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**An Investigation of the Effects of Home Country
Institutional Profile on the Adoption of ISO 14001
Standard by MNC Subsidiaries in Hong Kong**

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Master of Philosophy

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Declaration:

I hereby declare that this thesis has not been and will not be, submitted in whole or in part to another University for the award of any other degree.

Signature:

Abstract

The purpose of this research is to gain a better understanding about the imprinting effects of institutional dimensions on the adoption of Environmental Management System (EMS) by MNC subsidiaries in a host location, in this case, Hong Kong. The increasing importance of environment management by MNC firms because of globalisation has been the motivating factor to undertake this research. The study employs a cross-sectional quantitative research strategy and carries out a secondary data analysis technique to examine the imprinting effects of the home country's formal institutions on the adoption of ISO 14001 standard. The study contributes to the International Management discipline in environmental management, highlighting the role of the home country in environmental standards adoption at the subsidiary level. It provides an explanation about the imprinting effect of different dimensions of the home country formal institution on the adoption of ISO 14001 standard by MNC subsidiaries. It also makes a methodological contribution by accounting for the variable effects of institutional conditions of different home countries. The findings of the study partially validate proposed hypotheses suggesting that the home country's institutions do influence MNC subsidiaries to adopt environmental management standards, i.e. ISO 14001 standard, due to the imprinting effect. Further, these effects are observed to increase in the case of high polluting industry and home countries with high level of Greenhouse Gas Emission.

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Chapter 1: Introduction

1.1: Research Background

Globalisation allows multinational companies (MNCs) to rapidly expand their business operations and industrial activities across different countries to pursue competitive advantages and exploit opportunities (Ghauri and Buckley, 2003; Peng and Lin, 2008). The increasing pace of MNCs' business expansion has led to various issues relating to human rights, environment, labour rights, and fair-trade (Christmann and Taylor, 2002; Singh and Zammit, 2004; Raynolds et al., 2007). One of the major problems that has received much attention is MNCs causing air and water pollution, chemical spills, land pollution by toxic waste disposal, and industrial accidents (Peng and Lin, 2008; Rugman and Verbeke, 2000). MNCs' environmental conduct has thus given rise to significant concerns amongst the public on a global scale (Rugman and Verbeke, 2000; Christmann, 2004; Peng and Lin, 2008; Kolk and Tulder, 2010).

MNCs face pressure from international organisations such as the World Bank, the Organization for Economic Cooperation and Development (OECD), the International Monetary Fund (IMF), and the United Nations (UN), as well as media and environmental activists, to improve their environmental performance (Pinkse and Kolk, 2012; Yang and Rivers, 2009; Rugman and Verbeke, 1998a; Christmann and Taylor, 2002; 2006; Christmann, 2004). An increasing number of MNCs have recognised the importance of adopting an environmental management system (EMS) standard as an integral part of their business strategy.

EMS standards have been advocated as a tool for firms to self-regulate their environmental conduct by adopting management practices for pollution reduction, transparency, and efficiency, while simultaneously improving environmental performance (Khanna and Anton, 2002; Melnyk et al., 2003; Coglianese and Nash, 2001). By voluntarily integrating environmental management standards into policies, programmes, and practices through the adoption of an EMS framework, MNCs can thus mitigate their environmental impact, complement government regulation, and avoid sanctions or penalties by developing a reputation for good environmental governance (Kettl, 2002; Bansal and Hunter, 2003). Many corporate headquarters of foreign MNCs therefore expect their geographically dispersed subsidiaries to adopt EMS standards, meet

the standards' requirements, and consistently use the practices prescribed by those standards. MNCs are thus able to maintain their global reputation across their subsidiaries by earning legitimacy, and an enhanced business performance by increasing internal efficiency (Christmann and Taylor, 2002; Darnall et al., 2008; Menguc et al., 2010).

However, different institutional environments, socio-economic conditions, cultural traditions, and stakeholder pressure in different host countries create challenges for MNC subsidiaries to adopt mandates directed to them from their headquarters (Kostova and Roth, 2002; Pinkse and Kolk, 2012; Christmann and Taylor, 2006, Christmann, 2004). In addition, subsidiaries are also affected by the availability of relevant resources and capabilities to adopt practices complying with headquarters' directives (Christmann, 2000; Delmas, 2002). Moreover, adoption of EMS is a costly process, which can negatively affect firm productivity and profitability (Hart and Ahuja, 1996; Hart, 1997). MNCs companies therefore take advantage of foreign locations with lax regulatory conditions and shift their (environmentally damaging) production activities there. They do this to avoid expenditure related to EMS adoption or fines due to non-compliance with environmental regulations that may affect their profit margin (Cole and Elliott, 2005; Kellenberg, 2009; Wagner and Timmins, 2009). The above debate related to MNCs' EMS adoption across different country contexts has, therefore, made it an important topic for research.

1.2: Current Research on the Adoption of Environmental Management System (EMS) Standards

Extensive research has been carried out to examine the determinants, motivation, and consequences of the adoption of EMS standards by firms. Prior studies have considered the motivation behind the adoption of EMS standards using an institutional theoretical perspective; these have empirically concluded that firms are predominantly motivated by external institutional pressures for legitimacy, and to increase their internal efficiency (Bansal and Roth, 2000; Khanna and Anton, 2002; Bansal and Hunter, 2003; Potoski and Prakash, 2005a, b). Some studies have examined firm-level and industry factors using the resource-based view perspective; these have concluded that market factors and internal capabilities influence firms to adopt EMS standards (King and Lenox, 2001; Jiang and Bansal, 2003). Another set of studies have concluded that complementary resources and capabilities lead to the voluntary adoption of EMS standards to achieve competitive

advantages (Sharma and Vredenburg, 1998; Aragon-Correa and Sharma, 2003). While the strength of these studies has been to identify institutional, market and firm-level factors as determinants of the adoption of EMS standards by firms: these studies are not free from limitations. These studies have, in general, focused on a single country context, which has restricted the generalisability of the result in a diverse context.

Recognising this, scholars in international management have investigated the cross-country differences in the adoption of EMS standards by MNC firms. They have investigated the influence of firm-level and industry factors in the multinational context. Some scholars have found that MNC subsidiaries do not fully comply with certifiable standards in a context where regulatory structures are weak. They adapt standards to suit local conditions by lowering their performance standards, taking advantage of the weak regulatory conditions, thus reducing the cost of operation (Christmann and Taylor, 2002; Christmann, 2004). On the other hand, other academic scholars have suggested that subsidiaries adopt EMS standards, complying with institutional requirements to maintain the legitimacy of their operations among institutional actors (Darnall et al., 2008); they are influenced by the export-orientation and customer pressure (Darnall, 2006; Tatoglu et al., 2014).

Others have noted the difference between a symbolic and a substantive adoption of EMS standards that is influenced by institutional factors in addition to firms' resources/capabilities (Christmann and Taylor, 2006; Aravind and Christmann, 2008). The empirical findings of these studies in international settings were similar to prior research that emphasised the legitimation issue, market pressure and availability of complementary capabilities. However, they have either focused on developed economies or emerging economies without considering the aspect of institutional differences between countries; this could potentially influence the adoption of EMS by firms. Therefore, the results remain inconclusive in the multinational context.

To advance knowledge, another group of scholars has examined the effects of institutional distance (formal and informal) between the home and the host country of different MNC subsidiaries' environmental management practices (Aguilera-Caracuel et al., 2012; Aguilera-Caracuel et al., 2013). They have concluded that while greater formal institutional distance limits the adoption of standardised environmental practices at the subsidiary level, greater informal institutional distance drives the adoption of

standardised environmental practices in different host country contexts. Although these studies have recognised the role of institutions on the adoption of EMS standards, their treatment of a country's institutional conditions has been inadequate. This is because they have focused only on a one-dimensional aspect of the institutional environment, i.e. the regulatory aspect for formal institutions and the cultural aspect for informal institutions, undermining the multi-dimensional features of institutions.

A formal institutional condition constitutes not only the regulatory structure but also governance mechanisms, law and enforcement capacity, political stability, and level of corruption (Kaufmann et al., 2009). The informal institutional condition entails societal norms, perceived attitudes of the members of the society alongside cultural traditions (Arslan and Larimo, 2010; Xu and Shenkar, 2002; Kostova and Roth, 2002). Although previously the influence of regulatory institutional dimension and cultural dimension on firms' environmental management has been examined (e.g. Aguilera-Caracuel et al., 2012; Aguilera-Caracuel et al., 2013; Darnall et al., 2008; Henriques and Sadosky, 2006), effects of government effectiveness, stability of the political situation and control of corruption have not been examined in detail.

Several studies have carried out surveys of domestic firms in the US and Canada to investigate the extent of the adoption of ISO 14001 (e.g. Darnall et al., 2008; King and Lenox, 2001; Aravind and Christmann, 2011); a few studies have conducted in-depth interviews with managers at UK firms (e.g. Bansal and Roth, 2000; Bansal and Hunter, 2003), and a few studies have carried out archival research using publicly available data in the international context (e.g. Christmann and Taylor, 2001, 2004; Aguilera-Caracuel et al., 2013; Tatoglu et al., 2014). Although these studies have provided significant insights about firms' adoption of EMS, the methodological approaches have had limitations in accounting for the variable effects of different home country institutional conditions on the adoption of EMS in a host country. This suggests that determinants that affect the adoption of EMS standards by MNC subsidiaries in a context are far from resolved. There is still inadequate research about the effects of the institutional environment influencing the adoption of EMS standards by different MNCs headquartered in both developed and developing economies.

Further, prior studies have focused on the institutional condition of the host country in relation to EMS adoption, made assumptions regarding this to be weaker than the home

country's institution, and have paid little attention to the home country institutional context (e.g. Peng and Lin, 2008, Christmann and Taylor, 2001, 2006; Christmann, 2004). However, the current study argues that a home country's institutional structure can have some effect on the adoption of environmental standards at the subsidiary level due to the imprinting effect of the home institutional condition (e.g. Ferner, 1997; Sethi and Elnago, 1999; Bamford et al., 2000; Johnson, 2007).

According to the institution theory the firm strategy and performance are constrained by the conditions set by the institutions of a country, known as the "rules of the game" (North, 1990). A country that is characterised by strong institutions with well-developed markets, effective governance, and mechanisms for law enforcement, promotes smoother economic activities and growth prospects. On the other hand, a country with weak institutions creates constraints for business operations resulting from insufficiently developed markets, supporting institutions, political instability, inefficient governance style and weak law enforcement mechanisms (Peng, 2002). In either case, conditions that surround firms at the time of their founding gets imprinted onto their behaviour, and these attributes persist even after the subsequent environmental change (Marquis and Tilesik, 2013; Kriauciunas and Kale, 2006; Shinkle and Kriauciunas, 2012).

This view is supported by 'organisational imprinting' theoretical perspective, using which scholars have previously argued that organisational characteristics acquired in response to the initial institutional pressures tend to get retained even after any changes in the environment and these country-based institutional factors affect all firms from that country, and these elements manifest themselves through the action of firms from a particular country (Stinchcombe, 1965; Kimberly, 1979; Schien, 1983; Miles et al., 1974).

Institutional pressures are most salient when the organisation is being created and organisational practices that are being adopted by the founding company reflect this institutional environment (Dacin, 1997). In this context, MNC companies are deeply embedded in the national institutional configuration of their home countries (Porter, 1990), thus their strategies, structures and operational practices are argued to be strongly influenced by their home countries' institutional condition due to imprinting effects (Elnago and Sethi, 2007; Kimberly, 1979). This is likely to extend to MNCs' overseas

operations and influence subsidiaries' attitude and behaviour (i.e Mezia, 2002; Kriuciuna and Kale, 2006; Holburn and Zelner, 2010).

The 'organisational imprinting' theory is therefore becoming an emerging theoretical concept in the IB literature. However, imprinting effects on EMS adoption by MNC firms remains unexplored and less focused upon. An understanding of imprinting effects of the home country institutional conditions on MNCs' environmental management efforts is, therefore, an important topic to research for advancing existing knowledge in this field.

1.3: Research Objective

The aim of this research is, therefore, to provide a better explanation about the above mentioned research gap in the cross-country context by answering the following research questions:

RQ1: To what extent does the home country institutional condition affect the adoption of the ISO 14001 standard by MNC subsidiaries in a host location?

RQ2: What role does the home country institutional context play in the adoption of the ISO 14001 standard by MNC subsidiaries in a host location?

The study combines 'organisational imprinting' theoretical perspective and an institutional theoretical perspective to provide an explanation about the imprinting effect of the home country institution on the adoption of EMS standards by MNC subsidiaries. The study argues that parent companies (headquarters) of MNCs located in different countries may experience coercive or normative pressure depending on the institutional conditions in the home country. This may put pressure on them to participate in the ISO 14001 certification programme. They would also expect their subsidiaries operating in different host countries to adopt ISO 14001 standard to maintain consistency in their operations across the MNC network (Bartlett, 1995; Roth and Nigh, 1992; Harzing, 1999; Bouquet and Birkinshaw, 2008). Some subsidiaries, depending on their capabilities, size, and role within the MNC network, may behave autonomously and resist conforming to headquarters' directives (Nohria and Ghoshal, 1994; Rugman and Verbeke, 2001). However, due to the imprinting effect (Stinchcombe, 1965; Kimberly, 1979; Schein, 1983) subsidiaries may adopt the ISO 14001 standard influenced by the home country

institutional condition despite their motive or capabilities. The home country institutional environment thus matters in the adoption of the ISO 14001 standard by MNC firms.

1.4: Research Approach

To answer the research questions, the study adopts a positivist research philosophical approach considering it most suited for the research inquiry. Previous research in firms' environmental management has provided good insights both theoretically and empirically. Both the institutional theoretical perspective and the resource-based firm view have been used extensively to explain the determinants of firms' environmental proactivity and adoption of environmental management strategy. This study therefore, employs a quantitative research methodology for hypotheses testing to deduce imprinting effects of home country institution on the adoption of ISO 14001 standard by MNC firms. Due to the objective nature of the data collection process in a positivist research approach, little manipulation is possible. Hence, this enhances the robustness of data. Further, the highly structured methodology of this research approach facilitates replication (Gill and Johnson, 2002).

Using a cross-sectional dataset of MNCs headquartered in a variety of countries, data of ISO certified companies in Hong Kong and data of the World Governance Indicators developed by Kaufmann et al. (1999) and Kaufmann et al. (2009), the study tests hypotheses about the relationship between dimensions of the formal institution context of a variety of home countries, and the adoption of EMS standards (the ISO 14001 standard) in a particular context. An explanatory quantitative research is, therefore, more likely to be a robust methodology to test hypotheses concerning the effects of the institutional conditions of different home countries on the adoption of EMS standards.

1.5: Research Contribution

The current study aims to enrich the existing literature in the International Management field in relation to the adoption of specific CSR practices, i.e. environmental management standards by MNCs, by making two important contributions. The primary contribution lies in advancing organisational imprinting theory by examining imprinting effects of home country institutional conditions on the ISO 14001 standard adoption by MNCs. The

study focuses on the ‘formal’ dimension of the institution. This is because various studies have suggested that, in addition to the regulatory aspect, the effectiveness of government, law and enforcement mechanisms, political stability, and transparency of a country, which form the ‘formal’ dimension of an institution, are more likely to affect EMS adoption (North, 1990; Delmas, 2002; Neumayer and Perkins, 2004; Potoski and Prakash, 2004;2005a).

To test the hypotheses, the study therefore uses the institutional framework by Kaufmann et al. (1999) and Kaufmann et al. (2009), and the World Governance Indicators to examine imprinting effects of the ‘formal’ institutional structure of a country. The findings of the study thus provide new insights into the adoption of EMS, i.e. ISO 14001 standard by MNC firms and broadens the understanding of imprinting effects of home country institution in the context of MNC firms’ environmental management issues.

This study also makes a methodological contribution towards EMS adoption by MNCs focusing on the multiple home country context. To address this, the study makes use of two datasets covering MNCs headquartered in a variety of countries and the ISO 14001 certified companies operating in Hong Kong. The wide geographic coverage of the sample across a variety of countries provides potentially good variance to test the varying effects of a variety of home country institutional conditions.

1.6: Structure of the Thesis

This thesis is comprised of seven chapters. The structure of the thesis and summary of each chapter is presented below.

Chapter 1: Introduction

The first chapter introduces the research topic by providing an outline and presents the key research questions. Then it previews the contribution of the research.

Chapter 2: Literature review

The second chapter provides a critical review of the literature on various Corporate Social Responsibility (CSR) tools such as Codes of Conduct, Human rights standards, Labour rights standards, and environmental management standards of firms that examines the mechanisms of adoption of these tools by MNCs, evaluating various theoretical

foundations, methodological underpinnings, and empirical findings. It then focuses on environmental management standards i.e. the ISO 14001 certification. It offers a detailed academic understanding behind the determinants of the adoption of EMS standards by firms. It also provides an assessment of the existing research highlighting the research gaps in the current knowledge and summarises how this study can fill the research gap.

Chapter 3: Theoretical Background

This chapter provides the theoretical background of the research. It then presents the theoretical framework of the study and hypotheses.

Chapter 4: Methodology

The fourth chapter discusses the philosophical position and research strategy, provides a description of the sample for data collection and data collection technique.

Chapter 5: Results

This chapter provides discussion of the empirical findings of the data.

Chapter 6: Discussion

The sixth chapter provides a detailed discussion of the findings, comparing it with the theoretical underpinnings, methodological approaches, and empirical evidence of previous studies.

Chapter 7: Conclusions

This chapter provides the conclusions of the study, managerial implications, limitations, and future research direction.

Chapter 2: Literature Review

The aim of this chapter is to review the literature on the adoption of different CSR tools such as voluntary codes of conduct, environmental management standards, human rights standards, and labour rights standards by MNCs in different country contexts, and assess the extent to which previous studies have contributed to a good understanding of the determinants of the adoption of these practices by subsidiaries in host locations. The chapter then focuses on environmental management issue and discusses different theoretical underpinnings that have explained the motivation behind firms' adoption of these standards. It also presents the limitations in the existing literature by critically evaluating the methodological approaches and empirical findings of previous research. The chapter finally concludes by providing a direction for future research.

The first section (2.1) reviews literature dealing with various CSR practices from a wider perspective i.e. the adoption of code of conducts, labour rights standards. The following section (2.2) deals with the definition of environmental management standards as the focus of the study is to investigate adoption of this standard by MNCs. This section also provides a better insight into different types of environmental standards that firms adopt. The next section (2.3) specifically focuses on the ISO 14001 standard, which is the central topic of the thesis. It explains different procedures and processes involved in the adoption of the ISO 14001 standard by firms. It then examines theoretical, methodological, and empirical aspects of studies dealing with environmental management standards (the ISO 14001 standard) by firms (Section 2.4). It then provides an assessment of the existing studies (2.5) and a discussion of the extent to which these studies have explained different motivations for firms, in particular, for MNCs to adopt the ISO 14001 standard, from different theoretical perspectives. The last subsection summarises the overall literature review and lists the research gaps and areas for further research in relation to the current study. The review thus informs the basis of the theoretical framework for the study, which will enable filling the gaps identified in the existing knowledge.

2.1: Adoption of Different CSR Practices

Globalisation has intensified MNCs' involvement in socially responsible activities as firms are held accountable for their actions due to the institutional pressure globally (Mohan, 2006; Scherer and Palazzo 2008; Bansal and Roth, 2000; Christmann, 2004). To

build a positive relationship with different stakeholder groups, acquire legitimacy, and improve corporate reputation, MNCs therefore actively participate in different Corporate Social Responsibility (CSR) activities (Jamali and Mirshak, 2006; Brammer and Millington, 2003; Brammer and Pavelin, 2005). The adoption of CSR practices by firms has therefore gained a lot of attention globally.

Amongst different types of CSR practices, corporate 'codes of conduct' is argued to be the most common means for companies to self-regulate their behaviour and therefore express and implement social responsibility (Egles-Zanden and Hyllman, 2007; Kolk and Tulder, 2002a; Sethi, 2002). Codes of conduct are defined as

'guidelines, recommendations and rules issued by entities within society (adopting body or actor) with the intent to affect the behaviour of (international) business entities (target) within society to enhance corporate responsibility' (Kolk et al. 1999; p.151).

A growing number of MNCs are adopting corporate codes of conduct voluntarily as they are having to outsource their operations to maintain competitiveness (Frenkel and Kim, 2004). The main reasons for companies to adopt codes of conduct voluntarily are: a mechanism to formalise, encourage and guide certain employee behaviour that is deemed acceptable in a professional environment (Aaronson and Reeves, 2002). It is also suggested that companies adopt codes of conduct for legitimacy, to avoid governmental interference (Diller, 1999) and preserve public image (Brereton, 2002; Van Tulder and Kolk, 2002). A comparative web-based study conducted by Krista et al. (2004) concludes that UK companies use CSR codes for competitive advantage, whereas German and Canadian companies use codes of conduct for transparency through self-regulation, and for ensuring they have a positive image among external stakeholders. This supports previous argument that the adoption of codes of conduct voluntarily represents more of a desire to control the action and behaviour of groups within and outside of the corporations for risk management, for maintaining public image, and for differentiation in the marketplace to gain competitive advantage.

However, the effectiveness of codes of conduct in addressing the issue of a managerial dilemma on child labour is one of the most complex issues that companies have to deal with, and it is still surrounded by many caveats (Kolk and Tulder, 2002).

The main standards and conventions related to child labour are devised by ILO, UN convention and OECD guidelines for multinational enterprises. However, scholars argued that implementation of international law for child labour is problematic as the majority of child labour is employed in sectors such as agricultural, services and small-scale manufacturing, which are usually not adequately covered by national legislation (Kolk and Tulder, 2002a). Therefore, it is challenging to monitor these companies about their employment policies and use of child labour that cannot be scrutinised for non-compliance. Notably, the issue of child labour is least addressed by companies and business association and most addressed by NGOs and International Organisations.

Due to increasing societal attention on child labour issues, studies have started to investigate how multinationals, business organisations, and NGOs deal with child labour in their codes of conduct. The framework of analysis focuses on two dimensions: specificity of child labour provision included in the code and the compliance mechanisms, including monitoring and the type of sanctions in the case of violation (Kolk et al., 1999, p.155). Research conducted by Kolk and Van Tulder (2002a) shows that some multinational companies explicitly refer to international standards and include a clear monitoring mechanism and sanctions for their business partners for non-compliance. On the other hand, some companies implicitly include UN convention's minimum age limit in their codes of conduct, and prefer vague or internal monitoring mechanisms.

Supporting the empirical evidence drawn from previous studies, they conclude that European companies tend to favour a clearer monitoring system and adopt broader codes of conduct more frequently than US companies. However, this study was an exploratory study that investigated four garment companies, limiting the scope for deeper insights and understanding of the issues surrounding firms' motives behind implicitly or explicitly adopting codes of conduct for child labour.

Given this lack of a standardised approach for the development and implementation of codes of conduct for child labour, it is implied that the managerial dilemma of child labour cannot be resolved unless stakeholders' pressure and engagement with stakeholders' groups are taken into consideration (Kolk et al., 1999; Van Tulder and Kolk, 2001). Research into a larger set of companies encompassing other industries, including an analysis of divergences between companies from different home countries, and interaction with governmental and non-governmental stakeholders could provide more

profound insights and shed light onto the effectiveness of corporate codes of conduct in addressing the child labour issue.

Another important aspect of the adoption of corporate codes of conduct is MNCs' suppliers' compliance in their overseas operations. Since conditions in suppliers' factories in developing countries are poor compared to the conditions set forth in most MNC codes of conduct, scholars investigate as to what extent these codes of conduct are effective in terms of suppliers' compliance and lack thereof (Egles-Zanden, 2007; Nijhof et al., 2003; Frenkel and Kim, 2004; Kaufman et al., 2004). The findings suggest that labour law, economic incentive structure, and time-lag between the retailers' demand for changes and their realisation contribute to the lack of compliance with codes of conduct by suppliers.

