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Green Retailing: Construct measurement and its antecedent-adoption-performance relationships

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CERTIFICATE OF ORIGINALITY

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ABSTRACT

The emerging trend of "greening" has led retailers to recognize the importance of integrating environmental management practices into their retail value chain operations. However, prior literature lacks research on the topic of Green Retailing (GR), which is largely unexplored in terms of its construct measurement, adoption, antecedents, and performance outcomes. In this study we aim to (i) establish a theoretical framework to identify the different dimensions and roles of retailers in the adoption of GR, (ii) conceptualize and empirically validate the measures of GR, (iii) identify the motives of firms to adopt GR, and (iv) examine the performance implications of GR adoption.

To achieve these objectives, we carried out a study organized in three inter-related stages to obtain answers to address the research issues pertinent to GR. We first conducted an exploratory qualitative study focusing on the GR-oriented approaches and practices undertaken by world-class retailers to explore the phenomenon of GR in the retail industry. We then carried out a quantitative survey study with data collected from 141 retailers in Hong Kong to empirically validate the theoretical measures developed in this study for evaluating GR adoption and to test the hypothesized GR antecedent-adoption-performance relationships. Finally, we performed a qualitative analysis using secondary data from 375 publicly traded retailers in Japan to seek further empirical evidence in support of our findings.

Our results reveal that GR consists of three dimensions: *internal-improvement based GR*, *external-coordination based GR*, and *supportive-development based GR* with a total of

ten practices subsumed under these dimensions. The ten practices are green store operations, green transportation, green procurement, green product design, green packaging, green promotion, green after-sales service, green policy, green research development, and green human resource development. We also find that environmental regulatory pressure, customer pressure, supplier pressure, and competitive pressure as perceived by retailers are positively associated with the extent to which GR is adopted by retailers. In addition, we obtain empirical evidence that GR adoption is positively associated with the financial and environmental performance outcomes of the retailers.

The findings of this research are useful to researchers striving to come to grips with the important issues associated with GR – its phenomenon, antecedents, dimensions, and impact on firm performance. We provide managerial insights from the theoretical findings to guide practitioners on the ways to design and plan for the greening of their retail activities. This study also provides a helpful reference for policy makers, assisting them in formulating proper environmental regulations and promoting voluntary measures for environmental protection for the retail industry.

RESEARCH HIGHLIGHTS

The major findings of this study are highlighted below:

1. Green Retailing (GR) consists of three dimensions: *internal-improvement based GR*, *external-coordination based GR*, and *supportive-development based GR*, comprising the following ten management practices that underpin the adoption of GR:
   - green store operations
   - green transportation
   - green procurement
   - green product design
   - green packaging
   - green promotion
   - green after-sales service
   - green policy
   - green research development
   - green human resource development

2. Environmental regulatory pressure, customer pressure, supplier pressure, and competitive pressure as perceived by retailers are important antecedent factors that influence their extent of GR adoption.

3. GR adoption is associated with financial and environmental performance gains to retailers.

SELECTED RELATED PUBLICATIONS OF THE CANDIDATE

Journal Papers

Lai, K.H., Cheng, T.C.E, & Tang, A.K.Y. 2010. Green retailing: Factors for success. *California Management Review*, 52(2): 6-31.

Tang, A.K.Y., Lai, K.H., & Cheng, T.C.E. 2012. Environmental governance of enterprises and their economic upshot through corporate reputation and customer satisfaction. *Business Strategy and the Environment,* 21(6), 401-411.

Prajogo, D., Tang, A.K.Y., & Lai, K.H. 2012. Do firms get what they want from ISO 14001 Adoption?: An Australian Perspective. *Journal of Cleaner Production,* 33, 117-126.

Lai, K.H., Tang, A.K.Y., & Cheng, T.C.E. Unleashing the value of green retailing, revised and re-submitted to *Production and Operations Management*

Tang, A.K.Y., Lai, K.H., & Lloyd, A.E. Power of environmentally conscious customers on green retailing, submitted to *Industrial Marketing Management*

Tang, A.K.Y., Lai, K.H., & Cheng, T.C.E. Green retailing evaluation and its applications, submitted to *Journal of Retailing*

Tang, A.K.Y., & Lai, K.H. Stakeholder pressures on green retailing adoption, working paper

Conference Papers (Presentations)

Tang, A.K.Y. (May 2010). An integrated coordination- and institutional-theoretic framework for examining green retailing and sustainable development in China. 21th Annual Production and Operations Management Society (POMS) Conference, Vancouver, Canada.

Tang, A.K.Y., Lai, K.H., & Cheng, T.C.E. (January 2011). Unleashing the value of green retailing. 2nd Production and Operations Management Society (POMS) – Hong Kong International Conference, Hong Kong, China.

Tang, A.K.Y., Lai, K.H., & Cheng, T.C.E. (March 2011). Environmental governance and the role of customer satisfaction on economic performance. Asia Association for Global Studies (AAGS) 2011 Conference, Tokyo, Japan.

Tang, A.K.Y. & Lai, K.H. (May 2012). Green retail logistics and its implication on the financial and environmental performance. 5th International Forum on Shipping, Ports and Airports (IFSPA), Hong Kong, China.

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AWARDS OF THE CANDIDATE

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Honorable Mention in the Best Student Paper Award, 2nd Production and Operations Management Society (POMS) – Hong Kong International Conference in 2011.

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LSIT OF ABBREVIATIONS

AVE	average variance extracted	GSCM	green supply chain management
CFA	confirmatory factor analysis	GSO	green store operations
CFI	comparative fit index	GTS	green transportation
CITC	corrected-item-total correlation	HKRMA	Hong Kong Retail Management Association
CMP	competitive pressure	IFI	incremental fit index
CNG	compressed natural gas	I-I	internal-improvement
COP	cost pressure	ISO	International Organization for Standardization
CSP	customer pressure	LED	light-emitting diode
CS	corporate sustainability	LEED	Leadership in Energy and Environmental Design
CSR	corporate social responsibility	MSC	Marine Stewardship Council
df	degree of freedom	NGO	non-governmental organization
E-C	external-coordination	NPO	non-profit organizations
EM	environmental management	NRBV	natural resource-based view of the firm
EMS	environmental management system	n.s.	not significant
EMT	ecological modernization theory	PBB	polybrominated biphenyls
ENP	environmental performance	PBDE	polybrominated diphenyl ethers
ERP	environmental regulatory pressure	OECD	Organization for Economic Co-operation and Development
EU	European Union	RBV	resource-based view of the firm
FMCG	fast moving consumer goods	RMESA	root mean square error of approximation
FNP	financial performance	RoHS Directive	Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment
FSC	Forest Stewardship Council	ROI	return on investment
GAS	green after-sales service	S-D	supportive-development
GHR	green human resource development	SEM	Structural Equation Modeling
GLI	green policy	SME	small and medium enterprises
GPC	green procurement	SPP	Supplier pressure
GPD	green product design	TQEM	total quality environmental management
GPG	green packaging	WEEE	Waste Electrical and Electronic Equipment
GPO	green promotion		
GR	green retailing		
GRD	green research development		

1. INTRODUCTION

1.1. Motivations of this Study

1.1.1. The Natural Environment and the Emergence of Greening Business

The economic and environmental need for transition to a low-carbon economy is now at the forefront of human society. Treating the environment as a free good results in high levels of pollution caused by the economic development (Welford, 2003). The evidence for rapid climate changes due to pollution is compelling. Global sea level rose about 17 cm in the last century; the acidity of surface ocean waters has increased by 30% since the beginning of the Industrial Revolution; ice sheets are shrinking with Greenland having lost 150 to 250 cubic kilometres of ice per year between 2002 and 2006; and global average temperature is forecast to rise 4°C toward the end of the 21st century (Global Greenhouse Warning, 2012; National Aeronautics and Space Adminstration). The climate change can be attributed to human activities that alter the composition of the global atmosphere (Houghton et al., 2001). To tackle climate change, the Kyoto Protocol was adopted at Kyoto, Japan on 11 December 1997 and enacted on 16 February 2005. The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change with the major feature of setting binding targets for 37 industrialized countries and the European community for reducing greenhouse gas emissions (United Nations Framework Convention on Climate Change, 2012). Governments worldwide have enacted numerous policy measures which include environmental regulations on business firms. For example, the European Union (EU) has adopted legal measures that condition market access for autos, household appliances,

electronic equipment, and biotechnological products on compliance with new product-based environmental requirements. End-of-Life Vehicles Directive was adopted by EU in 2000 to avoid waste by improving product design and increasing the recycling and re-use of waste. Meanwhile, on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS Directive), manufacturers and importers are barred from placing on the market electrical and electronic equipment containing lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) (Hagen, 2006). The above EU regulations have posed a worldwide challenge not only to European firms, but also firms on the other side of the globe such as Chinese manufactures because they are expected to incorporate the eco-design throughout the product life cycle to change their materials, design, and manufacturing processes (Yu, Welford, & Hills, 2006). Regulations compliance, therefore, becomes one of the factors linking the relationship between business firms and the natural environment. Beyond regulations, as the awareness and concerns of environmental issues are increasing under the transition to a low-carbon community, the concept of "greening business" emerges together with the advocates of corporate social responsibility and sustainability which signify the necessity for firms to achieve the triple bottom line – social (people), economic (profit) and environmental (planet).

The pillar of environmental integrity has become one of the important fields in business studies in recent decades to address the corresponding opportunities and challenges. Going green is taking center stage in boardrooms around the world as green strategies garner growing interest among top managers, academics, and stakeholders alike (Cronin,

Smith, Gleim, Ramirez, & Martinez, 2011). Over two-thirds of Fortune Global 500 enterprises publish some forms of environmental reports (Brockett, Gilbert, Starbuck, & Steiner, 2010). Environmental issues are posing new challenges for firms to overcome as they encounter stricter environmental regulations, along with mounting stakeholder concerns as well as public pressure to incorporate environmental issues in their decision-making and operations (Banerjee, Iyer, & Kashyap, 2003; Leonidou & Leonidou, 2011). Although governments can formulate strategies and frameworks encouraging the green movement and sustainable development, it is ultimately the product manufacturers and end consumers who will fundamentally determine the extent to which such aims are achieved (Jones, Comfort, Hillier, & Eastwood, 2005). As a result, retailers are posited to play a crucial role as intermediaries between product manufacturers and customers (Jones et al., 2005). This notion is also echoed by Durieu (2003) who argues that retailers' pivotal role has the ability to exert pressure in favor of bringing about changes in production processes and sustainable consumption patterns. On the other hand, retail chain activities have been causing resource inefficiencies which can be tangible such as improper handling of discarded packaging and intangible, for instance, under-utilized trucks in delivering goods (Lai & Cheng, 2009; Porter & van der Linde, 1995). Inefficient and wasteful use of resources not only pollutes the natural environment but also increases the operational cost of retailers (Porter & Kramer, 2006). Some of the biggest retailers, such as Wal-Mart, Tesco, and Carrefour, are already leading the transition to more environmentally friendly practices in all corners of the organization (RSR, 2009). The benefits of green practices in the retail sector are increasingly visible and recognized. Wal-Mart, for instance, estimates it could save around 3,800 trees and

1,000 barrels of oil with an economic saving of US$2.4 million by reducing excessive packaging of its private-label toy products (Wal-Mart, 2006). Many retailers have thus begun to embrace green practices in the hopes of increasing resource efficiency and achieving economic and environmental performance gains. The green practices in the retail sector are described as "Green Retailing" in a growing number of business articles (e.g. The Business Press, 2008; Business Week, 2008; Chain Store Age, 2008; Retailing Today, 2007; Building Design & Construction, 2001). Green retailing (GR) is set to be the way forward as declared by Sir Terry Leahy, Chief Executive of Tesco, "*We Must Go Green*" (The Guardian, 2008). A longitudinal survey carried out by Retail Systems Research (2009) reported that 48% of retailers view sustainability as a strategic direction to their entire business, compared with 44% 12 months earlier. The era of GR has come.

