigate the extent to which information about climate change was disclosed in AR only and CSR only, and those disclosed in both AR and CSR (i.e. information replicated in AR and CSR) by Chinese companies. Table 6-2 demonstrates that information was disclosed more in ‘CSR only’ than traditional ‘AR only’ from 2006 to 2010. Further analysis of the result is reported in Section 8.3.2.

6.3 Change in reporting per industry

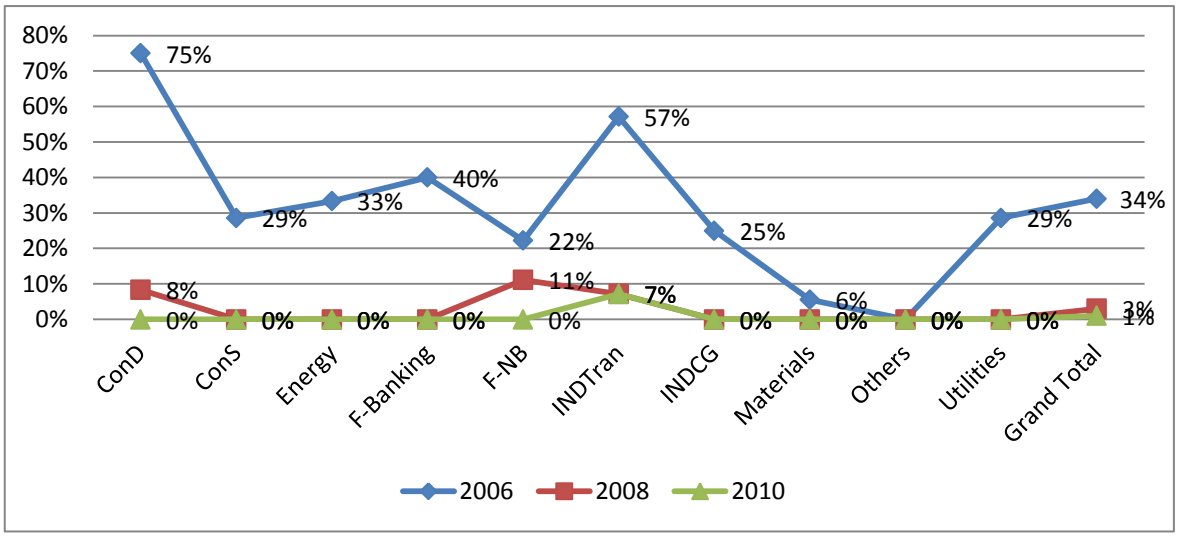
Consistent with the pattern of overall reporting in Section 6.2 above, there was a significant increase in average reporting in each industry between 2006 and 2008. Figure 6-5 below shows the change in average reporting by industry over time. The industry memberships are consumer discretionary (ConD), consumer staples (ConS), energy, financials-banking (F-Banking), financials-non-banking (F-NB), industrial-transportation (INDTran), industrial-capital goods (INDCG), materials, utilities, and others.

Figure 6-5 Change in average reporting by industry over time



Aligned with the increase in average reporting per industry, the percentage of companies with no reporting in each industry has dropped over time (see Figure 6-6).

Figure 6-6 Change in percentage of companies with nil disclosure



As shown in Figure 6-6, in the 2006 reporting year, all industries (except those classified as 'others') had at least one company with none of the reporting items. Three industries (ConD, INDTran, and F-Banking) had a relatively higher number of companies with nil disclosure than other industries. However, this changed in 2008. In

this year, nearly all companies disclosed some information about climate change. Exceptions were three companies with nil disclosure (ConD, F-NB and INDTran). In 2010, there was only one company (in INDTran) with nil disclosure.

Figure 6-5 and Figure 6-6 reveal continuous growth in reporting across industries in each reporting year and over time. Based on average reporting per industry (see Figure 6-5), energy, financial-banking, industrials-transportation, materials and utilities have a relatively higher level of reporting than other industries over time. This is consistent with the extant literature on the influence of industry membership on company climate change reporting behaviour (see, for example in KPMG & GRI 2007).

A further examination of the reporting levels in each industry reveals that intra-industry reporting varies. There was disparity between the maximum and minimum disclosure in each industry for each reporting year and over time, as shown in Figures 6-7, 6-8 and 6-9.

Figure 6-7 Change of reporting per industry in 2006

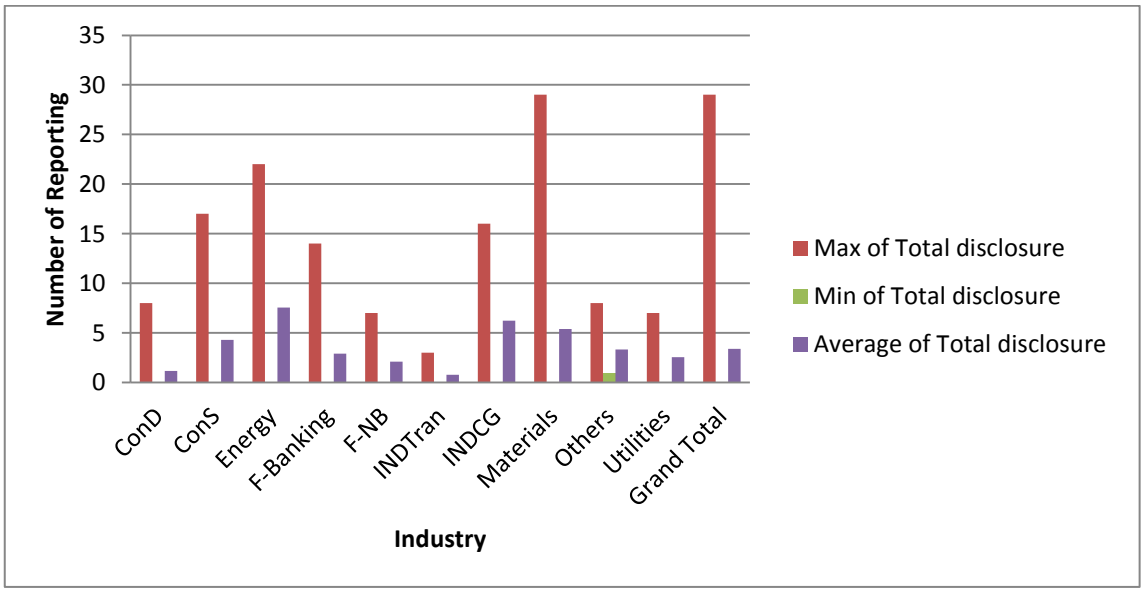


Figure 6-8 Change of reporting per industry in 2008

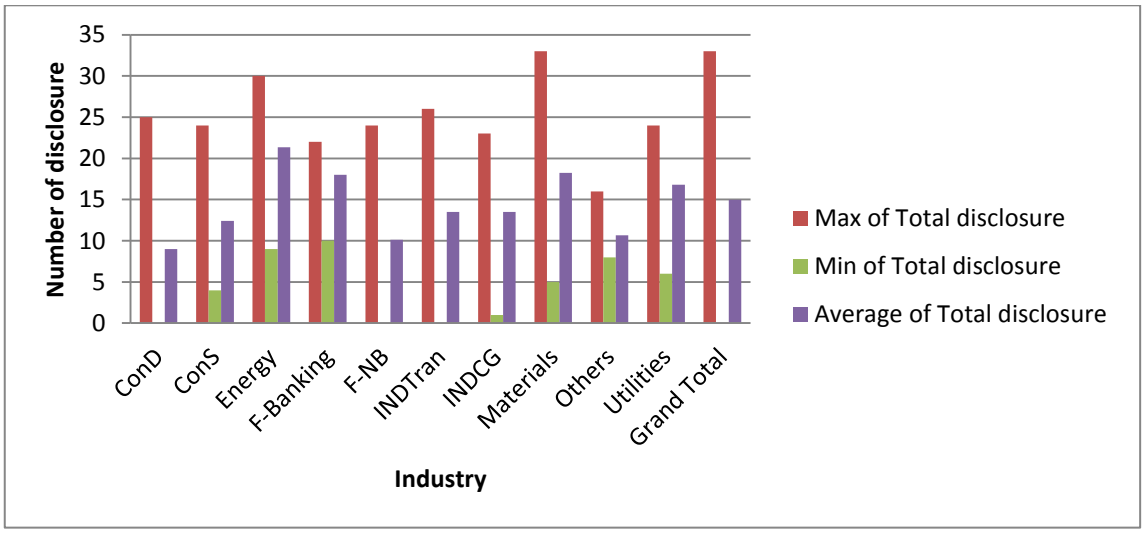
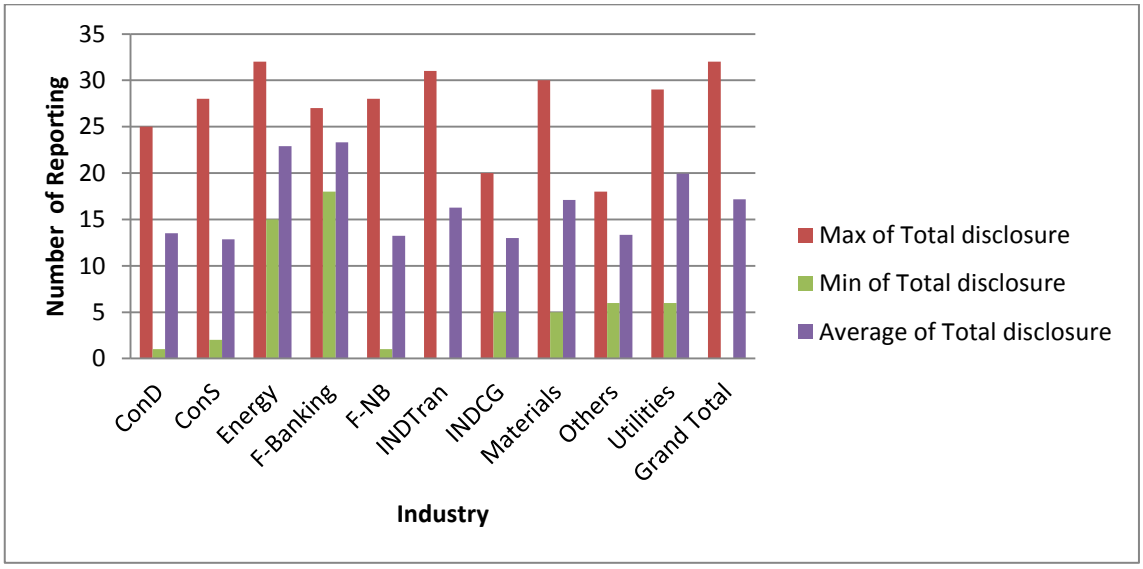


Figure 6-9 Change of reporting per industry in 2010



The above figures show that companies in the same industry had different reporting levels. Even in those environmentally sensitive industries (which had relatively higher levels of average reporting, such as energy, materials, and utilities), the disparity exists (although the minimum reporting level increased from 0 to 5). For example, in the industrials-transportation industry the highest reporting level was 31 in 2010, whereas the lowest was zero.

Companies in the financial-banking industry in particular have shown a rapid increase in average disclosure level over time. In 2006, the average disclosure level of the industry was three. However, this increased to 18 in 2008, equal with materials. The

average disclosure of the industry continued to grow to 23 in 2010. This led to the industry ranking first (along with energy) in terms of average reporting per industry. The result also shows that companies in the Financials-banking industry have a higher disclosure level. Minimum reporting changed from zero in 2006 to 10 in 2008, and increased to 18 in 2010 (see Figure 6-7, Figure 6-8, and Figure 6-9).

Content analysis of reports by companies in the F-Banking industry shows that the industry recognised potential business opportunities to provide financial services to 'energy saving and emission reductions' activities of Chinese companies while supporting the Chinese government's environmental policies. For example, Shanghai Pudong Development Bank Co Ltd (SPDB), one of the industry early movers in reporting social and environmental information in CSR, reports that its aim is to become the industry leader in the carbon financing market (SPDB, CSR, 2010).

Another example is Industrial and Commercial Bank of China Ltd (ICBC is one of the Chinese companies listed on the Global 500). It reports that the company:

> …pays close attention to climate-change, increases self-awareness of environmental protection, and proactively capture business opportunities in low carbon economy (AR 2008, p. 7, in Chinese).

ICBC's CSR (2008) further explains how the company contributes to environmental protection activities because it

> …actively follows the development and change of 'Equator Principles' and implements the 'Green Credit' (绿色信贷) policy to support the Chinese government's environmental policy specified in the 11th Five-Year Development Program to work with Chinese business enterprises in environmental protection actions (p. 23).

ICBC explains that 'green credit' policy means two things. One is to restrict financing to those business enterprises that have high levels of energy consumption and pollution, and who fail to meet environmental protection targets. The other is to proactively support the development of business enterprises or industries that are engaged in environmental protection, clean energy and circular economy (ICBC, CSR 2008, p. 23). The ICBC's

report on climate change and environmental performance for the year 2010 further reinforces its position of supporting the government's environmental policy on 'energy saving and emission reduction'; as well as its implementation of the 'scientific approach to development' (ICBC, CSR 2010, p. 17).

6.4 Change in reporting content over time

Table 6-3 Change in average disclosure per category over time

	2006	2008	2010	Total
Policy	20	62	70	151
Governance and strategy	5	25	29	59
Financial implications and other risks/opportunities	4	13	19	36
Performance and targets	4	29	28	61
Mitigation and adaptation	8	46	53	107
Credibility	6	42	48	97
Average disclosure per reporting item	9	39	45	93

Table 6-3 shows that the general disclosure category, Policy, has the highest disclosure incidence across each of the three observation years, followed then by Mitigation and Adaptation, Credibility, Performance and Targets, Governance and Strategy. The lowest disclosure was Financial Implications and Other Risks/Opportunities. In general, this reporting pattern is consistent with international studies on corporate climate-change reporting (ACCA & GRI, 2009; Freedman & Jaggi, 2005; KPMG & GRI, 2007). An exception is the Policy category. This has a higher level of disclosure than the Mitigation and Adaptation category. ACCA and GRI (2009) report disclosure on Mitigation and Adaptation by 36 internationally largest companies from high-impact (environmentally-sensitive) sectors is slightly higher than Policy disclosure (p. 25).

A closer examination of the specific disclosure items under each general category shows signs of convergence and divergence with international climate-change reporting practice across years, and across companies in any given year. Results reflect climate-change reporting in China's country-specific reporting context. The following subsections present the findings of individual reporting disclosed by AR only, CSR only, and both AR and CSR (AC). This will keep providing a better understanding of changes in reporting each category by disclosure medium over time. This complements the

results reported in Section 6.2.2. Further analysis of the change in reporting content is provided in Section 8.3.2 in Chapter 8.

6.4.1 Policy

Figure 6-10shows the change in policy disclosure over time and Table 6-4 provides further details of disclosure of each individual item by AR and CSR in each reporting year.

Figure 6-10 Change in policy disclosure

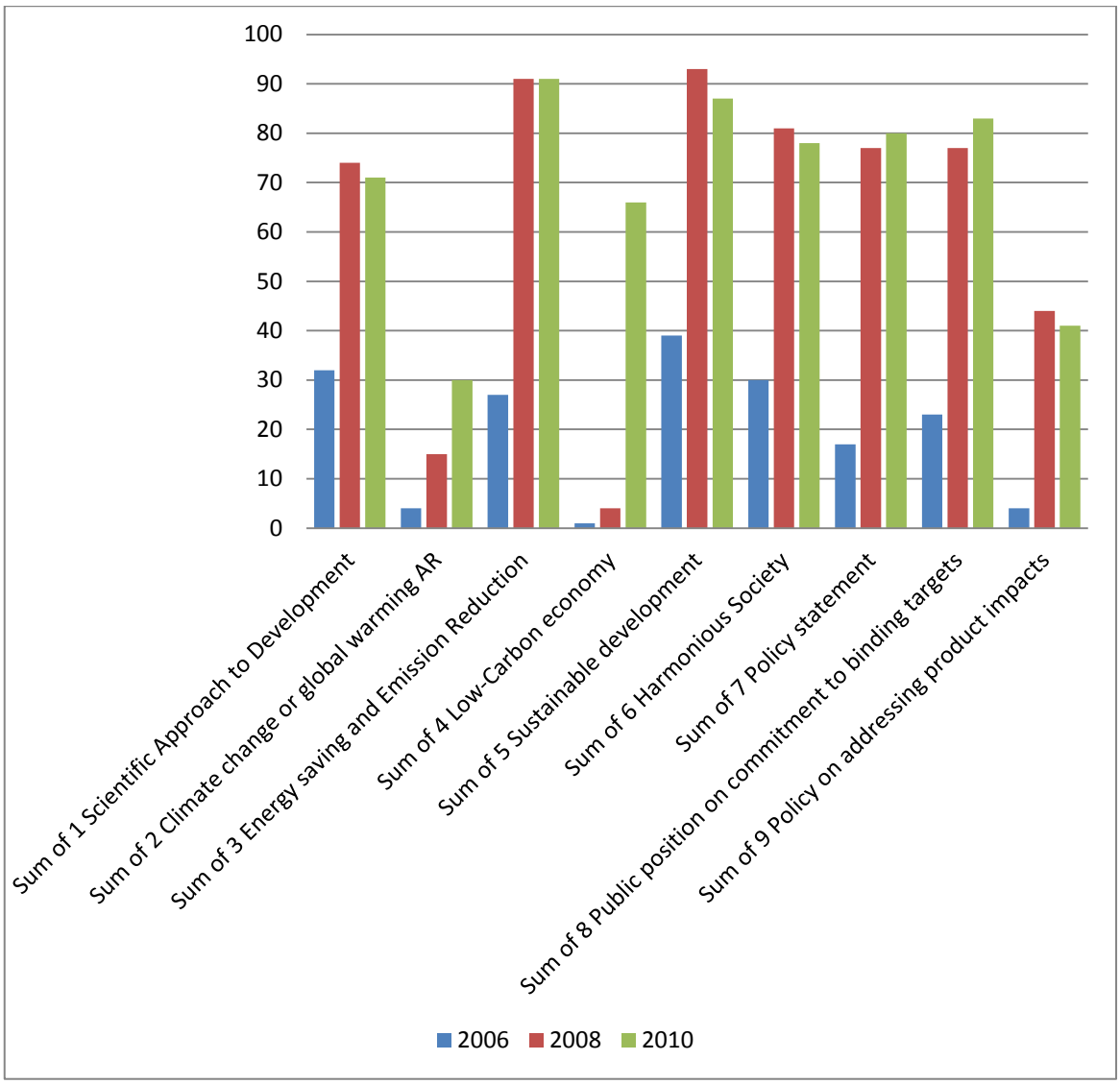


Table 6-4 Policy

	2006				2008				2010			
	AR only	**CSR only**	**AC**	**Overall**	**AR only**	**CSR only**	**AC**	**Overall**	**AR only**	**CSR only**	**AC**	**Overall**
Sum of 1. Mention of 'Scientific Approach to Development'	25	4	3	32	18	15	41	74	22	16	33	71
Sum of 2. Mention of climate change or global warming	1	3	0	4	2	5	8	15	3	25	2	30
Sum of 3. Mention of energy saving and emission reduction	18	5	4	27	16	13	62	91	12	22	57	91
Sum of 4. Low carbon economy	0	0	1	1	0	2	2	4	9	26	31	66
Sum of 5. Sustainable development	31	1	7	39	17	10	66	93	12	14	61	87
Sum of 6. Harmonious society	19	2	9	30	6	19	56	81	2	44	32	78
Sum of 7. Policy statement on operations and environmental protection	9	6	2	17	4	22	51	77	4	38	38	80
Sum of 8. Public position on commitment to binding targets	13	7	3	23	8	16	53	77	7	39	37	83
Sum of 9. Policy on addressing product impacts	0	3	1	4	4	7	33	44	1	25	15	41

As indicated in Figure 6-10 and Table 6-4 there was a remarkably higher level of reporting on specific items, including 'scientific approach to development', 'energy saving and emission reduction', 'sustainable development', 'harmonious society', 'public position on commitment to binding targets' than other specific items in this category over time. In contrast, the content analysis reveals a low level of explicit mentioning of 'climate change or global warming' (only 4% of sample companies in 2006, 15% in 2008 and 30% in 2010). This finding differs from studies in developed countries (ACCA & GRI, 2009; KPMG & GRI, 2007), where most international companies mentioned 'climate-change' in their reports explicitly.

A notable increase occurred with the disclosure of 'low carbon economy'. Such disclosure was relatively low in 2006 (1%) and 2008 (4%). However, it surged to 66 per cent in 2010.

Analysis of disclosure item 8 shows a majority of companies (77% in 2008 and 83% in 2010) reported their support of the Chinese government's environmental policy, and their commitment to the binding targets of 'energy saving and emission reduction'.

6.4.2 Governance and strategy

Figure 6-11shows the change in governance and strategy disclosure over time. Table 6-5 below provides further details of disclosure of each individual item by AR and CSR in each reporting year.