Labour standards are another globally recognised CSR practice that firms adopt to ensure employee welfare is in place and employee rights are met. Labour standards are defined as the norms and rules that govern working conditions within a company, including employee welfare and industrial relations (Mah, 1997). There are various kinds of labour standards according to International Labour Organisation (ILO) conventions: rights of workers to form their own organisations and negotiate freely about their working conditions with their employers; prohibitions of all forms of forced labour; and the right to equal respect and treatment of all workers (Mah, 1997).

There are various factors that affect the implementation of labour standards. For example, conflicting local labour standards; multiplicity and incompatibility of local regulations issued by various government agencies; human resource policies, and management attitude to the workplace; inadequate government inspection for occupational health and safety regulation, are some of the factors that create challenges for MNCs to implement labour standards across their overseas operations (Kaufman et al., 2004). It can therefore be argued that differences in institutional environment between home country and host country, particularly in the case of developed and developing economies, are important aspects that need consideration regarding the implementation of labour standards.

2.2: Overview of Environmental Management System (EMS) Standards

As mentioned previously (section 1.1), the adoption of environmental management standards is becoming increasingly important to MNC firms to minimise environmental impact of their operation globally. The origins of environmental management system (EMS) standards for managing firms' environmental impact can be traced back to the 1970s (Krut and Gleckman, 1998). However, widespread interest in EMS has only emerged since the 1980s (Neumayer and Perkins, 2004). An EMS is a systematic framework for environmental management consisting of a set of environmental policies, procedures, and processes to achieve overall corporate and environmental goals (Coglianese and Nash, 2001; Netherwood, 1998; Nash and Ehrenfeld, 1997; Khanna and Anton, 2002; Andrew et al., 2003). This framework enables firms to assess environmental impact, establish goals, implement practices, monitor, and measure their effectiveness, correct problems and review these practices through regular auditing. An EMS consists of a regulatory structure that arises from within the organisation, unlike government regulation (Coglianese and Nash, 2001). The purpose of an EMS is to enable the firms who adopt it to uncover ways in which they can reduce their environmental impact while simultaneously reducing costs or increasing productivity (Bansal and Bogner, 2002).

In addition, it coordinates the environmental activities of firms to achieve greater organisational efficiency and effectiveness. There are different types of standards established by organisations¹ that firms adopt, both at the national and regional levels. Examples include, the British Standards Institutes' 7750, the ISO 14001 standard (based on certification by industry bodies), the European Union Eco-management and Audit-scheme (EMAS) (voluntary participation in a regulated system), Sustainable Forestry Initiatives and the Responsible Care Programme of the American Chemical Council and Climate Wise Programme.

While EMAS has a strong hold in European countries, the ISO 14001 is the only environmental standard that is globally adopted and is the most widely recognised environmental standard (Darnall, 2006; Neumayer and Perkins, 2004). Organisations are

¹ Such as the British Standards Institute, the International Standards Organization, the European Union, the American Forest and Paper Association and the U.S. Department of Energy.

not legally required to adopt the ISO 14001 standard; however, the adoption of the ISO 14001 standard sends a strong and well recognised signal to firms' stakeholders about their commitment to environmental management and improving organisational efficiency (Bansal and Bogner, 2002; Jiang and Bansal, 2003).

The ISO 14001 standard is a proactive or voluntary environmental management strategy, which refers to firms' tendencies to participate in or adopt practices that are beyond regulatory requirements or to meet industry standards (Berry and Rondinelli, 1998; Sharma and Vredenburg, 1998). So far, more than 130,000 organisations worldwide have adopted the ISO 14001 standard (ISO, 2006).

The voluntary nature of the ISO 14001 certification offers flexibility and facilitates the participation of firms of all sizes, in all sectors, without any legal threat. The certification for this standard does not require firms to meet any environmental performance target other than a commitment to comply with applicable regulations (Delmas, 2003). The ISO 14001 certification is therefore not considered as a performance standard, rather a set of process-based standards intended to assist firms' managers in various aspects of environmental management (Bansal and Hunter, 2003). Some of the procedures are for evaluating an organisation's environmental performance and management systems: for example, environmental auditing. Others are process-evaluation and product-evaluation standards, which focus on the analysis and evaluation of product and process characteristics: for example, environmental labelling (Melnik et al., 2003).

To acquire the ISO 14001 certification, an organisation needs to undertake an initial audit and complete five surveillance visits by the sponsor during a three-year validity period (Adams, 1999). The cost of certification varies depending on the size of the organisation, the nature of its business, and the environmental system already in place. Potential benefits of the adoption of an ISO 14001 certified EMS is that it is flexible in nature, improves efficiency in production and waste management through the auditing process, reduces the risk of costly environmental accidents, maintains reputation, and improves legitimacy and competitiveness in the industry (Delmas, 2002; Adams, 1999; Fielding, 1998). Firms that comply with the ISO 14001 standard requirements have two choices: to declare themselves to be compliant; or to use a registered auditor to verify that the organisation's operations conform to the documented environmental management system (Mendel, 2002; Rondinelli and Vastag, 2000). In practice, many firms prefer third-party

accreditation of the ISO 14001 standard to ensure credibility rather than self-certification (Rondinelli and Vastag, 2000). The ISO 14001 certification thus offers firms a 'license to operate' in a particular context by legitimising their activities.

2.3: Adoption Process of the ISO 14001 Standard

Organisations need to follow six steps to adopt the ISO 14001 standard. The first is to develop an organisation-wide environmental policy that reflects organisational commitment to continual improvement and compliance with relevant environmental legislation (Starkey, 1998). Organisations thus make their environmental policy public to create awareness of the general philosophy of environmental improvement. In the second stage, organisations evaluate the current environmental conduct of their products and services. The third stage involves identifying legislative or regulatory requirements and goal setting. During this process, organisations translate their environmental policies into environmental actions, benchmarking and setting objectives/targets for reducing environmental impact (Netherwood, 1998, Bansal and Hunter, 2003). The fourth step is to establish a management structure for assigning responsibilities, employee training, communicating through public disclosure, and implementing environmental accounting procedures. The fifth stage is to implement monitoring and corrective actions to ensure continual improvement in operations. Organisations thus check for discrepancies within the system by recording and documenting routine operations and periodically auditing their activities. The final stage of the adoption is a management review that involves critical assessments of internal audits, performance reports, non-compliance activities, new environmental concerns and recommendations for amendments (Netherwood, 1998; Bansal and Hunter, 2003).

Any organisation that adopts the ISO 14001 standard must meet requirements for five basic components: 1) environmental policy and planning, 2) implementation and operation, 3) monitoring, 4) corrective action, and 5) management review (ISO 14001). MNCs tend to adopt EMS standards voluntarily so they can acquire an external certification of excellence across their network based on international standards (Khanna and Anton, 2002). In summary, the adoption of the ISO 14001 standard involves a written environmental policy, external audits, public disclosure of environmental performance, employee training regarding environmental concerns, environmental benchmarking, environmental accounting procedures, rewarding employees to find opportunities to

prevent pollution, internal environmental audits, developing environmental performance indicators, and setting goals (Coglianese and Nash, 2001; Nash and Ehrenfeld, 1997, Netherwood, 1998).

2.4: Determinants of the adoption of ISO 14001 standard by MNCs

The determinants of the adoption of EMS standards by organisations have been an ongoing research focus in the environmental management literature. Until recently, research on the determinants of the adoption of the ISO 14001 standard has largely remained limited to the facility level of domestic firms within a particular industry; they have been predominantly undertaken in industrialised countries in Europe, North America, Japan and China (Bansal and Roth, 2000; Khanna and Anton, 2002; Anton et al., 2004; Delmas, 2003; Berry and Rondinelli, 2000). However, over the years there has been an emergent body of empirical research on the adoption of ISO 14001 standards focusing on MNCs, particularly in emerging economy context (e.g. Aragon-Correa and Sharma, 2003; Peng and Lin, 2008; Darnall et al., 2008; Christmann, 2004; Christmann and Taylor, 2001; Darnall, 2006; Tatoglu et al. 2014). According to these scholars, organisations tend to be motivated by market-driven, regulation-driven and societal-driven factors. These include consumer pressures, institutional pressures for legitimacy, threats of liability, enhanced reputation, reduction of operation costs through improved efficiency and economic opportunities to achieve competitiveness (Bansal and Roth, 2000; Anton et al., 2004, Khanna and Anton, 2002; Tatoglu et al., 2014; Potoski and Prakash, 2005a, b, 2007; Darnall et al., 2008). In addition, organisations are also motivated by internal factors involving resources or capabilities (Hart, 1997; Russo and Fauts, 1997; Aragon-Correa and Sharma, 2003), individual actions for environmental initiatives (Andersson and Bateman, 2000), corporate culture (Egri and Herman, 2000), managerial interpretation of environmental issues (Sharma, 2000), and strategic leadership (Berry and Rondinelli, 2000).

The underlying assumption of these studies is that adoption of international standards, such as the ISO 14001 standard, offers many benefits to firms through an integrated system of environmental management. Firms can experience direct benefits of the certification such as organisational efficiency, lower cost of regulatory compliance, a reduced risk of costly environmental accidents, a lower corporate liability, enhanced corporate image and competitiveness in the marketplace (Fielding, 1998; Morrow and

Rondinelli, 2002; Adams, 1999, Delmas, 2001). Based on the previous findings it is therefore reasonable to assume that MNCs seek to adopt the ISO 14001 standard examining the goals of this certification that coincide with the overall organisational goal.

2.4.1: Organisational imprinting theoretical perspective and ISO 14001 standard adoption

The main thrust of the organisational imprinting theory is that ‘founding’ conditions of an organisation have implications in its future actions (Stinchcombe, 1965). This is evident in studies where it was empirically concluded that the home country of a firm influences a firm’s operation and has an impact on its performance in the host location (Elango and Sethi, 2007; Geringer et al., 1998). These findings support the argument that headquarters of MNCs devise organisational practices that reflect home country institutional conditions. These practices are adopted by subsidiaries in different host locations and tend to persist in the same way, even if the institutional environment of the host country differs significantly from that of the home country (Stinchcombe, 1965; Kimberly, 1979). Building on this, some scholars have investigated the influence of home country institutions on management practices, i.e. HRM practices, and empirically showed that an MNCs’ home country’s culture influences the HRM practices at the subsidiary level in different host locations (e.g. Ferner, 1997; Elgar and Smith, 2005; Ngo et al., 1998).

However, as mentioned previously, the influence of the home country on MNC subsidiaries tends to vary because of differences in cultural values, institutional structures, and economic policies, which lead to different degrees of adaptation to local conditions by subsidiaries (Noorderhaven and Harzing, 2003; Pudelko and Harzing, 2007). Pudelko and Harzing (2007) concluded that management practices at the subsidiary level are shaped by neither the host country (localisation effect), nor the home country (country-of-origin effect), but according to the country that set the standards that are perceived as global ‘best practices’. In addition, it is observed that there are significant differences between subsidiaries of the same MNC (Ghoshal and Nohria, 1989; Martinez and Jarillo, 1991; Harzing, 1999; Birkinshaw and Morrison, 1995).

These differences are caused by the role played by the subsidiary within the MNC network (Gupta and Govindarajan, 1991; Martinez and Jarillo, 1991); size or age of the subsidiary (Johnston and Menguc, 2007; Foss and Pedersen, 2002); differences in their

origin, i.e. start-up vs acquisition, as well as overall MNC policies (Bartlett and Ghoshal, 1989; Harzing, 1999). In terms of their strategic role, some subsidiaries act as the local implementers, others as the specialised contributors or the world mandate (Birkinshaw and Morrison, 1995). Jarillo and Martinez (1990) presented a categorisation of subsidiary role based on subsidiaries' ability to cope with external environmental pressure; depending on the pressure for high integration or responsiveness, subsidiaries play active, receptive, or autonomous role to fulfil their objectives.

MNCs' activities in a particular country are influenced by legitimacy, and to ensure consistency across the MNC network headquarters often impose pressures on subsidiaries to adopt practices used in the home country operations to comply with regulations (Kostova and Zaheer, 1999). MNC subsidiaries therefore encounter two types of institutional pressure, referred to as 'institutional-duality'; internal pressure for maintaining consistency and external pressure for legitimacy in the host country context. However, subsidiaries sometimes resist headquarters' pressure to adopt organisational practices to respond to the home country's institutional requirements when they suspect that adoption of these practices may be counter-productive for achieving their goals (Kostova and Roth, 2002). The headquarter-subsidiary relationship is therefore considered as a mixed-motive dyad, where both parties are involved in fulfilling their goals (Ghoshal and Nohria, 1989).

Arguably, while the home country institutional environment can potentially influence the adoption of corporate practices by subsidiaries, as directed to them from headquarters, a subsidiary's capabilities to adopt corporate practices could be dependent on the role, age, resources and capabilities, or size of the subsidiary. Certain strategies that MNCs pursue in responding to local conditions can reduce the influence of the home country institutional environment on the subsidiary; this is because it might be most relevant to pursue these strategies in the host country to meet local stakeholders' demands (e.g. Spencer and Gomez, 2011). This increases pressure on the subsidiary to conform to the host country institutional environment. However, in the case of environmental standards, given the increasing level of environmental pollution globally, practising environmental responsibility, not only in the home country but also in the host countries where they have their business operations, has become important. The current study therefore argues that, to respond to the home country institutional environment, the parent company of MNCs

adopt environmental standards, and their subsidiaries operating in different host countries also habitually adopt these standards following the parent company due to the imprinting effect.

2.4.2: Institution-based view on the ISO 14001 standard adoption

MNCs, due to their global distribution of value-chain activities, are embedded within diverse institutional structures that exert significant pressures on them during implementation of corporate strategies at a subsidiary level (e.g. Campbell, 2007; Aguilera-Caracuel et al., 2013; Kostova and Roth, 2002). The degree of institutional pressure depends on variations in institutional environments within which MNCs operate (Eden and Miller, 2004; Xu and Shenkar, 2002). The institutional context of a country refers to the structure and activities that govern societal transactions in the area of politics, law and society (Peng et al., 2008). The theoretical roots of the institution-based view can be traced back to both sociology (Scott, 1995) and economics (North, 1990). In sociology, the institutional theory emphasises regulatory, normative, and cognitive elements of the institutional environment for achieving social legitimacy – a precondition for organisational survival and thriving in a particular context (Kostova and Zaheer, 1999; Xu and Shenkar, 2002). The regulatory component of an institutional environment reflects existing laws and rules in a particular context that promote certain types of behaviours and restrict others (Scott, 1995; Kostova, 1999). The cognitive component reflects the widely shared social knowledge of people within a society (Markus and Zajonc, 1985) that influences the way a particular phenomenon is categorised and interpreted. The normative component reflects the values, beliefs, norms and assumptions about human nature and human behaviour held by the individuals in a society (Scott, 1995; Kostova, 1999). The institutional pressures arising from these three dimensions force organisations to conform to predominant norms, rules and cultural traditions in each context that lead to homogeneity among them in their structures and activities (Meyer and Rowan, 1977; DiMaggio and Powell, 1983). This homogeneity is termed as isomorphism (DiMaggio and Powell, 1983), which affects firms' decisions to adopt a specific organisational practice in a particular host country for legitimacy. The sociology perspective of institutional theory places particular importance on the legitimisation process and institutionalisation of organisational structures and procedures that should not be 'taken for granted' by firms (Oliver, 1992).

The institutional perspective in economics, on the other hand, emphasises the impact of the institutional conditions or the nature of the institution in a particular context; these are defined as ‘rules of the game’ that influence organisation behaviour, economic transaction and business operations of companies. The theoretical assumption is that firms comply with the governance structure of a country based on their efficiency (North, 1990; Williamson, 1996). According to economist North (1990) institutions are made up of formal constraints (rules, laws, constitutions), informal constraints (norms of behaviour, conventions, codes of conduct), and their enforcement characteristics. Institutions, together with these constraints determine the incentive structure and opportunities in a society (North, 1990, p.7). This perspective emphasises the role of these structural constraints on organisations that influence organisational practices and behaviour (Scott, 1992). Organisations face coercive, mimetic and normative pressure in an institutional setting that creates and diffuses a common set of values, norms and rules to produce similar practices and behaviour by organisations that share a common organisation field (DiMaggio and Powell, 1983). Key suppliers, resources and consumers, regulatory agencies and other organisations that produce similar services or products constitute an organisational field (DiMaggio and Powell, 1983, p.148). Organisations operating in similar social frameworks of norms, values and belief system often behave similarly to gain social approval (Meyer and Rowan, 1977). This theory thus recognises the importance of achieving social legitimacy to operate in a particular context. A motive of legitimisation refers to the desire of a firm to improve the appropriateness of its actions within an established set of regulations, norms, values, or beliefs for long-term survival (Suchman, 1995). Organisations acquire legitimacy by complying with institutional regulations and operating according to the norms of the broader social context within which it operates (Hoffman, 1997).

Several scholars exploring the determinants of the adoption of ISO 14001 standards have emphasised the aspect of legitimacy (Bansal and Roth, 2000; Khanna and Anton, 2002; Bansal and Hunter, 2003; Dasgupta et al, 2000; Bansal, 2005; Boiral, 2006; Anton et al., 2004; Darnall et al., 2008; Aguilera-Caracuel et al., 2013). The proponents claim that institutional pressures for legitimacy are one of the key factors that motivate firms to adopt EMS standards. The need for external legitimacy occurs due to the institutional pressure arising from external sources such as government, legislative bodies, markets and societal actors to conform to the established rules, regulations and norms in the

society (Hoffman, 2000). On the other hand, internal legitimacy occurs at the organisational level due to the pressures arising from the organisational culture, shared beliefs, political processes (DiMaggio and Powell, 1983) and shareholder pressure (Henriques and Sadorsky, 1999).

As mentioned in section 2.4.1 a firm therefore deals with two types of pressure in order to legitimise their actions. Institutional pressure arising from external sources reflects the formal dimension of the institution of a country, whereas at the organisational level, the institution reflects the informal aspect of the institution of a country represented by the organisational members or shareholders. An explanation of the formal and informal institutional dimensions is provided in detail in the theoretical background of the study in Chapter 3.

Among existing empirical studies that have used the institution theoretical perspective, qualitative research by a group of scholars (e.g. Bansal and Roth, 2000; Bansal and Bogner, 2002; Bansal and Hunter, 2003) has offered some useful insights about firms' motivation behind the adoption of EMS standards. They argue that ecologically responsive behaviour of firms is driven by the high need for legitimacy, to establish better relationships with stakeholders, to acquire economic wealth and competitive advantage for long-term survival. The findings of their studies suggest that firms' adoption of the ISO 14001 standard is largely motivated by threats of legitimacy that affect their long-term survival in a particular context. Concerns regarding 'fines', 'penalties', 'negative publicity', or 'sanctions' due to non-compliance of environmental practices appear to influence most firms to try to adopt the ISO 14001 standard and thus maintain their legitimacy to operate in a particular context.

Firms aim to satisfy the most influential stakeholder groups, in this case, government, and local regulatory bodies, by meeting the standards since their goal is to minimise the risk and cost of non-compliance. While government and regulatory bodies are considered important to the achievement of legitimacy, other stakeholders in a society, for example, community, public, environmental activists, and NGOs, are also considered as important because they impose norms that set the appropriateness of certain activities that are deemed acceptable. The findings thus highlight the influence of normative and coercive pressures on firms to adopt a proactive environmental management strategy, i.e. the ISO 14001 standard.

The influence of stakeholders' pressure on firms' environmental strategy has also gained considerable attention amongst academic scholars. Several scholars have empirically shown that firms have different environmental responses according to the relevant stakeholders they think are most important (Henriques and Sadorsky, 1999; Buysse and Verbeke, 2003; Sharma and Henriques, 2005). Other scholars have specifically focused on the environmental proactivity of firms arguing that pressure from any stakeholder has a positive impact on the degree of environmental proactivity of firms (Darnall et al., 2010; Gonzalez-Benito and Gonzalez-Benito, 2006).

Another set of studies has been interested in investigating managerial perceptions of different stakeholders' pressure influencing proactivity of firms' environmental management (Bansal, 2003; Marshall et al., 2005; Garces-Ayerbe et al., 2012). Among the early empirical studies, Henriques and Sadorsky (1996; 1999) made some useful contributions evaluating the perceived importance of different stakeholder groups in Canadian firms. Their findings support claims made by other researchers (e.g. Bansal and Roth, 2000; Bansal and Hunter, 2003) that, in addition to government regulation, it is primarily customers, shareholders, and local community groups that affect corporate environmental management practices. Although the study identifies the effect of different stakeholders on firms' environmental responses, it failed to account for the type of stakeholder groups influencing proactive environmental management practices. Given that different stakeholder groups have different levels of interest in a firm, the adoption of a proactive environmental strategy could be relative to each stakeholder groups' interest.

In a later study, Buysse and Verbeke (2003) have addressed this gap by evaluating the relationship between the level of proactiveness of environmental management strategies and the importance attached to relevant stakeholders using survey data of firms operating in Belgium (both domestic and MNC affiliates). The study used the modified version of the typology of firms' environmental strategies first developed by Hart (1995).

Scholars posit that firms display different types of environmental responses for environmental protection: 1) pollution prevention, 2) pollution control or end-of-pipe approach, and 3) sustainable development or environmental leadership. A pollution prevention strategy refers to environmental practices that are proactive in nature, help minimise emissions, a reduction in costs, increased productivity and efficiency. This type

of environmental strategy focuses on environmental practices involving innovations for the prevention of waste, emissions, and pollution through continuous learning, total quality environmental management, re-design of products and services (Hart, 1995; Aragon-Correa and Sharma, 2003). A pollution control strategy, which also refers to a reactive strategy, involves controlling emissions, disposal of waste in a responsible manner, and requires compliance and conformance to existing regulations (Hart, 1995; Sharma and Vredenburg, 1998). Firms take more of a remedial approach by adhering to minimal compliance threshold points to avoid penalties by regulatory bodies and governments. The sustainable development strategy, also known as an environmental leadership strategy, entails taking a long-term shared vision of sustainable development among all relevant stakeholders of the firm. A firm's vision for a long-term position in the global market rather than a short-term profit-making approach at the expense of the environment is the main driver for this type of strategy (Hart, 1995). Buysee and Verbeke's (2003) findings show that regulatory stakeholders are perceived to be the most influential regarding firms' proactive environmental management decisions. Further, the findings also indicate that both MNCs and domestic firms are pressurised by regulatory stakeholders to adopt a pollution prevention strategy.

On the other hand, primary stakeholders, i.e. customers, employees, shareholders, and suppliers, are considered as most important when undertaking an environmental leadership strategy approach as this strategy requires creating shared-vision through strong leadership (Bennis and Nanus, 1985). These findings thus clarify how different stakeholders' influence the choice of environmental strategies of firms. Managerial perception is also considered an important determinant concerning environmental management strategy, because managers are responsible for resource allocation, making strategic decisions, maintaining stakeholders' engagement, and establishing an organisational culture (Sharma, 2000). However, the influence of managerial perception of different stakeholders' pressures related to different environmental issues on the degree of proactivity of firms' environmental strategy lacked empirical evidence.

Garces-Ayrbe et al. (2012) address this research gap by considering the cognitive perspective of managers based on institutional theory, and analysing the influence of their perception of stakeholders' pressures on the proactive environmental strategy of firms. They find that managerial perception of stakeholders' pressures positively influences

firms' proactive stance; it increases together with managerial perception of opportunities in the external environment for competitiveness. However, in the case of pollution-intensive firms, the competitive expectation of managers, based on their perception of environmental issues, has no impact on the proactivity of a firm. This suggests that managers perceive the regulatory pressure important for maintaining firms' legitimacy to operate in a particular context rather than competitive opportunities. Therefore, they take the decision to implement a proactive environmental management strategy.