1.1.2. The Need for Green Retailing Research

Various CSR/sustainability studies have been carried out in the retail context. For example, Jones et al. (2005) explored the CSR reports and statements of 20 retailers in the UK to examine how retailers tackle the issue of sustainable development from environmental, societal, and economic standpoints. Similarly, Kolk, Hong and van Dolen (2010) examined the CSR practices of four Chinese retailers and four international retailers from economic, environmental, and social perspectives with specific categorization such as employee compensation, donation, local sourcing, recyclable materials and energy conservation, emissions and waste, labor relations, occupational health and safety, equal labor, etc. A study was also carried out specifically in a fashion retail supply chain context surveying 48 respondents which include

suppliers, manufacturers, retailers, textile recycling actors, service providers, and independent experts to study how economic, environmental, and social pillars can be achieved in fashion retail supply chains (de Brito, Carbone, & Blanquart, 2008). Adopting a multiple case study approach with fourteen cases, Quak and Koster (2007) examined the impact of regulatory pressures on retailers' logistical concepts and the consequential financial and environmental performance. Trends in sustainability reporting among Fortune Global 250 was studied with retailers as one of the categories together with other industries including automotive, chemicals and pharmaceuticals, computers and electronics, etc (Kolk, 2003).

Taking a more focused inspection on the studies of the greening business, existing environmental management studies have been confined to the manufacturing context (Lai & Wong, 2012; Melnyk, Sroufe, & Calantone, 2003; Vachon & Klassen, 2007; Zhu, Geng, Sarkis, & Lai, 2011a) and various industries such as the pulp and paper industry (Barla, 2007), furniture industry (Handfield, Walton, Seegers, & Melnyk, 1997), computer industry (Rosen, 2001; Rosen, Beckman, & Bercovitz, 2002), etc. Environmental management research dedicated to the retail sector is relatively scarce although there were studies sampling retailers as one of the study groups (Banerjee et al., 2003; Bansal & Roth, 2000; Henriques & Sadorsky, 1996). Unequivocally, the role of retailers as an intermediary between suppliers and customers in coordinating and fostering green practices across their value chains has been largely ignored despite the call for life-cycle consideration in all the stages of the value chain (Handfield et al., 1997; Porter & Kramer, 2006; Ross & Evans, 2002; Roy & Whelan, 1992). Studies focusing

on examining green practices in the retail sector are much desired and valuable to the academia and the industry.

1.1.3. Significance of GR Globally and in Hong Kong

A number of retailers have become the largest companies and leading firms worldwide. 47 of the Global Fortune 500 companies and 25 of Asia's Top 200 companies are retailers (Sanblue Enterprises Pvt. Ltd., 2007). Traditionally, retailers have been regarded as merely distributors of merchandise, adding little value for consumers or suppliers. But now retailers play a significant role in various aspects of the entire value chain, such as offering more services and a broader range of products to customers, setting product standards, promoting products, generating and disseminating information on consumer tastes and behavior in support of the supplier's response to customer demand (Nordås, 2008). Retailers are thus increasingly expected to mitigate the environmental damage.

In Hong Kong, retailing activities are prosperous and the environmental aspect of retailing is being emphasized by both the private and public sectors in the city. As highlighted in the *Hong Kong SAR Government Budget Speech 2009-2010* (HKSAR, 2009), efforts will be boosted in promoting investments and economic activities that protect the environment and save energy for "Green Economy". The retail industry is an important part contributing to the development of Green Economy due to its economic and environmental significance in Hong Kong. The retail industry accounted for 27.5% of Hong Kong's GDP with the total retail sales in the year 2005 amounting to HK$204.6

billion dollars (HKRMA). Its environmental implications can be reflected in a survey conducted at landfills. The number of plastic shopping bags disposed at landfills in Hong Kong was estimated to be about 23 million per day while over 30% came from retailers including supermarkets, convenience stores, bakeries, and the catering business (China Daily, 2006). The government is planning for legislation to combat the resultant pollution but they lack reference as GR is still a relatively new concept in Hong Kong. This situation highlights an urgent need to carry out a research study of GR in Hong Kong to provide a timely reference for policy makers as well.

In the following sections, we will first discuss the background of this study with the evolution of retailing and the contextual situations giving rise to GR. As portrayed by Cappelli and Sherer (1991), context is the surroundings associated with phenomena which help to illuminate that phenomena, typically factors associated with units of analysis above those expressly under investigation. Before developing research objectives, it is essential to understand the contextual background as it entails linking observations to a set of relevant facts, events, or points of view that make possible research and theory that form part of a larger whole (Rousseau & Fried, 2001). The discussion on the contextual background of GR will provide an overview of this important research topic.

1.2. Contextual Background

1.2.1. Evolution of Retailing

Retailing refers to "the activities involved in selling goods and services to ultimate consumers" (Runyan & Droge, 2008) with the function of removing discrepancies between the successive stages of physical production and between the last stage of this production and consumption (Dreesmann, 1968).

As early as the 1800s, retailers were implementing the "reducing cost" concept in their management philosophy. According to the basic profit equation***: profit= price - cost***, reducing cost is a means to increase the profit of a firm. During the 1800s, retailers reduced cost by stocking large quantities of goods from wholesalers and thus sold the goods at a lower price to attract customers (Alexander & Akehust, 1999). In the 1900s, retailers such as Marks & Spencer started purchasing in bulk directly from manufacturers in many different industries and countries to take cost advantage from globalization (Alexander & Akehust, 1999; Marks and Spencer). In the 2000s, retailers seek to reduce cost by minimizing waste in the retail value chains. Wal-Mart, for instance, has procured hybrid diesel-electric trucks and refrigerated trucks that feature a small power unit for cooling so the engine could be turned off when the truck is stopped. The logistics network of Wal-Mart has achieved roughly 25% improvement in fuel efficiency, amounting to almost US$75 million in annual savings and a reduction of 400,000 tons of carbon dioxide emissions per year (Plambeck, 2007). Tesco, meanwhile, has used reusable 'green trays' to replace the cardboard boxes and other packaging for transporting and displaying products. This has helped Tesco save over 132,000 tonnes of

cardboard packaging (Tesco, 2007). Food Lion, the other prominent example, has successfully reduced energy consumption by more than 25%, or 2.45 trillion BTUs- a sales equivalent of nearly US$1.34 billion by its energy-conservation efforts adopting and applying energy management practices and technology throughout its store operations (Food Lion, 2006). These practices not only save cost but also mitigate the environmental impact, giving rise to the development of GR.

1.2.2. Contextual Situations Giving Rise to GR

Apart from economic motivation to reduce cost, surrounding contextual situations are also urging retailers to embrace green practices. Retailers are increasingly expected to mitigate environmental damage and are urged by regulatory forces, customer expectations, as well as community group pressures to embrace green practices for improving their value chains.

There are increasing environmental regulations exerting greater pressures on retailers to emphasize environmental protection in their operations. For instance, New York Governor David Paterson signed legislation that requires large retail stores to recycle plastic carry-out bags and if they fail to comply, the State Department of Environmental Conservation will penalize them with a fine. The regulation went into effect January 2009 (Sichko, 2008). Failure to comply with regulations can be expensive. For example, Home Depot was sued by the state of Colorado because the company violated the Clean Water Act at more than 30 construction sites in 28 states where new Home Depot stores were being built. In 2008, Home Depot agreed to pay a US$1.3 million penalty and

implement a nationwide comprehensive, corporate-wide program to prevent storm water pollution at each new store (Environmental Leader, 2008a). A similar consent decree was reached with Kmart. This retailer was sentenced to a fine of US$102,422 to settle self-disclosed violations of federal environmental regulations discovered at 17 distribution centers in 13 states. The company reported violations of clean water, hazardous waste, and emergency planning and preparedness regulations to the U.S. Environmental Protection Agency (Environmental Leader, 2007).

In addition to regulatory forces, community group pressures have fostered the adoption of GR. B&Q, a British-based do-it-yourself retailer, was criticized by non-governmental organizations (NGOs) for its sourcing of tropical hardwood in the early 1990s. To resolve this crisis, B&Q shifted to purchasing certified wood conforming to the requirements and standards of the Forest Stewardship Council (FSC), a non-profit organization devoted to encouraging responsible management of the world's forests (Overdevest, 2004).

Retailers, on the other hand, are under the influence of consumers' evolving preferences for environmentally friendly merchandise to adopt GR. Environmentally conscious customers - who have at least some knowledge of, and a willingness to buy, environmentally friendly products - represent 87% of the adult population in the USA (Agriculture and Agri-Food Canada, 2007). Information Resources, Inc. found customers are actually maintaining or increasing spending on green products despite the economic downturn (Information Resources Inc., 2009). Nevertheless, The Natural

Marketing Institute expected the green consumer marketplace to reach $845 million by 2015 (LOHAS, 2007). It is appealing to this large customer segment if environmental attractions are developed in product/service offerings. While the segment is expanding, consumers are increasing their expectations, requirements, and standards in evaluating the green practices of retailers. As stated by Stuart Rose, CEO of Marks & Spencer, "Customers care more than ever how products are made" (Marks and Spencer, 2006). This expanding customer segment is exerting greater influence and driving retail chains to raise their environmental standard and quality. An increasing number of retailers (e.g., The Body Shop, Carrefour Group, and Metro Group) have emphasized protection of the natural environment as one of their company missions.

The above cases highlight the benefits of GR which are attractive to retailers seeking cost and service improvements. Pressures from regulators, customers, and the public also prompt retailers to pursue green practices. GR is now an environmental trend and also the key to surviving in the competitive retail environment.