Figure 6-11 Change in governance and strategy

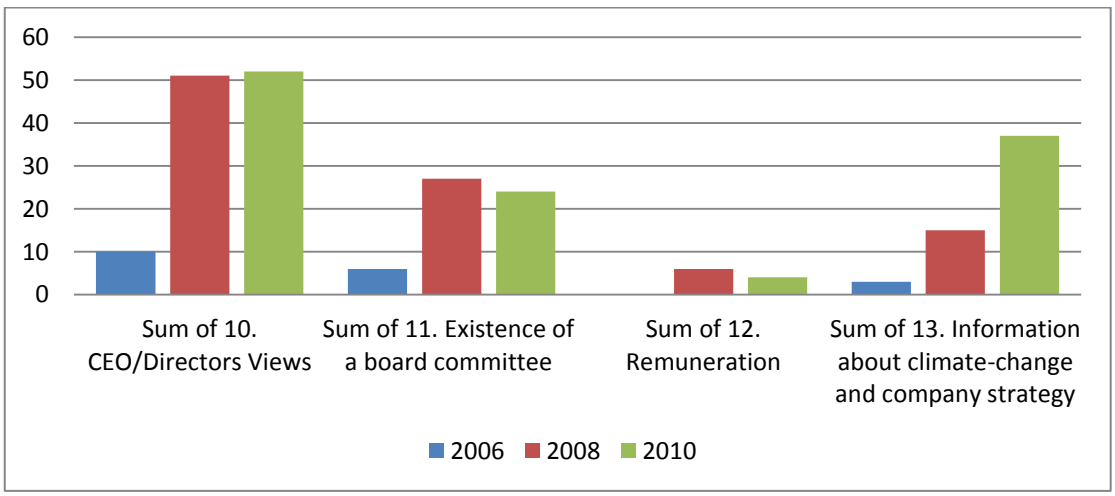


Table 6-5 Governance and strategy

	2006				2008				2010			
	AR only	**CSR only**	**AC**	**Overall**	**AR only**	**CSR only**	**AC**	**Overall**	**AR only**	**CSR only**	**AC**	**Overall**
Sum of 10. CEO/Directors articulate views on environmental protection and energy saving and emission reduction	6	3	1	10	9	9	33	51	8	24	20	52
Sum of 11. Existence of a board committee with specific responsibility for environmental affairs/energy saving and emission reduction	1	4	1	6	4	8	15	27	1	16	7	24
Sum of 12. Remuneration at executive and board level is linked to energy saving and emission reduction	0	0	0	0	1	1	4	6	0	1	3	4
Sum of 13. Information about how climate change trends/ energy saving and emission reduction are linked into future company strategy	1	2	0	3	2	4	9	15	7	22	8	37

There was no specific disclosure information about governance and strategy in Chinese reporting guidelines. Criteria of this category were drawn from international reporting guidelines (as discussed in Chapter 5). Results show that item 10 had a higher disclosure level over time than the other three items. Item 12 had the lowest disclosure (less than ten in each reporting year). With regard to item 10, reporting companies disclosed senior executives' views on environmental protection and 'energy saving and emission reduction' campaigns, but did not disclose 'climate-change' explicitly. This differs from international surveys (see, for example, ACCA & GRI, 2009; KPMG & GRI, 2007) where a majority of international companies reported executives' views on climate-change explicitly.

6.4.3 Financial implications and other risks/opportunities

Figure 6-12 shows the change in the category 'financial implications and other risks/opportunities'. Figure 6-12 provides the details of disclosure of each individual item by AR and CSR in each reporting year.

Figure 6-12 Change in financial implications and other risks/opportunities

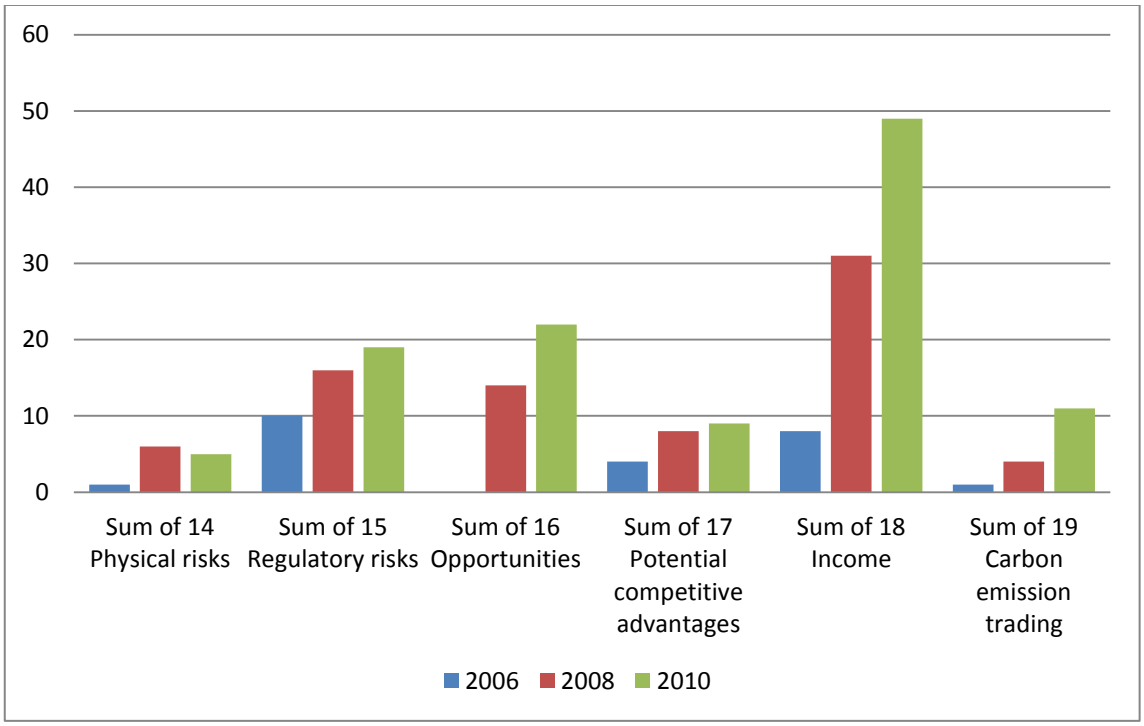


Table 6-6 Financial implications and other risks and opportunities

	2006				2008				2010			
	AR only	**CSR only**	**AC**	**Overall**	**AR only**	**CSR only**	**AC**	**Overall**	**AR only**	**CSR only**	**AC**	**Overall**
Sum of 14. Risks due to physical changes associated with climate change	0	1	0	1	1	1	4	6	3	2	0	5
Sum of 15. Regulatory risks	10	0	0	10	13	0	3	16	16	1	2	19
Sum of 16.Opportunities to provide new technologies, products or services to address challenges related to climate change/energy saving and emission reduction	0	0	0	0	4	3	7	14	6	10	6	22
Sum of 17. Potential competitive advantages created for the organisation by regulatory or other technology changed linked to climate change	4	0	0	4	3	3	2	8	0	5	4	9
Sum of 18. Income specifically related to environmental protection activities	3	5	0	8	13	2	16	31	21	11	17	49
Sum of 19. Carbon emission trading	1	0	1	2	0	0	4	4	1	7	2	10

In general this category had the lowest overall reporting of the six general categories. Item 18 (income) had the highest disclosure, followed by item 15 (regulatory risks). Item 14 had the lowest disclosure.

An interesting finding is the changing pattern of reporting on items 15 and 16. Both had increased over time. However, an increase the reporting levels of item 16, 'opportunities to provide new technologies, products or services to address challenges related to climate change (or energy saving and emission reduction in Chinese context)' surpassed that of item 15, 'regulatory risks', in 2008 and 2010 respectively. In 2010, reporting on item 16 surpassed item 15 in both aggregated incidence (22 for item 16 versus 19 for item 15) and growth rate (57% for item 16 and 19% for item 15). Item 19 'carbon emission trading' emerged as a reporting item in 2010 compared to its low reporting in 2006 and 2008. International studies on climate-change reporting (ACCA & GRI, 2009; Freedman & Jaggi, 2005; KPMG & GRI, 2007) reported a similar pattern. The only exception was the difference in time (represented by reporting year) where international companies had such reporting patterns prior to 2008 (at least two years earlier than the pattern became evident in Chinese companies).

The changing pattern in reporting opportunities and risks associated with climate-change reporting by Chinese companies suggests an increasing number of Chinese companies began to recognise business opportunities arising from energy saving and emission reduction in 2010, rather than the costs related regulation risks. Typical example of this is the report by Bao Steel (CSR, 2008) of the business opportunities arising from the establishment of China's domestic environment and energy exchanges in China

> … Market mechanism (of emission reduction and energy saving) reduces the cost to fund emission reduction projects. Pollution control and emission reduction activities are no longer seen by business as 'input only with no output'…the establishment of these environmental exchanges will inevitably provide new opportunities for BaoSteel to promote its advanced technology of 'energy saving and emission reduction' in the industry (p. 52).

There was a consistent increase in reporting of item 18 (income). This was eight per cent (in 2006), increasing to 31 per cent in 2008, and further increasing to 49 per cent in

2010. Further analysis of companies that reported on the item reveals the major source of income is from Chinese government grants for 'energy saving and emission reduction'. Reporting on the source of income by Chinese companies differs from the study by KPMG and GRI (2007). They reported that income was sourced from savings, from reductions in energy use and emissions, and from the trading of carbon credits.

The low disclosure of risks associated with climate-change by Chinese companies is consistent with findings in international studies mentioned above. Except for items 15 and 18, which both have relatively higher reporting in AR (i.e. sum of AR only and A&C) than CSR (i.e. sum of CSR only and A&C), other items had a greater incidence of reporting in CSR reports in the sample Chinese companies.

6.4.4 Performance and targets

Figure 6-13 shows change in the category of performance and targets associated with climate-change disclosure over time. Table 6-7 provides further details of disclosure of each individual item by AR and CSR in each reporting year.

Figure 6-13 Change in performance and target

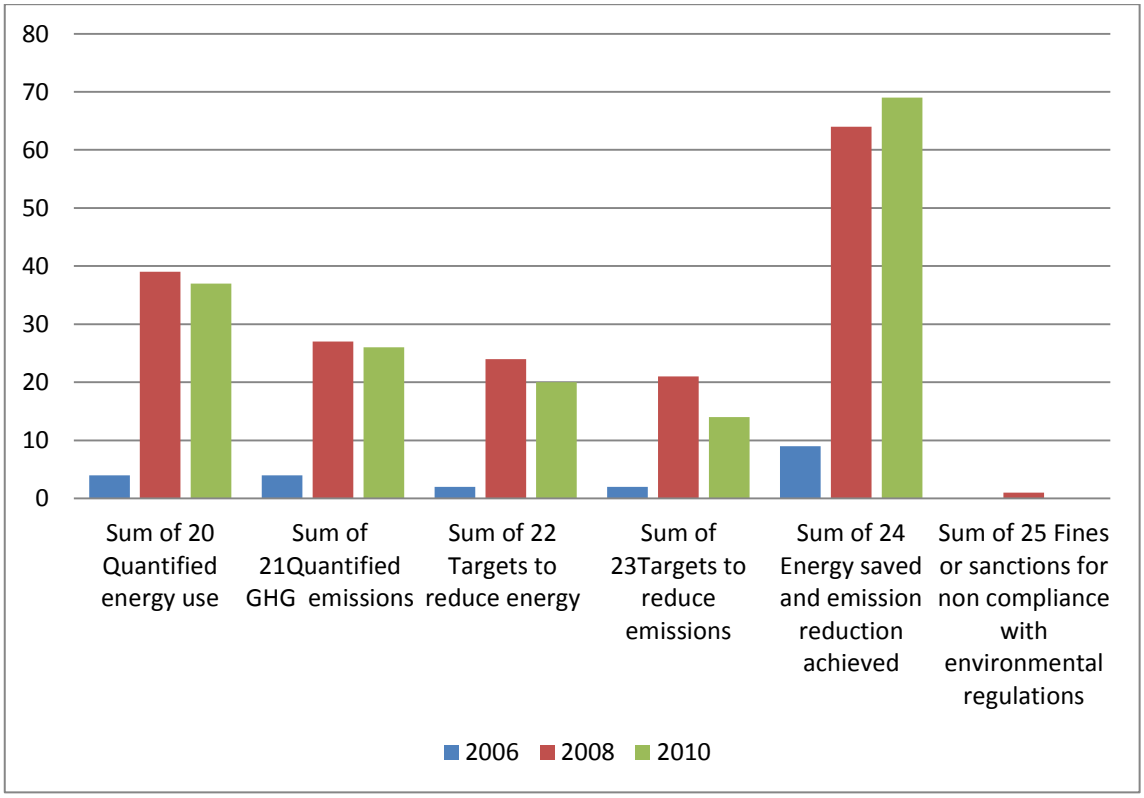


Table 6-7 Performance and targets

	2006				2008				2010			
	AR only	**CSR only**	**AC**	**Overall**	**AR only**	**CSR only**	**AC**	**Overall**	**AR only**	**CSR only**	**AC**	**Overall**
Sum of 20. Quantified energy use	0	3	1	4	1	13	25	39	0	29	8	37
Sum of 21. Quantified GHG emissions	0	4	0	4	0	6	21	27	0	20	6	26
Sum of 22. Targets to reduce energy	0	1	1	2	2	7	15	24	1	17	2	20
Sum of 23. Targets to reduce emissions	0	1	1	2	1	6	14	21	0	12	2	14
Sum of 24. Energy saved and emission reduction achieved	2	5	2	9	6	19	39	64	3	41	25	69
Sum of 25. Fines or sanctions for non-compliance with environmental regulations	0	0	0	0	0	0	1	1	0	0	0	0

Table 6-7 shows except for 'energy saved and emission reduction achieved' (item 24), which had increased over three observation years, the other five items had a rapid growth in 2008 compared to 2006, but dropped slightly in 2010.

6.4.5 Mitigation and adaptation

Figure 6-14 shows the change in the category Mitigation and adaptation associated with climate-change disclosure over time. Table 6.8 provides further details of disclosure of each individual item by AR and CSR in each reporting year.

Figure 6-14 Change in mitigation and adaptation

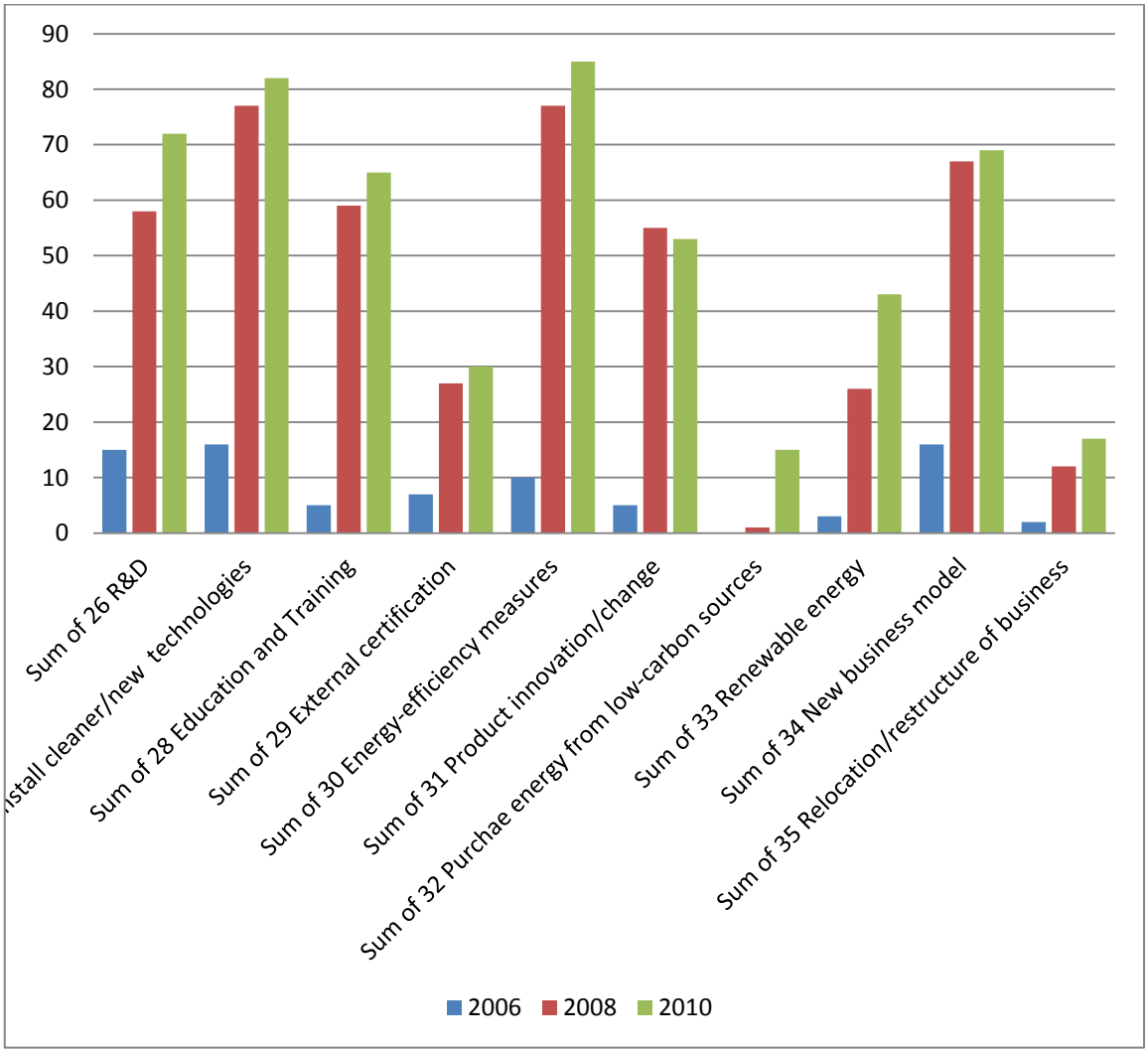


Table 6-8 Mitigation and adaptation

	2006				2008				2010			
	AR only	**CSR only**	**AC**	**Overall**	**AR only**	**CSR only**	**AC**	**Overall**	**AR only**	**CSR only**	**AC**	**Overall**
Sum of 26. R & D	8	5	2	15	7	2	39	58	6	20	46	72
Sum of 27. Install cleaner/new technologies	8	5	3	16	9	14	54	77	7	39	36	82
Sum of 28. Education and training	1	4	0	5	3	55	1	59	2	42	21	65
Sum of 29. External certification of environmental management	2	4	1	7	1	8	18	27	2	23	5	30
Sum of 30. energy efficiency measures	3	5	2	10	6	18	53	77	6	37	42	85
Sum of 31. Product innovation/change	0	5	0	5	3	12	40	55	2	32	19	53
Sum of 32. Purchase energy from low carbon sources	0	0	0	0	0	0	1	1	1	10	4	15
Sum of 33. Renewable energy	0	3	0	3	0	4	22	26	4	18	21	43
Sum of 34. New business model	7	7	2	16	6	17	44	67	5	32	32	69
Sum of 35. relocation/restructure of business	1	0	1	2	2	0	10	12	2	8	7	17

High disclosures were found in the Mitigation and Adaptation category. The level of reporting of each individual item in this category had a sustained growth across three observation years (an exception is item 31).

In general, findings are consistent with international surveys, except for the relatively (when compared to international studies) low disclosure of item 32 'purchase energy from low carbon sources' for the first two observation years (zero disclosure in 2006, 2% in 2008) and a moderate take-up (15%) in 2010 reports. Item 33 (Renewable energy) also had a strong increase in reporting (3%, 26% and 43%). This indicates that an increasing number of Chinese companies refer to renewable energy as a means to mitigate and adapt to climate-change. There was high disclosure of specific mitigation actions including 'research and development'(item 26); 'installing clean technologies' (item 27); 'education and training' (item 28); 'energy efficiency measures' (item 30) and 'new business models' (item 34).

With regard to the reporting medium, Table 6-8 shows that except for an increase in reporting items 26, 32, 33 in AR over time, disclosure of other items in AR declined in 2010 after a rapid increase in AR in 2008. In contrast, reporting by CSR continued to grow over time.

6.4.6 Credibility

Figure 6-15 shows change in the category of credibility associated with climate-change disclosure over time. Figure 6-15 provides further details of disclosure of each individual item by AR and CSR in each reporting year.

Figure 6-15 Change in credibility

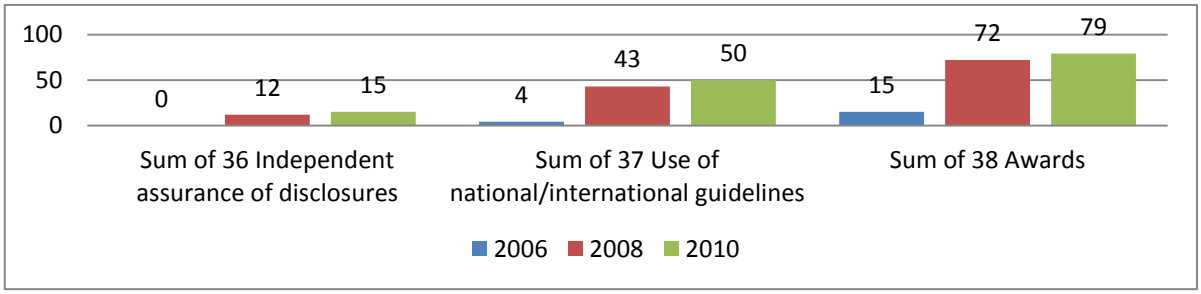


Table 6-9 Credibility

	2006				2008				2010			
	AR only	**CSR only**	**AC**	**Overall**	**AR only**	**CSR only**	**AC**	**Overall**	**AR only**	**CSR only**	**AC**	**Overall**
Sum of 36. Independent assurance of disclosures	0	0	0	0	2	4	6	12	0	15	0	15
Sum of 37. Use of national/international guidelines to report environmental performance	0	4	0	4	1	10	32	43	0	44	6	50
Sum of 38. Awards	6	5	4	15	5	15	52	72	7	21	51	79

Reporting levels in the category 'credibility' increased over time. The highest disclosed specific item in this category is 'awards' (item 38). The lowest disclosure is 'independent assurance of disclosure' (item 36). A notable change is the reporting of item 37 'use of national/international guidelines to report' (which was 4% in the year 2006). This increased to 43 per cent in 2008, with a further increase to 50 per cent in 2010. In 2006, only four companies reported using environmental reporting guidelines: Baoshan Steel (BaoSteel, material industry), China Petroleum and Chemical Corp (Sinopec, energy industry), SPDB, Financials-banking industry) and Yunnan BaiYao (Healthcare industry). Baoshan referred to the GRI (G3) as the guide for their CSR report; Sinopec referred to *Global Compact* in their report; SPDB referred to *Chinese Banking Industry CSR Reporting Guide*; and Yunnan Baiyao referred to *Shenzhen Stock Exchange Voluntary Corporate Social Responsibility Reporting* guidelines. These four companies were among the pioneers in China, issuing CSR reports prior to 2008. Except for Yunan Baiyao (the first west China based company listed on the Shenzhen Stock Exchange), the other three have overseas operations in developed countries and are on the list of the Global 500 largest multinational companies.