The above studies provide an explanation about the influence of institutional pressures on the voluntary adoption of EMS standards, including various stakeholders' influence and managerial perceptions. Regulatory pressures and threats to legitimacy play the dominant role in determining firms' proactive approach to environmental protection by adopting an EMS standard, i.e. the ISO 14001 certification. Although these studies have made significant contributions to the literature, they have overlooked the possible influence of firm-level factors and industry factors that may create constraints or incentives for the adoption of the ISO 14001 standard.

Giving a particular focus on the institutional environment, another group of researchers (e.g. Delmas, 2002; 2003; Delmas and Montes-Sanchos, 2010; Delmas and Toffel, 2004; King et al., 2005; Jiang and Bansal, 2003; Khanna and Anton, 2002; Anton et al., 2004) has advanced existing knowledge by examining firm-level factors to explain variations in the adoption of the ISO 14001 standard. According to these scholars, not only regulatory/coercive or normative pressures but also mimetic pressure influence firms' adoption of EMS standards. Industry regulation can produce normative pressure for firms' environmental compliance through the diffusion of norms and values across organisations (Meyer and Rowan, 1977). In addition, firms operating in the same industry are more likely to mimic the behaviour of other firms due to isomorphic pressures (DiMaggio and Powell, 1983).

Scholars also argue that different industries have different environmental impacts as the amount of pollution and toxicity level varies industry-to-industry (Hoffman, 1999; Levy, 1995). These variations necessitate companies to develop and implement relevant strategies to reduce their environmental impact. There is empirical evidence that industries with a high level of environmental impact tend to be closely associated with high visibility environmental issues such as air, land and water pollution (Bowen, 2000;

Brammer and Pavelin, 2008). Companies' different industrial activities, such as combustion of fossil fuel for the firms' manufacturing purposes (e.g. chemicals, automobile, steel, cement and electronics), transportations of goods, solid waste landfills, or disposal of toxic chemicals due to industrial processes, thus lead to Greenhouse Gas (GHG) emissions (EPA, 2014; Panwar et al., 2011; Kolk and Pinkse, 2008). The increasing level of GHG emissions is argued to be the consequences of multinational firms' business activities leading to global warming issues (Levy and Kolk, 2002; Boiral, 2006; Kolk and Pinkse, 2004).

Larger businesses tend to be more visible due to their wider activities and experience coercive pressures from different stakeholders. Based on this, Delmas and Toffel (2004) noted that, in addition to industry factors, firm characteristics and organisational structure are important determinants behind the adoption of the ISO 14001 standard. They integrated the institutional economic perspective with the sociology perspective to explain the costs and benefits of adopting EMS in a particular context. The authors posited that firm characteristics moderate the relationship between institutional pressures on firms and the adoption of the ISO 14001 standard depending on the associated costs and benefits.

Extending this view, other scholars (Delmas and Montes-Sancho, 2010; Anton et al., 2004) have examined the antecedent factors that give rise to the institutional pressures on a firm in particular, size of the business, firms' industry association and past environmental performance. The empirical findings show that adoption of the ISO 14001 standard mitigates the cost of compliance. Firms with historically poor environmental records benefit from an improved environmental reputation by adopting ISO 14001 certification; this is because they are often subjected to more scrutiny by regulatory bodies and local communities.

Jiang and Bansal (2003) further added that high visibility of firms' operation processes, defined as 'task visibility' (George, 1992; Jones, 1984), influences firms to adopt the ISO 14001 standard because this receives greater scrutiny by stakeholders. The empirical evidence shows that the ambiguity in measuring environmental impact influences firms' adoption of the ISO 14001 standards. When a firm's environmental impact is not easily comprehensible and measurable, by achieving the ISO 14001 certification firms can send a signal about sound environmental practices thus legitimising their activities. This result

is similar to King et al.'s (2005) finding where they have empirically shown that firms are motivated to adopt a certified environmental management standard, such as the ISO 14001 standard, to minimise information asymmetry between different functional departments. Lack of coordination could potentially have a negative impact on a firm's image. The certification is a signal that the firm has an environmental management system in place ensuring coordination among organisational members and functional departments, hence, a culture of commitment to environmental management prevails in the firm.

The study also found that US firms that are headquartered in Europe appear to adopt the ISO 14001 standard more than firms headquartered in the US due to experiencing more market pressure. This could also imply that institutional regulations about environmental management are more stringent in Europe. Therefore, firms legitimise their actions by adopting the ISO 14001 standard proactively. Further, firms with international exposure are more likely to adopt the ISO 14001 certification due to pressure from international consumers and external regulatory bodies for their environmental conduct.

The studies discussed above have mainly examined the institutional environment and firm-level factors that create variations in firms' decisions to adopt EMS. While these findings contribute to knowledge, a question remains to be explored as to what factors influence the extent to which firms adopt EMS standards in a particular institutional context. Focusing on the variations in the substantive adoption of EMS, scholars (e.g. Khanna and Anton, 2002; Anton et al., 2004) have explored the determinants of firms' environmental self-regulation. Using a survey data of 500 US-based firms, Khanna and Anton (2002) examined the regulatory and market -based factors, which arguably create incentives or constraints for firms. Scholars have previously argued that stringent environmental regulations in a particular context present opportunity for firms to improve their environmental efficiency (Porter and Van der Linde, 1995). Consumer demands, and concerns about environmental reputation also create incentives for the substantive adoption of EMS standards (King et al., 2005).

To avoid the high costs of regulatory compliance, high costs of waste disposal, or negative reputation, firms tend to self-regulate by adopting EMS substantively to reduce their environmental impact (Bansal and Roth, 2000). Pollution-intense firms thus experience benefits of legitimization by being compliant with the local institutional pressures. Further,

availability of information regarding environmental performance provides public recognition and a better reputation for environmental management initiatives. This is evident in their findings that the higher cost of compliance with the existing or anticipated mandatory regulations, threats of liabilities and market pressures from consumers, investors, and public in general, influences firms to adopt comprehensive EMS standards.

These findings thus support prior research, where scholars empirically showed that high costs of compliance and threats of liabilities are drivers for firms to adopt EMS standards (e.g. Bansal and Roth, 2000; Bansal and Hunter, 2003). Anton et al. (2004) further found that, together with regulatory and market-based pressure, the intensity of past emissions also motivates firms towards the comprehensive adoption of EMS. Although the study concludes that substantive adoption of EMS reduces toxic emissions, particularly among firms with past emission intensity, threats of legitimacy did not show any direct effect on the emission intensity. This implies that the adoption of EMS standards affects environmental performance of firms indirectly only, through encouraging institutional change in the operation of the firm.

From an institutional theoretical perspective, the results of the above empirical studies thus confirm that market pressures, institutional pressures for legitimacy, and salient stakeholder pressures are driving firms towards the substantive adoption of EMS standards. However, firms' resources and capabilities, which could potentially affect the adoption of the ISO 14001 standard, have not been explored in these empirical and theoretical studies. Therefore, the above findings remain inconclusive about the determinants of the adoption of the ISO 14001 standard.

2.4.3: Resource-based view on the ISO 14001 standard adoption

To address limitations in existing research, several scholars have explored the effects of resources and capabilities on the adoption of voluntary environmental management standards by firms using a resource-based theoretical perspective (e.g. Sharma and Vredenburg, 1998; Russo and Fouts, 1997; Hart, 1995; Bowen 2002; Stanwick and Stanwick, 2001; Darnall and Edwards, 2006; Aragon-Correa and Sharma, 2003; King et al., 2005; Sharma et al. 2007; King and Lenox, 2001). The resource-based theoretical perspective (Barney, 1986; 1991) posits that competitive advantage is an outcome of the deployment of available resources and the development of valuable organisational capabilities (Hart, 1995; Sharma and Vredenberg, 1998). Resources such as knowledge-

based skills (Hart, 1995), technology, incentives, and financial support from the parent company (Bowen, 2002) can help firms to achieve competitive advantage. Capabilities that facilitate achieving competitive advantage include technological expertise (Shrivastava, 1995), managerial skills, attitudes, and individual contributions for environmental initiatives (Andersson and Bateman, 2000; Sharma, 2000), degree of managerial discretion (Brammer and Millington, 2006), R&D skills (Hart, 1995), organisational learning and continuous innovation (Russo and Fouts, 1997), and stakeholder integration (Sharma and Vredenburg, 1998).

Among prior empirical studies supporting the resource-based view (RBV) perspective, several scholars have provided evidence that there is a positive relationship between complex capabilities and the adoption of voluntary environmental management practices (Christmann, 2000; Majumdar and Marcus, 2001; Russo and Fouts, 1997; Sharma and Vredenburg, 1998; King and Lenox, 2001; Christmann and Taylor, 2004). Capabilities such as total quality management, innovativeness, stakeholder integration, cross-functional management and shared-vision among organisational members are complex and rare to imitate, and can help firms acquire competitive advantage (Hart, 1995; Russo and Fouts, 1997). These capabilities enable firms to save significantly relative to competitors by avoiding the cost of installing equipment for pollution control, increased productivity and efficiency, reduced costs of regulatory compliance, and reduced legal liabilities (Sharma and Vredenburg, 1998). Firms can thus benefit from the reduced cost of operation, greater legitimacy, and better relationships with stakeholders by adopting proactive environmental management practices (Hart, 1995; Sharma and Vredenburg, 1998).

Russo and Fouts (1997), Marcus and Geffen (1998) and Majumdar and Marcus (2001) were the first to examine the exogenous factors on the development or acquisition of competitively valuable environmental capabilities that influence firms to adopt voluntary environmental management practices. Russo and Fouts (1997) found that industry growth influenced the relationship between firms' voluntary environmental strategy and organisational performance. In periods of high growth, industry firms make riskier investments, require a management structure that promotes an innovative culture, and need to develop an organisational reputation to differentiate themselves from others.

Firms therefore adopt voluntary environmental strategies that contribute to organisational performance.

Marcus and Geffen (1998) examined how electricity generation firms acquired pollution prevention competencies by interacting with institutional forces (government and markets) and deploying firm capability- organisational learning. Majumdar and Marcus's (2001) research found that strategic choice regarding environmental management of electric utility service firms in the US was contingent upon whether or not environmental regulations allowed discretion in their technological investment.

The external business environment thus appears to effect firms' adoption of an environmental management strategy in the above studies. However, from a methodological point of view these studies did not consider dimensions of the external business environment in their analysis. In a theoretical study, combining the logic of contingency theory with the RBV approach, Aragon-Correa and Sharma (2003) attempted to enhance knowledge about the condition in the external business environment of firms that may potentially influence the adoption of proactive environmental practices. They proposed that firms adopt voluntary environmental management practice such as the ISO 14001 standard in uncertain situations utilising their strategic resources and capabilities. For example, if there is a greater discretion for managerial actions for various experiments for environmental solutions, firms may adopt a voluntary environmental strategy. However, if the environmental issues are ambiguous, for example, conflicting stakeholder perspectives, differences in national/international environmental regulations, these can create complexity for managers to make strategic decisions. In such a situation, sophisticated resources and capabilities to make radical changes to improve environmental conduct would be difficult to create, administer and implement (Black and Boal, 1994). As a result, organisations would encounter constraints in developing and adopting a proactive environmental management strategy.

Aragon-Correa and Sharma (2003) therefore contributes to the theoretical understanding of the conditions in the external business environment that can influence the development of competitively valuable organisational capabilities; however, the propositions have not been empirically validated. Further, empirical measures of environment capabilities of firms that are inimitable, socially complex and path-dependent are challenging to develop

because they are tacit in nature. This limitation makes their theoretical proposition less useful for empirical application.

Another empirical study (e.g., Sharma et al., 2007) provided a better explanation about the influence of different dimensions of the external business environment on the adoption of voluntary environmental management practices. Sharma et al. (2007) identified strategic proactivity as an organisational capability (i.e. innovativeness, entrepreneurial orientation) that drives the proactive adoption of environmental management practice. This capability is embedded in organisational routines or processes, and is focused externally to maintain a strategic fit with the external environment (Miles and Snow, 1978).

A firm with a strategically proactive stance has the ability to integrate external information and actively seize and capitalise on new opportunities in the external environment in an uncertain situation (Aragon-Correa, 1998). Firms can thus deploy this capability through strategic leadership, which involves the early identification of new opportunities through environmental scanning and sense-making (Dvir et al., 1993), the facilitation of a timely response, and the adoption of organisational structures and processes that reduce uncertainty in managing strategic issues (Veliyath and Shortall, 1993).

On the other hand, organisational capabilities that are internally focused, such as R&D skills, management expertise for cross-functional integration and innovative skills, help firms diffuse knowledge and learning through continuous innovation, shared vision amongst organisational members and improvement (Hart, 1995; Marcus and Geffen, 2001). For example, improvement, reconfiguration and redesign of existing products, services, processes and business models, and the invention and creation of new products, services, technologies, and business models (e.g. Hart, 1995; Buysse and Verbeke, 2003). It is therefore concluded that, to adopt voluntary environmental management practices, firms need to integrate external knowledge acquired through externally focused capabilities with internally focused capabilities in a particular institutional context. The empirical evidence also indicates that deployment of organisational capabilities for the adoption of voluntary environmental practices is moderated by managerial perceptions about the uncertainty in their general business environment.

A few empirical studies have concluded that internally focused firm capabilities influence the adoption of the ISO 14001 standard. For example, King and Lenox (2001) identified certain firm characteristics, such as R&D intensity or experience of past management system adoption (i.e. ISO 9000), are indicators of a firm's capability and found that these capabilities contribute to the adoption of the ISO 14001 standard. Christmann and Taylor (2004) particularly emphasised the availability of complimentary assets (Teece, 1986), which are developed in the normal course of business to capture the benefits associated with the implementation of certain environmental practices. They identified three complimentary assets: a) the level of education of the workforce, which facilitates absorption of knowledge regarding ISO 14001 standards; b) the firm's innovative capabilities for product and process innovation; and c) employee participation in the environmental management process to facilitate dispersion of environmental responsibility throughout the organisation. These complimentary capabilities are shown to positively influence the adoption of ISO 14001 standards.

The findings of the above studies thus imply that voluntary environmental management practices – the adoption of the ISO 14001 standard – require an accumulation of skills and resources such as physical assets, technologies, complex interaction among organisational members, forward thinking management style, cross-functional integration, organisational learning, information sharing and innovative organisational culture (Russo and Fauts, 1997; Sharma, 2000; Shrivastava, 1995).

However, management scholars have argued that organisations must have basic competencies before they adopt voluntary environmental management practices that require higher-order learning proficiencies (Hart, 1995; Christmann, 2000). Lack of basic competencies makes the adoption of proactive environmental management practices, such as ISO 14001 standard, costly. To avoid a detrimental impact on their economic performance, firms would therefore prefer not to invest in costly environmental management standards proactively but rather adopt practices to satisfy (Hart and Ahuja, 1996; Aragon-Correa, 1998).

Supporting this view, among empirical studies that have investigated the relationship between the adoption of EMS standards and the financial performance of firms, Darnall and Edwards' (2006) study provides evidence that the cost of the adoption of EMS standards varies in firms with different ownership structures having different levels of

internal capabilities and access to resources. Ownership is defined as a summative condition that includes: 1) the interests and constraints of respective owners (such as societies, government, individuals) and managers, as well as the conflicts among owners and managers, and 2) the abilities of these parties to obtain resources such as financial capital, management expertise and technical talents (Mascarenhas, 1989). Depending on their ownership structure (for example, publicly traded firms, government enterprises and privately-owned firms), firms incur costs for EMS standard adoption. This is because different firms have different levels of internal organisational capabilities and access to resources, which either enable them or create constraints for the adoption of EMS standards.

The empirical evidence also shows that publicly traded firms incur the lowest adoption costs because they have stronger internal capabilities. They also have greater access to financial resources to develop internal capabilities (Russo and Fauts, 1997; Bowen 2002). Further, this type of organisation shares resources and capabilities between different operational units (Bowen, 2002), allowing greater dispersion of knowledge and managerial skills. This allows development of internal capabilities through employee interaction and shared vision, and low reliance on external resources. The study offers some critical evidence that internal organisational capability development through path-dependency reduces the cost of adoption of EMS standards; this is because path-dependent capabilities are developed through previous experiences acquired during the occurrence of unpredictable, non-purposive and somewhat random events (Vergne and Durand, 2010, p.741-742) that contribute efficient ways of doing things (Mahoney, 2000; Barney, 1991). Although the external resources/financial support may enable firms to increase their efficiency and acquire expertise, firms may lack the expertise required for continuous improvement or establishing an organisation culture for environmental commitment. The study thus offers some useful insights about the relationship between organisational resources and capabilities and the variations in EMS adoption costs in different firms.

Alongside the ownership structure of firms, it is also argued that firm size influences EMS adoption because it is considered as a conventional proxy for resource availability. Scholars argue that larger organisations are more likely to adopt proactive environmental practices (Aragon-Correa, 1998, Buysse and Verbeke, 2003; Sharma, 2000) because

larger firms tend to have greater levels of resource availability (Bowen, 2002). Having access to resources can provide opportunities and extra funds to firms for experimentation (Hambrick and Snow, 1977) and innovation (Nohria and Gulati, 1996).

Scholars have also argued that firm size is a key determinant of organisational power, which enables them to have a greater level of managerial discretion (Meznar and Nigh, 1995). However, the effect of any access resources on firms' adoption of proactive environmental management practices depends on the role it plays in a particular context and the nature of the available resources (Bowen, 2002). Larger firms with extra resources either use their resources to facilitate environmental improvements, avoid, or to defy institutional pressures for improving environmental conduct. They may want to protect their financial position by investing in buffering activities or by satisficing with less sound environmental solutions. Therefore, scholars have suggested that as much as extra resources facilitate corporate investment in a sound environmental management project and provide managers with an opportunity to experiment, alternatively, it can also limit firms' initiatives for environmental solutions to only what is required at a minimum level (Bowen, 2002).

Prior empirical studies have mainly focused on large companies paying inadequate attention to the adoption of EMS standards in small firms. Aragon-Correa et al. (2008) addressed this research gap by focusing on SME companies. In their view, SMEs can also adopt such practices based on their specific capabilities associated with their unique strategic characteristics, even if they lack resources. SMEs possess internally generated funds, strategic proactivity (i.e. innovativeness and entrepreneurial orientation of the manager) (Rangone, 1999; Yu, 2001), and are flexible enough to respond to changes in the general business environment due to a less bureaucratic management structure (Yu, 2001). Using their proactive stance, they can establish collaborative relationships with stakeholders such as other firms, suppliers, regulators and government agencies (Darnall, 2002).

Stakeholder integration and network relationships are important capabilities that enable firms to gain access to information, support, and resources. The findings of the study thus indicate that, contrary to the conventional wisdom of small firm's inability to adopt a proactive environmental strategy, SMEs build organisational capabilities based on their unique strategic characteristics, which allow them to adopt such strategies. From the

perspective of the resource-based view, it is therefore concluded that, like larger firms, SMEs are capable of adopting proactive environmental strategies through building organisational capabilities in significantly different ways; this enables them to achieve competitive advantages. However, this study focused exclusively on the function of internal capabilities of firms for generating a proactive environmental strategy. The study did not consider the influence of external conditions, which are also known to be relevant to the development of a proactive environmental strategy (Aragon-Correa and Sharma, 2003). Further, the study's findings offered limited generalisability due to the business-related and geographic peculiarities of the sample.

The above studies have made significant contributions to knowledge, both theoretically and empirically, and offered evidence as to why some firms adopt the ISO 14001 standard by comparing firms that are certified with firms that chose not to be certified. The analysis has mostly been carried out among domestic firms. With an increasing number of firms adopting the ISO 14001 certification globally due to globalisation, it therefore became necessary to investigate adoption of this standard in MNC firms in the multinational setting, considering both parent level and subsidiary level factors (Darnall et al., 2008; Peglau, 2005). In the following sections, the adoption of the ISO 14001 standard in multinational companies operating in different geographical contexts is reviewed.

2.4.4: Adoption of ISO 14001 standard in multinational companies

Among early empirical studies investigating MNCs' compliance with environmental regulation, Walter (1982), Leonard (1988), and Low and Yeats (1992) emphasised the differences in regulatory framework in the international context. They argued that MNCs from developed countries to take advantage of weak regulatory conditions and lower their environmental standards, thus avoiding the implementation of costly environmental practices. However, these studies lacked empirical support for their 'pollution haven' and 'industrial flight' hypotheses, which posited that pollution-intense firms transfer their manufacturing operations to countries with weak regulatory conditions to avoid the cost of regulatory compliance. The results of empirical analysis show no increase in foreign direct investment of pollution intense firms in countries with lower levels of environmental regulations and enforcement regime, which was contradictory to the expectation of these studies.

Acknowledging this, Christmann and Taylor (2001) proposed a broader view to analyse the reason behind firms' adoption of voluntary environmental practices and the role of government regulation in a cross-country context. Using an institutional theoretical perspective, they conducted a survey to investigate the variations in the adoption of environmental management standards in both domestic and foreign firms. In their view, differences in environmental regulation in a cross-country context occur due to differences in the domestic valuation of environmental quality, differences in country's capacity to tolerate, dilute, absorb or ignore pollution, as well as differences in the economic and environmental priorities. Even if the formal environmental regulations are identical across countries, the regulatory system may still differ in different countries in terms of countries' capacity to implement, monitor or enforce regulations (Hettige et al., 1996).

Their findings thus oppose the pollution haven and industrial flight hypotheses developed in prior studies, suggesting that variations in environmental regulations positively influence firms to self-regulate their environmental activities rather than lowering their environmental standards in countries with a weak regulatory framework. Factors such as ownership structure, international trade linkages, such as international customers and exports to developed countries, have been found to positively influence environmental compliance and the likelihood of the adoption of the ISO 14001 standard. However, the

study did not provide an explanation as to what extent firms adopt the ISO 14001 standard driven by the institutional and firm-level factors. Further, the data sample contained both domestic and MNC firms, which makes it challenging to extract the motivation behind foreign firms' adoption in a particular context.

Christmann and Taylor (2006) later enhanced our understanding and added to knowledge by examining the conditions under which the ISO 14001 certification is an effective governance mechanism for environmental management. By conducting a survey, they investigated how far the role of customers determines the extent to which firms comply with the ISO 14001 standard. The findings show that variations in frequency and quality of customers' monitoring, and perceived cost and likelihood of customers' sanctions, affect firms' compliance with the ISO 14001 standard. Firms tend to comply with the standard and adopt it in a symbolic manner by meeting minimum requirements when they perceive that customers are less likely to monitor their environmental conduct directly, and that customers are less likely to impose sanctions for non-compliance. However, firms are likely to be compliant with the ISO 14001 standard substantively when customers place high importance on compliance to the standard, and the frequency of customers' direct monitoring is high. The frequency of direct monitoring by customers also increases in the case of firms exporting their products to foreign customers.

The conclusions drawn from these studies imply that firms with more international trade linkages and foreign customers are likely to comply with the ISO 14001 standard substantively. Customer requirements have also been identified as the primary determinant of firms' adoption of certifiable standards in several other studies (e.g. Corbett and Kirsch, 2001; Guler et al., 2002; Potoski and Prakash, 2004). While these findings provide empirical evidence about the influence of institutional, market and firm-level factors, the influence of subsidiary resources and capabilities on the extent of the adoption of the ISO 14001 standard is still lacking. Christmann and Taylor (2006) only included certified firms in their sample, omitting non-certified firms. Therefore, the study could not address the differences between certified and non-certified firms to observe the variance in the extent of the adoption of the ISO 14001 standard. In addition, testing the hypotheses in a single country context weakened the generalisability of their findings.