1.2.3. Performance Contingencies of GR- Cases in the UK and HK

Practitioners are keen to understand how GR can be successfully implemented. However, a similar GR program can in effect produce different results, as illustrated in the cases of Tesco and ParknShop, each being one of the largest retailers in the UK and Hong Kong respectively. In November 2007, ParknShop put a halt on distributing free plastic bags to its customers. Shoppers would instead be required to donate HK$0.2 (approximately US$0.025) for each plastic bag requested. Such a policy triggered a flood of customer

complaints against the retailer. ParknShop was criticized for a lack of transparency in the use of the customer donation. Customers were skeptical as to whether the donation would be used to support the Hong Kong Community Chest (a local charity organization) or environmental groups as promised by the retailer. There was also criticism of a lack of consistency in policy implementation whereby customers were asked to donate in some outlets, while other stores continued to distribute plastic bags free-of-charge. Customers also lodged complaints that the policy was implemented at short notice and they found it difficult to cope with the change. Subsequently, ParknShop lifted the policy, aborting a well-intentioned environmental campaign only five days after its launch (Hong Kong Apple Daily, 2007).

In comparison, Tesco cut the number of plastic bags without adding a bag tax or levying charges on the bags. They launched the Green Clubcard Point in 2006, through which customers collect points by reusing bags and redeeming the points for such things as gift vouchers, magazine subscriptions, and insurance. This campaign allowed Tesco to save two billion plastic bags in about two years, and the plastic bag usage by its customers was down 40% compared with the same period two years before (Environmental Leader, 2008b; Tesco, 2007). These two cases highlight the performance contingencies of retailers' environmental efforts despite their similar endeavors to pursue GR.

We now turn to discuss the conceptual background of GR before identifying the research gaps for this timely study topic.

1.3. Conceptual Background

1.3.1. Issues Arising from the Extant Research

There are plenty studies in the environmental management literature covering a broad range of related topics on green practices. These include the adoption of the environmental management system (Arimura, Hibiki, & Katayama, 2008; Barla, 2007; Florida & Davison, 2001), and investigation of individual green practices such as eco-design changes (Yu, Hills, & Welford, 2008), voluntary environmental code (Howard, Nash, & Ehrenfeld, 2000), sustainable logistics (Frota Neto, Bloemhof-Ruwaard, van Nunen, & van Heck, 2008; Srivastava, 2008), green marketing (Chamorro, Rubio, & Miranda, 2009), etc. However, studies examining green practices in the retail sector with systematic analyses and categorizations of these practices grounded in management theories are scanty; the antecedents and the findings of performance outcomes of these green practices are either under-investigated or inconsistent in prior literature. The issues related to GR research are discussed in the following sections.

1.3.1.1. Lack of Consensual Definition and Construct Measurement of GR

There is no universally accepted definition of GR. Conducting a cursory search of business articles published between 2001 and 2011 using the research engine PROQUEST, we found different management issues associated with GR ranging from green procurement, green product design, green store design, green transport, green packaging, green technology investment, through to energy and water conversation of retailers, and cooperation with suppliers, NGOs, and customers for waste reduction (Table 1.1). Selecting and implementing an appropriate strategy can determine the long-

term success or failure of a retailer (Gauri, Trivedi, & Grewal, 2008). While GR is an emerging strategic approach for retail management, it is largely unexplored in terms of its nature, scope, and construct measurement. The lack of consensual definition of GR provides no clue for retailers to understand, let alone implement GR despite increasing concern of environmental protection in the retailing sector. Constructs are building blocks of theory, which are critical for capturing and communicating the often subjective meaning and interpretation of an abstraction by individual subjects. Construct clarity is of utmost importance as clear constructs facilitate communication between scholars, while improved clarity of constructs enhances researchers' ability to empirically explore phenomena, and allows for greater creativity and innovation in research (Suddaby, 2010). To advance knowledge on GR, it is thus timely to develop a multi-dimensional conceptualization that is theoretically grounded and empirically validated. As emphasized by Suddaby (2010), defining the essence of an abstraction precisely that differentiates it from other similar abstractions produces serious advantages for a scholarly community - it avoids confusion in sub-communities of researchers caused by a lack of a common means of communication. Hence, developing a "common and distinctive language" particularly for GR is an essential prerequisite for scholars to exchange ideas and build knowledge in this emerging field. Developing a GR measurement model is also of practical importance at this early stage of the GR movement and helpful for the diffusion of retailing-based green practices. Such a model provides retailers with a measurement tool to understand the different facets of GR implementation and evaluate their practices when adopting/considering the adoption of

GR. This also answers the call in the retailing literature to address novel phenomena that interest practitioners and provide handy managerial reference (Brown & Dant, 2008).

In view of an absence of a measurement scale for evaluating GR implementation in the literature, which is of both academic and managerial relevance and significance, development of a theoretical construct of GR and a measurement scale for it is thus critical in this emerging research field.

Table 1.1 Review of topics related to GR practices from business articles published between 2001 and 2011 by PROQUEST search
(continued on the next three pages)

Authors	Publication Title	Document Title	Scope of GR Examined
(Anonymous, 2011)	Investment Weekly News	Retail industry leaders association; landlords and retailers gather to discuss greener retail shopping experience	Energy efficient retail stores to enhance the overall shopping experience for consumers and waste reduction
(Johnson, 2010)	Dealernews	Going green? Even Wal-Mart knows eco-retailing is smart	Green transport by increasing the efficiency of its truck fleet; Green packaging; Green store design
(Piell, 2009)	Buildings	A closer look at green retail facilities	Green store design for energy conservation and green energy utilization
(Wilson, 2009b)	Chain Store Age	The future looks green	Energy conservation and greenhouse gas reduction
(Wilson, 2009c)	Chain Store Age	The power of green	Green store design for waste reduction; Water and energy conservation; Green energy utilization

(Wilson, 2009a)	McClatchy-Tribune Business News	Green retail tips discussed	Waste reduction; Green store design for waste reduction, water and energy conservation; Green design; Green human resource development
(Sieroty, 2008)	The Business Press	Coachella Valley to get first green retail centers	Green store design for waste reduction, water and energy conservation
(Field, 2008a)	Chain Store Age	Starbucks and REI share environmental commitment	Green store design for energy conservation
(Field, 2008b)	Chain Store Age	Sustainable principles guide building development	Green store design for waste reduction and energy conservation
(Wilson, 2008a)	Chain Store Age	Focus on solar power	Green store design with green energy utilization
(Wilson, 2008c)	Chain Store Age	Sustainability translates into profitability	Green store design for energy conservation
(Green & Capell, 2008)	Business Week	Carbon confusion	Supplier cooperation in carbon labeling; Green packaging; Green transport
(Wilson, 2008b)	Chain Store Age	Going Green	Reducing energy consumption in stores and the supply chain; Green packaging
(Duff, 2007)	Retailing Today	Carefully organizing 'green' efforts is key to reaping rewards	Green transport; Green procurement; Green design; Considering customer feedback in waste reduction
(Thompson, 2007)	Journal of Retail & Leisure Property	Green retail: Retailer strategies for surviving the sustainability storm	Green store design for energy conversation; Green energy utilization; Green transport

(Plambeck, 2007)	Supply Chain Management Review	The greening of Wal-Mart's supply chain	Green transport; Green packaging; Green product design Green procurement; Cooperating with suppliers and nongovernmental organizations
(Wilson, 2008b)	Chain Store Age	Going Green	Reducing energy consumption in stores and the supply chain; Green packaging
(Duff, 2007)	Retailing Today	Carefully organizing 'green' efforts is key to reaping rewards	Green transport; Green procurement; Green design; Considering customer feedback in waste reduction
(Thompson, 2007)	Journal of Retail & Leisure Property	Green retail: Retailer strategies for surviving the sustainability storm	Green store design for energy conversation; Green energy utilization; Green transport
(Plambeck, 2007)	Supply Chain Management Review	The greening of Wal-mart's supply chain	Green transport; Green packaging; Green product design Green procurement; Cooperating with suppliers and nongovernmental organizations
(Anonymous, 2007)	Business Wire	City of Miami and Staples to break ground on first LEED-registered green retail building in City	Green store design for waste reduction, water and energy conservation; Providing channels for customers to recycle products; Investing in energy efficiency and renewable energy; Green transport; Green procurement
(Stribling, 2007)	National Real Estate Investor	Green design goes mainstream	Green store design for waste reduction, water and energy conservation

(Degregorio, 2007)	The Daily Record	Carroll County to get mid-Atlantic region's first 'green' retail center	Green store design for waste reduction, water and energy conservation
(Craig, 2007)	Retailing Today	Green is the new black	Green building techniques; Green procurement; Green products
(McTaggart, 2007)	Progressive Grocer	Green is the new black	Green store design for energy conservation Green packaging; Cooperating with suppliers and nongovernmental organizations
(Wilson, 2006b)	Chain Store Age	Sky gardens	Green store design for energy and water conservation
(Wilson, 2006a)	Chain Store Age	Going green gets easier	Green store design for energy conservation
(Seifer, 2006)	Environmental Design + Construction	Consumers and the future of green retail	Green store design; Green technologies; Resource recovery systems
(Brill & Saulson, 2005)	Environmental Design + Construction	The paradox of green retail	Green store design for energy conservation and waste reduction
(Knight, 2004)	Consumer Policy Review	Sustainable consumption: the retailing paradox	Green procurement; Green packaging; Green policy development
(Anonymous, 2001)	Building Design & Construction	The rewards of green retailing	Green store design for energy conservation

1.3.1.2. Antecedents are Under-Investigated

Stakeholder influences have long been identified as important antecedents of green practices implementation (Murillo-Luna, Garcés-Ayerbe, & Rivera-Torres, 2008). It seems that stakeholders such as regulators and customers are driving the GR adoption as illustrated in the real-life cases discussed before (Section 1.2.2). However, the exact nature of their influences on GR remains unclear and unexamined in empirical studies.

Then again, previous studies in the literature seldom consider the multiple and interdependent influences existent in the stakeholder environment (Rowley, 1997). The role of stakeholders is highly situational and dependent on a number of variables related to the perception of stakeholders by managers (Mitchell, Agle, & Wood, 1997). Yet, previous studies did not investigate it with theoretical explanation provided. In particular, there exists a lack of research attention in the literature on whether one stakeholder pressure possesses mediating effect on another stakeholder pressure when driving the practices implementation (Delmas & Toffel, 2005; Rowley, 1997). This raises the question what motives drive the adoption of GR and whether the antecedents themselves affect each other in determining the adoption of GR.

1.3.1.3. Inconsistent Findings and Performance Implications

A significant number of empirical studies investigated the relationship between environmental management practices and its performance implications. Several studies showed that environmental management is positively related to better environmental performance (Melnyk et al., 2003), and both environmental performance and economic performance (Al-Tuwaijri, Christensen, & Hughes Ii, 2004). However, there were also studies indicating that environmental management does not have a significant positive impact on environmental performance or is even associated with worse environmental performance (Hertin, Berkhout, Wagner, & Tyteca, 2008; Sarkis & Dijkshoorn, 2007). Link and Naveh (2006) found insignificant correlation between environmental and business performance. Empirical supports of what particular moderators affect the relationship have not been extensive in the literature. As emphasized by Rueda-

Manzanares et al. (2008), most studies directly examined the link between environmental strategy and performance, without accounting for the underlying variables that possibly moderated this relationship. These raise the questions whether environmental management in the retail industry also helps retailers to achieve better financial and environmental performance; and what factors moderate the relationship between the environmental management practices and the consequential performance outcomes.