Analysis of reports for 2008 and 2010 reveals an increase in companies referring to national and/or international reporting guidelines in disclosing environmental and climate-change information. For example, companies listed on the SSE referred to *SSE Guidelines* more frequently, while those listed on the SZSE refer to *SZSE Guideline*. Reporting on the use of international reporting guidelines also increased. They were *GRI (G3), Global Compact*, international industry association issued industry reporting guidance (e.g. the *Equator Principle* for financial industry, and the global oil and gas industry association for environmental and social issues (IPIECA) and *American Petroleum Institute (API)* jointly issued Oil and Gas Industry Guidance on Voluntary Sustainability Reporting).

A low disclosure item under this category was 'independent assurance' (item 36). This finding is consistent with international surveys (ACCA and GRI, 2009). However, there was a change in reporting this information over time. Table 6-10 provides a summary of reporting of this item across industry over time.

Table 6-10 Disclosure of 'independent assurance'

Item 36	2006	2008	2010
Consumer Discretionary	0	1	1
Consumer Staples	0	0	1
Energy	0	1	2
Financials-Banking	0	4	5
Financials-Non banking	0	1	1
Industrials – Transportation	0	2	3
Materials	0	2	0
Utilities	0	1	2
Grand Total	**0**	**12**	**15**

In 2006, none of the sample companies across industries reported this information. In 2008, 12 companies reported on this item. In 2010, the number increased to 15 (five more companies, each from five industry memberships of Consumer Staples, Energy, Financials-Banking, Industrials – Transportation, and Utilities reported this item in 2010. However, two companies from industry membership of Materials, which reported this item in 2008, didn't report the item in 2010). Although reporting companies were from diverse industry sectors, companies from Financials-Banking had a higher reporting level in 2008 and 2010 when compared to other industry sectors. Chapter 8 will further analyse the changing reporting behaviour in this category.

6.4.7 Influence of international and Chinese guidelines on reporting

Table 6-11 summarises changes in the average reporting levels per individual disclosure item over time. Changes are based on those reporting items in the international guidelines only (n=19), those in Chinese guidelines only (n=3), and those that are mentioned in both Chinese and international guidelines (n=16).

Table 6-11 Disclosure of international versus Chinese reporting items

	Total disclosure	Average disclosure per item	Change
2006 Count international only	84	4	
2006 Count Chinese only	77	26	
2006 Both Chinese and international	179	11	
Subtotal 2006	340	9	
2008 Count international only	453	24	439%
2008 Count Chinese only	227	76	195%
2008 Both Chinese and international	816	51	356%
Subtotal 2008	1496	39	
2010 Count international only	536	28	18%
2010 Count Chinese only	228	76	0%
2010 Both Chinese and international	935	58	15%
Subtotal 2010	1699	45	

Table 6-11 shows that reporting on 'Chinese only' has the highest reporting level per item over the three observation years. Prior to the release of Chinese national guidelines on environmental reporting, there was an average 26 incidences of reporting for any 'Chinese only' item in the year 2006. After the release of OEI 2007 (effective in May 2008), the level of reporting increased to 76 in 2008, and remained unchanged in 2010.

The second highest level of reporting per item over time is occurs in both Chinese and international guidelines. In 2006, the average reporting level per any item in this group was 11. In 2008, this increased to 51, with a further increase to 58 in 2010.

The lowest level of reporting per item over time occurs in international guidelines only. In 2006, the average reporting level per any item in this group was four. In 2008, this changed to 24, and further increased to 28 in 2010.

In 2008, the reporting level for 'international only' was 4.39 times higher than those in 2006. In 2010 there was continued growth of 18% compared to 2008. In contrast, the reporting level per any Chinese only item increased by 1.95 times in 2008, with no further increase in 2010. Results show that for items mentioned in both Chinese and

international categories had increased by 3.56 times in 2008 compared to 2006, and continued to increase by 15 per cent in 2010 compared to 2008.

6.5 Summary

This chapter has provided descriptive findings about patterns of climate-change reporting by Chinese companies. There was a significant difference between the reporting years in overall reporting, reporting medium, reporting per industry, category reporting and a number of significant specific individual reporting items. There was low level of reporting in 2006. In 2008 there was a rapid growth in reporting compared to 2006. Reporting grew at a steady rate in 2010. Changes in reporting medium over the years reveal a trend for less information disclosure in 'AR only', and more information disclosure in 'CSR only'. Domestic guidelines show a greater influence in 2008, following the introduction of OGI 2007 and OEI 2007, and further alignment with international reporting guidelines in the 2010 reporting year. Results show that where reporting items are specified in Chinese domestic reporting guidelines, the item tends to have greater disclosure than if they appeared in international guidelines only. However, the growth of reporting on information of 'international only' increased after the release of the domestic guidelines OGI 2007 and OEI 2007. Chapter 7 presents the multivariate statistical results. Further analysis of results will be conducted in Chapter 8.

Chapter 7: Multivariate results

7.1 Introduction

This chapter complements Chapter 6 by reporting the results of the multivariate analyses. Those results provide evidence to the testing of the extended model. Specifically, results provide evidence to address the following research questions: Did the level of reporting change after the release of national guidelines on open environmental information in OEI 2007? Did changing institutional environment in China (represented by time factors T2006 and T2010) influence the overall level of reporting, categorical reporting and individual reporting? Did organisational populations of companies represented by CPC affiliations, ownership structure, the size of a company, industry membership, Big-Four accounting form, stock listing exchange, and international operations, influence overall level of reporting, categorical reporting, and individual reporting item over time? Did time factors and company characteristics influence the reporting medium of AR and/or CSR?

The extended model (in Section 4.3) was tested, by using Logit and multivariate regression models, from three perspectives (explained in Section 5.4.5): First, one multiple regression model was used for the aggregated reporting behaviour across all companies and time. Second, six separate multiple regression models were used for the aggregated reporting behaviour in each of the six groups across all companies and time. Third, 38 separate logit models were used for each individual reporting item across companies and time. In addition, two separate multiple regression models were used for investigating the reporting through AR and CSR across all companies and time.

Three levels of statistical significance ($p \leqslant 0.10$; $p \leqslant 0.05$; and $p \leqslant 0.01$) are reported. However, the conventional practice of using a five per cent level of significance ($p \leqslant 0.05$) in determining statistical significance of moderating factors is followed. As discussed in Chapter 4, this thesis takes a conservative approach in developing a two-tailed hypothesis. It is possible that regression and Logit results presented at the significance level of 10% in this chapter could be statistically significant at a 5% level if the hypothesis tests were one-tailed. Consistent with prior

literature (Myers, 1990; Stevens, 2012), tests using the Variance Inflation Factor (VIF) were conducted for problems of muticollinearity. The VIF for an independent variable indicates whether there is a strong linear association between it and all the remaining variables. No concern arose as no VIF values were greater than 10 in the tests. To measure the explanatory power of nine regression models, the coefficient of determination (R^2) was used. R^2 is a much used measure of the model's capability to fit the present data. It represents the proportion of variation in the response data that is explained by the model (Myers, 1990, pp. 37-38). However, there is no consensus on what is an acceptable value for R^2. How well a model can predict depends on research context. Myers (1990) explains

> …In truth, what is acceptable depends on the scientific field from which the data were taken. A chemist, charged with doing a linear calibration of a high precision piece of equipment, certainly expects to experience a very high R^2 value (perhaps exceeding 0.99), while a behavioural scientist, dealing in data reflecting human behaviour, may feel fortunate to observe an R^2 as high as 0.70. An experienced model fitter senses when the value of R^2 is large enough, given the situation confronted. Clearly, some scientific phenomena lend themselves to modeling with considerably more accuracy than others (p. 38).

Similarly, Stevens (2012) argues that in the social sciences (where accounting discipline is a part), 'where we are attempting to predict human behaviour (which can be influenced by many systematic and some idiosyncratic factors), prediction is much more difficult' (p. 73). Hence, this thesis considers an R^2 value equal or greater than 0.50 as strong explanatory power of the models tested, and considers an R^2 value less than 0.50 but greater than 0.20 as moderate.

The multivariate regression and logistic analyses (see Chapter 5) generated 47 sets of results. In the multivariate regression results, the industry variables of IND1to IND10 have been replaced by Consumer Staples (ConS), Consumer Discretionary (ConD), energy, F-Banking, Financials-Non-Banking (F-NB), Materials, Industrial-Transportation (INDTran), Industry capital goods (INDCG), Utilities, and Others, so that the specific industry can be identified. Similarly, the exchange variables of EXCH1 to EXCH5 have been replaced by SZSE, HK, NY, and LON (London). SSE

is omitted from the model so that the difference between the designated exchange and SSE is tested.

In multivariate regression, attempting to estimate the full moderation model presented in Chapter 5 creates problems with multicollinearity. This has been resolved by removing T2006 and T2010 variables, along with a number of cross-product variables. Tests of individual reporting item has reverted to the simple moderation model without cross-product variables because of a serious problem with multicollinearity when using logistic regression to estimate the full moderation model. A robustness check was also conducted by using an alternative measure of size (as represented by the log of assets). This rendered a slightly lower explanatory power (e.g. R^2 = .705 for the overall disclosure as opposed to R^2 =.717). However, all variables are relevant.

The remainder of the chapter is structured as follows: Section 7.2 presents results of changing reporting behaviour by Chinese companies from 2006 to 2010 with regard to overall reporting, general category reporting, reporting on specific individual items, and reporting medium. Section 7.3 analyses the moderating effect of Chinese company characteristics. Section 7.4 presents a summary.

7.2 Changing Climate-change reporting from 2006 to 2010

7.2.1 Overall disclosure

For overall disclosure, the model is statistically significant (see Table 7-1) and has strong explanatory power (R^2=0.717).

Table 7-1 Overall disclosure results

Model[a]	Unstandardized Coefficients		Standardized Coefficients	t	Sig[b].	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-34.812	8.162		-4.265	.000		
Con-D	-9.406	2.655	-.330	-3.542	.000***	.136	7.369
ConS	-5.985	2.985	-.165	-2.005	.046**	.174	5.746
F-Banking	-5.800	3.002	-.188	-1.932	.055*	.125	8.029
F-NB	-9.234	2.787	-.285	-3.313	.001***	.159	6.299

Materials	-2.924	2.384	-.118	-1.227	.221	.126	7.931
INDCG	-8.236	3.667	-.174	-2.246	.026**	.196	5.115
INDTran	-4.050	2.508	-.152	-1.615	.108	.133	7.495
Utilities	-2.152	2.562	-.081	-.840	.402	.128	7.819
Others	-5.938	3.894	-.109	-1.525	.129	.229	4.372
SHSE	3.366	1.361	.162	2.474	.014**	.273	3.657
HK	2.001	1.824	.096	1.097	.274	.153	6.522
NY	-2.143	2.448	-.067	-.875	.382	.199	5.019
London	-3.936	3.521	-.068	-1.118	.265	.314	3.189
BIG4	1.792	1.515	.096	1.183	.238	.178	5.627
CPC	3.815	1.517	.140	2.515	.013**	.380	2.632
CSC	-.496	1.387	-.026	-.357	.721	.219	4.570
Non-GovC	1.539	2.200	.057	.700	.485	.177	5.649
INT	1.490	1.479	.079	1.007	.315	.192	5.197
2006Consumer Discretionary	-4.679	2.657	-.099	-1.761	.079*	.372	2.685
2006 ConS	-5.164	3.165	-.084	-1.632	.104	.442	2.262
2006Energy	-10.388	3.220	-.191	-3.227	.001***	.335	2.989
2006F-Banking	-6.723	3.640	-.130	-1.847	.066*	.236	4.230
2006F-NB	-2.306	3.068	-.042	-.752	.453	.369	2.713
2006Materials	-7.330	2.607	-.178	-2.812	.005**	.294	3.399
2006INDCG	-1.823	4.836	-.023	-.377	.706	.328	3.048
200INDTran	-9.378	2.510	-.213	-3.736	.000***	.360	2.776
2006Utilities	-9.746	2.564	-.222	-3.801	.000***	.345	2.897
2006Others	-3.975	4.875	-.043	-.815	.416	.429	2.332
2006SHSE	-2.179	1.906	-.067	-1.143	.254	.340	2.945
2006HK	-5.374	2.606	-.166	-2.062	.040**	.182	5.507
2006NY	4.508	3.514	.083	1.283	.201	.281	3.560
2006London	6.869	4.949	.074	1.388	.166	.416	2.403
2006BIG4	-1.894	2.133	-.078	-.888	.375	.153	6.543
2006CSC	-.523	1.973	-.019	-.265	.791	.225	4.453
2006Non-GovC	-1.929	2.871	-.042	-.672	.502	.295	3.386
2006 INT	-.044	2.114	-.002	-.021	.984	.156	6.430
2010ConD	.258	2.689	.005	.096	.924	.364	2.751
2010ConS	-1.822	3.153	-.030	-.578	.564	.445	2.245
2010Energy	-1.047	3.148	-.019	-.333	.740	.350	2.857
2010F-Banking	1.571	3.602	.030	.436	.663	.241	4.142
2010F-NB	1.127	3.094	.021	.364	.716	.362	2.761
2010Materials	-4.876	2.546	-.122	-1.915	.057*	.291	3.432

2010INDCG	-2.643	4.677	-.033	-.565	.573	.351	2.852
2010INDTran	.948	2.454	.022	.386	.700	.377	2.654
2010Utilities	.836	2.540	.019	.329	.742	.352	2.843
2010Others	-1.991	4.928	-.021	-.404	.687	.420	2.383
2010SHSE	1.147	1.895	.036	.605	.546	.333	3.008
2010HK	-.439	2.517	-.014	-.174	.862	.188	5.308
2010NY	-.552	3.515	-.010	-.157	.875	.281	3.562
2010London	6.282	5.503	.055	1.142	.255	.503	1.987
2010 BIG4	-1.762	2.107	-.070	-.836	.404	.167	6.004
2010CSC	-1.087	1.976	-.040	-.550	.583	.219	4.559
2010Non-GovC	.486	2.847	.011	.171	.865	.280	3.573
2010INT	4.882	2.113	.212	2.310	.022**	.140	7.151
Log(Income)	4.706	.781	.332	6.029	.000***	.388	2.580
R Square	.717						
F Statistics				11.093			.000***

a. Dependent Variable: Total disclosure
b. * Significance level $p \leq 0.10$ ** Significance level $p \leq 0.05$ ***Significance level $p \leq 0.01$

With respect to overall reporting, the following relationships were statistically significant at the 5% significance level.

Size, SHSE and CPC have same positive effects on reporting all the time, whereas industry membership, HK, and INT are significant, but have different impact in different years.

7.2.2 Categorical disclosure

The models for disclosure in the six general categories were all statistically significant with R^2 ranging from 0.422 to 0.75. The following tables present the regression results for each general category reporting.

7.2.2.1 Policy

Table 7-2 Policy results

Model[a]	Unstandardized Coefficients		Standardized Coefficients	t	Sig[b].	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-2.615	1.711		-1.528	.128		
ConD	-1.079	.557	-.193	-1.938	.054*	.136	7.369
ConS	.011	.626	.002	.018	.985	.174	5.746
F-Banking	-.023	.629	-.004	-.036	.971	.125	8.029
F-NB	-1.019	.584	-.161	-1.744	.082*	.159	6.299
Materials	-.419	.500	-.087	-.839	.402	.126	7.931
INDCG	-.360	.769	-.039	-.468	.640	.196	5.115
INDTran	.254	.526	.048	.482	.630	.133	7.495
Utilities	.171	.537	.033	.318	.751	.128	7.819
Others	-.350	.816	-.033	-.429	.668	.229	4.372
SHSE	.779	.285	.192	2.730	.007**	.273	3.657
HK	.157	.382	.038	.410	.682	.153	6.522
NY	.252	.513	.040	.492	.623	.199	5.019
London	-.320	.738	-.028	-.434	.665	.314	3.189
BIG 4	.084	.318	.023	.263	.792	.178	5.627
CPC	.606	.318	.114	1.905	.058*	.380	2.632
CSC	.218	.291	.059	.749	.455	.219	4.570
Non-GovC	1.119	.461	.212	2.426	.016**	.177	5.649
INT	-.061	.310	-.016	-.195	.845	.192	5.197
2006ConD	-1.607	.557	-.174	-2.886	.004***	.372	2.685
2006ConS	-1.960	.664	-.163	-2.954	.003***	.442	2.262
2006Energy	-1.974	.675	-.186	-2.925	.004***	.335	2.989
2006F-Banking	-1.790	.763	-.177	-2.345	.020***	.236	4.230
2006F-NB	-.406	.643	-.038	-.631	.528	.369	2.713
2006Materials	-1.329	.547	-.165	-2.431	.016**	.294	3.399

2006INDCG	-.646	1.014	-.041	-.637	.525	.328	3.048
2006INDTran	-2.828	.526	-.329	-5.373	.000***	.360	2.776
2006Utilities	-2.257	.538	-.262	-4.198	.000***	.345	2.897
2006Others	-.685	1.022	-.038	-.670	.503	.429	2.332
2006SHSE	-.659	.400	-.104	-1.649	.100*	.340	2.945
2006HK	-.646	.546	-.102	-1.182	.238	.182	5.507
2006NY	.819	.737	.077	1.112	.267	.281	3.560
2006London	.586	1.038	.032	.565	.573	.416	2.403
2006BIG4	-.031	.447	-.006	-.069	.945	.153	6.543
2006CSC	-.166	.414	-.031	-.401	.689	.225	4.453
2006Non-GovC	-1.382	.602	-.155	-2.296	.023**	.295	3.386
2006 INT	.383	.443	.080	.864	.388	.156	6.430
2010ConD	.240	.564	.026	.425	.671	.364	2.751
2010ConS	-.277	.661	-.023	-.420	.675	.445	2.245
2010Energy	.713	.660	.067	1.081	.281	.350	2.857
2010F-Banking	1.216	.755	.120	1.610	.109	.241	4.142
2010F-NB	1.058	.649	.099	1.630	.104	.362	2.761
2010Materials	.075	.534	.010	.140	.888	.291	3.432
2010INDCG	-.509	.981	-.032	-.519	.604	.351	2.852
2010INDTran	-.027	.515	-.003	-.052	.959	.377	2.654
2010Utilities	.348	.533	.040	.653	.515	.352	2.843
2010Others	.045	1.033	.002	.043	.966	.420	2.383
2010SHSE	.098	.397	.016	.248	.805	.333	3.008
2010HK	.031	.528	.005	.058	.954	.188	5.308
2010NY	-.781	.737	-.073	-1.060	.290	.281	3.562
2010London	1.093	1.154	.049	.947	.345	.503	1.987
2010BIG4	-.227	.442	-.046	-.513	.608	.167	6.004
2010CSC	-.323	.414	-.061	-.779	.437	.219	4.559
2010Non-GovC	-.861	.597	-.100	-1.441	.151	.280	3.573
2010INT	1.043	.443	.231	2.353	.019**	.140	7.151
Log(Income)	.526	.164	.189	3.212	.001**	.388	2.580
R Square	.675						
F Statistics				9.099	.000***		

a. Dependent Variable: Policy

b. * Significance level $p \leq 0.10$ ** Significance level $p \leq 0.05$ ***Significance level $p \leq 0.01$

With respect to the ‘policy’ category, the model gave a strong explanatory power (R^2=0.675). The following were statistically significant at the 5% level.

Size and SHSE have same effects on reporting all the time, whereas industry membership, INT, and Non-Government control are significant, but have different impact in different years.

7.2.2.2 Governance and strategy

Table 7-3 Governance and strategy results

Model[a]	Unstandardized Coefficients		Standardized Coefficients	t	Sig[b].	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-6.309	1.510		-4.179	.000		
ConD	-.939	.491	-.196	-1.912	.057*	.136	7.369
ConS	.016	.552	.003	.028	.978	.174	5.746
F-Banking	-.125	.555	-.024	-.225	.822	.125	8.029
F-NB	-.714	.516	-.131	-1.386	.167	.159	6.299
Materials	.197	.441	.047	.446	.656	.126	7.931
INDCG	-1.058	.678	-.133	-1.560	.120	.196	5.115
INDTran	.234	.464	.052	.504	.615	.133	7.495
Utilities	.126	.474	.028	.267	.790	.128	7.819
Others	-.381	.720	-.042	-.529	.598	.229	4.372
SHSE	.622	.252	.178	2.470	.014**	.273	3.657
HK	.753	.337	.215	2.232	.027**	.153	6.522
NY	-.587	.453	-.109	-1.295	.196	.199	5.019
London	-.821	.651	-.085	-1.260	.209	.314	3.189
BIG4	.195	.280	.062	.697	.486	.178	5.627
CPC	.711	.281	.155	2.533	.012**	.380	2.632
CSC	.086	.257	.027	.337	.737	.219	4.570
Non-GovC	.806	.407	.178	1.982	.049**	.177	5.649
INT	.474	.274	.149	1.732	.085*	.192	5.197
2006ConD	-.359	.491	-.045	-.731	.465	.372	2.685
2006ConS	-1.041	.585	-.101	-1.778	.077*	.442	2.262
2006Energy	-.888	.596	-.097	-1.491	.137	.335	2.989
2006F-Banking	-.768	.673	-.088	-1.140	.255	.236	4.230
2006F-NB	-.502	.567	-.055	-.884	.378	.369	2.713
2006Materials	-1.047	.482	-.151	-2.172	.031**	.294	3.399
2006INDCG	.151	.894	.011	.169	.866	.328	3.048
2006INDTran	-1.570	.464	-.213	-3.383	.001***	.360	2.776
2006Utilities	-.780	.474	-.106	-1.645	.101	.345	2.897
2006Others	-.565	.902	-.036	-.627	.531	.429	2.332
2006SHSE (1)	-.461	.353	-.085	-1.307	.193	.340	2.945
2006HK	-1.212	.482	-.223	-2.513	.013**	.182	5.507

2006NY	1.431	.650	.157	2.202	.029**	.281	3.560
2006London	.835	.916	.053	.912	.363	.416	2.403
2006BIG4	-.345	.394	-.084	-.873	.383	.153	6.543
2006CSC	-.208	.365	-.045	-.569	.570	.225	4.453
2006Non-GovC	-.856	.531	-.112	-1.611	.108	.295	3.386
2006INT	-.233	.391	-.057	-.596	.552	.156	6.430
2010ConD	.298	.497	.038	.600	.549	.364	2.751
2010ConS	-.204	.583	-.020	-.350	.727	.445	2.245
2010Energy	.357	.582	.039	.612	.541	.350	2.857
2010F-Banking	.221	.666	.025	.332	.740	.241	4.142
2010F-NB	.162	.572	.018	.283	.777	.362	2.761
2010Materials	-.690	.471	-.102	-1.465	.144	.291	3.432
2010INDCG	-.169	.865	-.012	-.195	.845	.351	2.852
2010INDTran	.124	.454	.017	.273	.785	.377	2.654
2010Utilities	-.350	.470	-.047	-.744	.458	.352	2.843
2010Others	.083	.912	.005	.091	.927	.420	2.383
2010SHSE	.285	.350	.053	.812	.417	.333	3.008
2010HK	-.288	.466	-.054	-.618	.537	.188	5.308
2010NY	.268	.650	.029	.412	.681	.281	3.562
2010London	.654	1.018	.034	.643	.521	.503	1.987
2010BIG4	-.296	.390	-.070	-.760	.448	.167	6.004
2010CSC	-.180	.366	-.040	-.492	.623	.219	4.559
2010Non-GovC	-.064	.527	-.009	-.121	.904	.280	3.573
2010INT	.332	.391	.086	.849	.397	.140	7.151
Log(Income)	.731	.144	.307	5.060	.000***	.388	2.580
R Square	.657						
F Statistics				8.392	.000***		

a. Dependent Variable: Governance and Strategy

b. * Significance level $p \leq 0.10$ ** Significance level $p \leq 0.05$ ***Significance level $p \leq 0.01$

Model for 'governance and strategy' also gave a strong explanatory power (R^2=0.657). With respect to the category 'governance and strategy' reporting, the following is found to be statistically significant at the 5% level:

CPC, Non-Government ownership, Size, and SHSE have same effects on reporting all the time, whereas industry membership, HK are significant, but have different impact in different years.