Tatoglu et al. (2014) addressed this by conducting a quantitative study of foreign MNC subsidiaries located in Turkey to investigate the heterogeneity in the adoption of

voluntary environmental management practices. Applying both the institutional theory and the resource-based view the scholars empirically showed that foreign MNCs' subsidiaries adopt voluntary environmental standards influenced by stakeholder pressures, visibility and being customer oriented. The findings thus support the effects of institutional, market and firm level factors on the adoption of voluntary environmental management practices by foreign MNC subsidiaries in a particular context.

Giving a particular focus on the subsidiary level institutional context in an international setting, Peng and Lin (2008) attempted to explore how local institutional pressures and subsidiaries' resources influence the adoption of environmental management by Taiwanese subsidiaries in manufacturing industries operating in China. The empirical findings of the study supported previous research about firms being influenced by the local institutional context and stakeholder pressures to adopt proactive environmental management strategy (e.g. King and Shaver, 2001; Bansal and Roth, 2000; Bansal and Hunter, 2003; Buysse and Verbeke, 2003). Further, the results show that subsidiaries owning more resources are more motivated to adopt a proactive environmental management strategy, which is in line with previous findings (e.g. Christmann, 2000; Majumdar and Marcus, 2001; Russo and Fouts, 1997; King and Lenox, 2001; Christmann and Taylor, 2004). However, this study uses only cross-sectional data, deriving causalities between variables. Therefore, it is difficult to detect any changes in the environmental practice of firms over a period.

In a later study, Aguilera-Caracuel et al. (2012) provided further explanation about the adoption of the ISO 14001 standard in MNC firms from the strategic management perspective, incorporating a knowledge-based view. Knowledge, being tacit and complex, is a unique resource to a firm that can contribute to achieving competitive advantage. Firms' international experience gained through international diversification, which is employed as a competitive strategy, is found to positively influence the adoption of ISO 14001 standards in firms. Firms acquire valuable knowledge from different countries where they operate and seize opportunities in new markets. These resources and capabilities thus influence the adoption of ISO 14001 standards. However, firms' organisational learning capability moderates the relationship by reducing the positive influence of the international experience gained through diversification. Firms with high learning capabilities tend to adopt a proactive environmental management strategy

because these firms possess a set of internal mechanisms and capabilities that allow them to generate advanced and innovative environmental management strategies independently. Therefore, knowledge acquired through international diversification becomes less relevant to them than for those firms with low organisational learning capabilities. Further, firms having high learning capabilities may already be aware of knowledge that is acquired in different markets or they may find this knowledge inferior to what they already possess (Salomon and Jin, 2010). In conclusion, firms benefit more from international diversification owning low levels of organisational learning capabilities than firms with high levels of organisational learning capability.

From the review of the above studies, it is evident that research on MNCs' adoption of ISO 14001 standards at the subsidiary level, focusing on institutional factors and firm-level factors, has gained considerable attention among academic scholars. Although significant anecdotal evidence indicates that the parent company has a strong role to play in the adoption of ISO 14001 standards at the facility level of firms, there is considerably less empirical research investigating the effects of both institutional and firm-level factors at the parent firm level.

Darnall (2006) offered a conceptual framework and empirically explained the reason behind a parent company mandating ISO 14001 certification at the subsidiary level using both the institutional theory and the RBV perspective. This is one of the few studies that has considered institutional and firm level factors at the parent level in relation to the adoption of the ISO 14001 standard. They argue that not only institutional pressures but also resources and capabilities motivate firms to adopt environmental management practices. The study empirically supported the notion that companies adopt proactive or voluntary environmental management strategies to derive greater external legitimacy (e.g. Bansal and Roth, 2000; Bansal and Clelland, 2004). Further, the results show that the regulatory pressure, associated with achieving legitimacy and anticipating future regulatory benefits in the home country, influences the parent company mandating ISO 14001 certification at the subsidiary level. In terms of market pressure, profit maximisation, achieving competitive advantage, improving public relations and marketing abilities, affect the parent company in mandating ISO 14001 certification. Further, it was also found that complimentary resources and capabilities such as innovative technologies, capital investments and external resources from government at

the parent level positively influence firms to mandate ISO 14001 certification at the facility level.

The empirical findings have thus certainly enhanced understanding about the parent company's role in the adoption of ISO 14001 at the facility level; however, the study assumed that facilities possessed or accumulated required resources or capabilities to comply with the parent company's mandate. Furthermore, the sample of the study contained US-based firms only. This restricted the assessment of the parent company's role in mandating at the facility level ISO 14001 adoption in the multinational setting and determining factors influencing the adoption.

Responding to this limitation, Darnall et al. (2008) advanced knowledge by examining the influence of institutional (i.e. market, regulatory and social) and firm-level factors in the multinational setting, i.e. facilities in manufacturing industries based in Canada, Hungary, Germany and the United States. The results suggest that companies operating in the same institutional context do not respond to the institutional pressures in the same way due to differences in their capabilities and resources (Oliver, 1997). Firms obtain greater benefits through positive business performance, adopting ISO 14001 standards influenced more by resources/capabilities than by institutional pressures. Therefore, firms are more likely to adopt the ISO 14001 standard comprehensively when influenced by resources and capabilities than institutional pressures.

The adoption of an environmental management standard is therefore more of a symbolic action for firms when they are influenced by institutional pressures only to acquire external legitimacy in a particular context (Bansal and Hunter, 2003). The results also indicate that previous experience of the adoption of a management system, research and development skills and exports to other countries, positively influence the adoption of the ISO 14001 standard in firms across different countries; this is supported by previous studies (e.g. King and Lenox, 2001; Sharma, 2000; Shrivastava, 1995).

The aforementioned studies have thus offered a significant contribution to our understanding regarding the effects of various institutional and firm-level factors on the adoption of the ISO 14001 standard, considering both the parent and subsidiary level factors. While most studies have focused on the institutional conditions at the subsidiary level, the institutional conditions at the parent company level have received less attention.

The extent of the similarity or dissimilarity between institutional environments of home and host countries have been found to influence strategic decisions of MNCs, such as location choice (Holburn and Zelner, 2010; Xu and Shenkar, 2002), entry strategies (Arslan and Larimo, 2010), ownership strategy (Eden and Miller, 2004), and transfer of organisational strategy (Kostova and Roth, 2002). Therefore, effects of institutional differences between the home country and the host country of MNCs on the adoption of the ISO 14001 standard needed more research.

Drawing on previous findings to investigate the influence of institutional distance in the context of environmental management, Aguilera-Caracuel et al. (2012) first explored effects of institutional differences on the cross-border adoption of environmental practices within the MNC network. The empirical findings suggest that firms adopt environmental standards when the institutional distance between the home country and the host country is less (e.g. Ang and Massingham, 2007). This is mainly driven by the higher level of economies of scope and low institutional pressures for responsiveness in a particular host country context. The findings also support that high financial performance of MNCs reduces the negative effects of the high institutional distance on the adoption of environmental standards at the subsidiary level in a particular context, because better financial performance contributes to developing resources and capabilities, thus enabling firms to adopt environmental standards proactively ahead of legal requirements.

Although these findings contribute to the advancement of knowledge concerning the influence of differences in the institutional environment between the home and host country, the authors overlooked the differentiated effects of the dimensions of an institution.

Aguilera-Caracuel et al. (2013) addressed this research gap by analysing the differentiated effects of the institutional dimensions: formal and informal institutional distances between home and host countries on firms' environmental strategy adoption at the subsidiary level. The empirical findings of the study suggest that high formal institutional distance drives MNC subsidiaries to adapt their environmental practices according to each host country's institutional requirements. This helps MNCs avoid the penalties, sanctions or legal costs involved in violating local regulations. They do this by adapting

their practices as necessary according to the local institutional context rather than standardising their approach.

On the other hand, a high informal institutional distance between home and host countries discourages MNCs from adapting environmental management standards to the host country's institutional requirements. MNCs can thus avoid high costs and risks of adapting their environmental standards to the local context using a standardised approach, rather than attempt to discern and interpret subtle social beliefs and schemas that are deeply embedded in the local social structure (North, 1990).

Although the study provided valuable insights about the effect of institutional distance, there were some limitations in the methodology of the study. All firms belonged to the same industry, which reduced the variability because different firms in different industries may react differently to environmental demands.

2.5: Assessment of Existing Studies on Theoretical Foundation and Empirical Findings

This section presents an assessment of existing studies on various theoretical and empirical contributions in relation to determinants of the adoption of the ISO 14001 standard by MNC firms. In particular, the discussion provides an explanation about what factors motivate firms to adopt environmental management standards, i.e. ISO 14001 certification, in a particular context using different theoretical perspectives.

The existing research in International Management in the area of environmental management has predominantly used either an institution-based or a resource-based perspective, either in combination or independently, to explain how institutional and firm-level factors influence the adoption of environmental management practices. The extant literature has thus far investigated determinants of firms' environmental practices (Bansal and Roth, 2000; Bansal and Hunter, 2003; Sharma, 2000; Khanna and Anton, 2002), effects of general business conditions on firms' environmental practices (Aragon-Correa and Sharma, 2003), and contribution of resources and capabilities on voluntary environmental management strategy (King and Lenox, 2001; Christmann and Taylor, 2004; Aravind and Christmann, 2008). Several other studies have investigated issues within the multinational context. These studies have particularly focused on issues such as MNCs' environmental self-regulation (Christmann and Taylor, 2001, 2002, 2006);

EMS standards adoption (Christmann, 2004; Aguilera-Caracuel et al., 2012); determinants of voluntary environmental practices (Tatoglu et al., 2014); differentiated effects of the formal and the informal institutional distance on firms' environmental performance (Aguilera-Caracuel et al., 2013), and the link between the adoption of the ISO 14001 standard and environmental performance of firms (Darnall et al., 2008).

Using institutional logic, most studies suggest that threats of legitimation in the external environment is one of the key factors motivating firms to adopt environmental management standards (Bansal and Hunter, 2003; Jiang and Bansal, 2003; Buysse and Verbeke, 2003). Costs of regulatory compliance, penalties and sanctions for non-compliance, and stakeholder demands create pressure on firms to improve their environmental conduct. Internal pressure for maintaining internal legitimacy by meeting shareholder demands (Henriques and Sadorsky, 1999), organisational processes and procedures, and culture (DiMaggio and Powell, 1983) also influences firms to adopt environmental management standards. Scholars have also noted that firm-level factors such as size, visibility, and intensity of past emission (Delmas, 2003; Anton et al., 2004; Jiang and Bansal, 2003) create coercive pressures on firms to be environmentally responsible. Further, based on this logic, scholars have identified market-based factors such as industry linkages, customer demands, and exports to foreign countries (Khanna and Anton, 2002; Delmas and Montes-Sancho, 2010) creating pressure on firms to adopt the ISO 14001 standard.

From this assessment, it may seem that although the logic of institutional theory concerning normative, coercive, and mimetic pressures is useful and provides sound reasoning regarding firms' motivation behind adopting the ISO 14001 standard, this perspective does not fully explain the influence of firm characteristics concerning resources and capabilities to adopt such environmental standards. Hence, other scholars attempted to explore this gap using a resource-based theoretical perspective (e.g. Hart, 1995; Russo and Fouts, 1997; Sharma and Vredenburg, 1998). They suggested that the

Table 1: Assessment of Existing Research

Name of Authors	Theoretical Foundation	Methodology	Determinants of ISO 14001 Standard Adoption	Context of the Study
Bansal and Roth (2000); Bansal and Hunter, 2003; Bansal and Bogner, 2002	Institutional theory	Qualitative research using in-depth interviews with firm managers, participant observations and archival data analysis	Threats of legitimation	British and Japanese multinational firms
Sharma and Henriques, 2005; Henriques and Sadorsky, 1999; Buysse and Verbeke, 2003; Darnall et al., 2010	Institutional theory	Mixed methods using exploratory interviews, survey and content analysis, survey method, survey developed by OECD	Stakeholders' pressure, managerial perception of stakeholders' pressure, regulatory pressures	Canadian, Belgian, German, Hungarian and Canadian firms
Delmas, 2002; 2003; Delmas and Montes-Sancho, 2010; Jiang and Bansal, 2003; King et al., 2005	Institutional theory	Quantitative research method using secondary data analysis	Institutional factors, firm-level factors	Domestic firms in a variety of countries
Khanna and Anton, 2002	Institutional theory	Quantitative research method using secondary data analysis	Consumer demands, environmental reputation, intensity of past emission intensity	US firms
Anton et al., 2004	Institutional theory	Quantitative research method using secondary data analysis	Regulatory and market-based factors – legitimation, customers demand	US firms
Christmann, 2000; Majumdar and Marcus, 2001; Marcus and Geffen, 1998; Russo and Fauts, 1997; King and Lenox, 2001; Sharma and Vredenburg, 1998	Institution theory, Resource-based firm view	Qualitative interview method, mixed methods, secondary data analysis method, case study method	Capabilities – cross-functional management, higher order learning shared-vision, stakeholders' integration, R&D intensity, experience of past management system adoption (ISO 9000)	US firms, Canadian firms
Sharma et al., 2007	Resource-based firm view	Quantitative questionnaire survey	Innovativeness, entrepreneurial orientation	North American and European firms
Christmann and Taylor, 2004	Resource-based firm view	Quantitative questionnaire survey	Complimentary capabilities, education level of workforce, innovativeness, organisational learning and information sharing	Multinational and domestic firms in China

Darnall and Edwards, 2006	Institutional and resource base view theoretical perspective	Secondary data analysis method	Institutional factors, complimentary capabilities	US based firms
Darnall, 2006	Institutional and resource-based view	Questionnaire survey of managers at the facility level	Institutional pressures, market pressures and complimentary capabilities	US based ISO certified firms
Aragon-Correa et al., 2008; Aragon-Correa and Sharma, 2003	Resource-based view	Mixed-method using in-depth interviews and questionnaire survey	Specific organisational capabilities, strategic characteristics, entrepreneurial orientation, flexibility, stakeholders' management and shared vision	Spanish firms
Christmann and Taylor, 2001	Institutional theory, resource-based view	Questionnaire survey	Institutional pressures, international trade linkages, export orientation, ownership structure	Multinational and domestic firms in China
Christmann and Taylor, 2006	Institutional theory	Questionnaire survey	Foreign customer's demand, international trade linkages	Domestic firms in China
Tatoglu et al., 2014	Institutional theory and resource-based view theory	Questionnaire survey	Stakeholder pressures, firm-visibility and customer oriented	Multinational subsidiaries in Turkey
Peng and Lin, 2008	Institutional theory	Questionnaire survey	Local institutional pressures	Taiwanese subsidiaries in China
Aguilera-Caracuel et al., 2012	Resource-based view	Questionnaire survey and secondary data analysis	International experience through diversification, organisational learning	Spanish firms
Darnall et al., 2008	Institutional and resource-based view theory	Secondary data analysis method	Past experience of management system adoption, R&D skills and exports to other countries	Firms in Canada, Hungary, Germany and the US
Aguilera-Caracuel et al., 2012; Aguilera-Caracuel et al., 2013	Institutional theory	Secondary data analysis method	Institutional distance, the formal and the informal institutional distance	Firms in the US, Canada, France and Spain.

Source: Devised by author

deployment of strategic resources and capabilities drive firms to adopt the ISO 14001 standard. Firms can benefit from the reduced cost of operations, a greater level of legitimacy and better relationship with stakeholders (Hart, 1995; Sharma and Vredenburg, 1998) thus achieving competitive advantage through the adoption of this standard. Scholars have also advanced this theoretical perspective by suggesting that firms need to integrate external knowledge through externally focused capabilities (e.g. strategic proactivity) with internally focused capabilities (e.g. R&D skills, management expertise) to adopt the ISO 14001 standard (Sharma et al., 2007; Marcus and Geffen, 1998).

The availability of resources and capabilities also influences the variations in adoption. This is because, depending on the level of resources and capabilities and the role they play, firms may adopt environmental standards substantively (Darnall and Edwards, 2006; Bowen, 2002). The RBV logic thus helps to identify some firm-level determinants that influence the adoption of ISO 14001 to gain competitive advantage.

Using the institutional perspective, existing studies have mainly explored the legitimacy issue and appropriateness of firms' business activities about environmental management concerning domestic firms. Despite a good number of theoretical and empirical studies that have enhanced knowledge about the determinants of the adoption of ISO 14001 standards by firms applying both the institutional and RBV perspectives, many studies have focused only on a single country context (Darnall, 2006). Further, the majority of studies have focused on developed countries (e.g. Bansal and Roth, 2000; Bansal and Hunter, 2003; King and Lenox, 2002; Aragon-Correa and Sharma, 2003), with very few studies focused on developing countries (e.g. Christmann, 2004; Zhu and Sarkis, 2006).

In recent years, the issue of the adoption of ISO 14001 standards in a multinational context has gained significant scholarly attention due to the rapid pace of globalisation and the environmental impact caused by MNCs' business operations across the globe (Tatoglu et al., 2014; Aguilera-Caracuel et al., 2012; 2013). MNCs' approach towards preserving the natural environment through improved environmental conduct has thus become a subject of growing research interest. Institutional logic in an international setting therefore requires dealing with both the host and home country institutional context from a broader perspective, encompasses not just the regulatory context for legitimation but also the socio-political, economic, and cultural context.

With regard to the adoption of the ISO 14001 standard in MNCs, the institutional theory has been instrumental in explaining the importance of firms' regulatory compliance (e.g. Christmann and Taylor, 2001; Christmann and Taylor, 2006; Peng and Lin, 2008; Potoski and Prakash, 2004). However, the institutional theoretical logic focuses only at a country-level rather than a firm-level (e.g. Peng and Luo, 2000). Therefore, the key limitation of these studies is that they cannot explain any specific firm-level determinants of ISO 14001 adoption in a particular host country context.

To address this limitation, some studies have combined the logic of institutional theory with the RBV theory to explain firm characteristics alongside institutional factors influencing the adoption of environmental standards in multinational contexts (e.g. Darnall, 2006; Aguilera-Caracuel et al., 2012; Darnall et al., 2008; Tatoglu et al., 2014). These scholars suggest that knowledge acquired through international experience, R&D skills, previous experience of adopting management systems, customer orientation, potential for pollution and exports to other countries, influences firms to adopt the ISO 14001 standard alongside regulatory pressures for maintaining legitimacy of their operations and reputation.

It is often argued that institutional distance creates barriers to interactions between headquarters and subsidiaries of MNC firms operating in different host countries (Xu and Shenkar, 2002; Arslan and Larimo, 2010). In a multinational context, 'institutional distance' is therefore identified as an important factor that affects firms' business operations in a particular context (Kostova and Zaheer, 1999; Ghemawat, 2001; Salomon and Wu, 2012; Xu and Shenkar, 2002; Berry et al., 2010). Although the role of institutional distance between the home and host country has been widely explored in different contexts, research on the effects of home country institutional environment on the adoption of environmental standards has received relatively less attention by academic scholars (e.g. Aguilera-Caracuel et al., 2012; Aguilera-Caracuel et al., 2013). In addition, existing research have only considered a single dimension of the formal institutional context (e.g. regulatory dimension) and the informal institutional context (e.g. cultural dimension).

According to some scholars, institutions are multidimensional in nature and encompass political, economic, social, legal, cultural, and administrative factors, governance style, enforcement mechanisms and control of violence in a particular country (e.g. Berry et al.,

2010; Kaufmann et al., 2009). However, the existing research does not acknowledge the multi-dimensional nature of institutions in a country that could potentially affect the adoption of the ISO 14001 standard by firms. Therefore, this leaves a gap in knowledge. The proposed research aims to address this research gap.

2.6: Assessment of the Methodological Underpinning in Existing Research

The review of the literature shows that most studies looking at firms' environmental management have been based on the 'positivist' approach using deductive methods for testing theory. However, early studies on firms' motivation behind the adoption of the ISO 14001 standard have taken an 'interpretivism' approach for theory building using an inductive method (e.g. Bansal and Roth, 2000; Bansal and Hunter, 2003; Bansal and Bogner, 2002; Jiang and Bansal, 2003). These studies provided in-depth insights about the factors that motivate firms for their environmental responsiveness using qualitative research methods and developing theory from the collection and analysis of data (Manning, 1982; Bryman and Bell, 2011).

With the intention of building theory, these scholars have employed in-depth or semi-structured interviews with managers, participant observation and analysis of archival records. The use of multiple research methods in a qualitative approach provided opportunities to capture complexity in the organisation and frequently conflicting interpretations and meanings (Prasad, 1983, p.1404). However, these studies could not provide generalisable inferences about firms' motivation behind their adoption of the ISO 14001 standard. This was because the findings could not be tested on a broader population as they were only relative to the specific data of the study, and were gathered through unstructured/semi-structured interviews or observations with a small number of individuals in a specific organisation. Further, the inductive nature of these studies restricted validation about the relative efficacy of firms' motivation. Nevertheless, the qualitative research method has provided richer and in-depth insights and helped understanding managerial perceptions of external institutional pressures that drive the adoption of the ISO 14001 standard.

Quantitative research methods using questionnaire survey and archival record analysis have resolved the issue of the perceptual bias that is present in qualitative methods. This method gained popularity among researchers investigating firms' environmental conduct

because the findings were generalisable and replicable for validation (Bryman and Bell, 2011). The quantitative research strategy has thus provided a ‘real’ evaluation of the determinants that influence firms’ environmental management practice rather than a subjective interpretation of meaning often encountered in prior qualitative studies. In particular, Henriques and Sadorsky (1996; 1999; 2006), Sharma and Vredenburg (1998), Sharma and Henriques (2005), Peng and Lin (2008), Christmann and Taylor (2001; 2006) and Tatoglu et al. (2014) undertook research on the corporate choice of proactive environmental strategy that has provided a better explanation of the determinants of the adoption of ISO 14001 standards by firms than had been found using qualitative methods. These scholars carried out explanatory research using a quantitative hypothesis testing method employing a questionnaire survey. A survey based technique of data collection provided opportunities to capture individual responses from a variety of choices maintaining respondents’ anonymity. Thus, the survey technique enhanced the chances of accessing sensitive data, which is difficult to access through the interview method. This method also allowed the authors to measure the causal relationship between several institutional, market-based and firm-level variables and the adoption of the ISO 14001 standard.

However, one of the key weaknesses of this method is ‘common method bias’. The self-completed data using a questionnaire survey obtained from managers or employees of firms regarding firms’ environmental practice and performance may therefore be exaggerated. This reflects the social desirability bias (Podsakoff and Organ, 1986). Another limitation was non-response bias due to factors such as structure, length or choice of words of the instrument administered for the survey.

Several other studies opted for secondary data analysis, i.e. archival studies using repeatedly observable data that were readily accessible and accurate (King and Lenox, 2002; Darnall and Edwards, 2006; Anton et al., 2004; Aguilera-Caracuel et al., 2013; Darnall, 2006; Darnall et al., 2008). These studies used good-quality data to carry out secondary data analysis having access to Compustat database, Toxic Release Inventory (US) (TRI), firm-level data for Standard & Poor’s 500 firms, National Pollution Release Inventory (Canada) (NPRI), the European Pollution Emission Register (France) (EPER), National Database of Environmental Management Systems (NDEMS), Global International Quality Group (US) (GIQ), Dun and Bradstreet’s database, the Organisation

for Economic Cooperation and Development (OECD) to generalise their findings in a wider geographical setting. The secondary data analysis method allowed greater scope for a cross-national comparison of EMS adoption in an international setting, as well as longitudinal studies. This method has also offered objectivity, reduced the cost and time of data collection and provided a ‘real’ evaluation of the phenomenon, minimising the biases present in the case of interview and survey methods. The use of a secondary data analysis technique using archival data has therefore been a good research method in the context of environmental management research because of the availability of several databases on environmental measures, firm-level data and country-level data.