1.4. Statement of Research Problems

Despite abundant studies of environmental management, there are not many studies that deal with it in-depth, considering the main characteristics of an environmental management practices in the retail industry. Several research problems emerged from the above discussion of contextual and conceptual backgrounds. First, due to the lack of consensual definition on GR and the urgency of adopting GR among practitioners, it is highly desirable to advance knowledge in GR by developing a multi-dimensional conceptualization that is theoretically grounded. Second, the operationalization of GR constructs is absent in the literature yet validated constructs are essential to the future empirical studies. Third, our contextual background highlights several contextual situations giving rise to GR but previous studies did not investigate it with theoretical explanations provided. Fourth, there are inconsistent findings on the performance outcomes of environmental management practices adoption. This leads to the theoretical and managerial need to investigate whether GR adoption brings better financial and environmental performance.

Research questions are discussed below addressing the above problems, which then lead us to the development of the objectives of this study.

1.5. Research Questions

The challenge for retailers in the 21st century is to embrace GR despite the lack of guidance and reference. There is little information available for retailers to understand what GR is and what dimensions are included in GR practices. It is essential to pursue a systematic investigation into GR before it can successfully be adopted. Hence, we arrive at our first set of our research questions in this study:

Q1: What is Green Retailing? What are the theoretical dimensions that underpin the adoption of GR practices? What are the roles of retailers in performing these green practices?

Our real-life cases indicate that there are different drivers that prompt retailers to adopt GR and the consequential performance outcomes are inconsistent. However, these drivers and consequential performance have yet to receive due research attention, which leads us to our second set of research questions:

Q2: What factors lead retailers to adopt GR and what determine the extent of their adoption? What are the consequential performance outcomes of adopting GR? Does GR adoption lead to better financial and environmental performance for retailers?

To answer these broad research questions, we set the following objectives to guide our investigation.

1.6. Research Objectives

The objective of this study is to develop and empirically validate a theoretically grounded measurement model of GR and test the relationships between the determinants, adoption, and the performance outcomes of GR. Specifically, this study aims to achieve the following specific objectives:

1. establish a theoretical framework to identify the different dimensions and roles of retailers in the adoption of GR practices;
2. construct and validate a measurement model for evaluating the adoption of GR practices;
3. develop a set of hypotheses on the links amongst the antecedents, adoption, and consequences of adopting GR practices;
4. provide practical guidance for retailers on the ways they can design and plan for greening their retail activities;
5. generate management insights for retailers on how GR practices help improve economic and environmental performance;
6. provide policy reference for formulating environmental regulations and voluntary measures to diffuse GR in the retail industry.

1.7. Structure of the Dissertation

This dissertation consists of nine chapters. We have discussed the motivations, research questions, and research objectives of this study in Chapter 1 based on the discussion of the contextual and conceptual background with real-life cases and extant research. In Chapter 2, we conduct the literature review surveying related studies on CSR, sustainability, environmental management, and retail adoption decisions to understand the phenomenon from the existing body of knowledge for a guiding research framework and hypotheses development of this study in Chapter 3. We discuss the research methodology of this study in Chapter 4. The research design, analysis, and findings of our qualitative case study research are presented in Chapter 5. After the qualitative case study research, quantitative survey research design and its analysis are presented in Chapters 6 and 7, respectively. We further carry out a secondary data analysis to supplement the quantitative survey study in Chapter 8. Finally, we summarize and discuss the findings of our research, present the academic and managerial implications of our findings, discuss the limitations, and suggest future research directions for this study topic in Chapter 9. Figure 1.1 below summarizes the contents of the components in this research study.

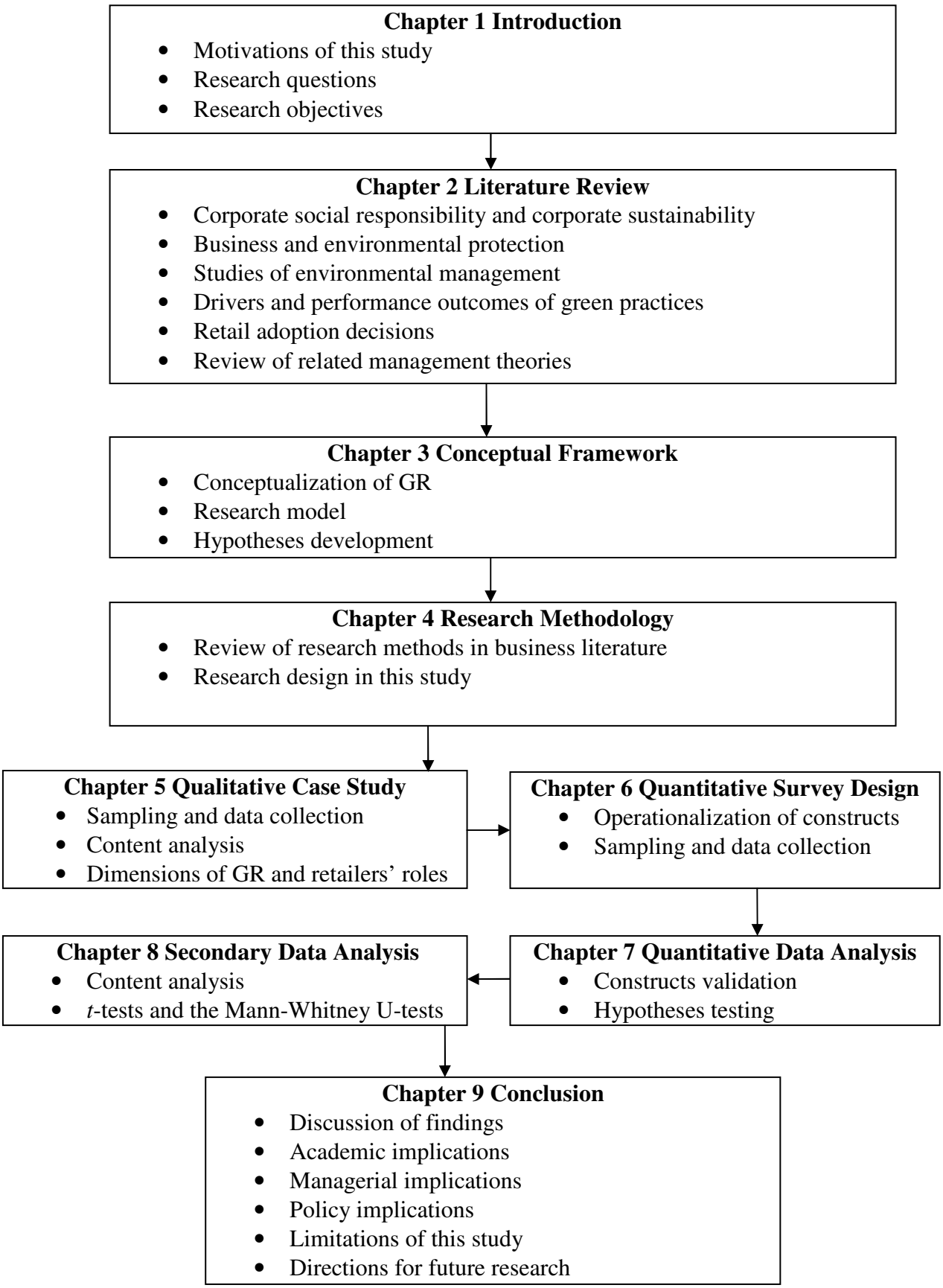


Figure 1.1 Summary of the contents in this research

2. LITERATURE REVIEW

In this chapter, we conduct the literature review which enables us to evaluate, justify, and investigate the previous studies which consist of the information, ideas, data, and evidence relating to this dissertation topic. We first review a broader field of CSR and sustainability, then we narrow down to environmental management which is more closely related to GR with a focus on greening practices in business management. We identify the key drivers of environmental management practices based on the findings in prior studies and discuss the performance outcomes of environmental management in these studies. We then discuss the common concepts in the environmental management and retail adoption decisions studies, generating insights on the factors influencing GR adoption and distinguish GR from similar green concepts including green marketing, green logistics, and green supply chain management. Lastly, we review related management theories as they apply to environmental management studies. Such a review enables us to develop a theoretical framework to conceptualize GR and guide our investigation, which is detailed in Chapter 3.

2.1. Corporate Social Responsibility and Corporate Sustainability

Corporate social responsibility (CSR) has been defined as situations where the firm goes beyond compliance and engages in actions that appear to favor some social good, beyond the interests of the firm and those stipulated by law (McWilliams, Siegel, & Wright, 2006). Firms, which cannot afford to be seen or perceived as doing anything to harm people or the environment, hope to reduce risk in damaging reputation and brand

name through CSR practices (Welford & Frost, 2006). Indeed, numerous definitions of CSR have been offered and it is an extensive term that overlaps with many concepts of business-society relations (Shum & Yam, 2011). CSR can be related, but not limited to social issues such as communication with employees; training and development; career-planning; retirement and termination counseling; lay-offs, redundancies, and plant closings; stress and mental health; absenteeism and turnover; health and safety; employment equity and discrimination; women in management; performance appraisal; and day care (Clarkson, 1988; Clarkson, 1995). Matten and Moon (2008) identified CSR with two distinct elements- explicit and implicit CSR. The former refers to the corporate policies that assume and articulate responsibility for some societal interests and the latter refers to corporations' role within the wider formal and informal intuitions for society's interests and concerns. CSR has also been interpreted from the perspectives of economic responsibilities, legal responsibilities, ethical responsibilities, and philanthropic responsibilities (Carroll, 1991). Researchers have aligned "rights" and "justice" standards with rules about duties: "rights" refers to the protections or extensions of individual entitlements; while "justice" prizes liberty, quality, and fairness of opportunity (Swanson, 1995). With the emphasis on human rights, Welford (2004) presented 20 elements of CSR from the aspects of internal, external, accountability, and citizenship to address issues such as non-discrimination, equal opportunities, freedom of association, collective bargaining, working hours, labor standards including health and safety, restriction on the use of child labor, suppliers' health and safety provisions, the protection of indigenous populations, commitment to reporting on corporate social

responsibility, policies and procedures for engaging stakeholders, and support for third-party programs promoting social improvement.