7.2.2.3 Financial implications and other risks/opportunities

Table 7-4 Financial implication results

Model[a]	Unstandardized Coefficients		Standardized Coefficients	t	Sig[b].	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-3.421	.995		-3.440	.001		
ConD	-.998	.324	-.410	-3.083	.002***	.136	7.369
ConS	-.870	.364	-.281	-2.391	.018**	.174	5.746
F-Banking	-1.318	.366	-.500	-3.602	.000***	.125	8.029
F-NB	-1.052	.340	-.380	-3.097	.002**	.159	6.299
Materials	-.992	.291	-.471	-3.416	.001***	.126	7.931
INDCG	-1.231	.447	-.305	-2.756	.006**	.196	5.115
INDTran	-1.180	.306	-.518	-3.861	.000***	.133	7.495
Utilities	-1.133	.312	-.497	-3.631	.000***	.128	7.819
Others	-.633	.475	-.137	-1.335	.183	.229	4.372
SHSE	.029	.166	.016	.174	.862	.273	3.657
HK	.229	.222	.129	1.033	.303	.153	6.522
NY	-.514	.298	-.189	-1.723	.086*	.199	5.019
London	-.306	.429	-.062	-.714	.476	.314	3.189
BIG4	.463	.185	.291	2.509	.013**	.178	5.627
CPC	.273	.185	.117	1.475	.142	.380	2.632
CSC	-.131	.169	-.081	-.772	.441	.219	4.570
Non-GovC	.188	.268	.082	.701	.484	.177	5.649
INT	.057	.180	.035	.316	.752	.192	5.197
2006ConD	-.100	.324	-.025	-.310	.757	.372	2.685
2006ConS	-.153	.386	-.029	-.396	.692	.442	2.262
2006Energy	-.609	.392	-.131	-1.552	.122	.335	2.989
2006F-Banking	.096	.444	.022	.216	.830	.236	4.230
2006F-NB	.078	.374	.017	.209	.835	.369	2.713
2006Materials	.117	.318	.033	.369	.713	.294	3.399
2006INDCG	.268	.589	.039	.456	.649	.328	3.048
2006INDTran	.204	.306	.054	.667	.505	.360	2.776
2006Utilities	.078	.312	.021	.248	.804	.345	2.897
2006Others	-.304	.594	-.038	-.511	.610	.429	2.332
2006SHSE	-.043	.232	-.016	-.185	.853	.340	2.945
2006HK	-.469	.318	-.170	-1.477	.141	.182	5.507
2006NY	.308	.428	.066	.718	.473	.281	3.560

2006London	.567	.603	.071	.940	.348	.416	2.403
2006BIG4	-.449	.260	-.216	-1.727	.085*	.153	6.543
2006CSC	.173	.240	.075	.721	.471	.225	4.453
2006Non-GovC	-.019	.350	-.005	-.055	.956	.295	3.386
2006INT	-.082	.258	-.039	-.317	.751	.156	6.430
2010ConD	-.025	.328	-.006	-.075	.940	.364	2.751
2010ConS	-.013	.384	-.002	-.033	.974	.445	2.245
2010Energy	-.301	.384	-.065	-.785	.433	.350	2.857
2010F-Banking	.618	.439	.140	1.408	.161	.241	4.142
2010F-NB	-.156	.377	-.034	-.413	.680	.362	2.761
2010Materials	.048	.310	.014	.156	.876	.291	3.432
2010INDCG	-.063	.570	-.009	-.110	.913	.351	2.852
2010INDTran	.473	.299	.126	1.580	.115	.377	2.654
2010Utilities	.447	.310	.119	1.445	.150	.352	2.843
2010Others	-.331	.601	-.042	-.552	.582	.420	2.383
2010SHSE	-.074	.231	-.027	-.321	.749	.333	3.008
2010HK	-.639	.307	-.235	-2.083	.038**	.188	5.308
2010NY	.769	.428	.166	1.796	.074*	.281	3.562
2010London	.181	.671	.019	.270	.788	.503	1.987
2010BIG4	-.292	.257	-.136	-1.136	.257	.167	6.004
2010CSC	.061	.241	.027	.254	.799	.219	4.559
2010Non-GovC	-.226	.347	-.060	-.653	.515	.280	3.573
2010INT	.361	.258	.184	1.404	.162	.140	7.151
Log(Income)	.434	.095	.358	4.559	.000***	.388	2.580
R Square	.422						
F Statistics				3.205	.000***		

a. Dependent Variable: Financial implications
b. * Significance level $p \leq 0.10$ ** Significance level $p \leq 0.05$ ***Significance level $p \leq 0.01$

The model for the category disclosure of 'Financial implications and other risks/opportunities' (financial implications) gives a moderate explanatory power (R^2=0.422). With respect to the category 'financial implications' reporting, the following is found to be statistically significant at the 5% level.

BIG4 and Size have same effects on reporting all the time, whereas industry membership, HK are significant, but have different impact in different years.

7.2.2.4 Performance and targets

Table 7-5 Performance and targets results

Model[a]	Unstandardized Coefficients		Standardized Coefficients	t	Sig[b].	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-3.694	1.380		-2.676	.008		
ConD	-1.572	.449	-.431	-3.502	.001**	.136	7.369
ConS	-1.444	.505	-.311	-2.860	.005**	.174	5.746
F-Banking	-1.784	.508	-.452	-3.515	.001***	.125	8.029
F-NB	-1.452	.471	-.351	-3.081	.002**	.159	6.299
Materials	-.685	.403	-.217	-1.700	.090*	.126	7.931
IINDC	-1.608	.620	-.266	-2.593	.010**	.196	5.115
INDTran	-1.679	.424	-.492	-3.958	.000***	.133	7.495
Utilities	-.978	.433	-.286	-2.258	.025**	.128	7.819
Others	-1.084	.659	-.156	-1.646	.101	.229	4.372
SHSE	.141	.230	.053	.611	.542	.273	3.657
HK	-.300	.308	-.113	-.971	.332	.153	6.522
NY	-.491	.414	-.120	-1.186	.237	.199	5.019
London	-.048	.596	-.007	-.081	.936	.314	3.189
BIG4	-.075	.256	-.032	-.295	.769	.178	5.627
CPC	.074	.257	.021	.290	.772	.380	2.632
CSC	-.101	.235	-.042	-.430	.667	.219	4.570
Non-GovC	-.464	.372	-.135	-1.247	.213	.177	5.649
INT	.437	.250	.181	1.748	.082*	.192	5.197
2006ConD	-.299	.449	-.049	-.665	.506	.372	2.685
2006ConS	-.305	.535	-.039	-.570	.569	.442	2.262
2006Energy	-1.619	.544	-.233	-2.973	.003**	.335	2.989
2006F-Banking	-.064	.616	-.010	-.103	.918	.236	4.230
2006F-NB	-.316	.519	-.046	-.609	.543	.369	2.713
2006Materials	-.793	.441	-.150	-1.798	.073*	.294	3.399
2006IINDCG	-.201	.818	-.019	-.246	.806	.328	3.048
2006IND-Trans	-.039	.424	-.007	-.092	.927	.360	2.776
2006Utilities	-.349	.434	-.062	-.804	.422	.345	2.897
2006Others	-.545	.824	-.046	-.661	.510	.429	2.332
2006SHSE	-.162	.322	-.039	-.503	.616	.340	2.945
2006HK	-.032	.441	-.008	-.072	.943	.182	5.507

2006NY	.486	.594	.070	.818	.414	.281	3.560
2006London	.029	.837	.002	.035	.972	.416	2.403
2006BIG4	-.160	.361	-.051	-.444	.658	.153	6.543
2006CSC	-.108	.334	-.031	-.323	.747	.225	4.453
2006NonGC	.073	.486	.013	.151	.880	.295	3.386
2006INT	-.113	.358	-.036	-.316	.752	.156	6.430
2010ConD	.367	.455	.061	.807	.421	.364	2.751
2010ConS	-.637	.533	-.081	-1.195	.233	.445	2.245
2010Energy	-.873	.532	-.126	-1.641	.102	.350	2.857
2010F-Banking	.127	.609	.019	.208	.835	.241	4.142
2010F-NB	-.163	.523	-.024	-.312	.755	.362	2.761
2010Materials	-1.122	.431	-.219	-2.607	.010**	.291	3.432
2010INDCG	-.430	.791	-.042	-.544	.587	.351	2.852
2010INDTran	.309	.415	.055	.744	.458	.377	2.654
2010Utilities	1.047	.430	.187	2.438	.015**	.352	2.843
2010Others	-.235	.833	-.020	-.282	.778	.420	2.383
2010SHSE	.337	.320	.083	1.051	.294	.333	3.008
2010HK	.517	.426	.127	1.214	.226	.188	5.308
2010NY	.100	.594	.014	.168	.867	.281	3.562
2010London	.199	.931	.014	.214	.831	.503	1.987
2010BIG4	.475	.356	.148	1.333	.184	.167	6.004
2010CSC	-.428	.334	-.124	-1.280	.202	.219	4.559
2010Non-GovC	.196	.481	.035	.407	.685	.280	3.573
2010Intl operation	.066	.357	.022	.185	.853	.140	7.151
Log(Income)	.576	.132	.318	4.364	.000***	.388	2.580
R Square	.504						
F Statistics				4.453	.000***		

a. Dependent Variable: Performance and Targets
b. * Significance level $p \leq 0.10$ ** Significance level $p \leq 0.05$ ***Significance level $p \leq 0.01$

The model for category disclosure 'performance and targets' gave a moderate explanatory power (R^2=0.504). With respect to the category 'performance and targets', the following is found to be statistically significant at the 5% level:

Size has same effects on reporting all the time, whereas industry membership is significant, but has different impact in different years.

7.2.2.5 Mitigation and adaptation

Table 7-6 Mitigation and adaptation results

Model[a]	Unstandardized Coefficients		Standardized Coefficients	t	Sig[b].	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-12.547	3.231		-3.883	.000		
ConDC	-3.644	1.051	-.354	-3.467	.001***	.136	7.369
ConS	-2.671	1.182	-.204	-2.260	.025**	.174	5.746
F-Banking	-3.019	1.188	-.271	-2.540	.012**	.125	8.029
F-NB	-3.984	1.103	-.341	-3.611	.000***	.159	6.299
Materials	-.830	.944	-.093	-.879	.380	.126	7.931
INDCG	-2.585	1.451	-.152	-1.781	.076*	.196	5.115
INDTran	-1.186	.993	-.123	-1.195	.233	.133	7.495
Utilities	-1.044	1.014	-.108	-1.029	.304	.128	7.819
Others	-2.539	1.542	-.130	-1.647	.101	.229	4.372
SHSE	1.138	.539	.152	2.113	.036**	.273	3.657
HK	.810	.722	.108	1.122	.263	.153	6.522
NY	-.713	.969	-.062	-.736	.462	.199	5.019
London	-2.207	1.394	-.106	-1.583	.115	.314	3.189
BIG 4 (1)	.510	.600	.076	.851	.396	.178	5.627
CPC	1.484	.601	.151	2.470	.014**	.380	2.632
CSC	-.203	.549	-.030	-.369	.712	.219	4.570
NonGC	-.109	.871	-.011	-.125	.900	.177	5.649
INT	.325	.586	.048	.555	.579	.192	5.197
2006ConD	-1.842	1.052	-.108	-1.752	.081*	.372	2.685
2006ConS	-1.548	1.253	-.070	-1.235	.218	.442	2.262
2006Energy	-4.234	1.274	-.216	-3.322	.001***	.335	2.989
2006F-Banking	-2.291	1.441	-.123	-1.590	.113	.236	4.230
2006F-NB	-.773	1.214	-.039	-.636	.525	.369	2.713
2006Materials	-3.283	1.032	-.221	-3.182	.002**	.294	3.399
2006IINDCG	-1.432	1.914	-.049	-.748	.455	.328	3.048
2006INDTran	-3.977	.993	-.251	-4.003	.000***	.360	2.776
2006Utilities	-4.093	1.015	-.258	-4.033	.000***	.345	2.897
2006Others	-2.067	1.930	-.062	-1.071	.285	.429	2.332
2006SHSE	-.464	.754	-.040	-.615	.539	.340	2.945
2006HK	-2.192	1.032	-.188	-2.125	.035**	.182	5.507

2006NY	1.183	1.391	.060	.851	.396	.281	3.560
2006London	3.347	1.959	.100	1.708	.089*	.416	2.403
2006BIG4	-.335	.844	-.038	-.397	.692	.153	6.543
2006CSC	-.203	.781	-.021	-.260	.795	.225	4.453
2006NonGovC	.259	1.137	.016	.228	.820	.295	3.386
2006INT	.078	.837	.009	.093	.926	.156	6.430
2010ConD	-.399	1.064	-.023	-.375	.708	.364	2.751
2010ConS	-.601	1.248	-.027	-.481	.631	.445	2.245
2010Energy	-.762	1.246	-.039	-.611	.542	.350	2.857
2010F-Banking	-.437	1.426	-.023	-.307	.759	.241	4.142
2010F-NB	.445	1.225	.023	.364	.716	.362	2.761
2010Materials	-2.247	1.008	-.155	-2.230	.027**	.291	3.432
2010INDCG	-1.561	1.852	-.054	-.843	.400	.351	2.852
2010INDTran	.013	.971	.001	.013	.990	.377	2.654
2010Utilities	-.688	1.005	-.043	-.685	.494	.352	2.843
2010Others	-1.396	1.951	-.042	-.715	.475	.420	2.383
2010SHSE	.445	.750	.039	.593	.554	.333	3.008
2010HK	.001	.996	.000	.001	.999	.188	5.308
2010NY	-.586	1.391	-.030	-.421	.674	.281	3.562
2010London	2.169	2.178	.053	.996	.320	.503	1.987
2010BIG4	-.855	.834	-.094	-1.024	.307	.167	6.004
2010CSC	-.387	.782	-.040	-.494	.622	.219	4.559
2010Non-GovC	1.291	1.127	.081	1.145	.253	.280	3.573
2010INT	1.906	.836	.229	2.279	.024**	.140	7.151
Log(Income)	1.687	.309	.330	5.461	.000***	.388	2.580
R Square	.659						
F Statistics				8.450	.000***		

a. Dependent Variable: Mitigation and Adaptation
b. * Significance level $p \leq 0.10$ ** Significance level $p \leq 0.05$ ***Significance level $p \leq 0.01$

The model of category 'mitigation and adaptation' gave a strong explanatory power (R^2=0.659). With respect to 'mitigation and adaptation' category reporting, the following is found to be statistically significant at the 5% level:

CPC, Size, and SHSE have same effects on reporting all the time, whereas industry membership, HK, and INT are significant, but have different impact in different years.

7.2.2.6 Credibility

Table 7-7 Credibility results

Model[a]	Unstandardized Coefficients		Standardized Coefficients	t	Sig[b].	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-3.361	.935		-3.594	.000		
ConD	-.686	.304	-.241	-2.254	.025**	.136	7.369
ConS	-.572	.342	-.158	-1.673	.096*	.174	5.746
F-Banking	.089	.344	.029	.258	.797	.125	8.029
F-NB	-.690	.319	-.213	-2.160	.032**	.159	6.299
Materials	-.209	.273	-.085	-.765	.445	.126	7.931
INDCG	-.864	.420	-.183	-2.057	.041**	.196	5.115
INDTran	-.499	.287	-.187	-1.735	.084*	.133	7.495
Utilities	.553	.294	.207	1.883	.061*	.128	7.819
Others	-.380	.446	-.070	-.852	.395	.229	4.372
SHSE	.383	.156	.185	2.457	.015**	.273	3.657
HK	.137	.209	.066	.654	.514	.153	6.522
NY	-.110	.280	-.035	-.393	.695	.199	5.019
London	-.185	.403	-.032	-.458	.647	.314	3.189
BIG4	.214	.174	.115	1.235	.218	.178	5.627
CPC	.360	.174	.132	2.072	.039**	.380	2.632
CSC	-.207	.159	-.109	-1.300	.195	.219	4.570
Non-GovC	-.129	.252	-.048	-.511	.610	.177	5.649
INT	.048	.169	.025	.280	.779	.192	5.197
2006ConD	-.203	.304	-.043	-.667	.505	.372	2.685
2006ConS	-.185	.363	-.030	-.509	.611	.442	2.262
2006Energy	-.498	.369	-.092	-1.350	.178	.335	2.989
2006F-Banking	-.816	.417	-.158	-1.955	.052*	.236	4.230
2006F-NB	-.102	.351	-.019	-.291	.771	.369	2.713
2006Materials	-.393	.299	-.096	-1.317	.189	.294	3.399
2006INDCG	.117	.554	.014	.210	.833	.328	3.048
2006INDTran	-.386	.288	-.088	-1.341	.181	.360	2.776
2006Utilities	-1.425	.294	-.325	-4.852	.000***	.345	2.897
2006Others	-.069	.559	-.007	-.124	.901	.429	2.332
2006SHSE	-.231	.218	-.071	-1.058	.291	.340	2.945
2006HK	-.440	.299	-.136	-1.474	.142	.182	5.507
2006NY	.235	.403	.043	.583	.561	.281	3.560

2006London	.773	.567	.083	1.364	.174	.416	2.403
2006BIG4	-.217	.244	-.089	-.888	.375	.153	6.543
2006CSC	-.003	.226	-.001	-.015	.988	.225	4.453
2006Non-GovC	.014	.329	.003	.043	.966	.295	3.386
2006INT	.081	.242	.033	.333	.739	.156	6.430
2010ConD	-.195	.308	-.041	-.634	.527	.364	2.751
2010ConS	-.178	.361	-.029	-.494	.622	.445	2.245
2010Energy	.122	.361	.022	.338	.736	.350	2.857
2010F-Banking	-.071	.413	-.014	-.172	.864	.241	4.142
2010F-NB	.032	.355	.006	.090	.929	.362	2.761
2010Materials	-.265	.292	-.066	-.909	.364	.291	3.432
2010INDCG	-.028	.536	-.003	-.052	.959	.351	2.852
2010INDTran	.036	.281	.008	.127	.899	.377	2.654
2010Utilities	.131	.291	.030	.451	.652	.352	2.843
2010Others	.327	.565	.035	.580	.563	.420	2.383
2010SHSE	-.060	.217	-.019	-.274	.784	.333	3.008
2010HK	-.012	.288	-.004	-.042	.966	.188	5.308
2010NY	-.225	.403	-.041	-.558	.578	.281	3.562
2010London	1.286	.630	.113	2.040	.042**	.503	1.987
2010BIG4	-.111	.241	-.045	-.462	.645	.167	6.004
2010CSC	-.097	.226	-.036	-.427	.670	.219	4.559
2010Non-GovC	.054	.326	.012	.164	.870	.280	3.573
2010INT	.529	.242	.230	2.184	.030**	.140	7.151
Log(Income)	.408	.089	.288	4.557	.000***	.388	2.580
R Square	.792						
F Statistics				7.367	.000***		

a. Dependent Variable: Credibility
b. * Significance level $p \leq 0.10$ ** Significance level $p \leq 0.05$ ***Significance level $p \leq 0.01$

The model of 'credibility' gave a strong explanatory power (R^2=0.792). The following was found to be statistically significant at the 5% level:

CPC, SHSE, and Size have same effects on reporting all the time, whereas industry membership, HK, and INT are significant, but have different impact in different years

7.2.3 Individual disclosure item

In the 38 separate logistic regression models for individual disclosure items, logit does not give values of R^2 but all models other than for item 25 were statistically significant. This is because there is only one incidence of reporting on item 25 across the three years. One example (individual disclosure item 8) of the 38 logistic analyses models is presented in Table 7-8. A summary of the results of the 38 logistic analyses is presented in Table 7-9.