However, there are some limitations with this method, including the complexity of the dataset, familiarisation of the dataset, missing data, relevance and lack of control over data quality (Ghauri and Gronhaug, 2010). Since other researchers have collected the data for a different research problem, they may not have met the criteria of the specific research inquiry. As a result, absence of key variables in the dataset is more pronounced than it is in the case of primary data.

2.7: Summary and Future Research Direction

The above literature review shows that motivation for firms’ adoption of environmental standards is mostly driven by the need for increasing internal efficiency, maintaining external legitimacy, and acquiring competitive advantage. Based on the assessment of existing research in previous sections, the key research area that further needs development arises from the scarcity of research explaining imprinting effects of institutional conditions of the home country of MNCs, consisting of different dimensions of the formal institutional structure of a country, on the adoption of ISO 14001 standards in a cross-country context.

Although existing studies in the context of environmental management have provided good insights and empirical evidence about the role of institutions on the adoption of environmental management practices considering home country and host country institutions, limited effort has been focused on the treatment of the home country institutional conditions and its imprinting effect on organisational practices. Further, the nature of the research methods used has reduced the possible generalisation of the findings to a wider geographical and industry setting. The future area for research in the

context of environmental management in MNCs therefore relies on capturing the rich diversity of the ways countries differ in their institutional profiles and, subsequently, how this affects the adoption of environmental management standard- ISO 14001 certification of firms operating in different industries in a cross-country context.

Chapter 3: Theoretical Framework and Research Hypotheses

3.1: Background

In this section, the theoretical framework of the research is presented. The proposed hypotheses are then presented, which are developed based on the imprinting theory (Stinchcombe, 1965) and institutional theoretical perspective (North, 1990) to explain effects of the home country institutional profile on the adoption of ISO 14001 standards by MNC subsidiaries. The concept of ‘imprinting’ that refers to ‘a process by which events occurring at certain developmental stages have persisting, if not lifelong consequences’ (Hannah et al. 1996, p.506).

Building on Stinchcombe’s (1965) seminal essay and early bioecological literature, Marquis and Tilcsik (2013) defined imprinting as:

“a process whereby, during a brief period of susceptibility, a focal entity develops characteristics that reflect prominent features of the environment, and these characteristics continue to persist despite significant environmental changes in subsequent periods” (p.201).

According to this theory, the institutional condition of the country of origin has a lasting impact on the structure, strategy, practices, or operating practices of an organisation (Stinchcombe, 1965; Kimberly, 1979; Schien, 1983; Miles et al., 1974; Bamford et al., 2000; Johnson, 2007). The internal organisational environment of an MNC therefore reflects the home country’s institutional profile since the home country’s institutional condition is likely to exert a powerful influence on MNC’s strategy formulation, structure, and processes due to the imprinting effect (Scott, 2008; DiMaggio and Powell, 1983). Johnson (2007) showed that institutional conditions shaped and constrained the strategic choices of the Paris Opera Founder, with persistent consequences for the organisation. Marquis and Huang (2010) argued that institutional conditions present in a focal firm’s state at the time of its founding powerfully influences organisational capabilities.

A subsidiary’s behaviour in a particular context will thus be affected by the home country’s institutional environment as the parent company determines the kind of practices, policies, and culture the affiliates should adopt to ensure organisational practices are consistent across the MNC network (Kostova and Zaheer, 1999; Rosenzweig and Singh, 1991; Kostova and Roth, 2002; DiMaggio and Powell, 1983). Scholars have

previously contended that adoption of standardised organisational practices contributes to maintaining consistency in the business operation across the MNC network and acquiring legitimacy in the international context (Aguilera-Caracuel et al., 2012; Aguilera-Caracuel et al., 2013; Christmann, 2004; Christman and Taylor, 2001; Hayden and Edwards, 2001). Thus, ‘best practices’ get diffused at the subsidiary level in different host locations. For instance, highly distinctive institutions of Sweden with stronger regulatory system, transparent governance mechanism and stable political structure had influenced Swedish MNCs’ organisation practices due to country of origin effect (Hayden and Edwards, 2001). The imprinting theory thus complements the institutional theory, that forms the theoretical framework of this study in answering the proposed research questions.

According to institution theory, the institution of a country consists of a formal and an informal dimension (North, 1990). The formal institution establishes rules and standards defining the nature of the regulatory and legislative structures of a country that have an impact on the development of a country (Hillman and Keim, 1995). A formal institution thus provides a structure in the way political bodies, economic agents and social actors interact with each other and adapt to changing environments (Oliver, 1997). Formal institutions are explicitly created and are composed of written or codified rules, regulations, laws and contracts in politics, legal systems and economics that include requirements, constraints, enforcement mechanisms, and incentive structures (North, 1990). A country’s effective formal institution contributes to the stability, reduces uncertainty, and alleviates information complexity in economic exchanges (North, 1990).

Institutional System (North, 1990)	Dimensions	Supportive Pillars (Scott, 1995)
Formal Institution	Law Regulations Rules	Regulative
Informal Institution	Norms	Normative
	Culture Ethics	Cognitive

Source: Peng et al. (2009)

A country's informal institution in general refers to the culture, tradition, and belief system of that country's society (North, 1990; Salomon and Wu, 2012). Culture reflects a socially constructed reality that is composed of patterns of beliefs, values, and attitude of people (Hofstede, 1980; 2001). These elements are manifested in practices, norms of behaviours and various artefacts that distinguish the members of one society or category of people from another (Hofstede, 1980; Trice and Beyer, 1993). Hofstede (1980) argued that the national culture conditions people's perceptions, thinking and way of doing things based on the power orientation, risk-taking attitude, time-orientation, social orientation, and goal-orientation. The underlying assumption of these cultural dimensions is that individuals become 'mentally programmed' by the way they are raised, educated, and influenced by their surrounding environment (Hofstede, 1980; House et al., 2004). These factors influence their beliefs, values, attitude, actions, and way of dealing with others in the society or in a broader context (Noorderhaven and Harzing, 2003).

The formal and informal structure of a country and their enforcement characteristics together define the incentives structure of the society and provide an exchange environment in which firms operate and engage in business transactions with various market actors by making strategic choices (Dunning and Lundan, 2008; Meyer et al., 2009; Peng, 2003).

The institutional constraints could arise not only due to the regulatory, cultural, or normative pressures but also due to the nature of the governance system, monitoring regime and mechanism of enforcement of law, which is more relevant in the case of environmental management by MNCs due to legitimacy (Bansal and Roth, 2000) and reputation (Dowell et al., 2000) issues.

The ISO 14001 certification demands compliance with government regulations, appropriate policies and procedures, formulation and implementation of environmental management plans and corrective measures of environmental conduct (Potoski and Prakash, 2005a). As shown in previous research, the formal institutional context is key to explaining the adoption of ISO 14001 standards (Delmas, 2002; Neumayer and Perkins, 2004; Potoski and Prakash, 2004). This study therefore focuses on the formal aspect of institutions because this aspect addresses rules, regulations, enforcement action and effectiveness of a country's governance mechanism.

The quality of governance within an MNC's home country potentially either creates constraints or a favourable environment for the practical adoption of ISO 14001 standards at a subsidiary level (Potoski and Prakash, 2004; 2005a). In the following sections, this study therefore attempts to draw insights using North's economic perspective of institutional theory (North, 1990) to examine effects of the dimensions of the formal institutional profile of home countries on the adoption of ISO 14001 standards by MNCs in a host country. The application of this perspective would thus enable a country-level analysis of the formal institutional profile (Kostova and Roth, 2002; Gelbuda et al., 2008), which would then enable determining the degree of the home country institutional profile effects on the adoption of ISO 14001 standards by MNC subsidiaries.

3.2: Hypotheses Development

3.2.1 : Effects of home country formal institutional profile on the ISO 14001 adoption in host countries

As discussed in the section 2.4.1 MNCs operating in geographically dispersed locations are subjected to conflicting pressures arising from the institutional environments of their home country, the host countries, and the industry (Kostova, 1999; Westney, 1993). Different home country institutional conditions create divergent pressures on MNCs headquartered in different countries (Rosenzweig and Singh, 1991). A stronger institutional condition (in terms of governance, law and enforcement mechanism, transparency) encourages firms to be more environmentally friendly in their home countries due to demands and enforcement by the local government. On the other hand, weaker institutional conditions (and the enforcement of these) in home countries encourages the avoidance of environmental concerns by managers. Either way, this creates 'mental models' among firms' managers to interpret their environment and act in a similar way while managing operations in their overseas locations (e.g. Denzau and North, 1994).

The internal institutional environment refers to organisational policies, practices, codes of conduct, structure, and procedures across the MNC network established by the parent company (DiMaggio and Powell, 1983; Kostova et al., 2008).

Subsidiaries in different geographical contexts are therefore, subjected to pressure from the parent company to comply with the corporate policies and procedures, thus maintaining the internal structural consistency and meet overall corporate objectives. Due to the imprinting effect of the home country institution, subsidiaries adopt the ISO 14001 standard when the home institutional condition is favourable to the parent company to participate in the ISO 14001 certification programme. On the other hand, they avoid adopting the practices if there is less pressure from the parent company that faces rather relaxed institutional conditions at the home country. Therefore, it is hypothesised:

H1 The stronger the home country's formal institutional condition, the greater is the level of adoption of the ISO 14001 standard by MNC subsidiaries in a host location.

3.2.2 : Moderating effect of industry type (High polluting versus low polluting industries)

I argue that imprinting effects of the home country institutional condition on the adoption of the ISO 14001 standard by MNC subsidiaries in host countries are influenced by the interactive effect of the industry. The adoption of the standard due to the imprinting effect of the home country institutional condition is expected to be greater in companies those operate in high polluting industries than those operate in low polluting industries.

Scholars have previously argued that companies operating in high polluting industries such as manufacturing, oil and gas, construction, mining, and transport cause considerable environmental impact through energy consumption, pollutant emissions and waste disposal during mining, transport, the procurement of raw materials, production, warehousing, and distribution (Hart, 1995; Sarkis, 1995). Such firms have caused serious public concerns globally due to their environmental conduct (e.g. Rugman and Verbeke, 2002; Christmann, 2004). These companies, due to the nature of their businesses, face frequent regulatory intervention, external auditing, and scrutiny by the public and media; they are more likely to comply with institutional requirements to maintain their legitimacy (Rugman and Verbeke, 2002; Bansal and Roth, 2000; Bansal and Hunter, 2003). MNCs operating in high polluting industries are therefore more likely to experience imprinting effect of the home country institution and adopt ISO 14001 standards voluntarily (than those in low polluting industries such as services) to take accountability of their environmental conduct and attempt to minimise their environmental impact by adopting EMS.

Their subsidiaries will also adopt the ISO 14001 standard following the parent company thus reflect imprinting effect of the home country institution. The imprinting effect is much greater for companies operating in high polluting industries originated in institutionally developed countries than institutionally weak countries.

On the other hand, the imprinting effect of home country institution on companies operating in low polluting industries will be lesser as these companies are less scrutinized about their environmental conducts. Their subsidiaries in different foreign locations are also less likely to adopt the ISO 14001 standard. Therefore, it is hypothesised:

H2: The positive effect of the home country institutional profile on the adoption of ISO 14001 by MNC subsidiaries is likely to be greater in the case of companies operating in high polluting industries than in low polluting industries.

3.2.3 : Moderating effect of a home country's GHG emission intensity

In this sub-section, I argue that the adoption of the ISO 14001 standard by MNC subsidiaries due to the imprinting effect of the home country institution is influenced by the home country's GHG emission intensity. The emission of greenhouse gases (GHG), such as carbon dioxide, methane, CFCs (chlorofluorocarbons), nitrous oxide and peroxyacetyl nitrate, in specific countries, has a considerable environmental impact. They are arguably the main reason for severe environmental issues that countries are dealing with globally (EPA, 2014). Home countries that have a history of manufacturing activities, or other heavy polluting activities, experience high level of GHG emission. MNC firms originating in these countries will experience imprinting effect of the home country institution and adopt the ISO 14001 standard to minimise the GHG emission level. This pressure is imprinted within firms when they form subsidiaries in foreign countries. Their subsidiaries will subsequently adopt the ISO 14001 standard reflecting the influence of the home country institutional condition. In the case of companies originating in institutionally developed countries with high level of GHG Emission, this effect is much greater than in countries with lax institutional condition.

By contrast, MNCs, operating in countries with low level of GHG emission due to less polluting activities, experience lesser imprinting effect of the home country institution thus reducing the general imprinting effect at the subsidiary level. Subsidiaries of these MNCs are therefore less likely to adopt the ISO 14001 standard. Therefore, it is hypothesised:

H3: The positive effect of the home country institutional profile on the adoption of ISO 14001 by MNC subsidiaries is likely to be greater in the case of home countries with higher levels of GHG emissions.

Chapter 4: Research Methodology

The aim of this chapter is to present a research methodology for this study to test the hypotheses, explaining the causal relationship between the predictors and dependent variable identified. The chapter also explains the sampling, data collection process and the limitations encountered during the process.

The chapter begins with a discussion of the research philosophy adopted in this study justifying the choice. Then a discussion on the research design is presented, providing the justification of the research strategy and method of data collection adopted. In the subsequent section, the research context of this study is described and the choice of Hong Kong as a context is justified. In the following sections, sampling techniques and a description of the sample are presented. The next section includes descriptions of the predictor variables, moderators, and control variables. The following section provides a detailed account of the data analysis method presenting the mathematical models.

4.1 : Research Philosophy

In the following section, the philosophical position of the study is discussed. Understanding the philosophical position of research is important as it helps the development of a research design to examine the general nature and significance of the empirical inquiry (Hughes and Sharrock, 1997).

4.2 : Philosophical Debate

A philosophical paradigm in social science is broadly divided into two competing traditions: positivism and interpretivism (or social constructionism) (Bryman and Bell, 2011; Hughes and Sharrock, 1997; Collis and Hussey, 2009). Due to their contrasting nature, a debate exists between these two philosophical positions. In business and management research, the *positivism* philosophical paradigm has gained popularity and tends to dominate many areas of business research (Collis and Hussey, 2009). This paradigm assumes that knowledge is free from speculation for its highest level of validity comparable to those of the natural sciences (Hughes and Sharrock, 1997). The main thrust of positivist philosophical stance is that there is only one reality, and social reality exists in its real form externally. Therefore, its properties are measurable through objective methods, rather than subjectively through perception, reflection or intuition (Comte,

1853). This view supports the notion that scientific knowledge about the society can be created just like natural science, i.e. through theoretical development and empirical testing (Donaldson, 2003). Positivist philosophical position assumes that knowledge is generated through the occurrence of events in the social reality that is observable and their meanings are socially confirmed over time (Burrell and Morgan, 1979). This philosophical stance thus offers verification of logical statements derived from a theory through analysing scientific data that either support or refute the statements (Murzi, 2007).

A positivist approach seems to be widely accepted as the most dominant research paradigm that has the capacity to offer a rigorous explanation of the ‘reality’ in social science. However, the positivist approach has some limitations. This approach is often criticised for being too rigid, highly structured, and abstract in its understanding of the ‘reality’ of social science, which imposes constraints on the findings (Hughes and Sharrock, 1997; Collis and Hussey, 2009). The critics suggest that positivism can only predict the average account of an outcome/behaviour, not an individual account of behaviour or an event occurring. In addition, capturing complex phenomena for analysis in a single measure leads to inadequacy in information. For example, a person’s intelligence or feelings cannot be accurately measured by assigning numeric values (e.g. Collis and Hussey, 2009). Thus, a positivist approach has limited scope to understand social phenomena in-depth (Fisher, 2010). Positivism therefore falls short in predicting the actual reality. However, the intention of positivism is to conceptualise a subject of research and seek general laws through the process of induction that can be used to predict probable outcome, if not with absolute certainty. Positivism epistemology therefore suggests that theoretical concepts are observable and verifications of theories can be made through deducing and testing hypotheses, by collecting and analysing empirical data (Popper, 1945; Burrell and Morgan, 1979).

Interpretivism tradition is the contrasting philosophical position of positivism that advocates the notion that reality of the social world and the meaning of it are socially constructed, which is not observable and cannot be measured objectively (Bryman and Bell, 2011). This philosophical position emphasises the subjective interpretations of social events that are necessary for researchers to explore to be able to understand the actions/behaviour of social actors (Saunders et al., 2007). In addition, it asserts that

interpretation of the social reality is influenced by individuals' values, beliefs, and the way they view the world. Therefore, the reality that is constructed socially is relative and pluralistic in nature. This necessitates taking into consideration different accounts/interpretations of the same event to derive a conclusion. This philosophical approach thus offers an in-depth explanation of social phenomena avoiding over-generalisation of the 'reality'.

In the business and management field, this philosophical tradition has been increasingly adopted to understand the organisational reality since organisational phenomena are better understood by stories, beliefs and myths through narratives or discourse analysis methods such as interviews and participants' observations (Baker, 2003; Saunders et al., 2007). While positivism emphasises the generalisability of the research findings, interpretivism puts emphasis on capturing the rich complexity of social interactions and subjective interpretations of organisational events, which occurs in a dynamic environment. In business and management research, however, the critics of interpretivist tradition suggest that the interpretivism approach produces biased findings that are value-laden (Collis and Hussey, 2009). It only captures how the researcher perceives the social reality constructed through the social interactions between different social (organisational) actors. This has the potentials of misconstruing the subjective reality or misperceiving how others have attached meaning to an organisational issue.

Arguably, organisation is a tangible object that has rules, regulations, systems, and procedures that are observable, and it exerts pressure on individual members of the organisation to conform to the requirements of the organisation (Bryman and Bell, 2011). Organisational members' behaviour is thus constrained by the rules and procedures that influence them to act in a certain way. Their actions may show some general regularities, which can be generalised across different organisations objectively through repeated observations of such nature (Burrell and Morgan, 1979). A theory is thus deduced, which can be further validated or falsified by future observations. Therefore, critics state that positivism provides a better insight of organisational reality, unlike interpretivism that focuses on the individual-level perceptions that are inadequate to provide a complete framework for organisational theory (Donaldson, 2003, p.123).

In the context of environmental management research, although few researchers have employed an interpretivist approach to explore firms' adoption of environmental

management standards, the positivist perspective has been the dominant approach in most studies that intended to determine factors influencing firms' adoption of EMS -ISO 14001 standard. As reviewed in Chapter 2, most studies focused on investigating institutional, industry factors and firm-level factors as determinants of firms' environmental activities. These factors, i.e. regulatory structure, stakeholders' pressure, export orientation, firm size, ownership structure and financial performance are observable phenomena and are measured using statistical techniques to provide generalisability and validity of the research findings. Therefore, a positivist approach was most appropriate for those studies.

As discussed in Chapter 3, the current study aims to examine imprinting effects of a country's institutions to explain the effects of institutional profile on the adoption of ISO 14001. These dimensions are observable factors that are objectively defined, external and are measurable to provide generalisability across a large sample. This research therefore adopts a '*positivist*' philosophical approach, which is associated with the philosophical assumption of '*objectivism*' and employs a research technique of '*quantitative*' methods.

4.3: Research Design

This section provides a discussion on research design highlighting the research strategy for this study, followed by the justification of the choice of data collection method adopted. A 'research strategy' is defined as the plan of action about how data will be collected to answer the research question, connecting the philosophical position of the research with the methodology (Denzin and Lincoln, 2005). This is a vital part of the empirical research that influences the subsequent research activities such as type of data collected and procedure to collect such data (Ghauri and Gronhaug, 2010).

4.3.1: Research strategy

In Section 2.5 (Chapter 2), the review of methodological approaches of past studies shows that most studies have predominantly adopted a quantitative research strategy using either a secondary data analysis technique or questionnaire survey technique to identify factors that determine the adoption of ISO 14001 in firms. Since this study investigates whether firms adopt the ISO 14001 standard influenced by different dimensions of the formal institution of their home country, the examination of the causal relationship between different dimensions of different home country institutions and the adoption of ISO 14001 standards necessitates quantification and measurement.

A cross-sectional quantitative secondary data analysis method that is grounded in the positivist philosophical paradigm is considered most appropriate in this case. It emphasises the quantification in the collection and analysis of archival data and entails deducing theory through the testing of hypotheses, thus validating or falsifying the theory. The justification for adopting a secondary data analysis technique or archival research is provided in the following sections.

Firstly, the secondary data analysis method offers an opportunity to use large amounts of data that potentially have wider geographic coverage (Hakim, 2000). Therefore, this method enables the conducting of international comparative research in the multinational setting. Publicly available secondary data sources provide industry related, country-level and firm-level information. This is very important in the context of the current study since the aim of the study is to generalise the findings in firms operating in different industries headquartered across wider geographic contexts. Although reliability of secondary data is dependent on how time variant the predictor variables are, the current study is interested in examining the effects of institutional dimensions controlling for firm-level, industry-level and country-level information. Therefore, this method enables the capturing of data across a large sample for generalisation in the multinational setting.

In a questionnaire survey research, collecting this information is not only time consuming but also an arduous process due to the difficulty of gaining access to firms, non-cooperative respondents, and budget constraints (Saunders et al., 2012; Bryman and Bell, 2011). Past studies that have used a questionnaire survey technique encountered several limitations: these have included less geographic coverage, social desirability bias, common method variance, missing data and low response rates. To overcome the limitations encountered in past studies the current study therefore uses a secondary data analysis method.

Secondly, many organisations, notably government departments and their various representatives produce secondary data in the form of official statistics that are readily available. Most of the data collected by international organisations and governments are of high quality and reliable; this is because they are mostly collected and compiled by

expert researchers using rigorous methods, and have been repeatedly used (Ghauri and Gronhaug, 2010)².

However, although it may not be possible to collect individual-level information in a secondary data analysis method, since the current study aims to determine the effects of the home country institutional profile on the adoption of the ISO 14001 standard by MNC subsidiaries, it is not required to collect micro-level data that is generally gathered using a questionnaire survey method. The industry-level, country-level and firm-level data, such as firm-size, type of industry, and home country institutional dimensions, that are used in this study are accessible from the OECD database, the World Bank's Governance Indicators, government published directory of ISO 14001 certified firms and the ORBIS database. Country-level institutional information using the World Bank's data also offers an opportunity to carry out a cross-cultural/multi-country investigation of institutional dimensions. In addition, unlike primary data collected using a questionnaire survey method, a good quality secondary data source generally provides data that are often available in a form that may be checked easily by others (Denscombe, 2007). This ensures research findings to be more validated and reliable.

Finally, since it is necessary for this study to have data from a variety of industry categories and ownership structure to ensure sufficient coverage, secondary data analysis method is most helpful, as this method enables categorising or creating sub-groups (Bryman and Bell, 2011). Although data may quickly become outdated, some governments and international agencies keep up-to-date sources of data relating to industries, countries, and firm level information, which ensures reliability. In addition, there may be variation in the definition of terms in secondary data; however, a data conversion process enables the changing of the original format of the data to a format that is suitable for the study.

4.3.2: Research context

To develop and test the hypotheses that would explain the variations in the adoption of ISO 14001 standard by the subsidiaries of MNCs headquartered in different countries, the current study considers Hong Kong as the research context. According to the World

² For example, the OECD database, the UNCTAD database, Datastream.

Investment report (United Nation Conference on Trade and Development, 2015), Hong Kong is described as a fast-growing industrialised economy with a rapid expansion of the capital market. The UNTACD (2015) report shows that Hong Kong is the second biggest recipient of FDI inflow in the globe after China, making it an important FDI conduit given its enduring advantages, including low and stable tax, free market access and easy business environment. The report also indicates that Hong Kong registered FDI inflows of US\$103 billion in 2014, a year-on-year increase of 39%. The increasing level of industrialisation in Hong Kong led to changes in the formal and informal dimension of the institution in the institutional development of the country. These changes include reformed government policies, low restriction on foreign ownership of companies, an effective and transparent public administration system, low tax regime, free-market structure creating new choices and opportunities to foreign investors (Peng, 2003; Wright et al., 2005).