In recent years, organizations' efforts in addressing a wider variety of social and environmental problems are also referred to as CSR (Lindgreen & Swaen, 2010). Corporation's responsibility is extended to a broad range of stakeholders, including the natural environmental and sustainability (Jenkins & Yakovleva, 2006; Munilla & Miles, 2005). Scholars indicate that the originally two separate notions of CSR and sustainability have grown into convergence (Montiel, 2008; van Marrewijk, 2003). Sustainability, broadly speaking, is related to the long-term carrying capacity or survival of a system (Jennings & Zandbergen, 1995). The World Commission on Environment and Development (1987) defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." To transpose the idea of sustainability more precisely to the business level, corporate sustainability (CS) is defined as meeting the needs of a firm's direct and indirect stakeholders without compromising its ability to meet the needs of future stakeholders as well (Dyllick & Hockerts, 2002). CS calls on organizations to view their responsibilities in terms of a "triple bottom line", a perspective based on measuring performance with respect to the effects of strategy on people, profits, and the planet (Chabowski, Mena, & Gonzalez-Padron, 2011; Cronin et al., 2011). These three areas are akin to social equity, economic prosperity, and environmental integrity (Elkington, 1994) which can be viewed as the basis for essential market-oriented resources, capabilities, and competitive advantage in relation to competitors (Bansal, 2005; Hunt &

Morgan, 1995; Jaworski & Kohli, 1993; Slater & Narver, 1995). Social equity urges firms to consider the expectations of not only financial shareholders but also other stakeholders, and the importance of acting in the interests of society in general (Bansal, 2005). Economic prosperity focuses on value creation and enhanced financial performance of the firm (Bansal, 2005; Chabowski et al., 2011). The environmental integrity dimension focuses on corporate environmental management, which comprises the firm's efforts to undertake activities that do not erode natural resources (Bansal, 2005; Chabowski et al., 2011).

van Marrewijk (2003) proposed a framework which classifies firms with six different ambition levels of CS: At the *pre-CS* level, firms basically do not have ambition for CS; CS at the compliance-driven level consists of providing welfare to society, within the limits of regulations from the rightful authorities; *profit-driven CS* comprises integration of social, ethical, and ecological aspects into business operations and decision-making, contributing to the financial bottom line; at *caring CS* level, it is composed of balancing economic, social, and ecological concerns which are all important elements in themselves with their initiatives going beyond legal compliance and profit consideration; *synergistic CS* consists of a search for well-balanced, functional solutions creating value in the economic, social, and ecological realms of corporate performance in a win-together approach with all relevant stakeholders; *holistic CS*, the highest level, is fully integrated and embedded in every aspect of the organization with the aim to contribute to the quality and continuation of life of every being and entity at the present and in the future.

Although CS has been defined in many ways, it has often focused on environmental concerns (Sheth, Sethia, & Srinivas, 2011). Within the business literature, CS is also viewed as a market opportunity as it provides an effective way for the firm to differentiate its offerings and achieve a competitive advantage, while adapting their conduct to society's norms (Fraj, Martínez, & Matute, 2011; Menon & Menon, 1997). An organizational commitment to sustainability opens the door to new markets and customers (Connelly, Ketchen, & Slater, 2011). Proponents of sustainability argue that environmentally conscious and ecologically friendly strategies give the firm superior financial performance (Hart, 1995; Sharma, Iyer, Mehrotra, & Krishnan, 2010). A better environmental record gains consumer approval and hence long-term profits (Iyer, 1999). Lash and Wellington (2007) warned that firms will be at a competitive disadvantage should they fail to pay attention to sustainability issues.

The CSR and CS constructs in recent literature have similar conceptualization of economic, social, and environmental dimensions (Montiel, 2008). van Marrewijk (2003) suggested that the "one solution fits all" definition for CSR or sustainability should be abandoned and we should adopt more specific definitions matching the development and practices of organizations. Hence, in order to better address our research theme "green retailing", we position our research on the environmental pillar of corporate practices to examine the green management practices adopted by retailers. In the following, we move to an in-depth review on the literature of greening business.

2.2. Business and Environmental Protection

Industry nowadays need to adopt a more strategic view of environmental problems (Welford, 1996). Berry and Rondeinelli (1998) indicated that environmental strategies of firms have gone through the revolution with three stages. In the 1960s and 1970s, firms coped with environmental crises only after an attempt to control the resulting damage had occurred. In the 1980s, firms entered the reactive mode to comply with rapidly changing governmental regulations and to minimize the cost of compliance. The proactive mode occurred in the 1990s, throughout when firms began to anticipate the environmental impacts of their operations, and take measures to reduce waste and pollution in advance of regulations (Berry & Rondinelli, 1998). Thinking about their social responsibilities in terms of trade, many large companies are now adopting environmental management strategies (Welford, 2003). Some voluntary environmental practices, which are also described as proactive environmental strategies, have been implemented by an increasing number of firms as supported by the figures of ISO 14001 certification. ISO standards were developed by a non-governmental International Organization for Standardization (ISO), located in Geneva, Switzerland. The goal of the ISO is to develop standards on a worldwide basis to allow commerce to transcend national boundaries without creating trade barriers. Particularly, the ISO 14000 standards were developed with the aim to provide guidance for developing a comprehensive approach to environmental management and for standardizing some key environmental tools of analysis such as labeling and life cycle assessment. Up to 2010, 250,972 organizations in 155 countries worldwide were certified to ISO 14001 (ISO, 2010).

For many firms, environmental values now become an integral part of management processes. Environmental management involves the reduction of environmental impact which is imposed by every firm, such as energy consumed by lighting systems, waste, and emissions generated by the production process (Bansal, 2005). “Green” and “efficient” go hand-in-hand that the concept of eco-efficiency has been widely recognized in the past decade. World Business Council for Sustainable Development (2006) defines eco-efficiency as “the delivery of competitively-priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life-cycle to a level at least in line with the Earth’s estimated carrying capacity’. In short, it is concerned with creating more value with less impact. This is also consistent with Porter’s assertion that pollution is a form of waste. Cost reduction in other words means enhancing efficiency and minimizing waste (Lai & Cheng, 2009; Porter & van der Linde, 1995).

Environmental management has gained increasing interest among scholars and a number of definitions have been suggested in the literature. Summarizing different definitions suggested in prior studies (Table 2.1), we interpret the term “environmental management” as the philosophy of integration between business and the environment, with consideration of environmental factors in planning, management, operations, and development activities.

Table 2.1 Environmental management definitions suggested in prior studies

Authors	Study	Definitions of Environmental Management
(Nijkamp, Munda, & Rietveld, 1994)	Qualitative multi-criteria evaluation for environmental management	Environmental management is essentially conflict analysis characterized by technical, socioeconomic, environmental, and political value judgments.
(Gupta, 1995)	Environmental management and its impact on the operations function	Environmental management is viewed as a continuous process of improving environmental corporate policies and programs by taking into account the regulatory, technical and scientific developments; it must also be fully integrated with operations management along with other functional areas.
(Klassen & McLaughlin, 1996)	The impact of environmental management on firm performance	Environmental management encompasses all efforts to minimize the negative environmental impact of the firm's products throughout their life cycle.
(Levy, 1997)	Environmental management as political sustainability	Environmental management is defined as the development and implementation of management practices that address environmental goals while furthering private corporate interests.
(Walton & Handfield, 1998)	The green supply chain: Integrating suppliers into environmental management processes	Environmental management approach accepts the goal of minimizing waste, without trying to eliminate the source of the waste.
(Schaltegger & Synnestvedt, 2002)	The link between 'green' and economic success: environmental management as the crucial trigger between environmental and economic performance	Corporate environmental management is a concept which helps managers to systematically focus entrepreneurial efforts to reduce environmental impacts of a company in the most economically efficient manner.
(Jabbour, 2010)	In the eye of the storm: exploring the introduction of environmental issues in the production function in Brazilian companies	Environmental management, the integration between business and environment, is defined as the weighing of environmental factors in each business decision, including process and product development activities and strategic planning.

2.3. Drivers of Environmental Practices Adoption

Prior studies have identified various determinants which drive the adoption of environmental management practices. These determinants can be broadly divided into: "external factor", which is mostly linked to stakeholder pressure; and "internal factor" which is related to the specific business-led strategic process (Testa & Iraldo, 2010).

2.3.1. External Factor - Stakeholder Pressure

Stakeholders are individuals or groups who can affect or be affected by the achievements of a firm's goals according to stakeholder theory (Freeman, 1984). Prior studies have identified different types of stakeholders which may affect the managerial decision of environmental management. Henriques and Sadorsky (1999) identified four groups that demand firms to protect the natural environment: regulatory stakeholders, organizational stakeholders, community stakeholders, and the media. Buysse and Verbeke (2003) proposed an alternative classification: regulatory stakeholders, external primary stakeholders, internal primary stakeholders, and secondary stakeholders. Based on the above mentioned work, Murillo-Luna et al. (2008) listed 14 types of stakeholders and classified them into five groups namely, corporate government stakeholders (managers and shareholders), internal economic stakeholders (employees and labor unions), external economic stakeholders (customers, suppliers, financial institutions, insurance companies, and competitors), regulatory stakeholders (environmental legislation, and administration control), and external social stakeholders (the media, communities, and ecologist organizations). Despite the various types and classifications, not all stakeholders are equally important for corporations when they craft

environmental management strategies (Buysse & Verbeke, 2003). Reviewing and summarizing the stakeholder literature, we identified four key stakeholder influences as follows:

2.3.1.1. Environmental Regulatory Pressure

Environmental regulators are individuals within government who have the authority to create environmental requirements and inspect the firm's compliance with those requirements (Darnall, Henriques, & Sadorsky, 2010). Regulatory pressures arise from threats of penalties and fines for non-compliance, or from requirements to publicly disclose information concerning the organization's environmental impact (Anderson, Fornell, & Rust, 1997). With more stringent regulations, the original operations process may become incompatible with the evolving requirements (Henriques & Sadorsky, 1996). The non-compliance cost with regulations such as penalties and fines are high (Banerjee et al., 2003). Legal liabilities on firms thus have been increased for them to embrace green practices (Berry & Rondinelli, 1998). By keeping ahead of regulations, firms can reduce the risk of noncompliance and the expensive legal consequences (Bansal & Roth, 2000; Murillo-Luna et al., 2008). Companies are also forced to adopt environmental management for complying with international trade agreements when they have overseas investment or trade with foreign companies (Berry & Rondinelli, 1998; Slater & Angel, 2000). Many researchers found a positive significant relationship between the influence of enforced extant legislation and firms' environmental management practices in various industries including manufacturing, electronic and electrical equipment, furniture and fixtures (Henriques & Sadorsky, 1996; Lai & Wong,

2012; Sarkis, Gonzalez-Torre, & Adenso-Diaz, 2010; Sharma & Henriques, 2005).

2.3.1.2. Customer Pressure

Environmental requirement from customers is a form of motivational driver and pressure. Customers respond positively to a company's actions by purchasing products that are benign toward the environment and they are likely to choose one product over another if is considered friendly to the environment (Banerjee, 2001; Kangun, Carlson, & Grove, 1991). While customers are now demanding more environmentally friendly products, firms may develop environmental programs targeting the environmentally conscious customers and present a green image to indicate their responsiveness to the customer concern for averting negative public attention (Banerjee, 2001; Banerjee et al., 2003; Berry & Rondinelli, 1998; Handfield et al., 1997).