Table 7-8 Logit results of individual disclosure

		Estimate	Std. Error	Wald	Df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[@8 = 0]	10.600	5.190	4.172	1	.041**	.428	20.771
Location	Ln(INC)	1.071	.435	6.073	1	.014**	.219	1.923
	[@2006=0]	3.196	.483	43.793	1	.000***	2.249	4.143
	[@2006=1]	0[a]	.	.	0	.	.	.
	[@2010=0]	-.444	.441	1.015	1	.314	-1.307	.420
	[@2010=1]	0[a]	.	.	0	.	.	.
	[ConD]	-3.428	.773	19.650	1	.000***	-4.943	-1.912
	[ConS]	-2.165	.819	6.978	1	.008***	-3.771	-.559
	[Energy]	-1.082	.837	1.672	1	.196	-2.722	.558
	[F-Banking]	-.891	.872	1.044	1	.307	-2.599	.818
	[F-NB]	-2.474	.750	10.886	1	.001***	-3.943	-1.004
	[INDTran]	-1.113	.687	2.619	1	.106	-2.460	.235
	[INDCG]	-2.237	1.068	4.391	1	.036**	-4.330	-.145
	[Materials]	-.154	.730	.044	1	.833	-1.585	1.277
	[Others]	-1.295	1.131	1.311	1	.252	-3.512	.922
	[Utilities]	0[a]	.	.	0	.	.	.
	[SZSE=0]	-1.297	.443	8.591	1	.003***	-2.164	-.430
	[SZSE=1]	0[a]	.	.	0	.	.	.
	[HK=0]	-.514	.620	.687	1	.407	-1.729	.701
	[HK=1]	0[a]	.	.	0	.	.	.
	[NY=0]	-.761	.896	.723	1	.395	-2.516	.994
	[NY=1]	0[a]	.	.	0	.	.	.
	[LON=0]	.383	1.379	.077	1	.781	-2.320	3.085
	[LON=1]	0[a]	.	.	0	.	.	.
	[BIG4=0]	.259	.493	.276	1	.599	-.707	1.226
	[BIG4=1]	0[a]	.	.	0	.	.	.
	[CPC=0]	-1.928	.852	5.122	1	.024**	-3.598	-.258
	[CPC=1]	0[a]	.	.	0	.	.	.

		Estimate	Std. Error	Wald	Df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
	[CSC=0]	1.926	.932	4.272	1	.039**	.100	3.752
	[CSC=1]	0[a]	.	.	0	.	.	.
	[LSC=0]	1.837	.896	4.198	1	.040**	.080	3.594
	[LSC=1]	0[a]	.	.	0	.	.	.
	[INT=0]	-1.099	.459	5.720	1	.017**	-1.999	-.198
	[INT=1]	0[a]	.	.	0	.	.	.
Chi-Square		189.315				.000***		
Pseudo R-Square		Cox and Snell .463						
		Nagelkerke .629						
		McFadden .466						

Link function: Logit.

* Significance level $p \leq 0.10$ ** Significance level $p \leq 0.05$ ***Significance level $p \leq 0.01$

Logit results give strong support for the above model of individual disclosure item 8. The following were statistically significant at the 5% level:

(i) There is a significant difference in reporting between 2006 and 2008 but the difference between 2008 and 2010 is not significant. Reporting in 2006 is lower than in 2008.

(ii) Companies with industry memberships in ConD, ConS, F-NB, and INDCG are found to have statistically higher reporting of item 8 than companies with industry membership in utilities.

(iii) Reporting on the SZSE is significantly higher than on the SSE, but there is no difference in other exchanges when compared to the SSE.

(iv) Companies with a CPC CEO or Chairman have significantly higher levels of reporting than companies that do not

(v) Companies with CSC or LSC have significantly lower levels of reporting of the item than companies that do not

(vi) Companies with INT have significantly higher levels of reporting than companies that do not

(vii) Larger companies report significantly more than smaller companies.

The logit results (statistically significant) of the 38 models of the individual reporting items are summarised in Table 7-9 at the 5% level.

Table 7-9 Summary of Logit results

Explanatory Variables	Positive significant relationship	Negative significant relationship	Total models significant
T2006		1-3, 5-11, 16, 18, 20-24, 26-31, 33-38	**29**
T2010	2, 4, 13, 18, 19, 32, 33	23	**8**
CPC	7, 8, 27, 30, 31, 35, 38		**7**
CSC		8, 34	**2**
LSC		7, 8, 24	**3**
Ln(INC)	2,4,7-14, 16, 17, 20-24, 26, 27, 29, 30-35, 37		**29**
IND	1-4, 6-24, 26-31, 33-38		**35**
BIG4	2, 13, 30	22	**4**
HK	5, 36	9,11,19, 29, 37	**7**
LON		29	**1**
NY	1	14, 36	**3**
SZSE	3, 6-9, 24, 26, 27, 29, 30, 31, 34, 38		**13**
INT	3,4,8,10,18,22, 24, 37, 38		**9**

For individual disclosure items, there are several notable exceptions to the reporting patterns by overall disclosure and general category. One set of exceptions is items 4, 12, 13, 14, 15, 17, 19, 25 and 32 where there are no statistically significant differences between 2006 and 2008. Another set of exceptions is items 2, 4, 13, 18, 19, 32 and 33 where there are statistically significant increases from 2008 to 2010.

7.2.4 Reporting medium

To analyse the behaviour with respect to reporting medium two further regressions were run. They looked at the percentage of items reported by each company that were reported in the AR and CSR respectively. Each will be presented in Table 7-10 and Table 7-11.

Table 7-10 Reporting by AR results

Model[a]	Unstandardized Coefficients		Standardized Coefficients	t	Sig[b].	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	38.385	84.341		.455	.649		
ConD	-2.556	27.437	-.013	-.093	.926	.136	7.369
ConS	12.209	30.849	.047	.396	.693	.174	5.746
F-Banking	23.842	31.019	.108	.769	.443	.125	8.029
F-NB	-12.496	28.798	-.054	-.434	.665	.159	6.299
Materials	27.670	24.634	.157	1.123	.262	.126	7.931
INDCG	19.410	37.888	.058	.512	.609	.196	5.115
INDTran	2.951	25.917	.016	.114	.909	.133	7.495
Utilities	13.562	26.472	.071	.512	.609	.128	7.819
Others	-15.045	40.239	-.039	-.374	.709	.229	4.372
SHSE	-42.804	14.058	-.290	-3.045	.003**	.273	3.657
HK	9.015	18.843	.061	.478	.633	.153	6.522
NY	8.736	25.290	.039	.345	.730	.199	5.019
London	8.488	36.387	.021	.233	.816	.314	3.189
BIG4	-22.756	15.655	-.172	-1.454	.147	.178	5.627
CPC	8.082	15.677	.042	.516	.607	.380	2.632
CSC	7.887	14.335	.059	.550	.583	.219	4.570
Non-GovC	4.900	22.729	.025	.216	.829	.177	5.649
INT	-10.524	15.285	-.078	-.689	.492	.192	5.197
2006ConD	-135.328	27.451	-.402	-4.930	.000***	.372	2.685
2006ConS	-92.679	32.706	-.212	-2.834	.005**	.442	2.262
2006Energy	-108.412	33.267	-.280	-3.259	.001***	.335	2.989
2006F-Banking	-101.991	37.613	-.277	-2.712	.007**	.236	4.230
2006F-NB	-20.773	31.698	-.054	-.655	.513	.369	2.713
2006Materials	-63.386	26.936	-.216	-2.353	.019**	.294	3.399
2006INDCG	-88.750	49.966	-.154	-1.776	.077*	.328	3.048
2006IND-Tran	-116.700	25.934	-.373	-4.500	.000***	.360	2.776
2006Utilities	-66.543	26.493	-.213	-2.512	.013**	.345	2.897
2006Others	21.320	50.375	.032	.423	.673	.429	2.332
2006SHSE	49.617	19.692	.215	2.520	.012**	.340	2.945
2006HK	9.584	26.928	.042	.356	.722	.182	5.507
2006NY	5.414	36.310	.014	.149	.882	.281	3.560
2006London	-49.080	51.141	-.074	-.960	.338	.416	2.403
2006BIG4	14.246	22.037	.082	.646	.519	.153	6.543

2006CSC	-13.606	20.392	-.070	-.667	.505	.225	4.453
2006Non-GovC	-89.931	29.669	-.278	-3.031	.003**	.295	3.386
2006INT	55.822	21.847	.322	2.555	.011**	.156	6.430
2010ConD	-11.482	27.785	-.034	-.413	.680	.364	2.751
2010ConS	-25.403	32.581	-.058	-.780	.436	.445	2.245
2010Energy	-17.308	32.524	-.045	-.532	.595	.350	2.857
2010F-Banking	-36.306	37.218	-.099	-.975	.330	.241	4.142
2010F-NB	-5.132	31.973	-.013	-.161	.873	.362	2.761
2010Materials	-13.005	26.306	-.046	-.494	.622	.291	3.432
2010INDCG	6.282	48.332	.011	.130	.897	.351	2.852
2010INDTran	-33.797	25.358	-.108	-1.333	.184	.377	2.654
2010Utilities	-16.313	26.246	-.052	-.622	.535	.352	2.843
2010Others	28.691	50.923	.043	.563	.574	.420	2.383
2010SHSE	11.399	19.577	.050	.582	.561	.333	3.008
2010HK	-11.958	26.009	-.053	-.460	.646	.188	5.308
2010NY	-6.244	36.321	-.016	-.172	.864	.281	3.562
2010London	10.952	56.860	.014	.193	.847	.503	1.987
2010BIG4	7.956	21.777	.045	.365	.715	.167	6.004
2010CSC	-11.129	20.419	-.058	-.545	.586	.219	4.559
2010Non-GovC	-7.405	29.421	-.024	-.252	.801	.280	3.573
2010INT	-.279	21.835	-.002	-.013	.990	.140	7.151
Log(Income)	4.073	8.065	.040	.505	.614	.388	2.580
R Square	.635						
F Statistics				2.962	.000***		

a. Dependent Variable: %AR
b. * Significance level $p \leq 0.10$ ** Significance level $p \leq 0.05$ ***Significance level $p \leq 0.01$

With respect to the AR results, the model is statistically significant with a reasonable explanatory power (R^2=0.635). The following is statistically significant at the 5% level:

SHSE has effects on reporting all the time, whereas industry membership and INT are significant but have different impact in different years.

Results by CSR are reported in Table 7-11.

Table 7-11 Reporting by CSR results

Model[a]	Unstandardized Coefficients		Standardized Coefficients	t	Sig[b].	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-132.985	69.730		-1.907	.058		
ConD	-6.548	22.684	-.031	-.289	.773	.136	7.369
ConS	-14.424	25.504	-.053	-.566	.572	.174	5.746
F-Banking	10.232	25.646	.044	.399	.690	.125	8.029
F-NB	-17.084	23.809	-.071	-.718	.474	.159	6.299
Materials	12.033	20.366	.065	.591	.555	.126	7.931
INDCG	9.428	31.325	.027	.301	.764	.196	5.115
INDTran	18.578	21.427	.093	.867	.387	.133	7.495
Utilities	19.949	21.886	.100	.911	.363	.128	7.819
Others	44.733	33.268	.111	1.345	.180	.229	4.372
SHSE	23.510	11.623	.152	2.023	.044**	.273	3.657
HK	29.357	15.579	.189	1.884	.061*	.153	6.522
NY	2.891	20.909	.012	.138	.890	.199	5.019
London	-10.220	30.084	-.024	-.340	.734	.314	3.189
BIG4	3.894	12.943	.028	.301	.764	.178	5.627
CPC	14.626	12.961	.072	1.128	.260	.380	2.632
CSC	2.473	11.851	.018	.209	.835	.219	4.570
Non-GOVC	42.474	18.792	.211	2.260	.025**	.177	5.649
INT	-9.083	12.637	-.064	-.719	.473	.192	5.197
2006ConD	-105.082	22.695	-.298	-4.630	.000***	.372	2.685
2006ConS	-65.712	27.040	-.144	-2.430	.016**	.442	2.262
2006Energy	-88.587	27.504	-.219	-3.221	.001***	.335	2.989
2006F-Banking	-69.399	31.097	-.181	-2.232	.027**	.236	4.230
2006F-NB	-39.799	26.207	-.098	-1.519	.130	.369	2.713
2006Materials	-64.820	22.270	-.211	-2.911	.004**	.294	3.399
2006INDCG	-66.043	41.309	-.110	-1.599	.111	.328	3.048
2006INDTran	-123.599	21.441	-.378	-5.765	.000***	.360	2.776
2006Utilities	-84.751	21.903	-.259	-3.869	.000***	.345	2.897
2006Others	-58.759	41.648	-.085	-1.411	.160	.429	2.332
2006SHSE	-1.620	16.281	-.007	-.099	.921	.340	2.945
2006HK	-41.878	22.263	-.174	-1.881	.061*	.182	5.507

2006NY	24.055	30.020	.059	.801	.424	.281	3.560
2006London	14.703	42.281	.021	.348	.728	.416	2.403
2006BIG4	-4.621	18.219	-.026	-.254	.800	.153	6.543
2006CSC	-24.873	16.859	-.122	-1.475	.141	.225	4.453
2006Non-GovC	-102.942	24.529	-.304	-4.197	.000***	.295	3.386
2006INT	49.580	18.062	.274	2.745	.007**	.156	6.430
2010ConD	-3.088	22.972	-.009	-.134	.893	.364	2.751
2010ConS	4.074	26.937	.009	.151	.880	.445	2.245
2010Energy	-7.625	26.890	-.019	-.284	.777	.350	2.857
2010F-Banking	-2.996	30.771	-.008	-.097	.923	.241	4.142
2010F-NB	29.978	26.434	.074	1.134	.258	.362	2.761
2010Materials	-14.972	21.749	-.050	-.688	.492	.291	3.432
2010INDCG	-15.796	39.959	-.026	-.395	.693	.351	2.852
2010INDTran	-9.135	20.965	-.028	-.436	.663	.377	2.654
2010Utilities	-11.848	21.699	-.036	-.546	.586	.352	2.843
2010Others	-28.337	42.101	-.041	-.673	.502	.420	2.383
2010SHSE	7.677	16.186	.032	.474	.636	.333	3.008
2010HK	-17.327	21.504	-.073	-.806	.421	.188	5.308
2010NY	-.664	30.029	-.002	-.022	.982	.281	3.562
2010London	4.928	47.009	.006	.105	.917	.503	1.987
2010BIG4	-10.725	18.004	-.057	-.596	.552	.167	6.004
2010CSC	2.547	16.882	.013	.151	.880	.219	4.559
2010Non-GovC	-18.047	24.324	-.055	-.742	.459	.280	3.573
2010INT	26.748	18.053	.156	1.482	.140	.140	7.151
Log(Income)	16.374	6.668	.155	2.456	.015**	.388	2.580
R Square	.627						
F Statistics				7.373	.000***		

a. Dependent Variable: %CSR

b. * Significance level $p \leq 0.10$ ** Significance level $p \leq 0.05$ ***Significance level $p \leq 0.01$

For CSR the results give a model that is statistically significant and has a good explanatory power (R^2=0.627). The following is statistically significant at the 5% significance level:

SZSE and Size have same effects on reporting all the time, whereas industry membership and INT are significant, but have different effects on reporting in different years.

7.3 Chinese company characteristics as modifying factors

7.3.1 CPC affiliation

In the regression and logit analyses, CPC affiliation has a positive statistically significant influence on overall disclosure, governance related disclosure, mitigation and adaptation related disclosure, and on individual items 7, 8, 27, 30, 31, 35 and 38.

This strongly supports Hypothesis 1. It is statistically significant related to the large number of models reported above.

7.3.2 Ownership identity

In the regression and logit analyses, non-government control when compared to local government control, has differing statistically significant influence on policy related disclosure, governance related disclosure, and on specific individual items 7, 8, and 24.

In addition to this, central government control when compared to non-government control has a negative statistically significant influence on specific individual items 8 and 34.

This gives reasonable support to Hypothesis 2. It is statistically related to moderate models and individual reporting items

7.3.3 Size

In the regression and logit analyses, size (as represented by the log of income) has a positive statistically significant influence on overall disclosure, each general category disclosure and all individual items other than 1, 3, 15, 18, 19, 25, 28, 36 and 38. This strongly supports Hypothesis 3. It is statistically significant related to the large number of models reported above.

7.3.4 Industry

In the regression and logistic analyses, Industry has a statistically significant influence on overall disclosure, each general category disclosure, and all specific individual items other than 5, 25 and 32.

This strongly supports Hypothesis 4. It is statistically significant related to the large number of models reported above.

7.3.5 Big-Four international auditor

In the regression and logit analyses, Big Four auditors, when compared to non-Big Four auditors, have a positive statistically significant influence on the financial implications related disclosure, and have a positive statistically significant influence on individual items 2, 13, 30 and a negative statistically significant influence on individual item 22.

This gives moderate support to Hypothesis 5, because it is statistically significant related to some models reported above.

7.3.6 Listing exchange

In the regression and logit analyses, being listed on SZSE, compared to being listed on SSE, has a positive statistically significant influence on overall disclosure, each general category disclosure (other than financial implications and risks, and performance and targets related disclosure) and specific individual items 3, 6, 7, 8, 9, 24, 26, 27, 29, 30, 31, 34 and 38.

In addition to this, the regression and logit analyses indicate that being cross-listed on a foreign exchange has a positive statistically significant influence on group reporting of governance and strategy related disclosure (HK, NY), financial implications related disclosure (HK), credibility related disclosure (London), individual items 1 (NY), 5 and 36 (HK); and negative statistically significant influence on group reporting of mitigation and adaptation related disclosure (HK), and individual items 9, 11, 14 (NY), 19, 29 (LON), 36 (NY) and 37. This gives strong support to Hypothesis 6 with respect to the

difference between SSE and SZSE. It is statistically significant related to the large number of models reported above. It lends moderate support to Hypothesis 6 with respect to cross-listing because cross-listing is found to be statistically significant in some models reported above.

7.3.7 International operation

In the regression and logit analyses, operating internationally has a positive statistically significant influence on overall disclosure, each general category disclosure (other than governance and strategy related disclosure and financial implications and risks related disclosure) and specific individual items 3, 4, 8, 10, 18, 22, 24, 37 and 38.

This gives strong support to Hypothesis 7. It is statistically significant related to a large number of models reported above.

7.4 Summary

This chapter presented the multivariate results of empirical testing of the model developed in Chapter 4. Results give strong support to that extended model. Regression and logistic analyses reveal that the time factor (reporting year 2006 compared with 2008, and reporting year 2008 compared with 2010) each yields a statistically significant difference for reporting. This is explained by the changes in institutions over time in China (see Chapter 8). The year 2006 has a negative statistically significant association with the overall level of reporting, all six general categories of reporting, a majority (29 out of 38) of individual reporting items, and reporting medium by CSR. This is consistent with the reporting environment in 2006, where few Chinese companies voluntarily reported environmental information. The year 2010 has a statistically significant difference for the categorical reporting of policy, Performance and Targets, and credibility; some individual reporting items (8 out of 38); and reporting medium in the form of AR.

Results show that in addition to the time factor (representing institutional changes), Chinese company characteristics have statistically significant differences for reporting with regard to overall level of reporting, category reporting and individual reporting.

The role of company characteristics in modifying reporting behaviour is strongly supported by the high amount of statistical significance found in models reported in this chapter.

Industry membership and size have a statistically significant influence on reporting. Industries in energy, utilities and F-Banking report more than other industries. In addition, results provide strong support to other factors that characterise Chinese companies including CPC affiliation, listing on the SZSE and companies with international operations having positive statistical influence on reporting. The findings are important because they provide empirical evidence to the previously under-researched role of factors that characterise Chinese companies in environmental reporting.

The results provide limited support to ownership structure and Big4 international accounting firms acting as auditors having a statistically significant difference on reporting.

The results presented in Chapters 6 and 7 are further analysed in Chapter 8.

Chapter 8: Conclusion

8.1 Introduction

This research was motivated by the under-developed theoretical and empirical analysis of climate-change reporting by Chinese companies, in the context of China's changing institutional environment. The research advances theoretical debates and empirical analysis of climate-change related environmental reporting, by addressing the overarching research question: How can we theoretically and empirically determine and explain factors that influence climate-change reporting in the Chinese context?

Theoretically, this research has advanced institutional theory generally and its application to corporate reporting research in the Chinese context: This is the first study that introduces an integrated conceptual framework (the extended model in Section 4.3) which brings the change in institutions resulting from political ideology of the ruling CPC, and Chinese company characteristics into the institutional analysis of climate-change reporting in China. The extended model theorises the role of organisational populations formed by company characteristics in modifying institutions in the organisation field of climate-change reporting.

This is also the first research that includes Chinese language literature to critically examine the extent to which Western theories are applied in Chinese CER research. The extensive comparative review of English and Chinese language literature highlights the urgent need to narrow the gap in theoretical and empirical analysis of corporate climate-change reporting in the Chinese context. The ground-breaking review of Chinese and English literature justifies the use of institutional theory as the base for developing an integrated analytical framework to explain climate-change reporting in the Chinese context. This research has implications for promoting communication between scholars from the West and the East. Theoretical contributions of this research are further discussed in Section 8.5.1.

Empirically, this study has found strong support for the extended model. Climate-change reporting by Chinese companies reflects the changing political and social context in which the climate-change issue is situated in China. This is the first

research that investigates explicitly the impact of the fundamental institutional change of government and environmental information transparency in China, represented by the OGI 2007 and OEI 2007, on the pattern of climate-change reporting across the critical 2006−2010 five-year period. It is also the first research that analyses the influence of international and Chinese domestic guidelines on climate-change reporting of Chinese companies, by developing a research instrument that incorporates international and Chinese domestic environmental reporting guidelines to capture Chinese specific climate-change reporting context. Future researchers can utilise the research instrument and extend this study to a longer time period to monitor how climate-change reporting evolves after the reporting year 2010. This study highlights that it is important to understand climate-change reporting in the context of the specific country and to exercise caution (as also proposed by Belal & Owen, 2007) when applying international reporting guidelines to developing countries.

It gives strong supporting evidence that there has been an institutional effect on reporting, represented by the time factors T2006 and T2010 (when compared with T2008), with regard to the level, content, and reporting medium of climate-change reporting by Chinese companies. Findings firmly suggest that climate-change reporting by Chinese companies was driven by China's changing institutions, resulting from the political ideology of the ruling CPC. Those institutions, moderated by organisational populations formed by different Chinese company characteristics, result in homogeneity and heterogeneity in reporting over time and at a point of time.

There are two important findings related to this moderating role of Chinese company characteristics in the climate-change reporting pattern. First, specific factors that characterise Chinese companies−CPC affiliation, SZSE listing, international operations, and ownership structure−moderated the way they reported climate-change related environmental information. Second, there were similarities between the types of company characteristics (the size of a company and industry membership) influencing Western corporate reporting and Chinese company reporting. These findings provide empirical evidence of climate-change reporting unique to the Chinese context, but also reveal that Chinese companies behave like western companies to a certain extent.