The fast-paced industrialisation of the country has thus given rise to the establishment of many MNCs in different industrial sectors (Meyer, 2004). According to the Hong Kong Government (HKG) statistics, 3,752 overseas companies were registered in Hong Kong in 2011, making it an attractive country for foreign investors. US MNCs have the largest number of subsidiaries in Hong Kong (840 companies), followed by Japan (648 companies), and the United Kingdom (327 companies). The major industries of businesses include wholesale/retail, import/export, finance and banking, manufacturing, real estate, education services, and transportation. The rapid establishment of foreign firms' business operations in Hong Kong has thus contributed to several environmental problems in the country (Gao et al., 2005; Barron and Steinbrecher, 1999; Studer et al., 2008).

In particular, the pollution-intense industries have caused many of the most important environmental challenges such as poor air quality, water pollution, waste disposal issues, degradation of biodiversity, and industrial accidents. Further, they are heavily criticised for environmental impact (Struder et al., 2006; Barron and Steinbrecher, 1999). Rising environmental problems in the country have caused the Government of Hong Kong to introduce environmental regulations to improve the environmental conduct of companies operating in the country (Struder et al., 2008). Multinational companies and domestic companies in Hong Kong, have therefore been scrutinised by regulators and international

stakeholders to improve their environmental conduct. In particular, MNCs, being more visible due their size, are encouraged to self-regulate their environmental conduct by adopting ISO 14001 certification, thus avoid the risk of sanction or penalties (Hills, 2005). Hong Kong therefore makes a good research context due to the availability of government published data of both domestic and multinational companies regarding ISO 14001 certification, which would enable the investigation of the imprinting effects of the home country institution on the variation in the adoption of ISO 14001 standards by different MNC subsidiaries headquartered in different countries.

4.3.3: Description of data

The empirical analysis is based on data gathered from five sources: the ORBIS database, the directory of ISO 14001 certified companies published by the Government of Hong Kong in 2015, the World Bank's World Wide Governance Indicators (Kaufmann et al., 2009) and the GLOBE database (House et al., 2004). I also used publicly available data, such as the United Nation's world development indicators, which provided data for country-wide GDP and GHG emission intensity.

4.3.4: Sampling

First, I obtained the list of ISO 14001 certified firms from the directory. The directory recorded information for 902 ISO 14001 certified companies across different industry sectors operating in Hong Kong, comprising of both domestic and multinational firms.

Then I downloaded a list of the top 10,000 foreign owned firms in HK from ORBIS database to access firm-level data using random sampling technique. Once the sampling frame was created top 4,000 observations were considered and a sample of 3,640 was selected based on data availability. This procedure has enabled me minimising sampling errors by excluding observations that had missing values after top 4000 observations. Then I manually matched the list of 902 ISO 14001 certified companies in Hong Kong with the observations in the selected sample of 3,643. From the list, 190 MNCs appeared in the sample, including MNCs that are headquartered in Hong Kong.

The final sample selected for the analysis contained both ISO 14001 certified and non-certified MNCs operating in high polluting industries (chemicals, automobile, manufacturing, transport, construction, and civil engineering), and low polluting industries (wholesale, retail, and real estate sectors).

The procedure for creating the sample involved carrying out a search of MNC firms in the ORBIS database that had 51% and over ownership in the subsidiary company operating in Hong Kong and have headquarters across the globe. Firms that were headquartered in Hong Kong but operating internationally were also included in the sample. To avoid sampling errors, in the case of companies with global headquarters based in locations reputed for being 'Tax Haven' countries (e.g. Dharmapala and Hines Jr., 2009; Hines Jr. and Rice, 1994), locations of operating headquarters were included for the analysis. Names of firms listed in the directory of ISO 14001 certified companies were manually matched with the firms in the sample generated, to ensure consistency and accuracy while obtaining the firm-level data. These MNCs are headquartered in 55 countries across seven regions – South-East Asia and the Pacific, Middle-East and North Africa, Sub-Saharan Africa, North America, Latin America-Caribbean, Europe, and Central Asia. To conduct industry-wise categorisation of high polluting and low polluting companies, the 'Industry Classification System' four-digit NACE code was used. NACE code refers to industry standard classification system in the European union, the European implementation of the UN version. Of 3,640 MNC firms, there were 1,392 firms in the heavy polluting industries (NACE 1032-4399; 4910-5122), 2,248 firms were in the low polluting industries (NACE 4511-4799, 6020-6832).

The table in Appendix 1 provides a list of subsidiaries of these MNCs comprising the sample for this study in each industry sectors and headquartered in these 55 countries. I focussed on the above industries because these industries are considered to have a more significant environmental impact than service industries (King and Lenox, 2002). In the sample, each MNC's ultimate global owner (ownership structure) was considered as the parent company (headquarters) that owns over 51% shares in the subsidiary. Scholars have stated that the larger the absolute size of the sample, the more closely its distribution will be to the normal distribution and thus more robust for analysis (Saunders et al., 2007). This is shown empirically that a sample size of 30 or more will usually result in a sampling distribution for the mean that is very close to a normal distribution. Based on this, it can be asserted that the sample size of the current study is suitable to carry out the data analysis.

4.3.5: Description of variables

In this section, a description of the variables for this study is presented. Once the method of data collection has been determined, the next activity is to identify the variables about which data will be collected. Since the research underpins a positivist approach, the deductive nature of the study builds on already identified theoretical perspectives. The variables for the analysis are chosen based on the theoretical ground of an institution-based view. The selection of a dependent variable is dictated by the research problem. The independent (or predictors) variables are selected taking into account the issue of inclusion of irrelevant variables or the omission of relevant variables. Although it is argued that inclusion of irrelevant variables does not bias the result of the analysis, it does have some impact on the prediction (Hair et al., 1998). Firstly, it reduces the parsimony of the model, which may be critical in the interpretation of the result. Secondly, it may mask or replace the effects of more relevant variables. Finally, it may reduce the testing of statistical significance of the independent variables and therefore be less precise.

On the other hand, the omission of relevant variables can seriously bias the results and negatively affect any interpretation; this is because they are likely to be correlated with the included variables. Thus, the omission of these types of variables can negatively affect the statistical significance and reduce the overall predictive accuracy of the analysis. Moderator variables are included in the analysis to estimate their interaction effects on the relationship between independent and dependent variables. To measure the effect of a moderator variable, a compound variable is formed by multiplying the independent variable with the moderator, which is then entered into the regression model. Control variables, which are also treated as independent variables, are selected based on their inclusion in previous studies.

4.3.3.1 Dependent Variable

The current study investigates whether the institutional profile of the home country influences subsidiaries of MNCs that are headquartered in different countries to adopt ISO 14001 standards in the context of Hong Kong. The adoption of the ISO 14001 standard is, therefore, treated as the dichotomous (0, 1) dependent variable that captures whether a company has adopted the ISO 14001 standard or not. To identify companies: value '1' was assigned for companies that have adopted ISO 14001

standards and value '0' for the companies that have not adopted the standards. For the most part, dichotomous variables are treated as ordinary nominal variables in the analysis (Bryman and Bell, 2011).

4.3.3.2 Independent Variables - Home Country Institutional Profile

The formal institutional structure is measured based on World Governance Indicators developed by Kaufmann et al. (2009). According to this framework the formal institutional structure of a country is composed of six indicators:

- i) voice and accountability;
- ii) political stability and absence of violence;
- iii) government effectiveness;
- iv) regulatory quality;
- v) rule of law; and
- vi) control of corruption.

This framework is a comprehensive representation of the formal institution of a country and has been widely used by scholars (e.g. Globerman and Shapiro, 2002; Gani, 2007; Globerman and Shapiro, 2003; Hur et al., 2011). These six dimensions correspond to three different aspects of the formal institution. The first two, voice and accountability, and political stability and absence of violence, reflect the process of government selection, monitoring or replacement. The second two, government effectiveness and regulatory quality, represent the capacity of the government to effectively formulate and implement sound policies and regulations. The final two, rule of law and control of corruption, reflect the respect of the state and its citizens for the institutions that govern the social and economic interactions among them (Kauffman et al., 2009). These indicators will thus enable the capturing of the formal institutional condition of a country in relation to political stability, effectiveness of governance mechanism and quality of regulation.

4.3.3.3 Moderating Variables

Industry type

Following Christmann and Taylor (2001) and Aguilera-Caracuel et al. (2013), to measure the moderating effects of industry type, I created a dummy variable for two categories: high polluting industry (e.g. chemical, manufacturing, construction, transport,

mining) coded as 1 and low polluting industry (e.g. financial service, technology, real estate, wholesale, and retail) coded as 0. The sample was split into two categories to test the moderating effect of the industry type. The firms in the sample were assigned to these two categories based on their NACE codes. This variable is a dichotomous nominal variable coded as categorical data for analysis.

GHG emission intensity

GHG Emission variable is defined as the emission of greenhouse gases (GHG), such as carbon dioxide, methane, CFCs (chlorofluorocarbons), nitrous oxide and peroxyacetyl nitrate (EPA, 2014). These gases are fundamental causes of greenhouse effect. To measure this variable, I used the indicator: per capita GHG emissions. This indicator refers to GHG emissions (metric tons of Co₂ equivalent) per person in each country across the globe. This variable is treated as a ratio variable and coded as numeric data. The data is obtained from the United Nation's World Development Indicators data on GHG emissions (2012). Each governance indicator's country-wise value was multiplied by the value for that country's GHG emissions to test the moderating effect of GHG emission intensity.

4.3.3.4 Control Variables

Headquarters and Subsidiary size

Prior studies have considered firm size as an important determinant of environmental conduct (e.g. Aragon-Correa, 1998; Christmann and Taylor, 2001; Christmann, 2004; Martin-Tapia et al., 2010). Scholars posited that larger firms have more resources to invest in EMS than smaller firms. In addition, large firms are more exposed to public scrutiny and face significant institutional pressure to improve environmental conduct (Uhlener et al., 2012; Greening and Gray, 1994; Tolbert and Zucker, 1983). Therefore, I have controlled for the size of headquarters and subsidiary by using 'total number of employees' as a proxy for firm size (King and Shaver, 2001).

Subsidiary Age

Subsidiary age is included as a control variable as it represents the experience of subsidiary in a host country. Prior studies have recognised subsidiary age as a determinant for voluntary environmental management practices by subsidiaries in a host country; this is because newly established subsidiaries are more influenced by the need for legitimacy than long established ones (Tatoglu et al., 2014).

Culture

Informal institution, broadly defined as cultural institution (Salomon and Wu, 2012), is argued to influence MNCs' environmental practices in different country contexts (Aguilera-Caracuel et al., 2013). Scholars have empirically shown that values, beliefs, customs, traditions, and codes of conduct that prevail in a country can influence the management decisions of MNEs regarding adaptation of environmental practices in the host country context (Aguilera-Caracuel et al., 2013). This is because societal beliefs, perception and attitude towards environmental issues in a particular country are embedded in a subtle social structure that is a socially constructed reality and manifested in practices, behaviour, and artefacts of members of the society (Hofstede, 1980b). Several scholars have attempted to measure a country's cultural dimensions and have developed frameworks for measuring these dimensions (Hofstede, 1980; House et al., 2004; Schwartz, 1994). Hofstede (1980a) developed indices of cultural dimensions to define a country's cultural environment based on five dimensions. He argued that the national culture conditions people's perceptions, thinking and way of doing things. Building on Hofstede's framework, House et al. (2004) developed a more comprehensive framework, GLOBE, to measure cultural dimensions.

Although Hofstede's cultural framework and the GLOBE framework are quite similar, the GLOBE framework not only provides data at the national level, it also captures data at the organisational level as it considers both value-based and practice-based dimensions (Gerhart, 2008). In management and organisation research, cultural dimensions, namely 'Power Distance' (PDI) and 'Uncertainty Avoidance' (UAI) are most relevant as these dimensions relate to the functioning of organisations (Hofstede, 2001). They are widely used by academic scholars to capture both value- and practice-based behaviour at the organisational level (Shenkar, 2001; House et al., 2004; Gerhart, 2008).

While PDI is related to preferences regarding the distribution of authority within an organisation, UAI refers to the importance of rules and procedures and the degree to which an organisation's members take risks. The current study has controlled for cultural dimensions; PDI and UAI analysing country level scores based on the GLOBE cultural dimension framework.

Gross Domestic Product (GDP)

GDP per capita is commonly used by researchers as an important indicator to measure a country's economic condition as it is correlated with consumer purchasing power, economic stability of country, inflation rate and intensity with the rest of the world (Berry et al., 2010; Tsang and Yip, 2007). Countries with varying levels of economic condition influence the way companies adopt EMS (e.g. Christmann and Taylor, 2001; Christmann, 2004; Dowell et al., 2000). The study uses the United Nation's World Development Indicators database for GDP (USD) per capita scores of different countries across the globe.

4.4: Method of Data Analysis – Binary Logistic Regression

In this section, the method of data analysis is discussed. When the dependent variable is measured as a dichotomous categorical variable, a specialised form of regression, logistic regression, is considered appropriate (Hair et al., 1998; Field, 2009). Given the nature of the hypotheses and dependent variable, a **binary logistic regression** method is therefore employed in this study to carry out the data analysis. This method enables the incorporation of non-linear effects, a wide range of diagnostics, and also enables direct prediction of the probability of an event occurring, given known values of independent (explanatory) variables (Field, 2009; Hair et al., 2006).

The dependent variable 'the adoption of ISO 14001 standards' is a categorical dichotomous variable that takes the value of either 0 or 1. The variance of this dichotomous variable is not constant. Such a relationship thus cannot be studied using an ordinary regression model because it would violate several assumptions. For example, violation of the assumption of linearity in a logistic regression assumes that there is a linear relationship between any continuous independent variables and the logarithm of the outcome variable. The violation of assumption of independence error produces 'overdispersion' by limiting standard errors and resulting in narrower confidence intervals. The usefulness of using a binary logistic regression method is that it allows evaluation of the degree and nature of the relationship between dependent and independent variables, and assessed the strength and statistical coefficient for each independent variable. The flexibility of this type of regression method also enables testing and controlling for the effects of several control variables identified in the literature review (Hair et al., 2006).

The binary logistic regression process calculates the logistic coefficient by comparing the probability of an event occurring with the probability of its not occurring (Hair et al., 1998; 2006). The resulting value from the equation therefore varies between 0 and 1. In relation to the current study, the value close to 0 would indicate that the probability of a subsidiary adopting the ISO 14001 standard is very unlikely to occur, given the set of independent variables. On the other hand, a value close to 1 would indicate the probability that adoption is very likely to occur. Each predictor or independent variable in the logistic regression has its own coefficient. The logistic regression equation from which probability of a subsidiary adopting ISO 14001 standards, given a set of independent variables, is predicted by:

$$(y) = \frac{1}{1 + e^{-(b_0 + b_1 X_{1i} + b_2 X_{2i} + \dots + b_n X_{ni})}}$$

In this equation, (y) refers to the probability of the adoption of the ISO 14001 standard. e is the base of natural logarithms and b_0 is the constant (intercept at Y-axis). X_1 is an independent variable and b_1 is the coefficient (line gradient) attached to it. The values of the parameters in the equation are estimated by fitting models, based on available independent variables, to the observed data. The chosen model is estimated by a maximum-likelihood estimation, when values of independent variables in the model result in values of outcome variable closest to the observed values. In this estimation, the selected coefficients in the chosen model make the observed values most likely to have occurred. Larger values of the log-likelihood statistic would indicate poorly fitting statistical models, because the larger the value of the log-likelihood, the more unexplained observations exist (Field, 2009).

To assess the fit of the model, the log-likelihood measure is used. This is presented by:

$$\log - \text{likelihood} = \sum_{i=1}^N [Y_i \ln(P(Y_i)) + (1 - Y_i) \ln(1 - P(Y_i))]$$

To determine how well the data fit the model, Nagelkerke pseudo R^2 value is considered as a useful statistical measure. This is based on the log-likelihood of the original model (LL(baseline)) before any independent variables were entered into the model. This is presented by the following equation where the sample size is n :

$$R^2 N = \frac{R^2 CS}{1 - \left[\frac{2((\text{baseline}))}{n} \right]}$$

$$R^2 CS = 1 - e^{-\left[\frac{2}{n} (LL(\text{new})) - (LL(\text{baseline})) \right]}$$

R^2_{CS} is Cox and Snell's R^2 (1989) calculation based on the log-likelihood of the new model ($LL(new)$) after the independent variables were entered into the model with the log-likelihood of the original model ($LL(baseline)$).

Chapter 5: Results

The purpose of this chapter is to present the research findings obtained from analysing the data. The chapter gives a detailed account of the steps of the quantitative data analysis process for hypothesis-testing, establishing the relevance of the proposed theoretical framework. The data analysis was carried out using SPSS statistical software. Section 5.1 begins with providing a discussion about the descriptive statistics ensuring the data represents the study well, the correlation matrix and the aspect of multicollinearity. Then Section 5.2 presents the empirical findings of the regression analysis process that explained the influence of different institutional dimensions on the adoption, validating the hypothesised relationship between institutional dimensions and the adoption of the ISO 14001 standard.

5.1: Descriptive Statistics

5.1.1: Measures of central tendency and dispersion

A descriptive statistical analysis and correlation analysis were first carried out using statistical software SPSS, which is widely used in business research because it can process large amounts of data. The purpose of using a descriptive statistical analysis was to describe and compare variables numerically, focusing on two aspects: the measure of the central tendency measure and measure of the dispersion. While the mean value is a measure of the central tendency of a distribution that provides the arithmetical average of a set of data in the sample calculating only ratio data, dispersion is measured by standard deviation (SD), which explains how well the mean represents the data (Field, 2000). The error term is the difference between the mean and the data value (the observation). It measures the deviation of the observation from the mean value that summarises a large set of data. A small SD value relative to the mean suggests the mean represents the data well. Alternatively, a large value suggests the mean does not represent the data well because the data values are widely dispersed (Collis and Hussey, 2009). These two statistical analyses are important for the study because they allow patterns to be discerned and positively aid in subsequent hypotheses testing (Lovie, 1986). Tables 4 and 5 present the descriptive statistics and correlation matrix for all the variables.

In the descriptive statistical analysis for dependent variable (DV) '*ISO 14001 standard*', the mean obtained was 0.05 with standard deviation (SD) equal to 0.215. Since this is a dichotomous variable, the mean value and low SD value relative to the mean suggests that the mean represents the data well and the data values are less dispersed.

Among independent variable (IV),

- 1) For *Home country Voice & Accountability (VA)*, the mean obtained was 66.36 and the SD was 22.764, this suggests that the average strength of VA in home countries in the sample is fairly strong and a moderately low variability is observed. The histogram (Appendix 1) shows that at least 27% of firms in the sample score high on VA.
- 2) For *Home country Political Stability and Absence of Violence, Home Country Government Effectiveness, Home Country Regulatory Quality, Home Country Control of Corruption*, the mean value ranges from 74 to 86.58, and SD value ranges from 10.75 to 18.04, with the lowest value 10.75. This suggests the mean value represents the data well. The histogram (Appendix 1) shows that nearly 27% of firms in the sample had a strong institutional condition, suggesting a good representation in the study.

Among control variables:

- 1) For *Subsidiary Age*, the mean obtained was 21.03 and maximum age 129, which suggests that the subsidiaries in the sample have been operating in Hong Kong for at least 21 years. The SD value is 13, which is low relative to the mean value suggesting good representation of the data. The histogram (Appendix 1) shows that nearly 10% of firms have operated in Hong Kong for a minimum of 6 years, and less than 10% of firms have operated for 40 years.
- 2) For *Subsidiary Size*, the mean was 458 for number of employees used as a proxy for subsidiary age. The maximum number of employees was 252,000. The histogram (Appendix 1) shows that that over 80% of firms have 100 employees, less than 20% of firms have less than 20 employees. Maximum number of firms are small size.
- 3) For *Headquarters' Size*, the mean was 25,893, and maximum number of employees was 631,465. Nearly 65% of firms have 20,000 employees.

- 4) For *Culture*, the mean was 5.01 for PDI and 4.4092 for UAI. SD is nearly 0.13473 for PDI and 0.34434 for UAI. The low SD scores relative to the mean suggests good representation of data. The histogram (Appendix 1) for both PDI and UAI shows that data are positively skewed. However, SD value is lower relative to the mean value for PDI suggesting the data represent the sample fairly well. In P-P plot (Appendix 1) scores show that PDI are clustered at the bottom end of the scale, suggesting that there are more firms representing a high degree of PDI in the sample.
- 5) For *GDP*, the mean was 37745.98 in USD and SD recorded as 14934.001. The histogram shows nearly 17% of the countries are in the low-income region with a GDP of less than US\$20,000, and over 20% of firms in the sample belong to an average income region. It can thus be observed that a range of low income and middle-income countries were represented in the study.

Table 3: Descriptive Statistics

Variable	Mean	Std. Deviation
ISO 14001	0.05	0.215
Subsidiary Age	21.03	13.201
Subsidiary Size	457.75	5898.931
Headquarters' Size	25893.55	61380.848
Industry Type	0.38	0.486
GDP	37745.98	14934.001
GHG Emission	2005062.2	3747674.843
Home VA	66.36	22.764
Home PS-AV	74	18.04
Home GE	92.77	10.75
Home RQ	89.80	16.840
Home RL	87.82	15.347
Home CC	86.58	13.807
Home PDI	5.0111	0.13473
Home UAI	4.4092	0.34434

N= 3643, where N is the total number of observations

Source: Devised by author

Among moderating variables:

- 1) For *Industry Type*, the mean was 0.38 and SD was 0.48. Industry type in this study is a dummy variable categorised as 'heavy polluting':1 and 'low polluting':0. From the pie chart (Appendix 1) it can be seen that nearly 29% of firms in the sample are from heavy polluting industry. The remaining 71% are distributed among wholesale, retail, and real estate industry.
- 2) For *GHG emission intensity*, the mean obtained was 2005062.2 and SD was 3747674.843. This statistics show that the SD value is greater than the mean score indicating greater dispersion of data from the central point. This could be interpreted that in the sample data of GHG emission intensity of countries varies significantly from the average value. The histogram shows that data is positively skewed. This means that number of countries with GHG Emission value closer to the mean value is greater.

5.1.2: Correlations

A correlation matrix for the variables is presented in Table 4. This table provides information about the association between two independent (predictor) variables. The purpose of a correlation analysis is to measure the direction and strength of any linear relationship between two numeric variables without assuming the causality (Collis and Hussey, 2009). The strength of the association is measured by the size of the correlation coefficient value. The value ranges between -1 to +1. The direction of the relationship is positive when the variables are directly related, which means as the values of one variable increases, values of the other variable also increases. However, when the direction of the relationship is negative, variables are inversely related.

It is observed (Table 4) that all independent variables are significantly positively correlated with each other. This suggests that a direct association exists between the institutional indicators. Although correlation analysis does not establish the causal relationship between variables, care was taken to interpret the result that two causally unrelated variables could be correlated because they both relate to a third variable.