2.3.1.3. Supplier Pressure

In addition to customers, suppliers are also major stakeholders influencing organizational adoption of environmental management practices (Banerjee et al., 2003; Lee & Klassen, 2008). Suppliers provide the firm with critical input resources and seek dependable buyers in economic exchange (Hill & Jones, 1992). Relationships with suppliers are important in managing environmental management practices in firms (Elkington, 1994). Buzzelli (1991) noted the importance of firms in seeking active participation of suppliers when dealing with environmental issues as they are the agents who have strong influence in determining the success or failure of any environmental

initiative. Suppliers motivate many companies to adopt environmental management practices and standards (Christmann & Taylor, 2001; Henriques & Sadorsky, 1996; Jiang & Bansal, 2003). Vachon and Klassen (2008) mentioned an example of supplier-driven environmental practices that helped Keller Crescent, a commercial printer, to solve a waste disposal problem. An engineering firm that had supplied services to Keller Crescent suggested developing a microwave-based solvent recovery system which could, ultimately, reduce the amount of solvent waste trapped in the towels used to clean presses. After a year of collaborative work, Keller Crescent eliminated all hazardous waste costs related to this waste stream. This example highlights that suppliers can drive and determine the success of an environmental management practice.

2.3.1.4. Competitive Pressure

Pressures for environmental responsibility can result from competitors' action when firms evaluate competitive threats and policies of competitors (Jennings & Lumpkin, 1992; Sharma, 2000). In light of market changes in which competitors implement environmental strategies in response to the growing number of environmentally conscious customers, firms are forced go green in order to remain competitive (Lewis & Harvey, 2001). Firms may feel pressure when they acknowledge that their competitors have developed new green technology and fear that they will be placed at a disadvantaged position if many competitors profit from adopting green practices (Christmann, 2004; Rothenberg, 2003). The fear of losing market shares to green-oriented competitors is a strong incentive for firms to change and follow environmental management (Klaus, 1997).

2.3.2. Internal Factor - Cost Pressure

In considering pollution as a form of economic waste, reducing waste not only can reduce the environmental impact but also improve operational efficiency (Porter & van der Linde, 1995). Cost such as operation costs, waste disposal costs, and pollution control costs can be reduced through the environmental management practices as suggested by Berry and Rondinelli (1998). Bansal and Roth (2000) revealed in their qualitative study that firms generally perceive that environmental management practices can help operational efficiency improvement and cost reduction, thus adopt environmental management practices to improve their operations. The cost performance objective is enforced by environmental management actions, which tend to cut down on waste and stimulate the discovery of new raw materials, by reusing and recycling materials (Jabbour, 2010).

2.4. Performance Outcomes of Environmental Management

In recent years, there has been a rich body of empirical-based environmental studies examining the performance implications. There is a theoretical belief in the adoption of environment management for better business performance, based on the view that improvements in financial performance stem from better resource utilization, reducing variety, increasing efficiency, and improving adaptation to current environments so that superior environmental management is associated with a lower cost of capital and increased profitability (Klassen & McLaughlin, 1996; Sharfman & Fernando, 2008; Uotila, Maula, Keil, & Zahra, 2009). However, some scholars suggested that

profitability is hurt by the higher production costs of environmental management initiatives. There is evidence that the effect of environment management on economic performance is insignificant (Gilley, Worrell, Davidson Iii, & El-Jelly, 2000), and some studies even found no relationship between improvements in environmental performance and EMS adoption (Barla, 2007; Fryxell & Szeto, 2002).

The relationship between environmental performance and financial performance is also inconclusive. Al-Tuwaijri (2004) demonstrated, by a simultaneous equation model, that good environmental performance is significantly associated with good economic performance. King and Lenox (2001) found an association between lower pollution and higher financial valuation. Ahuja and Hart (1996) indicated that efforts to prevent pollution and reduce emissions drop to the 'bottom line' within one to two years of initiation and that those firms with the highest emission levels stand the most to gain. Chan (2005), meanwhile, found an insignificant relationship between environmental performance and financial performance.

Nevertheless, some scholars found mixed results. Jacobs et al. (2010) found ISO 14001 certifications are associated with significant positive market reaction but the market reacts negatively to voluntary emission reductions. They also found evidence indicating that LEED certifications and government awards are value-neutral, but non-governmental awards have a negative market reaction. Henri and Journeault (2010) found eco-control has no direct effect on economic performance (ROI, operating profits, cash flow from operations) but environmental performance influences economic

performance in the context of higher environmental exposure, higher public visibility, higher environmental concern, and larger size. These inconsistent findings can be attributable to the different data sets used, the types of industry investigated, and the research time span involved (Schaltegger & Synnestvedt, 2002).

Prior empirical research on the performance implications of environmental management are mainly divided into three streams: (1) the relationship between environmental management and financial performance; (2) the relationship between environmental management and environmental performance; and (3) the inter-relationship between financial performance and environmental performance. These studies are summarized in Table 2.2.

Table 2.2 Previous studies on the performance implications of environmental management (EM)
(continued on the next two pages)

Author	EM and Financial Performance	EM and Environmental Performance	Link between Financial and Environmental Performance
(Jaggi & Freedman, 1992)			There is a negative relationship between environmental performance and financial performance in the short term.
(Gilley et al., 2000)	There is no overall effect of announced environmental initiatives on stock returns.		
(Melnyk et al., 2003)		Firms in possession of a formal EMS perceive impacts well beyond pollution abatement. Firms having gone through EMS certification experience a greater impact on performance than those firms that have not certified their EMS.	
(Al-Tuwaijri et al., 2004)			Good environmental performance and economic profitability go hand-in-hand. Economic performance and environmental performance are both related to the quality of management.
(Menguc & Ozanne, 2005)	Natural environmental orientation is positively and significantly related to profit after tax and market share; however, it is negatively related to sales growth.		

(Chan, 2005)	Enterprises that adopt environmental strategies are more likely to achieve higher financial performance.	Enterprises that adopt environmental strategies are more likely to achieve higher environmental performance.	There is no evidence that enterprises with improvement in environmental performance are more likely to achieve corresponding improvement in financial performance.
(Link & Naveh, 2006)			It is insignificant that achieving improvement in environmental performance as a result of ISO 14001 leads to better business performance as measured in annual gross profit margin, investment in R&D, sales, sales per employee, and business with foreign organizations.
(Barla, 2007)		ISO certification does not lead to a reduction in total suspended solid emissions or in quantity of rejected process water.	
(Zhu, Sarkis, & Lai, 2007)	Green supply chain management has not resulted in significant economic performance improvement.	Green supply chain management has only slightly improved environmental performance.	
(Sarkis & Dijkshoorn, 2007)		Organizations that have not adopted environmental practices perform better on environmental performance measures	
(Hertin et al., 2008)		There is no evidence that EMS have a consistent and significant positive impact on environmental performance.	

(Kassinis & Vafeas, 2009)	Facilities that seem to be more environmentally responsible do not perform better financially and may even perform worse than facilities that are less environmentally responsible.		
(Iraldo, Testa, & Frey, 2009)	Environmental management system has a non-significant relationship with market performance (market shares, increase of sale and turnover, innovation, image and customer satisfaction).	There is positive impact of a well designed environmental management system on environmental performance.	
(Uotila et al., 2009)			There is a curvilinear relationship between the relative amount of exploration and financial performance. A positive interaction effect presents between the relative amount of exploration and industry R&D intensity to financial performance.
(Henri & Journeault, 2010)			Environmental performance influences economic performance in the context of (i) higher environmental exposure, (ii) higher public visibility (iii) higher environmental concern, and (iv) larger size.
(Lai & Wong, 2012)		The implementation of green logistics management by a Chinese manufacturing exporter is positively related to its environmental performance.	

2.5. Retail Adoption Decisions

Retail adoption studies in the literature mainly investigated the new product and technology innovation adoption (Hultink, Thölke, & Robben, 1999; Venkatraman, 1991). van Everdingen (2011) proposed three variables which affect general retailers' adoption decisions on new product. They are profit-related variables which refer to the relative gross margin, trade support, and consumer marketing support; relationship variables with the perceived relationship quality, and perceived dependence on supplier and relationship length; and category variables which are related to the expected category growth due to new product introduction and importance of the category in which the new product is introduced. On the other hand, retailers take consideration in three perspectives when marking their strategic choices to determine their retail strategy: consumer demographics and demand, store factors (e.g., service), and competition (Eng & Quaia, 2009; Gauri et al., 2008).

2.6. How Retail and Environmental Management Studies Converge to Give Insight to GR

Integrating the retail literature and the environmental management literature, we found they are consistent on the factors which may drive the GR adoption of retailers. Shankar and Bolton (2004) noted that retailers' strategies and tactics are likely influenced by upstream (supplier) and downstream (customer) factors. It is consistent with the environmental literature that firms face pressure from partners in the value chain. Retail adoption decisions depend on the customer demands addressing their preferences and

needs while environmental literature indicates that an increasing number of environmentally-conscious customers drive firms to provide green services. The environmental management literature advocates that going green can be a way for firms to gain competitive advantage by reducing cost and gain profit, which is in line with the retail literature that retailers are influenced by the competition environment and retailers would adopt competitor products/services which is expected to have positive gross margin.

Table 2.3 Common concepts between the environmental and retail literature

Drivers of practices/strategies	Environmental literature	Retail literature
	Firms face pressure from the partners in the value chain- supplier and customer.	Retailers' strategies and tactics are likely influenced by upstream (supplier) and downstream (customer) factors.
	Green practices are driven by the increasing number of environmentally conscious customers.	Customer demographics, preferences and needs drive retailers' adoption decision.
	Going green can reduce cost and thus boost profit to firms.	Adoption decision is dependent on expected gross margin from new products.
	Green is a means for firms to gain competitive advantage.	Retailers aim to perform better than competitors, and are affected by adoptions of other competitors.

2.7. How GR Differs with Other Related Green Concepts

Green marketing/environmental marketing is associated with the greening of the different aspects of traditional marketing. The scope of green marketing includes the production of green products for sale to environmentally conscious consumers

(Kilbourne, 1998), environmental communications on how to persuade consumers to act in an environmentally responsible manner (Kronrod, Grinstein, & Wathieu, 2012), how product sustainability affects consumers' preferences (Luchs, Naylor, Irwin, & Raghunathan, 2010), how companies can create a menu of offerings that differ in their level of environmental friendliness and price them accordingly (Kotler, 2011) and the effect of environmental attributes on brand attractiveness (Irwin & Spira, 1997). Table 2.4 presents different terms adopted in previous marketing literature with a similar concept to green marketing. In sum, green marketing puts emphasis on the role of business to satisfy consumption desire for environmental protection (Kilbourne, 1998).

Table 2.4 Green marketing and the related terms adopted in previous literature

Terms	**Concepts**	**Scholars**
Green marketing	The study of the environmental effects of the traditional marketing activities and their social, economic and political implications	(Chamorro et al., 2009)
Sustainable marketing	Marketing that is within, and supportive of, sustainable economic development	(Hunt, 2011)
Environmental Marketing / Enviropreneurial marketing	Defined as environmentally-friendly marketing practices, strategies, and tactics initiated by a firm in the realm of marketing; see environmental issues as market opportunities; make commitments that are substantial and visible, and possess a fundamental desire to do the right thing	(Baker & Sinkula, 2005)

Eco-marketing	Current and potential customer aspirations with respect to the environmental impact of a business and its products primarily in terms of opportunities and threats	(Daub & Ergenzinger, 2005)

Green logistics involves internal activities such as product development, manufacturing processes, and managing physical product flows. It reflects organizational ability to conserve resources, reduce waste, improve operational efficiency, and satisfy the social expectation for environmental protection (Lai & Wong, 2012). Although both green marketing and green logistics are helpful for environmental protection, they are more functional-oriented with green marketing focuses on the customer perspective and green logistics focuses on the internal operations process. GR is distinctive from them with an emphasis on managing the entire value chain. Table 2.5 shows the comparison of the concept of GR relative to green logistics and green marketing. GR aims to help companies to gain competitiveness through delivering uniqueness perceived by customers and achieving lower cost position.