This is the first time that research found evidence of what factors led to reporting in different types of reporting medium (AR and CSR). This study found how the place of reporting in the form of reporting medium has been changed over time by Chinese companies. This finding will significantly enhance future climate-change reporting research because it provides evidence that reporting based on solely AR or solely CSR can lead to misleading and inconclusive results. Empirical implications of this research are further discussed in Section 8.5.2.

Findings of this research have important implications for policy development and future researchers who are interested in corporate reporting by Chinese companies. Details are discussed in Section 8.5.3.

Analysis of the results (reported in Chapters 6 and 7) is conducted in Sections 8.3 and 8.4. Section 8.3 analyses the changing climate-change reporting pattern of Chinese companies over time from three perspectives. First, change in the volume of reporting. Second, change in the content of reporting. Third, change in the reporting medium. Section 8.4 analyses the moderating role of Chinese company characteristics in reporting.

Three key contributions of this research are highlighted in Section 8.5. However, there are areas beyond the scope of the research, and these can be addressed in future research. Section 8.2 will address the limitations of this research and provide directions for future research.

8.2 Limitations and future research

The study period of this research was between 2006 and 2010, consistent with China's 11th Five-Year National Development Program. China's changing institutional environment from 2011 onwards, as well as the CPC's new political ideology for the 12th Five-Year National Development Program (2012–2015), will be addressed in future research. The study focuses on large listed Chinese companies only; it is not prudent to generalise the findings. Future study could include other types of Chinese companies. There are other disclosure medium (for example Internet) that can be included in future study. This study uses equal weighting to code data for analysis,

future study could use unequal weighting to code company reports and compare results with this study. Future study could also address the moderating effect of additional company characteristics.

The extended model developed in this study is tested primarily through quantitative methodology. It can be explored in more detail through qualitative investigations of its components in future study, by using interviews and surveys to investigate how Chinese company characteristics moderate the institutional influences at the perception and the internal decision making processes. This leads to another question to be addressed in future research: how can we best integrate qualitative and quantitative research approaches to CER studies informed by institutional theory? In accounting disciplines, the (actual or perceived) preference for a qualitative research approach to institutional theory informed study is evident. For example, in a review of institutional theory application in accounting research, Moll et al. (2006) states:

> From a methodological point of view, many of the studies reviewed... involved qualitative methods. Since institutional theory focuses on understanding context specific accounting practices, this (*qualitative*) methodology is particularly apt (p. 197, italics added).

The value of combining qualitative and quantitative approaches in research has been increasingly recognised in diverse disciplines. However, philosophical differences in the structure and confirmation of knowledge, on which qualitative and quantitative research approaches are built, present practical difficulties for researchers who attempt to integrate the two approaches (see Bryman, 2007; Foss & Ellefsen, 2002;). Bryman (2007) has identified barriers to integrating qualitative and quantitative research. Among these are methodological preferences in a discipline's conventions, a researcher's skills in qualitative and quantitative research, and publication issues. There are also two publication challenges: One is the 'tendency for some journals to be known (or perceived to be known)' to have a 'methodological bias' toward either quantitative or qualitative research. The other is the word limit imposed by journals (p. 18). The publication challenges present a practical barrier for researchers to disseminate their findings. These barriers make it difficult to integrate qualitative and quantitative research to further advance environmental accounting study.

Despite the difficulties, it is important for researchers to be open-minded and embrace the strengths of qualitative and quantitative research. As argued persuasively in Foss and Ellefsen (2002):

> …various methods… should be recognised as springing from different epistemological traditions which, when combined, add new perspectives to phenomenon under investigation. The different types of knowledge should not be seen as ranked, but as equally valid and necessary to obtain a richer and more comprehensive picture of the issue under investigation (p. 242).

Researchers need to be bold and courageous in challenging the actual or perceived methodological preference (or bias) in the field of environmental accounting research. They also need to develop capable skills in qualitative and quantitative research. This research begins the process of bringing together qualitative and quantitative methodologies in investigating Chinese corporate reporting behaviour (with a particular attention to climate-change related information disclosure) through developing a conceptual framework that can be used in qualitative and quantitative research. This research adopted a qualitative approach to developing a research instrument and analysing the content of reporting (see Chapter 6 and Section 8.3); and a quantitative approach to empirically testing the influence of the changing institutional environment and resulting changing institutions, and moderating role of Chinese companies (represented by time factors) on the level, content and reporting medium of climate-change related environmental reporting by Chinese companies (see Chapter 7 and Sections 8.3 and 8.4).

Future study will endeavour to further bridge the two methodologies in investigating Chinese corporate reporting behaviour in order to obtain a more comprehensive understanding of the issue of reporting in the Chinese context.

8.3 Changing institutional environment and climate-change reporting

The reporting pattern reflects China's changing institutional environment and the moderating effect of Chinese company characteristics on reporting behaviour. This

section analyses results from three perspectives: the level of reporting (volume of reporting); content of reporting; and reporting medium. The analysis of the moderating role of Chinese company characteristic is provided in Section 8.4.

8.3.1 Change in the level of reporting over time

The results show a statistically significant difference between the reporting years in overall level of reporting, all six grouped categories of reporting, all but one of the specific individual reporting items, and reporting medium between 2006 and 2010. The findings support the institutional analysis (in Chapter 4) that there were converging institutional pressures for more corporate environmental transparency on Chinese companies.

The low level of overall reporting for 2006 reflected the extant CER setting in China (see Chapter 4) before Chinese national guidelines OGI 2007 and OEI 2007 became effective in May 2008. The old Chinese institutional bureaucratic secrecy was dominant and constrained open environmental information disclosure. In the absence of national level guidelines endorsed by the central government, Chinese companies were faced with technical and political uncertainties in reporting.

Despite the low level of overall reporting in 2006, there were early movers in reporting. In 2006, four companies (see Section 6.4.6) explicitly mentioned whether the reporting guidelines they followed were international, set by China's domestic banking industry, or listing stock exchange (SZSE) guidelines. This suggests company characteristics (e.g. international operation, SZSE, or a membership of financials-banking industry) moderate the 'propensity to report'. The reference to international reporting guidelines suggests a magnified effect on institutional influence exerted by other powerful constituents (international stakeholders, for example international customers, suppliers, international organisations) at the global level on the reporting behaviour of Chinese companies. As a relatively new entrant to the international trade system, reference to international reporting guidelines can help to establish and maintain the legitimacy of Chines companies (most of which were transformed from SOEs). Reference to Chinese banking industry guidelines or SZSE guidelines, because of their reference to international reporting practice suggests the early movers desired to take the lead in

innovative reporting practice by modelling international best practice in reporting (discussed in Chapter 4). This reflects company characteristics (Financials-banking industry, listing on SZSE) modify the combined normative and cognitive institutional influences of the Chinese banking industry association (to be discussed further in Section 8.4) and SZSE listing on climate-change reporting of Chinese companies.

The level of overall reporting increased significantly (statistical and descriptive results) in AR and CSR for 2008 compared to 2006. The rapid growth in reporting for 2008 gave strong support to the immediate regulative institutional influence (coercive pressure) of the release of OGI 2007 and OEI 2007 (both became effective on 1 May 2008) on Chinese company reporting behaviour. The coercive pressure, resulting from the changing CPC political ideology, challenged the legitimacy of China's old institution of bureaucratic secrecy in environmental information disclosure. It created a change in environmental information transparency. This important finding suggests Chinese government, as an economically and politically powerful stakeholder of Chinese companies, exerted the regulative influence (coercive pressure) on environmental transparency of Chinese companies. This coercive institutional pressure reinforced extant and emerging institutional influences of environmental transparency in the organisational field (see Section 4.3). This led to a rapid growth in reporting in 2008.

The coercive institutional pressure, represented by the OGI 2007 and OEI 2007, also stimulated the reporting on the use of international reporting guidelines in climate-change reporting by Chinese companies (further analysed in Section 8.3.2). There was statistically significant increase of reporting of alignment with international or national reporting guidelines (item 37) in 2008 (42 times increase compared to 2006). The increase in the reporting of alignment with Chinese domestic reporting guidelines and international reporting guidelines suggests the regulative (coercive) institutional pressure of the Chinese government influences Chinese companies to implement procedures (e.g. reference to global and national reporting guidelines in AR and/or CSR) in order to maintain or enhance their legitimacy.

The continued steady (however slow down) growth of overall reporting levels for 2010 compared to 2008 indicates constituents (for example, Chinese government and CPC,

international competitors and customers, international and domestic industry associations, NGOs, listing exchanges) in the organisational field continued to exert institutional influences on more extensive and transparent approaches to CER (Hopwood, 2009). The converging expectations from institutional constituents create pressures for late adopters (companies formerly with nil or low reporting) to seek legitimacy by modelling themselves on early adopters (DiMaggio & Powell, 1983). This results in the diffusion of climate-change reporting practice among Chinese companies (see Section 6.1) because no reporting would be seen as abnormal and would risk losing legitimacy.

8.3.2 Change in the content of reporting over time

Findings of this study support the proposition that the political and economic environment of China shape the content of disclosure, consistent with international studies (Escobar & Vredenburg, 2011; Holland & Boon Foo, 2003; Williams, 1999). The findings suggest the organisational field, centered on the issue of climate-change, is an 'empirical trace'. The field is evolving with new constituents joining the field and they exert institutional influences on Chinese companies. The ongoing interacting and contending of institutional constituents defines the field logic which shapes and change the content and meaning of institutions (Thornton & Ocasio, 2008). The extant and emerging institutions of the regulative institutions (China's radical institutional change to government and environmental information transparency; domestic policy response to climate change; growing global and domestic carbon trading markets; and international expansion of business operations), normative institutions (CPC Party Schools and Party meetings, NGOs, and industry associations), and cognitive institutions situated in the organisational field of climate-change reporting were moderated by organisational populations (see Section 8.4). The moderated institutional influences were then embedded in the content of reporting by Chinese companies.

8.3.2.1 Influence of global versus domestic guidelines on reporting

Content analysis of the disclosure of individual reporting items reveals signs of a strong domestic guideline influence in 2008, following the introduction of OGI 2007 and OEI

2007, and further alignment with international practice in 2010 (see Table 6-10 and Table 7-8). Where a reporting item is specified in Chinese domestic reporting guidelines, the item tends to have a greater level of disclosure than if it was specified in 'international guidelines only'. The relatively low level of average reporting for any item in 'international guidelines only' suggests that Chinese companies pay much more attention to Chinese guidelines than international guidelines. The findings suggest climate-change reporting is subject to China's interpretation of climate change, outlined in the country's policy response to climate change (see Section 4.3).

Despite the low level of reporting of any items in 'international guidelines only' (when compared to items in the Chinese guidelines), reporting of information mentioned in 'international guidelines only' grew rapidly in 2008 (439% growth when compared to 2006), with further steady growth in 2010 (18% increase when compared to 2008). In contrast, although the reporting of information mentioned in 'Chinese guidelines only' experienced a rapid growth (195% in 2008 when compared to 2006), the reporting of information in this area remained unchanged in 2010 when compared to 2008 (0% growth). Change in the reporting of information mentioned in both international and Chinese guidelines across three observation years is similar to that of the reporting of information mentioned in 'international guidelines only' (see Section 6.4.7). These findings (reported above) are important for future research. It shows the institutional change of environmental information transparency in China has stimulated greater level of reporting of climate-change related information mentioned in international guidelines. The finding supports the institutional analysis in Section 4.3.1 that the growing interactions between Chinese companies and the international market, resulting from Chinese government' call for Chinese companies to 'go global', make it imperative that Chinese companies be perceived as legitimate organisations by international stakeholders. Reporting of climate-change replated environmental information (aligned with international reporting guidelines) is one of the means by which Chinese companies establish its legitimacy in the international market. The global expansion of Chinese companies will continue in the next decade. It is expected there will be greater Chinese companies aligning climate-change related environmental reporting with items in the international guidelines.

The findings of this study strongly support the influence of Chinese country-level regulations and social pressures on climate-change reporting (consistent with prior CER research based in developed countries, discussed in Chapter 3). However, the findings differ from those of a recent international climate-change reporting study by ACCA and GRI (2009) which reported they could not relate the influence of country-level regulations and social pressures to levels of climate-change reporting. This can be explained by two possible reasons: the sample selection and the research instrument. ACCA and GRI's study (2009) was drawn from CSR reports of large international companies in environmentally sensitive industries and had a small sample (36). The sample used in this research was drawn from Chinese companies across ten industries. It is a large sample (471 reports), richer (combined analysis of AR reports and CSR reports), and more current (including reporting year 2010) data. ACCA and GRI (2009) drew on international reporting guidelines (GRI) to undertake content analysis. This research drew on a combined analysis of international and Chinese domestic guidelines on environmental reporting (see Chapter 5). Hence, the Chinese country-specific reporting environment has been captured in the research instrument and has found to be a significant factor.

The difference between the findings of ACCA and GRI (2009) and this research can also be explained from an institutional theoretical perspective. Companies, in the study by ACCA and GRI (2009), share similar characteristics (i.e. size, international operation, and industry). Hence, they form a 'supra' organisational population operating at the international level. They interact with each other in climate-change reporting beyond national levels, and have developed 'collective understandings' of climate change and reporting. Hence, country-specific influence on climate-change reporting would be diminished by this supra organisational population, and more attention is given to international reporting guidelines than national level reporting guidelines.

8.3.2.2 Climate-change reporting with Chinese characteristics

Content analysis reveals a distinctive Chinese contextual environment of climate-change reporting in categories of policy, governance and strategy, financial implications and other risks/opportunities, performance and targets, mitigation and

adaptation, and credibility (see Sections 6.4 and 7.2). Findings provide the evidence of the strong administrative capacity of the Chinese government in dealing with climate-change issues, by means of combined administrative and market mechanisms (specified in the Chinese government's environmental protection agenda in the 11th Five-year Program) to push Chinese companies to commit to energy savings and emission reduction.

Generally, this research validates the pervasive influence of the ruling CPC on Chinese company reporting behaviour. The reporting of the 'policy' category (see Sections 6.4.1 and 7.2.2.1) corresponds to China's domestic policy response to climate-change. There are consistently high levels of reporting of 'scientific development' (item 1), 'energy saving and emission reduction' (item 3), 'sustainable development' (item 5), 'harmonious society (item 6)', when contrasted with the lower level of reporting on 'climate-change or global warming (item 2)'. A majority of companies reported their position to support the Chinese government's environmental policy, by stating they were committed to binding targets of 'energy saving and emission reduction'. This is consistent with the high levels of disclosure of item 3 (91% in both 2008 and 2010) as opposed to low levels of explicit disclosure of 'climate change'. This finding differs from international studies by KPMG and GRI (2007), and by ACCA and GRI (2009), where most international companies mentioned 'climate change' explicitly in their reports and where higher levels of disclosure of executives' views on 'climate change' are evident.

There was a changing pattern of reporting on the category of risks and opportunities from 2006 to 2010 (see Sections 6.4.3 and 7.2.2.3). As reported in Table 6-6, in 2006, none of the Chinese companies reported opportunities associated with climate change (item 16). In contrast, there were ten companies reporting regulatory risks (item 15). In 2008, however, the reporting of item 16 increased to 14, greater growth in reporting than that of item 15. In 2010, the reporting of item 16 surpassed that of item 15. The shift to report more on opportunities than risks associated with 'energy saving and emission reduction' can be explained in part by incentives provided to Chinese companies by the Chinese government through a designated 'energy saving and emission reduction subsidy'. This is evidenced by consistent growth in reporting of item 18 (income associated with climate change and environmental protection activities).

This reporting disclosed that the major source of income is from the Chinese government's 'energy saving and emission reduction subsidy'. This differs from the findings of KPMG and GRI (2007) that reported income by Western companies was sourced from savings from reductions in energy use and emissions, and trading of carbon credits. The finding strongly supports the influence of the different economic institutional environment in which Chinese and Western companies are operated. It indicates a still-prevailing administrative role for the Chinese government as a resource provider for Chinese companies in mitigating and adapting to climate change. It is also consistent with companies in developed countries drawing more on market mechanisms than administrative tools in generating income associated with environmental protection activities.

Findings indicate early movers began to take advantage of the commercial benefits arising from the global and Chinese domestic emission trading markets. Compared to reporting in 2006 and 2008, in 2010 there are statistically significant increases in reporting on 'climate change' (item 2), 'low carbon economy' (item 4), 'information about how climate-change trends are linked to future company strategy' (item 13) 'income specifically related to environmental protection activities' (item 18), 'carbon emission trading' (item 19), 'purchase energy from low carbon sources' (item 32) and 'renewable energy' (item 33). It is notable that reporting of 'carbon emission trading' emerges as a reporting item in 2010 compared to its low reporting levels in 2006 and 2008.

The change of reporting of the above items in 2010 can be explained by three possible reasons:

First, China's 12th Five-Year national development program (2011-2015) was announced in 2010. The 12th Five-Year program reinforced environmental protection in economic development. It exerts pressures on Chinese companies to continue to change their business operation to meet with Chinese government's environmental protection targets.

Second, the business opportunities for growing global and emerging Chinese domestic carbon trading markets (see Section 4.3.2) motivated leading Chinese companies to seek

business opportunities in greenhouse gas emission reduction and carbon financial activities.

Third, the impact of China's increasing involvement in the global climate-change dialogue in the United Nations Climate-change (UNCC) Summits in 2009 (Copenhagen Summit) and 2010 (Cancun Summit) on Chinese company reporting. China's high profiled participation in those summits was covered frequently in the news in 2009 and 2010 by Chinese mainstream media, according to the study by Chinese National Language Resources Monitoring and Research Center (CNLR) of Beijing Language and Culture University (2009; 2010) in China. Chinese media attention to climate-change summits and related China's response to climate change sent a strong message (salience cues) to the public that climate-change is relevant to China's economic development and would have impact on Chinese companies, a key player in China's economic development and also a key source of China's environmental pollution. The frequent media coverage on issues such as 'low carbon economy' 'energy saving and emission reduction' 'climate-change summit' signals the importance of such issues and would enhance the cognitive institutional influence on reporting companies. Hence, reporting companies use 'these salience cues from the media to organise their own agenda and decide what issues are important' (McCombs, 2004, p. 2) to report.

With China's growing contribution to the world economy and the urgent need to develop a global solution to climate change, it is expected future development of international reporting guidelines on corporate reporting (including climate-change related environmental information) will engage with Chinese companies in the process so that international reporting guidelines can be more adaptable to the Chinese environmental reporting context.

A high disclosure level was found in the 'mitigation and adaptation' category (see Sections 6.4.5 and Table 7.2.2.5). Most reporting items in this category are common in Chinese national guidelines and international guidelines. High reporting levels of on information about 'energy saved and emission reduced', 'mitigation and adaptation actions', 'awards', and under reporting of 'fines or sanctions for non-compliance' suggest companies tend to send positive messages to report recipients. This is consistent with the findings of international studies on climate-change reporting (ACCA & GRI,

2009; Freedman & Jaggi, 2005; KPMG & GRI, 2007) and those of Chinese language literature (see Lu & Li, 2010; Xiao & Hu, 2005). High level of reporting in this area suggests the convergent interpretation of climate-change mitigation and adaptation actions from the institutional constituents at the organisational field increased the 'propensity to report' by Chinese companies. It symbolises Chinese company's conformance with Chinese government's domestic policy of climate-change through implementing a 'energy saving and emission reduction' campaign, as well as meeting international stakeholder expectations on climate-change mitigation and adaptation.

There were general lower level disclosure of categories 'financial implications and other risks/opportunities' and 'performance and targets' (see Sections 6.4.3 and 6.4.4), compared to the other categories. The low level of disclosure of risks indicates Chinese companies are still uncertain about how to define the risks or the consequences of reporting risks. Therefore, they are not yet prepared to recognise the potential risks associated with climate change. The low reporting of most information in the category 'performance and targets' both within China and internationally suggests the technical challenge of accurately measuring quantities of energy use and emissions. Despite the low reporting, there was statistically significant difference represented by time variables (see Tables 7.4 and 7.5), which shows the growth of reporting in this area over time.

Although a low level of independent assurance (see item 36 in Sections 6.4.6 and 7.2.3) was found, reporting of this information increased over time (see Table 6-10), consistent with international studies, although the percentage of Chinese companies is much lower than those found in international studies. For example, 'nearly 40 per cent of sustainability reports included external assurance in 2003 compared with only 17 per cent ten years previously', reported in the study by O'Dwyer & Owen (2007, p. 78). In contrast, only 12 per cent of Chinese CSR reports of the sample companies included external assurance of CSR in 2008. The number increased to 15 per cent in 2010. Among those few companies that included external assurance report (item 36), findings reveal the independent assurance was provided to reporting companies' CSR reports (where climate-change related reporting was a part of those reports). This research finds a great disparity among reporting companies with regard to providers of the assurance and approaches to the assurance, consistent with the international studies of assurance of corporate sustainability reports (see O'Dwyer and Owen 2005; 2007). Some

companies (e.g. China Citic Bank; Pingan Insurance, and Merchant Energy Shipping) had international consulting firms based in China (such as Ernst & Young, DNV Certification China, and Lloyd's Register Quality Assurance) perform the assurance service. International assurance guidelines including AccountAbility's AA 1000 assurance standards; and ISAE 3000 were used. In contrast, some companies (e.g. China Minsheng Banking Corp Ltd; Shanxi Taigang Stainless Steel Co Ltd) had a statement issued by the director of Chinese national business association or a Chinese local journal WTO Journal, which commenting on their CSR reports.

This is the first finding about the assurance of Chinese CSR reports. It has implications for future policy development in this area. This finding shows assurance of climate-change related environmental information reporting is at its infant stage and is worth further investigation in future study. The increase in external assurance of CSR can improve the credibility of a reporting company's climate-change related information disclosure. This finding also reflects the reporting companies' strategic response to institutional influence, which can be explained from two perspectives: First, reporting this item is voluntary and independent assurance is not required. Second, the item is specified in international reporting guidelines only, there is no explicit statement regarding how to undertake independent assurance of environmental reports in Chinese domestic guidelines OEI 2007. Even at the international level, there are different assurance guidelines (e.g. AA1000 versus International Standard on Assurance Engagements (ISAE) 3000) with differing approaches to the assurance of corporate sustainability reporting. The lack of consensus on assurance guidelines and who should provide such assurance leads to divergence (and a low level of reporting) in the reporting of item 36 by Chinese companies. Findings provide support to the institutional theoretical perspective that an individual company will respond strategically to institutional pressures when there are divergent institutions in the organisational field, and will choose 'avoidance' strategy (Oliver, 1991) to not to include independent assurance report on CSR.