5.1.3: Multicollinearity

To include more than one explanatory variable in the regression model, it is important to ensure that the variables are not strongly correlated with each other. If one independent variable is correlated with the other, it becomes impossible to obtain unique estimates of the regression coefficients. This situation is referred to as 'multicollinearity' (Hair et al., 1998). Given the fact that multicollinearity among

*P <.05 **P<.01 N 3643

Table 4: Correlation Matrix

Variable	ISO	homeV A	homeP SAV	homeG E	homeR Q	homeR L	Home CC	SubAge	Subsize	HQ Size	GDP	GHG	Industr y Type	PDI	UAI
ISO14001	1														
homeVA	.022	1													
homPSAV	.036*	.636**	1												
homeGE	.043**	.548**	.641**	1											
homeRQ	.017	.641**	.888**	.937**	1										
homeRL	.028	.750**	.910**	.935**	.968**	1									
homeCC	.036*	.749**	.901**	.931**	.928**	.976**	1								
SubAge	.163**	.142**	.160**	.151**	.149**	.167**	.172**	1							
SubSize	.044**	-.015	.019	.024	.024	.016	.012	.031	1						
HQSize	.189**	-.073**	-.289**	-.278**	-.322**	-.277**	-.227**	.091**	.102**	1					
GDP	.000	.587**	.539**	.559**	.643**	.674**	.691**	.100**	-.001	-.115**	1				
GHG	-.055	-.477**	.443**	.522**	.674**	.627**	.578**	.049**	.015	-.183**	.518**	1			
Industry pe	.068**	-.032	.018	.040*	.002	.019	.003	.057**	.011	.034	-.012	.005	1		
PDI	.035*	.014	-.390**	-.410**	-.341**	-.326**	-.386**	-.037*	-.015	.155**	-.237**	-.195**	-.056**	1	
UAI	-.038*	-.282**	-.290**	-.229**	-.289**	-.292**	-.222**	-.094**	-.008	.189**	-.335**	.097**	.026	.030	1

Source: Devised by author

institutional variables can affect the parameters of the regression models, a collinearity diagnostic test was also carried out to assess the presence of any multicollinearity between independent variables. A review of the statistics, such as tolerance and VIF (variance inflation factor) reveals potential collinearity problems within the data. The tolerance values for all the independent variables were less than 0.1, except homePSAV; this indicates a potential collinearity issue (e.g. Menard, 1995). For the VIF (variance inflation factor), the threshold point is 3, and any value greater than 10 is considered to cause serious collinearity (Myers, 1990). It is observed from the diagnostic test that all VIF values for all WGI variables were greater than 3, except homePSAV, suggesting high collinearity between variables. In relation to the variance proportion, independent variables that have high proportions on the small eigenvalue indicate that regression coefficients are dependent on each other.

Therefore, the current study tests each WGI variable in six separate regression models following other established studies (e.g. Globberman and Shapiro, 2002, 2003, 2005).

5.2: Hypotheses Testing

Tables 6, 7 and 8 present results of the binary logistic regression analysis. Regression models 1-6 represent separate estimates of each WGI (World Governance Indicators) variable. Nine control variables were also included in each model: SubAge, SubSize, HQSize, Industrytype, GDP, GHGEmission, Foreignfirms, PDI and UAI. Several statistical measures, such as goodness of fit measure, Wald statistic, Nagelkerke's R² and odds ratio (Exp (B)), were estimated to determine the statistical significance of the coefficient of WGI variables.

5.2.1: Hypothesis 1 (H1) - Effects of the home country institutional dimensions

The empirical findings provide support for hypothesis 1 (H1), theoretically explained in Chapter 3. It can be seen (Table 5) that three WGI variables (homePSAV, homeGE and homeCC) are positively and significantly associated with the adoption of ISO 14001 in Hong Kong. For variable homeVA, the result shows that the coefficient is negative and however, statistically significant. Findings also show that regression coefficients are small and there is no inflation in standard errors (SE). More precisely, this test suggests that the likelihood-ratio tests for overdispersions are statistically significant.

To run a robustness test, I have created a dummy variable 'Foreignfirm' where firms headquarters in foreign locations are given a value '1' and firms headquartered in Hong Kong were given a value '0'. I have then included this variable into each regression model while assessing the effect of each WGI variable. To assess whether regression models are correctly specified I carried out a Hosmer-Lemeshow's (1980) goodness-of-fit (GOF) test ; the findings show a non-statistically significant chi-square value where the P-value is greater than 0.05. According to Hosmer-Lemeshow's measure, if the P-value is greater than 0.05 it indicates that variables fit the model well. Thus, the findings confirm a good model fit for all WGI variables. As the predictors are continuous variable, Nagelkerke's pseudo R^2 measure is also taken into consideration to predict whether each regression model actually fits the data. The pseudo R^2 values across Models 1-6 show a decent fit of the data to the models. Lastly, the odds ratio is estimated using $EXP(B)$ value, which is found to be greater than 1 for homePSAV, home GE and homeCC. This indicates that these three predictors have better explanatory power; with an increase in the value of these predictors, the probability of a subsidiary adopting the ISO 14001 standard in Hong Kong increases.

5.2.2: Hypothesis 2 (H2) - Moderating effect of the industry type

Tables 6.1 and 6.2 show the moderating effect of the high polluting and low polluting industry on the relationship between the home country institutional profile and the adoption of the ISO 14001 standard in Hong Kong. The findings are consistent with this hypothesis in the case of high polluting industry where it is observed (Table 6.1) that coefficients of all the WGI variables are positively significant in the Wald test (p-value ranging from 0.01 to 0.001). It is also observed that the significance level of the coefficients has increased. The findings also suggest a good fit of data to the model as pseudo R^2 values and the Hosmer-Lemeshow test indicates that p value is greater than 0.05. In addition, the odds ratio statistics also suggests strong support for H2, confirming that the positive effect of the home country formal institutional profile on the adoption of ISO 14001 by MNC subsidiaries is greater in the case of high polluting industry than low polluting industry.

However, as shown (Table 6.2) in the case of low polluting industry coefficients of all the WGI variables are negatively significant in the Wald test. This implies that result of imprinting effects of the home institutional profile on firms operating in low polluting industries does not support H2 on moderating effect.

5.2.3: Hypothesis 3 (H3) - Moderating effect of the GHG emission in the home country

Table 7 shows a moderating effect of the GHG emission intensity on the relationship between formal institutional dimensions and the adoption of the ISO 14001 standard in Hong Kong. As predicted, the findings show that coefficients of at least two WGI variables (homePSAV, and homeGE) are positive and statistically significant. This indicates that the higher level of GHG emissions in the home country positively moderates the effect of stronger home country institutional condition on the adoption of the ISO 14001 standard by MNC subsidiaries. The result thus shows support for H3. The pseudo R^2 value in each model suggests that models fit the variables decently. It is observed that the significance of the constituent term PSAV's coefficient has increased slightly due to the interactive effect of the GHG emission variable.

Table 5: Regression results for six WGI variables

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
HomeVA	-0.028* (0.012)					
HomePS-AV		0.053* (0.022)				
HomeGE			0.150** (0.057)			
HomeRQ				0.010 (0.033)		
HomeRL					0.036 (0.031)	
HomeCC						0.082* (0.036)
SubAge	0.035*** (0.006)	0.036*** (0.006)	0.035*** (0.006)	0.035*** (0.006)	0.035*** (0.006)	0.035*** (0.006)
SubSize	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)
HQSize	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Foreignfirm	-0.934* (0.444)	0.453 (0.374)	0.331 (0.337)	-0.075 (0.278)	0.165 (0.344)	0.797 (0.503)
IndustryType	-0.523** (0.194)	-0.515** (0.194)	-0.504** (0.194)	-0.548** (0.193)	-0.540** (0.193)	-0.532** (0.194)
GDP	0.000 (0.000)	0.000 (0.000)	0.000** (0.000)	0.000 (0.000)	0.000 (0.000)	0.000** (0.000)
GHGEmission	0.000** (0.000)	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
PDI	0.260 (1.000)	4.823** (1.792)	5.677** (1.813)	1.635 (1.522)	2.813 (1.636)	5.273** (2.044)
UAI	-1.119** (0.409)	-0.565 (0.398)	-0.834* (0.409)	-1.008* (0.440)	-1.059** (0.413)	-1.212** (0.425)
Pseudo R2	0.151	0.154	0.163	0.145	0.147	0.154
Hosmer and Lemeshow	0.508	0.271	0.910	0.086	0.240	0.476

Robust standard errors in parentheses *p< 0.05, ** p< 0.01, *** p <0.001 N= 3643

Source: Devised by author

Table 6.1: Regression result of the moderating effects of high polluting industry

Variables	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
HighPollVA	0.007** (0.003)					
HighPollPSAV		0.007** (0.002)				
HighPollGE			0.006** (0.002)			
HighPollRQ				0.006** (0.002)		
HighPollRL					0.006** (0.002)	
HighPollCC						0.006** (0.002)
ForeignFirm	0.074 (0.272)	-0.023 (0.270)	-0.051 (0.270)	-0.061 (0.270)	-0.037 (0.270)	-0.026 (0.270)
SubAge	0.036*** (0.006)	0.035*** (0.006)	0.035*** (0.006)	0.035*** (0.006)	0.035*** (0.006)	0.035*** (0.006)
Subsize	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)
HQsize	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
GDP	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
GHGEmission	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
PDI	1.430 (0.871)	1.477* (0.880)	1.343 (0.873)	1.370 (0.871)	1.384 (0.873)	1.399 (0.875)
UAI	-0.926* (0.394)	-0.925* (0.270)	-0.948* (0.393)	-0.958* (0.393)	-0.949* (0.393)	-0.951* (0.393)
Pseudo R^2	0.144	0.146	0.146	0.146	0.146	0.146
Hosmer and Lemeshow's	0.861	0.371	0.368	0.606	0.370	0.281

Robust standard errors in parentheses *p< 0.05, ** p< 0.01, *** p <0.001 N=1392

Source: DeVised by author)

Table 6.2: Regression result of the moderating effects of low polluting industry

Variables	Model13	Model14	Model15	Model16	Model17	Model18
LowPollVA	-0.008** (0.003)					
LowPollPS-AV		-0.006** (0.002)				
LowPollGE			-0.005** (0.002)			
LowPollRQ				-0.006** (0.002)		
LowPollRL					-0.006** (0.002)	
LowPollCC						-0.006** (0.002)
ForeignFirm	-0.192 (0.274)	-0.065 (0.269)	-0.054 (0.269)	-0.047 (0.269)	-0.076 (0.270)	-0.076 (0.270)
SubAge	0.035*** (0.006)	0.036*** (0.006)	0.036*** (0.006)	0.035*** (0.006)	0.035*** (0.006)	0.036*** (0.006)
SubSize	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.00)	0.000* (0.000)	0.000* (0.000)
HQSize	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
GDP	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
GHGEmission	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
PDI	1.160 (0.876)	1.036 (0.859)	1.150 (0.862)	1.146 (0.865)	1.268 (0.870)	1.105 (0.861)
UAI	-0.929* (0.274)	-0.974* (0.395)	-0.942* (0.393)	-0.925* (0.392)	-0.952* (0.393)	-0.928* (0.392)
PseudoR2	0.147	0.143	0.144	0.145	0.145	0.144
Hosmer and Lemeshow R^2	0.443	0.168	0.213	0.650	0.282	0.263

Robust standard errors in parentheses *p< 0.05, ** p< 0.01, *** p <0.001 N= 2248

Source: Devised by author

Table 7: Regression result of the moderating effect of GHG Emission Intensity

Variables	Model 13	Model 14	Model 15	Model 16	Model 17	Model 18
GHGhomeVA	0.000 (0.000)					
GHGhomePS AV		0.000* (0.000)				
GHGhomeGE			0.000* (0.000)			
GHGhomeRQ				0.000 (0.000)		
GHGhomeRL					0.000 (0.000)	
GHGhomeCC						0.000 (0.000)
HomeVA	-0.032 (0.018)					
HomePS-AV		0.023 (0.024)				
HomeGE			0.083 (0.053)			
HomeRQ				0.013 (0.033)		
HomeRL					0.025 (0.032)	
HomeCC						0.058 (0.037)
Foreignfirm	-0.967* (0.444)	0.143 (0.379)	-0.171 (0.383)	-0.259 (0.442)	0.063 (0.349)	0.747 (0.490)
GHGEmission	0.000* (0.000)	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
SubAge	0.037*** (0.006)	0.037*** (0.006)	0.037*** (0.006)	0.037*** (0.006)	0.037** (0.006)	0.037*** (0.006)
SubSize	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)	0.000* (0.000)
HQSize	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
GDP	0.000 (0.000)	0.000* (0.000)	0.000* (0.000)	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)
PDI	0.098 (1.014)	4.031* (1.652)	4.585** (1.641)	1.999 (1.612)	3.007 (1.563)	5.099** (1.974)
UAI	-1.114** (0.408)	-0.628 (0.381)	-0.892* (0.397)	-1.259* (0.588)	-1.289** (0.440)	-1.380*** (0.428)
Pseudo R2	0.142	0.150	0.161	0.136	0.140	0.149
Hosmer and	0.945	0.840	0.812	0.816	0.761	0.842

Robust standard errors in parentheses

*p<0.05, **p<0.01, ***<p.001 N= 3643

Source: Devised by author

Chapter 6: Discussion

The aim of this chapter is to interpret the findings of this research obtained from the data analysis in the previous chapter, reflecting on previous research findings. The chapter provides a discussion about how these findings have filled the research gap outlined in Chapter 1, and contributed to the literature about imprinting effects of home institutional conditions on the adoption of ISO 14001 standard by MNC firms. In Section 6.1, the effects of the WGI indicators on the adoption of the ISO 14001 standard are discussed. In Section 6.2, findings related to the moderating effects of industry type and the intensity of greenhouse gas emissions on the above relationship is discussed. The following section (6.3) highlights the significance of some of the control variables on the criterion (dependent) variable. The subsequent section (6.4) discusses the implication of the study on the institutional-based theoretical perspective that explained MNC firms' adoption of ISO 14001 standard.

6.1: Influence of the Home Country Institutional Profile

The result of the first hypothesis testing has partially confirmed that the home country's institutional condition does matter in the adoption of certifiable environmental management standards, i.e. ISO 14001 certification. The empirical findings indicate that three WGI variables make a significant positive contribution to the prediction of the adoption of ISO 14001 standard by MNC subsidiaries in Hong Kong due to imprinting effects. This provides support to the proposed argument that subsidiaries of MNCs that are headquartered (or have operating HQs) in home countries with high level of political stability and lack of violence, effective governance mechanism, and low level of corruption (representing the formal institutional profile) adopt the ISO 14001 standard due to the imprinting effect.

Previous studies have emphasised that foreign MNC subsidiaries do not fully comply with the ISO 14001 standard in countries with a weak institutional structure (Christmann, 2004; Christmann and Taylor, 2006). Further, scholars have also claimed that a high formal institutional distance between the home country and host country influences firms to localise environmental management standards according to the host country condition, thus reducing costs (Aguilera-Caracuel et al., 2012; Aguilera-Caracuel et al. 2013). Other studies have concluded that availability of complimentary capabilities and export

orientation influence the adoption of the ISO 14001 standard at the subsidiary level (Darnall et al., 2008; Tatoglu et al., 2014). The findings of this study, as evidenced in the above discussion, provide a contrasting perspective of these claims by previous scholars.

This study emphasises the role of the home country formal institutional condition in MNC firms' adoption of the ISO 14001 standard at the host location. The empirical findings thus validate the theoretical proposition presented in this study using the organisation imprinting theory and the institutional theoretical perspective that MNC subsidiaries adopt the ISO 14001 standard complying with the home country's formal institutional condition due to imprinting effects. This study thus advanced existing knowledge in IM research regarding MNCs' environmental management issue by adding an explanation of the imprinting effect of home country institution.

Interestingly, data resulted in a negative significant relationship between 'voice and accountability (VA) dimension and ISO 14001 standard' variables. Although VA is one of the key elements of the institutional structure of a country, in this case, it seems to be not as relevant as other WGI indicators. As previously argued, the existence of law and enforcement, transparency, and effectiveness of governance mechanisms, that define the quality of an institution (Potoski and Prakash, 2004; Potoski and Prakash, 2005s), are more relevant from the perspective of legitimacy (Bansal and Roth, 2000) and reputation (Dowell et al., 2000) issue of firms regarding their environmental behaviour. Indeed, VA addresses a country's citizen's freedom of expression, freedom of association and a free media, and democratic power to hold organisations accountable for their actions. However, in relation to firms' environmental management issue, efficient governance system for monitoring firms' environmental actions and stable government for establishing a strong institution, and effective enforcement mechanism to control corruption, are more likely to affect a firm's environmental practices. Therefore, this study concludes that the result does support the argument that home country institutional conditions do have imprinting effects on MNC subsidiaries' adoption of the ISO 14001 standard.

6.2 Moderating effects of industry type and Greenhouse Gas Emission Intensity

With regards to the outcome of the interaction hypotheses, moderating effect of ‘industry type’ on the relationship between institutional dimensions and ISO 14001 standard adoption, a dummy variable was created for both high polluting industry and less polluting industry. Moderating effect on each WGI variable were treated separately to provide a robust estimate. The regression models do not estimate the direct effects of WGI variables rather their interactive effects with industry type. Each model therefore included an interactive effect of the high polluting industry with each WGI variable and control variables. This was repeated to estimate the interactive effect of low polluting industry separately.

The empirical findings support the hypothesised moderating effect of industry type, providing evidence that the imprinting effect of the home country institutional profile on firms’ adoption of the ISO 14001 standard is more in the case of firms operating in high polluting industries than low polluting industries. This is because MNCs operating in pollution intensive industries face more scrutiny and intervention of different stakeholder groups (Khanna and Anton, 2002; Altman, 2001; Bansal and Roth, 2000; Bansal and Hunter, 2003). Therefore, these firms tend to adopt EMS standard reflecting the imprinting effect of the home institutional profile to maintain legitimacy. Their subsidiaries in different host locations also adopt EMS following the parent company thus reflect imprinting effect.

Finally, to estimate the moderating effect of ‘GHG emission’ variable each regression model included an interactive effect of GHGEmission with each WGI variable, each WGI variable and GHG Emission variable along with control variables. The empirical findings show that there is a significant positive relationship between the interactive effect of two WGI indicators and GHGEmission: GHGEmissionPSAV, GHGEmissionGE and the adoption ISO 14001 certification. The result thus partially supports the hypothesis put forward in the previous section that firms originating in countries with high level of GHG emissions reflect greater level of imprinting effect of home country institution than firms originating in countries with low level of GHG emission. The result could be interpreted this way that due to the high level of GHG emissions, firms originating in these countries experience greater level of governance and monitoring mechanism by the local institution to oversee environmental conduct of firms.

These firms therefore adopt ISO 14001 standards reflecting the imprinting effect of home institution. Their subsidiaries subsequently adopt ISO 14001 standards due to the imprinting effect of home institution.

6.3: Influence of the Control Variables

The findings presented in Table 5 in regression Model 1-6 also show that some of the control variables (i.e. sub age, sub size, HQ size, GDP, GHG emission, and cultural variables) as discussed in the literature review, are relevant to the analysis. In particular, sub age, sub size, HQ size, GHG emission, and cultural dimension (informal institution) have significant effects ($p < 0.05$) on the adoption of ISO 14001 standard. These findings are in line with previous findings where it is shown that larger firms are more likely to adopt environmental management standards (Aragon-Correa, 1998; Sharma, 2000). Tatoglu et al. (2014) empirically showed that foreign subsidiaries adopt the ISO 14001 standard influenced by market, institutional and firm-level factors. Firms in industrialised countries with a higher GDP level tend to adopt the ISO 14001 standard more readily due to a stronger institutional structure (Pinske, 2007). A high level of informal institutional distance between the home country and host country encourages firms to adopt standardised environmental practices (Aguilera-Caracuel et al., 2013). However, the result shows that industry type is negatively associated with the adoption of ISO 14001 standard. This implies that foreign MNC subsidiaries in heavy polluting industry adopt the ISO 14001 standard pressurised by the home country institutional conditions. However, if they do not face any institutional pressure they may not adopt the standard given the fact that this standard is voluntary in nature.

6.4: Theoretical implications of the Study

This study has made some important contributions to knowledge by employing ‘imprinting theory’ in the context of MNCs environmental management issue. Based on the empirical evidences I suggest that the formal institution of a home country has ‘imprinting effects’ on firms’ environmental management efforts i.e. the adoption of ISO 14001 standard. This study, unlike previous research, emphasises the role of the ‘home country’ institutional condition in EMS adoption by MNC firms. The findings show that the institutional condition of the home country influences the parent company of MNCs to adhere to the institutional requirement at the home country level. MNCs therefore adopt the standard for legitimising their operations. Subsidiaries of MNCs are subsequently influenced by the parent company to adopt ISO 140001 standards reflecting the imprinting effect of home country institutional condition. Firms adopt this standard depending on the degree of influence the formal institution of a country has on them.

Chapter 7: Conclusions

This chapter presents the conclusion of this study, highlighting a brief summary of the thesis and empirical findings followed by their implications for managers and policy makers. The chapter then presents the contributions of this research and limitations. In the concluding section, future directions in this area of research are provided.

7.1: Brief Summary of the Thesis

The purpose of this research was to gain a better understanding about the imprinting effects of institutional conditions on the adoption of ISO 14001 standard by MNC subsidiaries in a host context. The increasing importance of MNC firm's environmental management issue, due to globalisation, has been the motivating factor to undertake this research. As outlined in Chapter 2, environmental management research in the international context has tended to focus on the legitimisation issue and stakeholders' demands, predominantly using the institutional theoretical perspective. The research then advanced to investigating the influence of firm-level factors, in particular, resources and capabilities, enabling firms to adopt certifiable environmental management standards using the resource-based view theoretical perspective.

Although early studies in environmental management have adopted an interpretivist philosophical position to understand the motivation behind firms' environmental management efforts, the findings lacked generalisability as the data that was gathered reflected subjective views and were only relevant to the firms under investigation. In addition, the exploratory nature of these studies lacked an accurate reflection of the reality as findings were socially constructed to understand 'how' and 'why' firms are motivated; they could not be quantifiable (e.g. Bansal and Roth, 2000; Bansal and Hunter, 2003; Jiang and Bansal, 2003).

Research then progressed to adopting a positivist approach to identify the determinants of firms' environmental management practices that could be generalisable across a wider context. These studies tried to explain the determinants and why firms adopt environmental management standards, and to what extent firms are able to adopt these standards (e.g. King and Lenox, 2001; King et al. 2005; Delmas, 2002; Khanna and Anton, 2002; Anton et al., 2004; Christmann and Taylor, 2001, 2006; Darnall et al. 2008;

Aguilera-Caracuel et al., 2013). Despite significant theoretical and empirical contributions provided by previous studies in this area of research, a detailed understanding of the imprinting effect of institutional condition of the home country on MNC firms' adoption of environmental management standards received much less attention. Given the importance of headquarters' role in MNC subsidiaries' strategic choices, and consequent business activities across the globe, it was important to understand what role the home country institution plays in MNC subsidiaries' environmental management efforts.

In Chapter 3, the theoretical framework of the study was presented. This was built on the logic of imprinting theory and economic institutional theoretical perspective (Stinchcombe, 1965; North, 1990). The hypotheses of the study aimed to validate imprinting effects, providing empirical evidence that a home country's institutional condition effects subsidiaries' environmental management behaviour in a cross-country setting.

In Chapter 4, a detailed account of the methodology was presented, giving justification for undertaking this research. This study adopted a positivist philosophical approach to provide a better explanation about the influence of the multidimensional nature of an institution. For this purpose, the study carried out an explanatory quantitative secondary data analysis method using data from multiple sources. Employing the imprinting theory and the economic perspective of institution theory, the study examined the effects of formal institutional structure to determine why MNC subsidiaries adopt the ISO 14001 standard, and to what extent home country institutional conditions influence the adoption process. The study contributed to the literature by examining imprinting effects of the home country institutional profile, an area that has been overlooked in previous research. The hypotheses were tested using the WGI variables, which represented the formal institutional condition of different home countries.