Table 2.5 Comparing the concept of GR to green logistics and green marketing

	Competitive Advantage	
Approach	Uniqueness perceived by the customer	Lower cost position
Functional Approach	Green Logistics	Green Marketing
Management Approach	Green Retailing	

Green supply chain management (GSCM) has its roots in both environmental management and supply chain management literature. It addresses the influence and relationships between supply-chain management and the natural environment (Srivastava, 2007). The scope of green supply chain management implementation ranges from green purchasing to integrated life-cycle management supply chains flowing from supplier, through to manufacturer, customer, and closing the loop with reverse logistics (Zhu, Sarkis, & Lai, 2008b). While both GR and GSCM orient towards management practices that are useful for mitigating the environmental damages throughout their life-cycle, the latter one puts more emphasis on product perspective in handling end-of-life or returned products by recycling and remanufacturing. Retailers differ from manufacturers in their business orientation and strategic considerations with the former focusing on store setting and design, and offering goods and services to end customers; while the latter focuses on product lines and production sites (Curry, 1989). The measurement tools developed for manufacturers evaluating their GSCM thus may not be directly applicable to retailers which operate in a service context. Moreover, GSCM focuses on the relationship with suppliers and B2B customers, while GR emphasizes cooperation with suppliers and the end customers, as well as the sustainable development of firms in support of the retail chain activities. Further distinction of GR is provided with further details in Chapter 3 when we conceptualize GR and discuss the roles of retailers in greening the value chain in Chapter 5.

2.8. Review of Related Management Theories

In the following sections, we present a review of the literature on environmental management studies within the context of various management theories. The review helps us obtain a thorough and comprehensive understanding of environmental management with different theoretical perspectives. The theories are discussed one by one.

2.8.1. Institutional Theory

Asserting that firms adopt initiatives in order to gain legitimacy or acceptance within society, institutional theory aims to understand questions of strategy and focuses on persistent differences among organizations that share common organizational fields (Delmas & Toffel, 2008). There are two streams of institutional theory: 1) the process of how organizations respond to organizational change; and 2) sources or drivers of institutional change (Dacin, Goodstein, & Scott, 2002).

Scott (1987) described institutionalization as a process of instilling value or creating reality, with institutions as classes of elements or institutions as distinct societal spheres. Tolbert and Zucker (1999) outlined a three-step process of institutionalization: habitualization, objectification, and sedimentation. Habitualization occurs as particular organizational responses become commonly associated with particular problem situations; objectification occurs when the benefits of an organizational response become widely acknowledged; and sedimentation results when the response has been almost universally adopted in the organizational field over a significant period of time.

Regarding the source of institutional change, organizations may be influenced by three isomorphic pressures: coercive, mimetic, and normative (DiMaggio & Powell, 1983). Coercive isomorphism stems from pressures exerted on firms by other parties upon which they depend (DiMaggio & Powell, 1983). Direct or indirect coercion depends on the type of enforcement which can be consensual, conciliatory, and consultative under either a market- or rule-based framework (Jennings & Zandbergen, 1995). Mimetic process occurs when firms replicate other organizations within their sector that they perceive to be successful; while normative refers to the pressure exerted by professional associations on the organizations by establishing a cognitive base and legitimation for the autonomy of the industry (DiMaggio & Powell, 1983). Jennings and Zandbergen (1995) suggested that some practices are adopted by firms because they give the firm competitive advantage or are considered to be standards in the industry other than due to coercive force from government. In sum, Scott (1987) described institutions as "symbolic and behavioral systems containing representational, constitutive, and normative rules together with regulatory mechanisms that define a common meaning system and give rise to distinctive actors and action routines".

Because of its focus on how items become rule-like or social facts, institutional theory has been applied to environmental management literature analyzing how the consensus of green concepts/practices are developed and diffused among organizations (Jennings & Zandbergen, 1995). Institutional theory is particularly useful in identifying the actors imposing pressure on corporate sustainable development, and explaining how value and

belief systems judge a firm's commitment to sustainable development which in turn affect perceptions of the firms' acceptability and legitimacy (Bansal, 2005).

2.8.2. Stakeholder Theory

The concept of Stakeholder Theory was first proposed by R. Edward Freeman in the book *Strategic Management: A Stakeholder Approach*. Freeman (1984) described stakeholders as individuals or groups who can affect or be affected by the achievements of a firm's goals.

Donaldson and Preston (1995) proposed three perspectives on stakeholder theory, namely descriptive, instrumental, and normative. Descriptive perspective describes and explains the specific corporate characteristics and behaviors. It focuses on the nature of the firm; the way managers think about managing; how board members think about the interests of corporate constituencies; and how some corporations are actually managed. Instrumental perspective identifies the connections, or lack of connections, between stakeholder management and the achievement of traditional corporate objectives such as profitability and growth. Normative perspective interprets the function of the corporation, and identifies moral or philosophical guidelines for the operations and management of corporations. Later studies on the area have focused on identifying stakeholder attributes. Mitchell et al. (1997) identified the stakeholder's power to influence the firm, the moral legitimacy of the stakeholder's claim, and the urgency of the stakeholder's issue as the three key stakeholder attributes. In their model, stakeholder salience is positively related to the cumulative impact of these three stakeholder attributes and hence provides

managers with an indication of which stakeholder concerns to pay attention to and address. Frooman (1999) suggested that stakeholders influence firm decision through power with two strategies: 1) withholding strategy, in which the stakeholder chooses not to allocate their resource to the firm; and 2) usage strategy, in which the stakeholders continue to supply a resource but with strings attached. In other words, the firm dependence on resources from the stakeholders leads the firm to be externally constrained and controlled (Davis & Powell, 1992; Emerson, 1962). A stakeholder possesses greater power if the firm is more dependent on the stakeholder relative to the stakeholder's dependence on the firm (Pfeffer & Salancik, 2003).

A stakeholder approach emphasizes active management and integration of the relationships and interests of shareholders, employees, customers, suppliers, communities and other groups in a way that ensures the long-term success of the firm (Freeman & McVea, 2001). A key issue that then emerges is the lack of consensus on what or who is a legitimate stakeholder of the firm (Donaldson & Preston, 1995). Darnall et al. (2010) identified two types of stakeholders: primary and secondary. Primary stakeholders have a direct economic stake in the organization while secondary stakeholders are not involved directly in the firm's economic transactions (Darnall et al., 2010). Primary stakeholders consist of employees, shareholders, customers, and suppliers; while the secondary stakeholder groups include actors such as the media and special interest groups, not engaged in formal transactions with the organization (Buysse & Verbeke, 2003).

Stakeholder theory has also been applied widely in CSR and environmental management literature with its theoretical grounds that firms' performance is influenced by stakeholders who exert their influence in accordance with their interest. Stakeholder theory also helps define appropriate and inappropriate corporate behavior in terms of how corporations act among their stakeholders (Campbell, 2007).

2.8.3. Resource Based View of the Firm

The resource based view of the firm (RBV) asserts that the ability of a firm's resources to confer competitive advantage cannot be determined without taking into consideration the broader competitive context (Dess, Lumpkin, & Eisner, 2007). In the RBV literature, the distinction between resources and capabilities is often not clearly defined. Barney (1991) broadly defined firm resources as all assets, capabilities, organizational processes, firm attributes, information, and knowledge which are controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness. Grant (1991) viewed resources as inputs of the production process of the firm whereas organizational capabilities refer to the firm's overall competencies to effectively coordinate its complex human and non-human resources in order to achieve corporate performance. Later studies in RBV literature are often based on Grant's (1991) view to develop a more concrete definition. For example, Hart and Dowell (2011) defined resource as something that a firm possesses which can include physical and financial assets as well as employee' skills and organizational social processes; while capability is something a firm is able to perform which stems from resources and routines upon which the firm can draw. Dess et al. (2007), meanwhile, classified three

types of resources: tangible, intangible, and organizational capabilities. Tangibles include financial resources such as a firm's cash account and borrowing capability; physical resources such as plant and facilities; technological resources such as patents, copyrights and trademarks; and organizational resources such as effective planning processes and control system. Intangible resources comprise human experience and skills, innovation, creativity, as well as reputation of a firm. Organizational capabilities refer to a firm's competencies or skills the firm employs to transfer inputs to outputs, and the capacity to combine tangible and intangible resources to attain desired end.

RBV asserts that resources alone are not a basis for sustainable competitive advantage. Only firms acquiring *valuable*, *rare*, *imperfectly imitable,* and *non-substitutable* resources and capabilities can achieve a state of sustainable competitive advantage (Barney, 1991; Teece, 1986). Barney (1991) emphasized the difference between *competitive advantage* and *sustained competitive advantage*. A firm enjoys a *competitive advantage* when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors; while a firm possess *sustained competitive advantage* when it is implementing value creating strategy not simultaneously being implemented by any current or potential competitors and when these other firms are unable to duplicate the benefits of this strategy. Resources are *valuable* when they enable a firm to conceive of or implement strategies that improve its efficiency and effectiveness. A resource is said to be *rare* if it is not simultaneously possessed by a large numbers of other firms. Firm resources can be *imperfectly imitable* for one or a combination of the following three reasons: 1) the ability of a firm to obtain

a resource is dependent upon unique historical conditions; 2) the link between the resources possessed by a firm and a firm's sustained competitive advantage is causally ambiguous; 3) the resource generating a firm's advantage is socially complex. Finally, resource has to be *non-substitutable* that there must be no strategically equivalent valuable resources that are themselves either not rare or imitable.

RBV has been widely adopted to investigate various topics in the business literature (Priem & Butler, 2001) such as strategic management processes (Ray, Barney, & Muhanna, 2004); strategy formulation (Grant, 1991); and entrepreneurship (Hitt, Ireland, Camp, & Sexton, 2001). Particularly, Hart (1995) extended the scope of RBV to stress a firm's relationship with the natural environment, proposing the natural resource-based view of the firm (NRBV). NRBV highlights three strategies of the firm, namely *pollution prevention*, *product stewardship*, and *sustainable development*. These strategies are built upon different bundles of resources, possessing different environmental driving forces, and different sources of competitive advantage (Hart & Dowell, 2011). Pollution prevention, which seeks to prevent waste and emissions, can thus increase efficiency by reducing the inputs required, compliance and liability costs, and simplifying the process. Product stewardship, through stakeholder engagement, expands the scope of pollution prevention to include the entire value chain or life cycle of the firm's product system. Sustainable development strategy does not merely seek to do less environmental damage but to produce a way that can be maintained indefinitely into the future (Hart & Dowell, 2011). Firms with different resource profiles are likely to

exhibit different degrees of effectiveness in adopting environmental management strategies (Chan, 2005).