The low or no disclosure of any climate-change reporting items by companies in the reporting years 2008 and 2010 (see Figure 6-2 that shows 17% of companies reported less than 10 items even in 2010) indicates the old institutions of bureaucratic secrecy still existed in the organisational field. The finding validates Hubbart's (2008) view that

reforming institutionalised preferences for bureaucratic secrecy is a challenge for Chinese companies. It also suggests a need for more forceful regulations of climate-change related environmental information transparency in China.

8.3.3 Change in reporting medium

There has been a significant shift in the balance of reporting between AR and CSR by Chinese companies between 2006 and 2010 (see sections 6.2.2 and 7.2.4). An important finding of this research is that the percentage of reporting in the form of CSR has increased (statistically significant) in 2008 (see Table 7-11) when compared to 2006, while the percentage of reporting in the form of AR has reduced (statistically significant) in 2010 (see Table 7-10) when compared to 2008. Institutional effect (represented by time factors T2006 and T2010), and company characteristics (listed on SZSE, industry membership, size of a company) were found to be statistically related to the use of AR or CSR in climate-change reporting. This is the first finding on the factors that explain the use of AR and CSR (see Section 7.2.4). The shift in the balance of reporting between AR and CSR (see Figure 6-4, and Table 6-2) suggests companies are selective in climate-change reporting through disclosure media (one form of institutional carrier) to accommodate diverse stakeholder expectations of the organisation. This is an important finding for future research. Clearly, as revealed in this thesis, it is important to consider both AR and CSR reports when conducting CER studies. Basing research on just AR or CSR will provide only a partial picture of CER and result in the reporting of inconclusive and misleading results.

8.4 Moderating role of company characteristics

This study provides strong evidence for the institutional theoretical justification of the moderating role of company characteristics in explaining cross-sectional variation and temporal change in the 'propensity to report'. Results suggest the 'propensity to report' is influenced by individual organisational populations formed by individual company characteristics in the context of a changing institutional environment. There are multiple characteristics that define a company. For any specific characteristics, e.g. industry, the category in which the company sits, e.g. Energy, represents an organisational population.

Any one company is a member of multiple organisational populations (represented by characteristics of a company) that interact with each other. The multiple organisational populations perceive institutional pressures through their own perspectives. This results in a differing extent to which the perceived institutional pressures translate into pressures to report climate-change related information within one company. The extent of this difference is dependent upon the characteristics of the company, and hence the organisational population it is a member of (see Chapter 4).

Regression and logit analyses (see Chapter 7) strongly support (significant in many models) the hypothesis of a moderating effect of organisational population formed by CPC affiliation, size, industry, listing exchange, and international operation in reporting. Results reasonably support (significant in a moderate number of models) ownership identity and limited support (significant in very few models) for Big Four international auditors.

This research provides new evidence in the Chinese context of the influence of related organisational populations in climate-change reporting. Chinese-unique organisational populations represented by CPC affiliation, SZSE, and international operations have a magnifying effect on climate-change reporting. Consistent with arguments in prior literature (Opper et al., 2002; Scott, 2002; Yang, 2002; Yang, 2011), findings provide support to the political influence of CPC persisting in Chinese companies in enterprise decision-making processes.

Domestic stock exchange listings on SZSE differ from companies listed on SSE with regard to the level of climate-change reporting and reporting medium. Chinese companies listed on SZSE have greater reporting levels per company and tend to use CSR to report climate-change information more than those listed on SSE. The findings provide support to the institutional analysis of two Chinese stock exchanges in the context of China's radical institutional change of environmental information transparency (see Chapter 4). This finding reveals treating Chinese domestic stock exchanges as one variable in prior English language literature (e.g. in Ferguson et al., 2002) is problematic because the influence of each Chinese domestic stock exchange on their listed companies is not examined, and could risk results being incomplete. The differing level of reporting per company by companies listed on SZSE and SSE reflects

the different level of the cultural cognitive institutional influence on companies listed on each exchange at different points in time. As discussed in Chapter 4, SZSE took the lead in issuing corporate voluntary social responsibility guidelines (where CER is required) in China in 2006, whereas SSE issued similar guidelines only in 2008 (immediately after OEI 2007 became effective). Reporting corporate environmental information in the form of CSR had already begun to diffuse among companies listed on SZSE by the time the national guidelines OEI 2007 became effective. Thus, reporting environmental information in the form of CSR became expected practice on SZSE from 2006 onwards. In contrast, the institutional influence on environmental transparency exerted by SSE only began in early 2008. Hence, it is understandable that SSE listed companies would experience a steep learning curve to embed the new institution in their reporting practice. This also explains why companies listed on SZSE showed greater use of the reporting medium CSR than AR compared to SSE to report climate-change information.

This research also finds some statistically significant negative relationships between cross-listings and items that are specified in the international reporting guidelines (see Table 7-9). This can have two possible explanations. First, international studies (e.g. ACCA & GRI, 2009; KPMG & GRI, 2007) reported a similar low level of reporting of those individual items. Chinese companies (with cross-listings) may model the reporting practice of general international reporting behaviour. Second, following the argument in Escobar and Vredenburg (2011), that reporting reflects a host country's (where the foreign listing exchange is situated) interpretation of climate change. The host listing exchange may not have specific guidelines on reporting information related to those individual items, thus there is no pressure to report.

The findings reveal Chinese companies with international operations are highly aligned with international climate-change reporting practice. This finding reflects the greater international influence on organisational populations with international operations than those operating only domestically. With China's growing international operation, in future there will be greater number of Chinese companies aligning their reporting with international reporting guidelines. The finding provides support to the analysis of changing regulative institutions (see Section 4.3.2) and the modifying role of Chinese companies characterised by international operations (see Section 4.3.3).

The findings also provide strong support for the moderating effect of organisational population as represented by industry membership and size (see Sections 6.3 and 7.3.3). These are consistent with general corporate disclosure research in Chinese and English language literature (for example, Aerts & Cormier, 2009; Brammer & Pavelin, 2006; Freedman & Jaggi, 2005; Gao et al., 2005). Larger companies have higher levels of reporting than smaller companies. This validates the argument (see Chapter 4) that large companies are more visible, and therefore have more pressure to report. The pressure can be regulative, such as a target of government regulation or market competition. It can also be normative and cultural cognitive, as large companies view reporting as the right thing to do and feel obliged to take the lead in environmental reporting because they have more resources to dedicate to such report.

The industry membership of energy; financial-banking; industrials-transportation; materials and utilities have a higher reporting level than other industries over time (see Section 7.3.4). This is consistent with the extant literature on the influence of industry membership on company reporting behaviour (Berrone & Gomez-Mejia, 2009; Chan & Welford, 2005; Gao et al., 2005; González-Benito & González-Benito, 2010; Jennings & Zandbergen, 1995; Williams & Pei, 1999). Intra-industry variation in reporting (Delmas & Toffel, 2004; Tagesson et al., 2009) was also found. This can be explained by the fact that while the companies share membership of the relevant industry organisational population they differ on the other organisational populations (represented by different company characteristics) they are members: This difference in membership of other organisational populations moderates the 'propensity to report', even for companies in the same industry.

The findings reveal that the Chinese financials–banking industry had a more rapid growth in reporting climate-change information compared to other industry populations. This reflects the changing institutional environment of the banking industry in China. Foreign financial investors began to enter China's banking industry following China's commitment to the WTO that by 31 December, 2006 China would open its banking industry to overseas investors. By the end of 2006, there were 21 Chinese companies that commenced joint ventures with 29 foreign financial institutions (Bank of China, 2006). Chinese banking partners were exposed to the normative and cognitive institutional influence exerted by foreign financial institutions on reporting practice.

Such cognitive institutional influence of foreign banks on Chinese banking industry means Chinese financial–banking industry would experience a steep learning curve before embedding international best practice in reporting into environmental performance. This cognitive institutional influence from foreign banks was enhanced by the release of China's Banking Supervision Association Guidelines (requiring the banking industry to fulfil corporate social responsibility in 2007), just after the central Chinese government's release of OGI 2007 and OEI 2007. The convergent cognitive and normative institutions in the banking sector encouraged the banking industry to report voluntarily on environmental performance.

The rapid growth in reporting levels in the financial–banking sector also reflects Chinese banking industry recognition of emerging business opportunities to provide financial services to energy saving and emission reduction activities by Chinese companies in their efforts to align with Chinese government domestic policy on climate change. China's emerging carbon trading markets since 2008, along with China's high profile participation in the United Nations Climate-Change Conference at Copenhagen in December 2009 increased recognition of Chinese banking's role in meeting China's emission reduction and energy saving targets. Hence there are coercive institutional pressures on the banking industry to report on climate-change information. The findings about the reporting behaviour of companies with the membership of financials-banking are important for future research. It shows the exclusion of companies from financials-banking industry in prior Chinese language literature risks incomplete results being reported.

This thesis finds limited support for Hypothesis 2 (the ownership population of a company influences climate-change reporting). However, results (presented in Section 7.3.2) provide empirical evidence for the diminishing role of the organisational population represented by membership of local government control (when compared to non-government control) in the reporting of the category reporting of 'governance and strategy', and a few specific individual disclosure information in the category of 'policy and performance' (items, 7, 8, and 24). Similar diminishing effect on the reporting of items 8 and 34 was found in companies characterised by central government control. These findings reveal the differing effect of Chinese company characteristics on the reporting of climate-change information.

Although there is also limited support for Hypothesis 5 (membership of the population of companies with Big Four accounting firms as company auditor influences climate-change reporting), results provide support to a magnifying (i.e. items 2, 13, 30) and diminishing role (i.e. item 22) of Big Four accounting firms as company auditors in influencing specific information reporting (see Section 7.3.5). Despite the statistically significant relationship found in some individual disclosure items, this thesis did not find a statistically significant positive relationship between companies with Big Four as auditors and the overall level of reporting (when compared to companies with non-Big Four auditors) as reported in prior studies (see Archambault & Archambault, 2003; Collin et al., 2009; Xiao et al., 2004). This difference can be explained by two reasons: First, the focus of this research, and second, data collection.

First, the focus of this research on climate-change related corporate reporting behaviour, not general financial information disclosure nor general social and environmental reporting, as does the prior literature mentioned above.

Second, data collection in prior studies was sourced from AR only, not CSR and the study periods were dated. None of the prior studies have included reporting after 2007 (when China implanted its new accounting standards which are substantively convergent with international financial reporting standards).

8.5 Implications of this research

Contributions of this research are theoretical, empirical and practical. Each is discussed below.

8.5.1 Theoretical implication

This research did not rely on agency theory and/or Positive Accounting Theory to test company characteristics. Instead, it conceptualised the role of company characteristics (in particular Chinese company characteristics such as CPC membership; and two mainland stock exchanges SSE and SHSE, not studied in prior literature) in the context of institutional theory. This research has responded to Scott's (2002) call for more

research on Chinese enterprise characteristics in the context of China's institutional transitions. It extends and modifies institutional theory to incorporate China's country-specific context, and subjects the extended model to empirical testing (see Chapters 4 and 5). The research developed an integrated institutional analytic framework to explain climate-change reporting in the Chinese context. It bridges the gap in the theoretical justification for the relevance of company characteristics in company reporting behaviour.

The extended model offers a more comprehensive understanding of homogeneity and heterogeneity in climate-change reporting by Chinese companies. It explained changing climate-change reporting by Chinese companies through three interrelated levels of institutional analysis.

- At the societal (political and economic environment) level: the model explains the changing political ideology of the ruling CPC and its impact on changing Chinese company characteristics and the creation of new institutions of environmental transparency in China.

- At organisational field level: the model describes and evaluates the changing yet converging institutions on environmental transparency of Chinese companies, exerted by multiple institutional actors operating in the field of climate-change reporting.

- At organisational level: the model draws on the concept of 'organisational population' to conceptualise how individual organisational populations, formed by Chinese company characteristics, interact with institutions in the organisational field.

Analysis of the reporting pattern of climate-change in China's changing institutional environment reveals 'legitimacy is a relative concept; it is relative to the social system in which the entity operates and is time and place specific' (Deegan, 2009, p. 324). The international and national climate-change related reporting guidelines were both divergent and convergent depending upon the specific reporting item (see Chapter 5).

When there was a divergent interpretation of climate change in the international and the national reporting guidelines, Chinese companies respond strategically to such divergence. The Chinese government (led by CPC) domestic policy response to climate change is to implement a national policy of 'energy saving and emission reduction' and industry restructure. 'Climate change' is not mentioned explicitly in environmental reporting guidelines issued by the Chinese government or stock exchanges. In the absence of clear guidance from the state on reporting on 'climate change', companies can choose not to mention 'climate change' in their reports, according to their individual circumstances (which are defined by different sets of company characteristics). This is because low disclosure of the item 'climate change' would not pose any immediate legitimacy threat. In contrast, when there was a convergent interpretation of climate-change related reporting in the international and the national guidelines, the propensity to report was high.

The organisational field, centred on climate-change reporting is an evolving process. New forms of debates emerge in the wake of triggering events that cause a reconfiguration of field membership and/or interaction patterns (Hoffman, 1999). Findings suggest the release of OGI 2007 and OEI 2007 formed 'triggering events' in China's institutional changes to information transparency. This led to new governance structures in the field of climate-change reporting. The 'triggering event' affirms the extant normative and cognitive institutional influences at global and national levels on Chinese companies to report on environmental information between 2006 and 2010. Reporting climate-change related information through issuing CSRs became an expected practice by large Chinese listed companies and hence has been institutionalised.

This study highlights the usefulness of the integrated multi-level institutional analyses to examine convergence versus divergence of corporate climate-change reporting behaviour in a developing country, specifically China. To the extent that there is similarity in the reporting pattern across companies within each year and over time during the three observation years, this reflects the convergent institutional influences on Chinese companies, consistent with the principles of traditional institutional theory (Levy & Kolk, 2002). To the extent that there is variation in the reporting pattern across companies over time during the three observation years, this reflects either the changing

political and economic environment and changing institutions or a change in the characteristics of a company across time. To the extent that there is variation in the reporting pattern across companies within each year, this reflects the moderating effect of organisational populations formed by company characteristics on either magnifying or diminishing institutional influences exerted by actors in the organisational field on the issue of climate-change related reporting.

The integrated analysis of regulative, normative and cognitive aspects of institutions situated in the organisational field of climate change (see Chapter 4) supports the view of 'contextualised' organisational fields. Disparate organisational populations (formed by Chinese company characteristics) interact with each other in the field and within an organisation to develop 'collective understanding' in relation to matters that are important to them (Lee, 2011; Wooten & Hoffman, 2008). The collective understanding shapes the institutional logic in the field and influences the content of climate-change reporting. Regulative (coercive) institutional influences from the Chinese government create imperatives for Chinese companies to take action in environmental reporting. The regulative institutions stimulate converging normative and cultural cognitive aspects of institutions in the field of climate-change reporting. This has resulted in institutionalised reporting practice. Consistent with studies by Scott (2008) and Unerman and Bennett (2004), although three (coercive, normative and cognitive) aspects of institutions are integrated and difficult to distinguish empirically, each aspect of institutions can be more influential than others at certain point of time. The coercive institutional pressure exerted by Chinese government in this research is found to be more salient than other institutions in the early stage of defining institutional logic. Hence, it is more likely to force change of company reporting behaviour. The findings of this research lend some support to the argument about the relationship between coercive and mimetic (cognitive) institutions, discussed in Unerman and Bennett (2004):

> … If these *(powerful*) stakeholders remained interested in the wider social and environmental impact of organisational activities, such an increase in the expectations of economically powerful stakeholders should result in managers continually striving to demonstrate improvements in the initiatives they take to facilitate wider participation in debates ostensibly designed to determine the moral acceptability of the actions of their organisation. Thus, even a small initial movement along the continuum towards the ideal speech situation archetype might act as a catalyst for momentum to move even further

> along this continuum, bringing about an increasing degree of democracy in the determination of corporate responsibilities ... Processes of institutional mimetic isomorphism … should therefore result both in many companies adopting similar stakeholder dialogue procedures, and the standard gradually increasing for so long as managers of these companies perceive there to be a competitive advantage in being seen to engage in widespread stakeholder dialogue (p. 692).

This research highlights that the climate-change reporting pattern is subject to the changing institutions in the organisational field which are moderated by organisational populations formed by Chinese company characteristics. This research has translated the concept of 'organisational population' in the institutional theory to the theoretical justification of the role of company characteristics in explaining corporate reporting behaviour. Company characteristics can 'amplify' or 'buffer' China's changing institutional influences (represented by the year difference T2006, T2008 and T2010) on reporting. Thus, they moderate the 'propensity to report' (or propensity to not report) climate-change related information.

Unlike prior studies (see Section 3.4.2) that saw company characteristics as 'determinant' factors, this research regards company characteristics as 'moderating' factors of institutional influences on Chinese company climate-change reporting. Organisational populations formed by company characteristics are situated in the context of a changing institutional environment (GEP_t, DEP_t) and the resulting institutions (I_t). They moderate perceived institutional influences (PIP_{jt}) and the 'propensity to report' (PTR_{jt}). This research explains how moderating variables (Chinese company characteristics) can be used as explanatory variables in modelling. The mathematical representation (Section 5.2) of the extended model (Section 4.3) also enhanced justification for an empirical quantitative approach to the qualitative approach informed by institutional theory. Findings complemented the currently dominant qualitative application of institutional theory in CER research.

The extended model developed in this thesis makes a positive contribution to future researchers in different countries. This model supports the examination of the 'propensity to report' not just climate-change related environmental reporting but also general corporate reporting. The extended model systematically justifies the use of time

variables and relevant company characteristics in empirical testing of factors influencing corporate disclosure. It integrates previously loosely connected and theoretically unjustified factors (macro political and economic environment, company characteristics, and internal management decision making processes, see Section 3.4) into one theoretical framework. The model provides a sound theoretical justification for the use of a time related factor to measure the impact of institutional change over time. It justifies the use of company characteristics into explaining heterogeneity of reporting at any point of time and over time, by drawing on the concept of organisational population. Future researchers can use this model as a theoretical base for including time variables, and company characteristics in their empirical studies.

The model contributes to bringing together qualitative and quantitative research approaches to corporate information disclosure through its capability of connecting qualitative and quantitative methods for future researchers. The model integrates agency behaviour (as proposed in agency theory) into institutional theory. The qualitative research can be used to explain the mechanism by which these variables are having the influence indicated by the empirical results; and to discover additional relevant company characteristics that could be empirically tested in future quantitative research.

8.5.2 Empirical contribution

This thesis contributes to current CER research by offering timely empirical findings of changing corporate climate-change reporting by Chinese companies that has under researched in prior literature. The empirical findings offer more current and comprehensive evidence of the changing institutions and the moderating effect of Chinese company characteristics on reporting behaviour. The thesis complemented prior empirical studies into Chinese company environmental reporting by the use of more current and critical study period (2006-2010), the use of CSR reports in addition to AR, a Chinese-specific research instrument, a wider range of industries, and consideration of the Chinese context in selecting relevant company characteristics.

This thesis has addressed China's country-specific contextual characteristics of climate-change reporting. The thesis attended to the under-explored area of the CPC's changing political ideology and its influence on the transformation of Chinese

companies. The thesis presents evidence of the radical institutional change of China's environmental transparency, marked by the OGI 2007 and OEI 2007 and driven by the political ideology 'Scientific approach to development' that was promoted by the fourth generation of CPC leaders. The findings provide evidence of the impact on Chinese company reporting practice of the changing climate-change related political and social environment in China. The findings indicate that availability of Chinese guidelines on CSR reporting (although voluntary) since 2007 has had a stimulating effect on the number of Chinese companies adopting CSR reports. Climate-change reporting in the form of CSR became institutionalised in the sample companies. Findings provide support for the theoretical argument developed in Chapter 4 regarding the impact of enhanced institutional influences arising from the Chinese government's move towards general and environmental transparency (marked by the year difference in 2006 and 2008) on Chinese company reporting behaviour.

The thesis has identified Chinese company characteristics including CPC affiliation, SZSE, SSE and international operations were not adequately addressed in the previous Chinese and English language literature (see Chapter 3). The thesis developed a research instrument drawn from combined international and Chinese domestic reporting guidelines to capture Chinese characteristics of climate-change reporting. Findings indicate the research instrument has enabled a more sophisticated analysis of climate-change reporting in the Chinese context. The research instrument also allows better analysis of the influence and diffusion of international reporting guidelines on Chinese CER reporting (see Chapters 5, 6 and 7). This is the first finding on the influence of international and national guidelines on the content of climate-change related environmental reporting by Chinese companies. The finding serves a reference point for future researchers who are interested in analysing the content of corporate reporting by companies in a developing country's context. It highlights the importance of considering a developing country's specific reporting environment when applying research based in Western developed countries to a developing country's context.

This thesis finds Chinese company characteristics have a differing influence on individual reporting items. There are even characteristics that have an effect across reporting items ranging from positive to none to negative (see Chapter 7). This finding provides support to the two-tailed hypothesis testing (see Chapter 4). It also supports

modelling individual reporting items through 38 separate logit models in this thesis. Grouping all reporting items into one logit model as used in prior studies (for example in Zeng et al., 2012), in which company characteristics are assumed to have the same effect on every reporting item, is shown to be flawed.

This thesis is among the first known studies to analyse climate-change related environmental reporting by Chinese companies systematically through both AR and CSR of companies listed on both Chinese mainland stock exchanges, SSE and SZSE. Chinese company reports analysed in this thesis are more up-to-date than those available in the current English language literature. Findings reveal the use of AR alone risks misleading results in CER research. This thesis points to the importance of including alternative corporate reporting media (such as sustainability reports) in corporate environmental and sustainability reporting research, as argued by Frost et al. (2005), Guthrie et al. (2008), and Unerman (2000). This creates better understanding of reporting practices.