In Chapter 5, empirical findings were reported that validated the theoretical propositions and confirmed that the institutional condition of the home country has imprinting effects on the adoption of the ISO 14001 standard by MNC subsidiaries. The results suggest that the home country institution puts pressure on headquarters to manage their environmental conduct. MNCs therefore participate in the ISO 14001 certificate programme influenced by the institutional pressure at the home country level to maintain legitimacy and

reputation. To maintain consistency of their businesses across the network, headquarters mandate the adoption of ISO 14001 certification at the subsidiary level. Subsidiaries in different host countries therefore face pressure to adopt this standard to comply with headquarters' mandates, which reflects home country institutional requirements. Subsidiaries' environmental management efforts through the adoption of ISO 14001 standard are thus influenced by the home country's institutional condition, rather than the host country's institutional condition.

The empirical findings also extend the view that imprinting effects of home country institution on the adoption of ISO 14001 standard by MNC subsidiaries increases more in the case of high polluting industry than low polluting industries. In line with the proposed theoretical framework, this study also suggests that imprinting effects of home country institution on the adoption of ISO 14001 standard increases in the case of home countries that have a high level of GHG emissions.

This study thus fulfils the research objective and fills the research gap. After reviewing the literature and conducting an empirical analysis, the research offered some interesting insights, and advanced existing knowledge offering theoretical and empirical contributions. In doing so, the study contributes to the growing literature in environmental management research in the International Management discipline that is grounded in organisational imprinting theoretical perspective underlying positivist philosophical paradigm.

7.2: Implications for Managers and Policymakers

The findings of this study have important practical implications for managers and policy-makers. According to the organisational imprinting theoretical perspective managers develop common 'mental model' while taking actions following home country's institution (Denzau and North, 1994). This is evident in this study where the findings suggest that subsidiary managers would habitually follow the home country's institutional requirement and comply with them. The findings thus have implications for MNC firms' managers. Managers involved in firms operating in countries with weak institutions may practice environmental activities, which may not be environmentally friendly. This is because institutional actors in countries with weak institutional structure may not intervene much

on firms' environmental conducts due to inefficient governance mechanism, lack of stringent laws or ineffective law enforcement mechanism. This may allow firms to get away with environmental violations and practices, which are ultimately detrimental for the environment. This kind of behaviour may trickle down to the subsidiary level and have an imprinting effect across subsidiary operations. Subsidiary managers would habitually follow bad environmental practices reflecting home country's institutional conditions. Therefore, managers at the subsidiary level should try to unlearn bad environmental practices and minimise environmental damage by making effort to manage subsidiaries' environmental activities by participating in ISO 14001 certification. Managers of companies operating in high polluting industries should be even more careful as environmental effects are historically significant in these industries. Subsidiaries may unknowingly follow certain practices that are practised by the parent company in the home country, which may be counterproductive to environmental management concerns for MNC firms. This may ultimately have a negative impact on firms' operation. By making strategic decision that are environmentally responsible and taking accountability of environmental practices, managers of firms operating in high polluting industries can help firms minimise the adverse effect of their operations on the environment. The adoption of ISO 14001 standard can help these firms minimise their environmental impact significantly.

I also suggest that managers should take a more comprehensive approach of the institutional condition, rather than just the regulatory and cultural factors. An awareness of government effectiveness, political stability of the country, mechanisms of law and enforcement, and levels of transparency can contribute to making sound judgments about participating in the ISO 14001 certification programme, and mandate the standard across the MNC network for all subsidiaries to adopt. They can thus assess the economic benefit of adopting the standard considering perceived risks and uncertainties associated with institutional condition of the home country.

The policymakers can draw insights from this study to develop favourable and supportive policies at the home country level, and thus create incentives and encouragement for MNC firms to participate in ISO 14001 certification. The policymakers can thus contribute to improving the home country's institutional quality, which can positively influence MNC firms to minimise their environmental impact through adopting the ISO 14001 standard voluntarily, and mandate the standard to ensure their subsidiaries across different countries comply with it.

7.3: Limitation of Research and Future Research Direction

Although the study contributes to the literature theoretically and empirically providing generalisable empirical evidence, there are some limitations to this study. The study mainly focuses on the home country's formal institutional condition explaining the role it plays in terms of governance, law and enforcement mechanisms, and levels of corruption. The study does not take into account other country-level factors such as administrative factors concerning bureaucratic and political condition, financial factors in terms of the level of financial resources and knowledge resources available. Future research could focus on these aspects to determine their effects, which may enhance understanding and add further rigour to the current empirical findings.

From a methodological perspective, firstly, the study conducts a cross-sectional research due to the limitation of data availability of the ISO 14001 certification period for firms. Further, this study considers only one single host country and a variety of home countries due to the time constraints. Future research could extend the sampling frame and include multiple host locations, thus pairing up with each home country for a more rigorous investigation and comparative study on a broader context. Secondly, the directory of ISO 14001 certified firms only offered information as to whether a firm is certified or not; it does not provide detailed information about the number of practices adopted by firms as per the standard. However, this information is difficult to access from a secondary source of data, which restricted the exploration of the extent of adoption of ISO 14001 at the subsidiary level. Although the ISO 14001 standard suggests voluntary disclosure of environmental reporting, the report does not specify whether firms are continuously implementing these practices. Future research could potentially incorporate a survey of firms to collect data about the number of practices firms have adopted.

Finally, future research could carry out a comparative study between developed country's MNCs and emerging economy MNCs to offer insights on the variation in environmental management efforts in a cross-country setting.

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Appendix I

Table A1: List of MNC subsidiaries in different Industry sectors and their home countries

Home Country	No. of Subsidiaries in Hong Kong	Industry Type					
		Manufacturing	Wholesale	Construction	Retail	Real Estate	Transport
Antigua & Barbuda	2	0	2	0	0	0	0
Austria	8	1	7	0	0	0	0
Australia	18	4	14	1	0	0	0
Belgium	18	6	10	1	1		1
Brazil	1	0	0	0	1	0	0
Belize	1	0	1	0	0	00	
Canada	13	3	8	0	2	0	0
Switzerland	95	32	57	0	2	1	3
Chile	1	0	1	0	0	0	0
China	310	95	141	27	14	15	18
Colombia	1	0	1	0	0	0	0
Cyprus	1	0	1	0	0	0	0
Germany	147	38	87	5	3	1	13
Denmark	18	3	12	0	0	0	3
Spain	11	2	5	3	1	0	0

Finland	9	3	5	1	0	0	0
France	69	10	49	2	2	1	5
Great Britain	69	15	41	1	8	4	0
Hong Kong	1737	505	641	149	103	282	54
Indonesia	1	0	1	0	0	0	0
Ireland	8	0	7	1	0	0	0
Israel	6	1	5	0	0	0	0
India	19	6	13	0	0	0	0
Italy	48	4	35	0	7	0	2
Japan	321	95	207	5	3	0	11
Korea	14	4	8	0	0	0	2
Kazakhstan	1	0	1	0	0	0	0
Lebanon	1	0	0	0	1	0	0
Liechtenstein	3	2	1	0	0	0	0
Liberia	1	0	1	0	0	0	0
Luxembourg	16	3	6	0	5	0	2
Monaco	1	1	0	0	0	0	0
Marshall Island	3	1	0	0	1	1	0
Macao	1	0	1	0	0	0	0
Mauritius	3	2	1	0	0	0	0
Malaysia	27	7	19	0	1	0	0

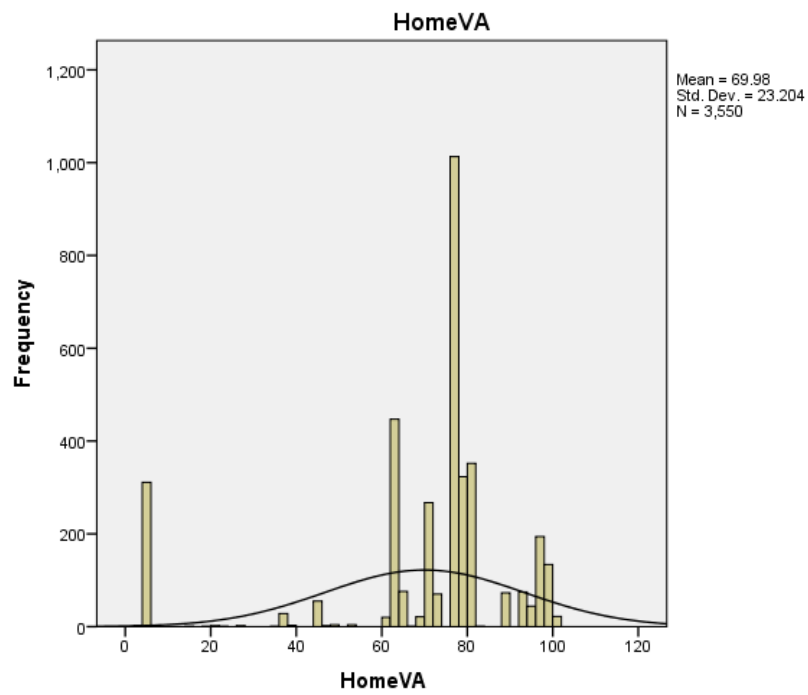
Netherlands	29	8	17	1	3	0	0
New Zealand	1	1	0	0	0	0	0
Panama	1	0	0	0	1	0	0
Philippines	3	2	0	0	0	1	0
Portugal	1	0	1	0	0	0	0
Qatar	1	1	0	0	0	0	0
Russia	2	0	1	0	1	0	0
Saudi Arabia	2	0	2	0	0	0	0
Seychelles	4	0	2	0	2	0	0
Sweden	22	4	16	0	2	0	0
Singapore	55	21	28	2	1	1	2
Thailand	2	1	1	0	0	0	0
Turkey	2	0	2	0	0	0	0
Taiwan	67	14	48	3	1	0	1
United Arab	1	0	1	0	0	0	0
United States	346	122	122	6	18	4	5
Samoa	8	2	1	0	5	0	0
South Africa	5	1	2	1	1	0	0

Source: the ORBIS database compiled by author

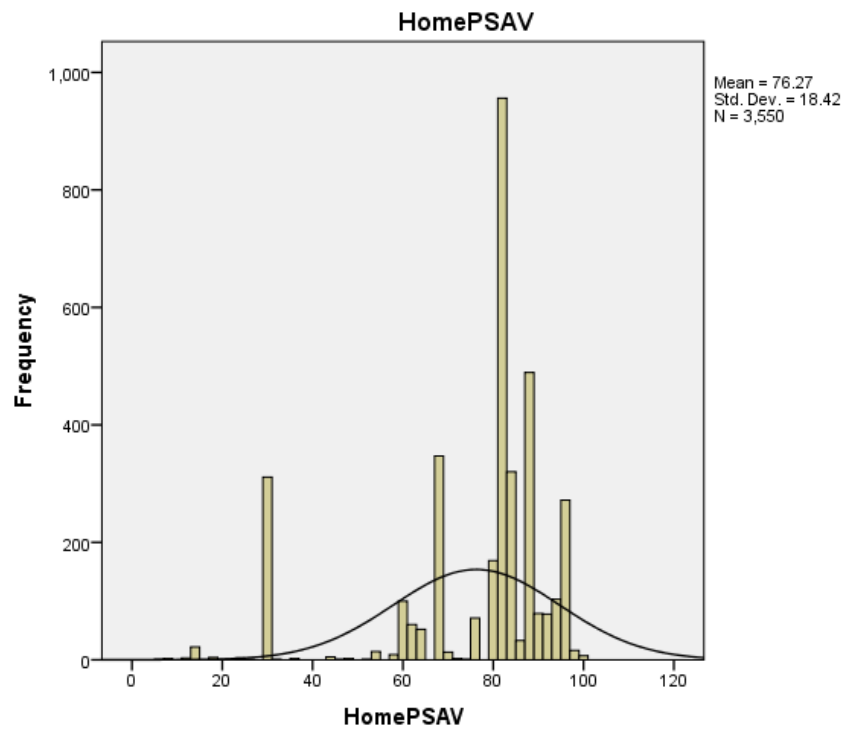
Appendix II (all graphs devised by author)

Histogram charts of independent and control variables

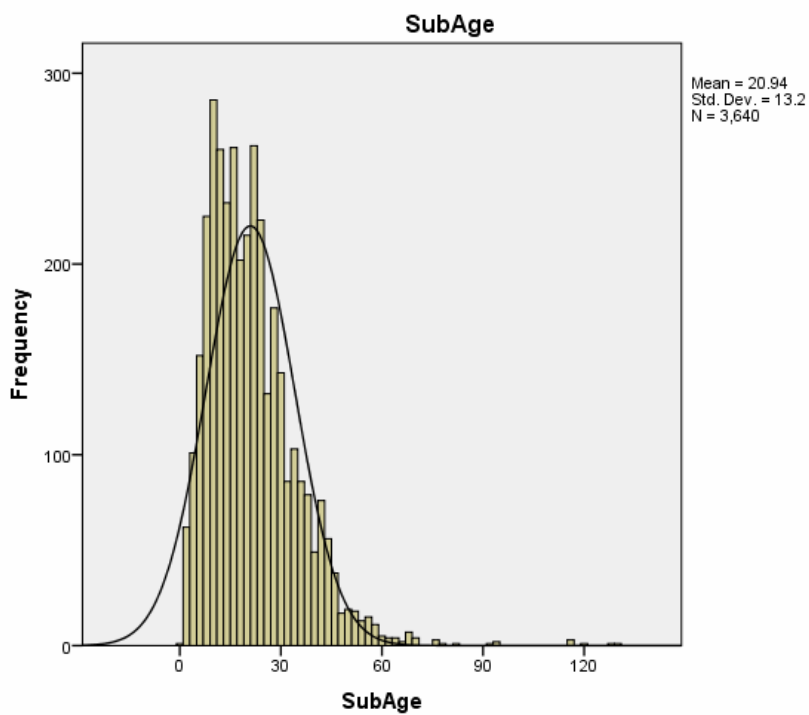
Home country voice and accountability:



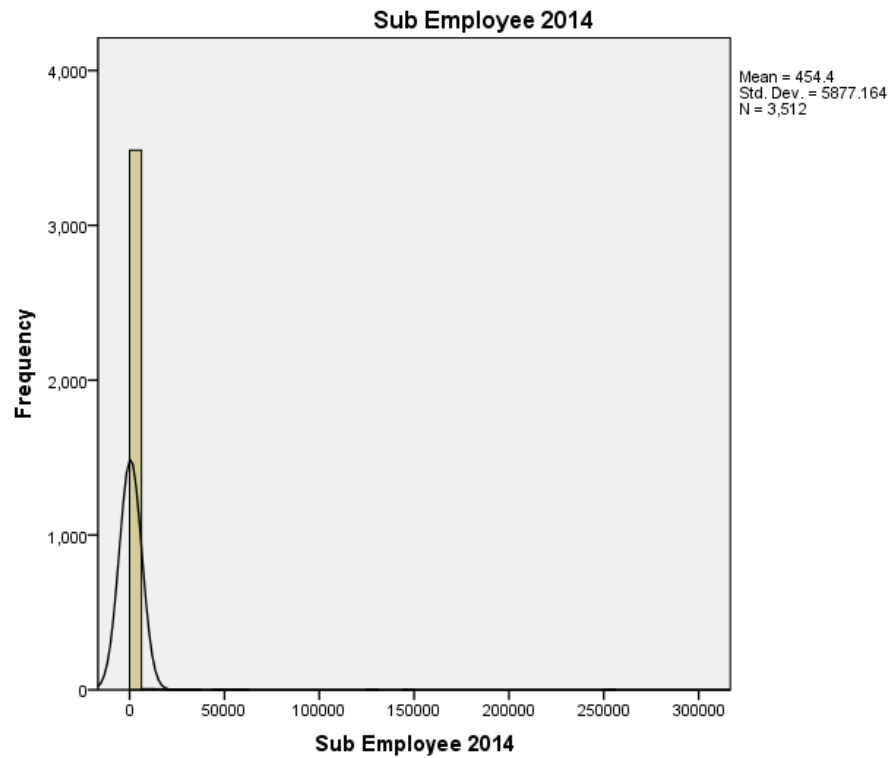
Home country political stability and absence of violence:



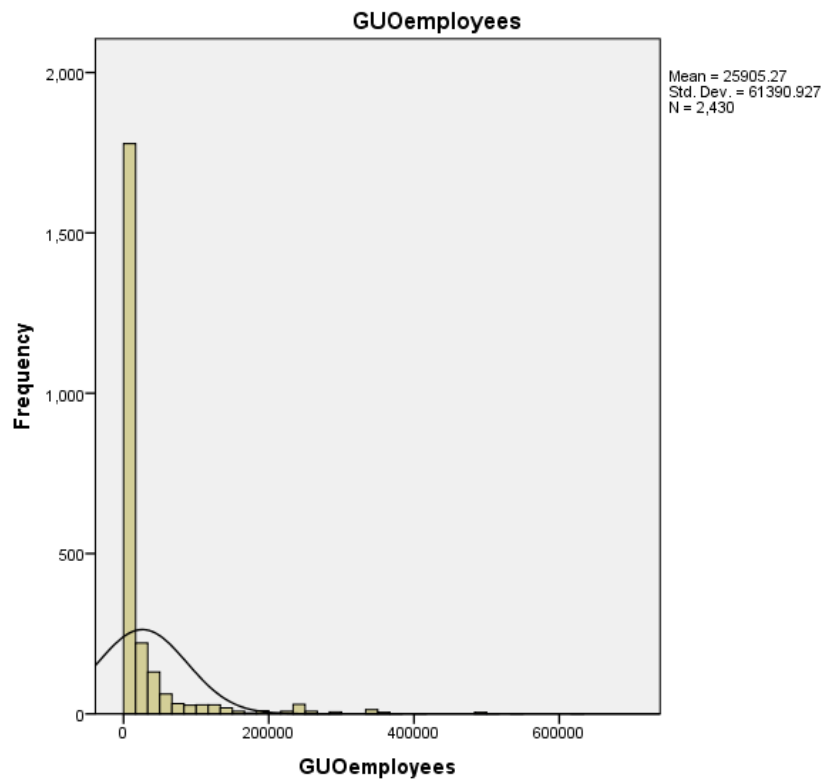
Subsidiary Age:

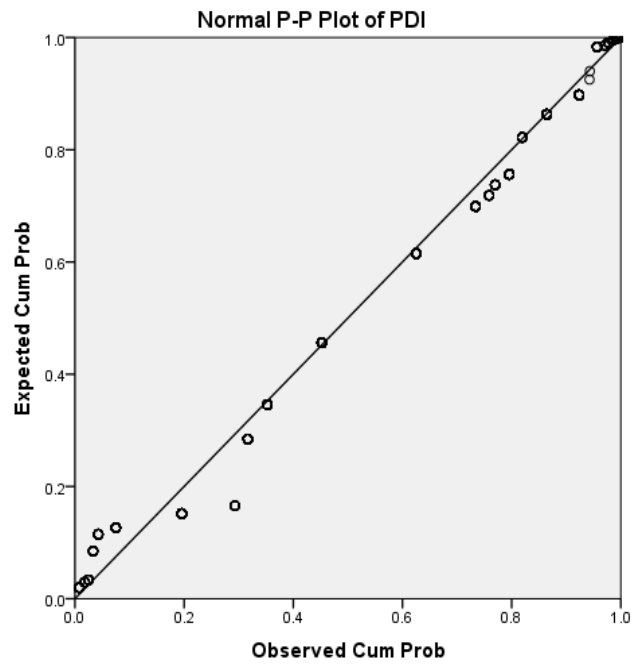
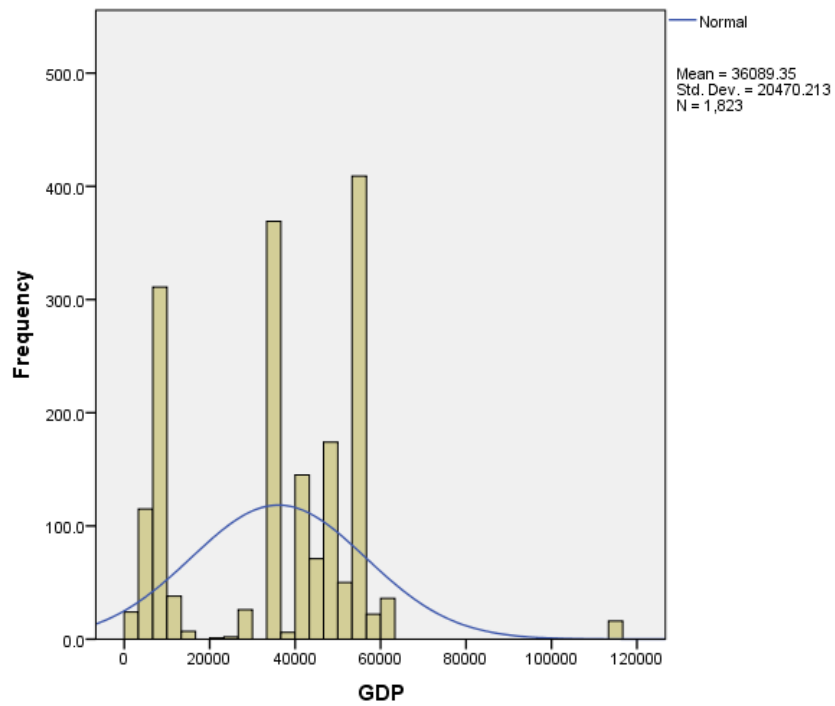


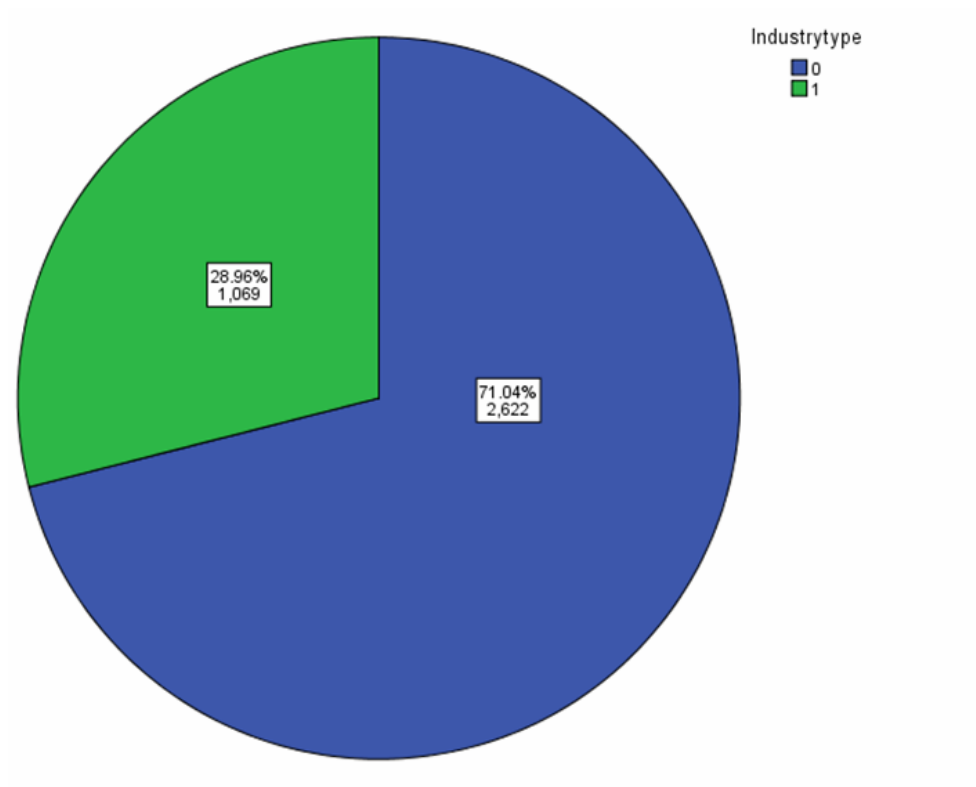
Subsidiary Size:



Headquarters' Size:



Culture:**Gross Domestic Product:**

Industry Type:**Green House Gas Emission Intensity:**