The empirical approach of this thesis addressed limitations of the extant accounting literature informed by institutional theory (as identified in Chapter 3). Inspired by advances in institutional theory in the organisational study literature (see Chapter 4), and in response to Ehrenfeld's (2002) challenge of the dominant qualitative research methodology pervading institutional theory–informed CER studies, the quantitative approach adopted in this thesis bridges the prior qualitative and quantitative research. The mathematical representation of the model (see Chapter 5) makes it possible to use larger data to undertake a quantitative approach to empirically test the model.

8.5.3 Practical implications

8.5.3.1 Policy developments in corporate information transparency

Findings of this research have important practical implications for policy development to further improve corporate information transparency. It supports that an increase and improvement in government regulation (or more extensive government guidelines on voluntary reporting in China) can 'stimulate and increase' corporate climate-change related environmental disclosures, despite persistent non-compliance, consistent with

studies by Broberg et al (2010) and Criado et al (2008). Without external regulative (coercive) institutional pressures from powerful stakeholders (government, industry regulators, market competitors, customers, suppliers), it is unlikely that there would be perceived pressures to model reporting practice on other (global and national) companies (Unerman & Bennett, 2004).

Although the three aspects of institutional influences are integrated in practice and difficult to distinguish empirically the findings of this research indicate that in the Chinese context the fundamental change to information transparency was initiated by the coercive institutional influence, marked by the release of OGI 2007 and OEI 2007. The coercive influence of the Chinese government on environmental information transparency (marked by OGI 2007 and OEI 2007) creates normative and cognitive institutional pressures on Chinese companies to report environmental information. This is evidenced by a rapid growth in climate-change related environmental reporting from 2006 to 2008 when OGI 2007 and OEI 2007 became effective on 1 May 2008 (significant differences in the level, content and medium of reporting as represented by statistically significant time variables T2006 and T2008). However, there is a continuing but declining growth effect of the introduction of OGI 2007 and OEI 2007 from 2008 to 2010 compared to 2006 to 2008. This suggests there is not likely to be a significant flow on of compliance with the guidelines beyond 2010 unless further extensive guidelines or regulations are issued by Chinese government (with enhanced enforcement).

The low level of reporting in some areas (financial implications of risks associated with climate change; quantitative information of targets of energy efficiency and emission reduction; and independent assurance of climate-change related environmental reporting) requires more extensive government guidelines, including further development of general financial reporting standards. In the absence of ‘cost information about climate change’, even ‘sophisticated users with expertise in analysing financial statements’ will have problems understanding the impact of climate change on company performance (Freedman & Jaggi, 2005, pp. 228–229).

There is also an urgent need for internationally and domestically convergent guidelines for the providers and measures of independent assurance of climate-change related

environmental (and CSR) reporting. At present, there are no Chinese national guidelines for such information. At international level, different guidelines (e.g. two prevalent guidelines AA1000 assurance standards and ISAE 3000) are being used. Without compatible international and domestic guidelines for information about who should and how to perform the independent assurance of climate-change related environmental reporting, the credibility of such reporting would be compromised. There are questions about the perceived (and actual) lack of the independence of any assurance exercise of climate-change related (and CSR) reporting and a large degree of management capture of the assurance process (O'Dwyer & Owen, 2005).

Another consequence is that there is an expectation of divergent reporting outcomes for any specific policy settings. This is due to the moderating effect of organisational populations formed by company characteristics, evident in the results reported in Chapters 6 and 7.

This research strongly supports differing roles of members of organisational populations (formed by company characteristics) in the level, content and medium of reporting. Larger companies are more likely to report and hence should be encouraged to take an exemplary role in climate-change related environmental reporting. It is suggested regulators encourage smaller companies to model the reporting behaviour of larger companies in the same industry.

This research has found evidence of inter-industry variation in reporting by Chinese companies, consistent with prior English and Chinese language literature. It also finds strong intra-industry differences in reporting by Chinese companies. For those industries with a lower level of reporting (e.g. Consumer-discretionary, Consumer-staples, Financials-Non-Banking), there is a need for setting customised industry regulations and more specific guidelines for reporting. Leading companies in each industry should be encouraged to take the leadership in corporate reporting and set examples for other companies in the same industry to follow. An example of this is the reporting by Tsingtao Brewery Company Limited, a leading company of the consumer-staples industry. The company's CSR 2010 report shows that the company led the industry by being the first to carry out greenhouse gas inspection and sign up to the 'low-carbon research agreement' with the China Standardisation Institute. The

exemplary role of the company will lead more companies in the same industry to join the trend of low carbon economy and promote sustainable development of the industry (Tsingtao Brewery Company Limited, CSR 2010).

This research provides the first finding that the CPC affiliation of a company's leader has a positive influence on disclosure (overall disclosure, governance related disclosure, mitigation and adaptation related disclosure, credibility related disclosure and a few specific individual items). This important finding validates the arguments about the CPC political influence on Chinese companies' operation and performance (Opper et al., 2002; Yang, 2002; Yang 2011). It has implications for foreign owned companies that operate in China. If a foreign owned company sets up in china, it is less likely that they would have a senior management with CPC membership. Hence the political influence of CPC on the foreign firm's operation and performance would be less than domestic companies. They would be less likely to do as much climate-change related reporting.

This research provides evidence that growing internationalisation of Chinese companies is positively related to the reporting of climate-change related environmental information. This finding suggests the benefit of Chinese government encouraging Chinese companies in international operation (in particular in developed countries). There will be more likelihood of further increased reporting with further expanded internationalisation of Chinese companies. The more exposure of Chinese companies to the international market, the better Chinese companies can get first-hand information about how business operates and reports information in developed countries. This in turn can influence domestic policy development through, for example, regular CPC party meetings at local and central government levels. The international operation of Chinese companies can also better educate the international community about the special political and economic environment related to where the climate-change issue is situated in China. Improved climate-change related environmental reporting by Chinese companies can better inform the world of China's actions in dealing with climate change. This will help to achieve a more convergent approach to climate-change reporting internationally.

The findings about the differences in the level, content and reporting medium between listing exchanges in this research suggest benefits from more jointly developed listing

rules (or guidelines) for environmental (and other non-financial) reporting (including information about independent assurance of non-financial reporting) by listed companies, provided the higher standards of the multiple exchanges are adopted. This would also promote the comparability and the reliability of information disclosed by reporting companies.

Findings of the limited support for international Big-Four auditors having an impact on climate-change related environmental reporting are important. According to Jones and Rabinovitch (reported in *Financial Times* on April 13, 2013), with the government support in recent years, Chinese top ten largest local accounting firms increased their revenues 38 per cent in 2011. In contrast, the Big Four's share of the fees peaked at 55 per cent in 2007 and had slipped to 36 per cent in 2011. Findings of this research suggest further Chinese government's support for more domestic Chinese accounting firms and de-emphasising international Big-Four accounting firms would not affect the reporting of a Chinese company.

This research finds limited support for ownership identity having an impact on climate-change related environmental reporting. It provides some support to findings in prior studies (e.g. He & Hou, 2010; Wang, 2008). This finding suggests that if China continues to broaden up its ownership types and moves to more market-oriented economy, it would not have detrimental effect on reporting of Chinese companies.

8.5.3.2 Future collaborative research between the West and the East

This thesis has implications for future collaborative research between researchers from the West and the East. It is widely recognised in the literature that language barriers and access to data have been obstacles for most Western researchers in undertaking studies of Chinese CER (see Chapter 1). Previously, CER research published in Chinese language literature received little attention from the West. Neither have current Western developments in CER research been incorporated into the Chinese CER literature (see Chapter 3). This thesis contributes to promoting dialogue between scholars from the West and the East, by undertaking an extensive literature review of theories and empirical findings in CER studies published in the English and Chinese languages (see Chapters 2 and 3). The literature review combined leading Chinese language CER

literature with the international literature. It has identified gaps in the theory and empirical analysis of current CER research between the West and the East (which in part has been addressed by this study).

This research highlights the importance for future researchers of critically evaluating the adaptability of Western theories when applied to studies based in the Chinese context (or any developing country's context). It provides sources of Chinese and English language references that could be useful for future researchers who are interested in conducting corporate reporting research in China.

8.6 Concluding remarks

The thesis has addressed the research objectives and questions outlined in Chapter 1, by means of:

- evaluating the adaptability of theories originating in the West to the Chinese context (in Chapters 2 and 3), and justifying the use of institutional theory as a basic theoretical framework in this thesis
- developing an extended model with an integrated multiple-level institutional analysis, by attending to China's specific political and economic context, changing institutions, and the moderating role of Chinese company characteristics in reporting (in Chapter 4)
- developing the methodology to empirically test the extended model (in Chapter 5)
- presenting qualitative and quantitative results respectively (in Chapters 6 and 7)
- explaining the results in the context of institutional theoretical perspective (in this Chapter)

It advances previous CER research by theoretically and empirically examining under-researched corporate climate-change related reporting behaviour in a developing country context. Factors that potentially explain significant differences and similarities in climate-change reporting by Chinese companies have been tested empirically. The findings support the relevance and suitability of an institutional theoretical perspective to

CER study in China. The study provides a theoretical and empirical foundation for future research and developments in this area.

It is well recognised that climate change is a global issue (politically, economically and environmentally), and hence requires an international solution to the issue. It requires collaboration from the developed countries and the developing countries. 'The primary barriers to rapid de-carbonisation are political not technological. Courageous, visionary and decisive leadership is the key' (Wiseman, 2013). Findings of this study evidenced the strong administrative capacity of Chinese government to formulate policies adapted to local condition. It affirms China's unique standing in the developing world because of that capacity (argued in Hubbart, 2008). At the time when the thesis was about to be completed in 2013, China appointed its fifth generation of CPC leadership. The new president Xi Jinping and the Premier Li Keqiang are facing greater challenges than their predecessors in tackling the social and environmental problems associated with China's rapid (and arguably unsustainable) economic growth over the past three decades. *People's Daily* (a mainstream Chinese newspaper) reported the first Macro Strategic Research Report on the PRC's Environment (hereafter the Report) released by Chinese government on 21 April 2011 (the first of its kind in China's history). The Report states that China's overall environmental quality has not reached a turning point, although China made improvements in environmental protection during 2006 and 2010; and that China's overall environmental situation continues to deteriorate. It has been recognised by the Chinese government that climate-change related environmental problems will challenge the country's environment and economy into the future. It has already imposed significant economic costs on China in the three decades since 1978.

Asian Development Bank (ADB) 2012, reported on an assessment carried out by the Chinese Academy of Sciences in 2009 that:

> …the total annual cost of resource and environmental degradation (the assessment took account not only of air and water pollution, but also of resource consumption and ecological degradation) amounted to 13.5% of GDP in 2005. The figure is considerably higher than those of Germany, Japan, United Kingdom, United States, and other developed economies and on par with countries such as Ghana, Mexico, and Pakistan. These estimates reflect the growth model of the PRC—high growth, high resource

> consumption and associated pollution—which makes decoupling environmental degradation from economic development a difficult task (p. xviii).

There is no easy solution for new CPC leaders to tackle the urgent issue of managing economic development with environmental deterioration. However, promoting an institutional environment that encourages public supervision, information transparency, and law enforcement, could provide a way forward. A promising sign in China is the new leaders' pledged commitment to integrate environmental pollution controls into the country's economic development policies. The increasing public pressure on environmental pollution control in China, the growing international business of Chinese companies, and China's emerging emissions trading market, will continue to influence climate-change reporting by Chinese companies in the future. Future study will monitor ongoing institutional changes in China and the moderating role of Chinese company characteristics on the reporting pattern of Chinese companies.

Findings point to further new questions: What is the future development of climate-change reporting by Chinese companies? How do organisational populations, as represented by Chinese company characteristics, interact with each other in a company's internal decision-making process? How can we ensure the credibility of reporting, given such reporting is voluntary and there is no consensus on whether disclosure should be independently audited? How can we best integrate AR and CSR in future corporate climate-change reporting? How can we know if reporting practice is integrated into the organization's managerial and operating processes? It is important to address these questions in future research because China is an important player in the global solution to climate-change (as discussed in Chapter 1) politically and economically. Credible and comparable information about climate-change reported by Chinese companies can better inform the world of China's progress in dealing with environmental pollution while developing its economy.

The expansion of Chinese companies (and companies from other emerging economies) in international market means the growing interaction between Chinese companies and global international companies. A notable institutional change in financial reporting in China occurred when the new Chinese Accounting Standard for Business Enterprises (CASBE) became effective in 2007. Substantially convergent with the *International*

Financial Reporting Standards (IFRS), the new CASBE required Chinese companies to report the provision for environmental expenditure associated with decommissioning mines. The implementation of this financial reporting requirement provides some guidelines to the technical uncertainty of how to account for environmental activities in financial reporting. Future study will consider if convergence with IFRS has improved CER in China.

Given the fundamental institutional differences distinguish the West and the East, how do we engage with the context of developing countries in formulating international reporting guidelines? How can we best inform international stakeholders of climate-change issues in the special context of China (and other developing countries)? A sensible way to move forward is that Chinese companies will be called upon to help shape new international guidelines for economic, environmental and social reporting, argued in GRI (2011). Future research will facilitate the dialogue between developed countries and China in environmental pollution control. It will promote better understanding of the specific context that Chinese companies are facing in dealing with climate-change issues.

This thesis makes some positive contributions to informing the future discussion on these issues.

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Appendixes

Appendix 1: English language literature on Chinese organisational studies

Research Topic	Studies
China's economic reform and Chinese organisational studies (10)	Child, 1994 Ezzamel, et al., 2007 Firth, 1996 Hilmy, 1999 Peng, 2003 Scott, 2002 Walder, 1986, 1995 Xu and Uddin 2008 Yang, 2009 Yang and Modell, 2012
Corporate general reporting (2)	Kumar, et al., 2008 Xiao,1999
Corporate environmental management (including CER and sustainability reporting studies) (13)	ACCA and GRI, 2009 Branzei and Vertinsky, 2002 Chan and Welford, 2005 Gao, et al., 2005 Guo, 2005 Kolk, et al., 2008 Rowe and Guthrie, 2010 SustainAbility, 2007 Taylor and Shan, 2007 WWF China (2010) Xiao, 2006 Yang, 2011 Zeng, et al., 2012 Zhang, et al., 2007

Appendix 2: Chinese language literature on empirical CER studies

Year of Publication	Author	Journal Title in English	Journal Title in Chinese	Analysis Period
1997	Wang, Yin & Li	Accounting Research	会计研究	1996
1998	Wang, Yin & Li	Accounting Research	会计研究	1997
2002	Geng & Jiao	Accounting Research	会计研究	1992-99
2002	Li & Jiao	Accounting Research	会计研究	2001
2004	Xiao & Mi	Forestry Economy	林业经济	2004
2005	Xiao & Hu	Accounting Research	会计研究	2002-03
2006	Zhou & Sun	Journal of Nanjing Audit University	南京审计学院学报	2004
2006	Tang, Chen, Liu & Li	Management World	管理世界	2001-02
2007	Shang, Liu & Geng	Environmental Protection	环境保护	1992-2002
2008	Xiao & Zhang	Accounting Research	会计研究	2003-06
2008	Wang	Accounting Research	会计研究	2006
2008	Tang & Li	China Population, Resources and Environment	中国人口，资源与环境	2004-06
2008	Wu, Zhang & Lin	China Population, Resources and Environment	中国人口，资源与环境	2006
2008	Li, Kuang & Gong	The theory and Practice of Finance and Economics	财经理论与实践	2004-06
2009	Zhang & Guan	China Population, Resources and Environment	中国人口，资源与环境	2007
2010	He & Hou	China Population, Resources and Environment	中国人口，资源与环境	2008
2010	Chen, Luo &Yuan	Contemporary Finance and Economics	当代财经	2002-06

2010	Sun & Zhang	Friends of Accounting	会计之友	2006-08
2010	Lu & Li	Journal of Audit & Economics	审计与经济研究	2007-08
2010	Shen & Li	Securities Market Herald	证券市场导报	2006-08
2010	Hu	Securities Market Herald	证券市场导报	2006-09
2011	Yang, Li, & Shen	Finance and Trade Research	财贸研究	2006-08
2011	He & Huang	Financial Accounting and Communication	财会通讯	2008
2011	Wu	Journal of zhongnan University of Economics and Law	中南财经政法大学学报	2009
2012	Shen & Feng	Accounting Research	会计研究	2008-09
2012	Bi, Peng & Zuo	Accounting Research	会计研究	2006-2010
2012	Huang & Zhou	China Soft Science	中国软科学	2007-2010
2012	Wang, Song, & Dong	Financial Accounting Monthly	财会月刊	2008-2010
Total	28			

Appendix 3: Sample companies

Air China Ltd	中国国航
Aisino Co Ltd	航天信息
Aluminum Corporation of China Limited	中国铝业
Angang Steel Co Ltd	鞍钢股份
Anhui Conch Cement Co Ltd	海螺水泥
Bank of China Ltd	中国银行
Bank of Communications Co Ltd	交通银行
Baoji Titanium Industry Co Ltd	宝钛股份
Baoshan Iron &Steel Co Ltd	宝钢股份
Beijing Capital Co Ltd	首创股份
Beijing Gehua Catv Network Co Ltd	歌华有线
Beijing North Star Company Limited	北辰实业
Beijing Yanjing Brewery Co Ltd	燕京啤酒
Handan Iron and Steel	邯郸钢铁
China Citic Bank Corporation Limited	中信银行
China International Marine Containers (Group) Co Ltd	中集集团
China Life Insurance Company Limited	中国人寿
China Merchants Bank Co Ltd	招商银行
China Minsheng Banking Corp Ltd	民生银行
China Petroleum And Chemical Corp (Sinopec)	中国石化
China Shenhua Energy Co Ltd	中国神华
China Shipping Development Co Ltd	中海发展
China Southern Airlines Co Ltd	南方航空
China United Telecommunications Co Ltd	中国联通
China Vanke Co Ltd	万科A
China Yangtze Power Co Ltd	长江电力
Chongqing Changan Automobile Co Ltd	长安汽车
Citic Guoan Information Industry Co Ltd	中信国安
Citic Securities Co Ltd	中信证券
Daqin Railway Co Ltd	大秦铁路
Dashang Co Ltd	大商股份
Datang Power Generation	大唐发电
Datong Coal Industry Co Ltd	大同煤业
Dongfeng Automobile Co Ltd	东风汽车/DFAC
Financial Street Holding Co Ltd	金 融 街
Fuyao Glass Industry Group Co Ltd	福耀玻璃
Gd Power Development Co Ltd	国电电力
Gree Electric Appliances Inc of Zhuahai	格力电器
Guangdong Electric Power Development Co Ltd	粤电力A
Guangshen Railway	广深铁路
Guangxi Guiguan Electric Power Co Ltd	桂冠电力
Guangzhou Development Industry	广州控股
Hainan Airlines Company Limited	海南航空/HNA
Heilongjiang Agriculture Co Ltd	北大荒
Hong Yuan Securities Co Ltd	宏源证券
Hua Xia Bank Co Ltd	华夏银行
Huadian Power International Corporation Ltd	华电国际

Huaneng Power International Inc	华能国际
Hunan Valin Steel Co Ltd	华菱管线
Industrial and Commercial Bank of China Ltd	工商银行
Industrial Bank	兴业银行
Inner Mongolia Baotou Steel Union Co Ltd	包钢股份
Inner Mongolia Yili Industrial Group Co Ltd	伊利股份
Jiangxi Copper Co Ltd	江西铜业
Jiangxi Ganyue Expressway Co Ltd	赣粤高速
Kweichow Moutai Co Ltd	贵州茅台
Luzhou Lao Jiao Co Ltd	泸州老窖
Maanshan Iron and Steel Co Ltd	马钢股份
Merchants Energy Shipping	招商轮船
Offshore Oil Engineering Co Ltd	海油工程
Panzhihua New Steel & Vanadium Co Ltd	攀钢钢钒
Petrochina Co Ltd	中国石油
Ping An Insurance (Group) Company Of China Ltd	中国平安
Pingdingshan Tianan Coal Mining Co Ltd	平煤股份
Poly Real Estate Group Co Ltd	保利地产
Qinghai Salt Lake Potash Co Ltd	盐湖钾肥
Saic Motor Co Ltd	上海汽车
Sany Heavy Industry Co Ltd	三一重工
Shandong Expressway Co Ltd	山东高速
Shanghai Bailian Group Co Ltd	百联股份
Shanghai International Airport Co Ltd	上海机场
Shanghai International Port (Group) Co Ltd	上港集团
Shanghai Lujiazui Finance And Trade Zone Development Co Ltd	陆家嘴
Shanghai Municipal Raw Water Co Ltd	城投控股
Shanghai Oriental Pearl (Group) Co Ltd	东方明珠
Shanghai Pudong Development Bank Co Ltd	浦发银行
Shanghai Zhenhua Port Machinery Co Ltd	振华重工
Shanxi Taigang Stainless Steel Co Ltd	太钢不锈
Shanxi Xishan Coal And Electricity Power Co Ltd	西山煤电
Shenergy Co Ltd	申能股份
Shenzhen Airport Co Ltd	深圳机场
Shenzhen Development Bank Co Ltd	深发展 A
Shenzhen Energy Group Co Ltd	深圳能源
Shenzhen Overseas Chinese Town Holding Co	华侨城 A
Shenzhen Yan Tian Port Holdings Co Ltd	盐 田 港
Sinochem International Corporation	中化国际
Sinopec Shanghai Petrochemical Co Ltd	上海石化
Suning Appliance Co Ltd	苏宁电器
Tangshan Iron & Steel Co Ltd	唐钢股份
Tianjin Faw Xiali Automobile Co Ltd	一汽夏利
Tianjin Port Co Ltd	天津港
Tsingtao Brewery Company Limited	青岛啤酒
Wuhan Iron and Steel Co Ltd	武钢股份
Wuliangye Yibin Co Ltd	五 粮 液
Yantai Wanhua Polyurethane Co Ltd	烟台万华
Yanzhou Coal Mining Co Ltd	兖州煤业

Youngor Group Co Ltd	雅戈尔
Yunnan Baiyao Group Co Ltd	云南白药
Yunnan Copper Co Ltd	云南铜业
ZTE Corporation	中兴通讯