2.8.4. Ecological Modernization Theory

With the belief that the earth's resources are finite, unlimited economic growth and increased resource consumption threatens the survival of all life on the planet (Wackernagel & Rees, 1996). In the 1980s and 1990s, the view that there is zero-sum trade-off between economic prosperity and environmental concern is challenged and scholars advocate that economic growth can still occur even if physical expansion is environmentally constrained (Stubbs & Cocklin, 2008). Ecological modernization theory (EMT) emerged with the central view that continued industrial development, technological development, and economic growth can be compatible with ecological sustainability (Fisher & Freudenburg, 2001; York & Rosa, 2003).

Mol and Sonnefeld (2000) highlighted five key transformations observed from ecological modernization literature. First, the role of science and technology has been changed that they are no longer only judged as the initiator of environmental problems. Their potential role in curing and preventing environmental problems is recognized. Second, agents such as producers and customers are of increasing importance in restricting and reforming the ecological system. Third, there are less top-down national command and control environmental regulations. Fourth, social movements are increasingly involved in public and private decision-making institutions regarding environmental reforms. Finally, complete neglect of the environment and the fundamental counter-positioning of economic and environmental interests are no longer

accepted as legitimate positions. EMT addresses the ecological crisis through a constant and continuing process of institutional, technical, and social transformation within the framework of the existing capitalist system (Lam, Hills, & Welford, 2005; Mol, 2002). Through institutional learning, societies draw upon their reflexive capabilities to critically evaluate their foundations and their external consequences to develop institutions with better environment and economy (Gouldson, Hills, & Welford, 2008). The institutional learning perspective defines ecological modernization as the perception of nature as a new and essential subsystem and the integration of ecological rationality as a key variable in social decision-making (Hajer, 1996). Technological innovation such as the discovery, experimentation, development, imitation, and adoption of new products, new processes and new organizational set-ups produces transformation cultures in societies, as well as improvements in economic and environmental performance (Christoff, 1996; Lam et al., 2005). Clean technology, resource recovery and reuse, waste reduction and elimination, and dematerialization help to enhance the environmental efficiency of the economy by reducing the rate of environmental damaged caused per unit of output (Hills & Roberts, 2001).

EMT provides a variety of theoretical and prescriptive propositions on studies at both macro and micro levels. EMT helps in depicting prevailing discourses of environmental policy, environmental improvement, and how contemporary industrialized societies deal with environmental crises are emphasized (Mol & Sonnenfeld, 2000). Studies have been carried out at the macro level to examine the environmental impact of economic development in various nations (York, Rosa, & Dietz, 2004); global environmental

reforms (Mol, 2002); and environmental policy-making (Gouldson et al., 2008). EMT has also been applied at the micro business firm level suggesting that ecological issues is a means of enhancing economic competitiveness and a market opportunity to raise revenue instead of a threat of increasing costs (Berger, Flynn, Hines, & Johns, 2001; Pataki, 2009). The business industry has started adopting an "efficiency strategy" which allows further economic growth and ecological adaptation of industrial production by improving the environmental performance, such as, improving the efficient use of material and energy, to increase resource productivity on top of labor and capital productivity (Huber, 2000). In other words, one major goal of ecological modernization is to bring less pollution, produce less resource-intensive products, and improve efficiency in utilizing resources (Jänicke, 2008; Zhu, Geng, & Lai, 2010). EMT has become a useful theory to examine how to motivate environmental management practices with the emphasis on the possibility of ecological-economic "win-win" solutions that can be achieved through cost reduction and competition for innovation (Zhu et al., 2011a).

Although EMT is found helpful in formulating general explanations of current transformations of environmental practices, disclosure, and policies, Pepper (1998) identified five shortcomings of EM. First, environmentally harmful activities have been transferred to newly industrialized and developing countries although environmental improvement is gained in some developed regions. Second, the technological adjustment and policy discourse aspects of EM do not ensure the diminishment of total resource consumption. Third, EM is currently conceived as weakly ecological only. Fourth, it is

not truly international and holistic by taking the displacement cost, environmental and social cost of efficiency gains through globalization, and comparative advantage in trade into account. Fifth, various possibilities raised by different cultures and different approaches to economics are ignored when EM is conceived as development and sustainability.

2.8.5. Porter's Value Chain and Competitive Strategies

According to Porter (1980, 1985), the value chain model is the guiding framework for assessing the competitive position of a business and the tasks of a business organization which can be classified into two board categories: primary activities and support activities. The primary activities involve the physical movement of raw materials and finished products, the marketing, sales, and service of these products. The role of supportive activities, which includes human resource management, technology development, and procurement, is to provide support to the primary activities, ensuring coordination and accountability. Value is viewed as the amount that buyers are willing to pay for what a firm provides them, in other words, a firm is a sequential process of value-creating activities (Dess et al., 2007).

In Porter's view, strategy involves a different set of activities for the creation of a unique and valuable position, whereby the firm can defend itself from competitive forces and/or influence them in a way that places it at an advantage facing its competitors (Porter, 1996). Porter postulated two strategic options: low cost and differentiation. Firms can gain competitive advantage by either lowering the cost below the average player or

adding features or functionality to differentiate the product. Jennings and Lumpkin (2000) indicated that firms with a low cost strategy tend to evaluate competitive threats and track the policies and tactics of competitors while firms with a differentiation strategy tend to place more importance on evaluating opportunities and customer attitudes. Although Porter stressed that achieving cost leadership and differentiation are inconsistent as differentiation is usually costly, other scholars hold the view that the two strategies are compatible (Hill, 1988; Kim & Mauborgne, 2005). A firm can gain a competitive edge by being efficient, but in the long run, it can be matched by other firms. Once the firm has achieved a minimum-cost position and efficiency among competing firms is equal, it can gain a sustainable competitive advantage through differentiation which is based upon firm-specific skills (Hill, 1988).

The link between the competitiveness of firms and the natural environment is also stressed. Pollution is a form of waste and inefficiency, implying that environmental improvement can provide both process and product benefits such as lower energy consumption during the production process, reduced material storage and handling costs, and more consistent products with higher quality (Porter & van der Linde, 1995). In the later article from Porter and Kramer (2006) titled "*Strategy and Society: The link between competitive advantage and corporate social responsibility*", the integration of business and social needs is emphasized. Social issues affecting a company are grouped into three categories: generic social issues, value chain social impacts, and social dimensions of competitive context. Generic social issues are those which may be important to society but neither are significantly affected by the company's operations

nor materially affect the company's long-term competitiveness; value chain social impacts are issues that are significantly affected by a company's activities in the ordinary course of business; social dimensions of competitive context are factors in the external environment that significantly influence the underlying drivers of competitiveness in places where the company operates. It is suggested that value chain activities should be transformed to benefit society while reinforcing strategy.

In Table 2.6, we present the summary of previous studies which employed institutional theory, stakeholder theory, RBV, EMT, and Porter's value chain and competitive strategy on environmental management studies.

Table 2.6 Summary of theoretical perspectives on environmental management studies
(continued on next two pages)

Studies	Theory	Type of study	Theory application and findings
(Sharma & Vredenburg, 1998)	RBV	Case study and survey in the Canadian oil and gas industry	The relationship between environmental strategies and capabilities, and between capabilities and competitive benefits are positively related.
(Christmann, 2000)	RBV	Survey with chemical companies	Capabilities for process innovation and implementation are complementary assets that moderate the relationship between environmental strategies and cost advantage.
(Kassinis & Vafeas, 2002)	Stakeholder theory	Archival data from manufacturing firms	Facilities that seem to be more environmentally responsible do not perform better financially and may even perform worse than facilities that are less environmentally responsible with the number of directorships held by outside directors.

(Buysse & Verbeke, 2003)	NRBV and stakeholder theory	Survey in Belgium (including chemical, food and textile industry)	Firms were classified according to NRBV. Not all stakeholders appear to be perceived as equally important for firms with an environmental strategy.
(Delmas & Toffel, 2004)	Institutional theory	Theoretical development	Stakeholders – including governments, regulators, customers, competitors, community and environmental interest groups, and industry associations – impose coercive and normative pressures on firms
(Chan, 2005)	NRBV	Survey in China	Enterprises that possess greater firm specific resources are more likely to develop organizational capabilities; enterprises that possess greater organizational capabilities are more likely to adopt environmental strategies; enterprises that adopt environmental strategies are more likely to achieve higher environmental and financial performance.
(Menguc & Ozanne, 2005)	NRBV	Survey with Australian manufacturing firms	Natural environmental orientation impacts the performance of firms.
(Darnall & Edwards Jr, 2006)	RBV and institutional theory	Survey	The development of organizational capabilities and resources appears to be a function of both organizational exploitation of imperfect or incomplete market factors, and the institutional context of these decisions.
(Zhu & Sarkis, 2007)	Institutional theory	Survey with Chinese manufacturer	Institutional pressures moderate emergent green supply chain management practices in Chinese manufacturing enterprises.
(Murillo-Luna et al., 2008)	Stakeholder theory	Survey in Aragon	Environmental pressure from stakeholders leads to greater environmental proactivity.

(Delmas & Toffel, 2008)	Institutional theory	Survey and archival data	Differences in the influence of corporate departments lead their facilities to prioritize different external pressures and thus adopt different management practices.
(Darnall et al., 2010)	Stakeholder theory	Survey	Smaller firms are more responsive to value-chain, internal, and regulatory stakeholder pressures.
(Sarkis et al., 2010)	Institutional theory, RBV, Stakeholder theory	Survey in the Spanish automotive industry	Internal organizational resources mediate the relationship to external forces (institutional forces) and green supply chain management practices adoption.
(Delmas & Montes-Sancho, 2010)	Institutional theory	Archival data	Late joiners and early joiners within environmental voluntary agreements adopt different cooperative strategies because they face different institutional pressures.
(Zhu et al., 2011a)	EMT	Survey in China	Circular economy-targeted performance is positively associated with manufacturing types which implement environmental supply chain management practices at higher levels.
(Zhu, Sarkis, & Lai, 2011b)	Institutional Theory	Survey with 377 Chinese manufacturers	The international environmentally oriented institutional drivers encountered are positively associated with the adoption of environmental supply chain management practices. There are significant differences in the environmental, economic and operational performance outcomes across the three manufacturer clusters.

2.9. Summary

In this chapter, we reviewed the literature relevant to our research inquiries on the environmental management and retail literature. To better posit our study, we first narrowed it down to the environmental management literature after the review of the

broad CSR and CS concepts. We then discussed how GR is rooted between the environmental management and the retail literature by converging the common concepts from the two fields. We also outlined how GR differs from other green concepts such as green marketing, green logistics, and green supply chain management. Moreover, five theoretical perspectives on environmental management, namely institutional theory, stakeholder theory, resource based view of the firm, ecological modernization theory, and Porter's value chain were reviewed. This step provides us with a theoretical ground to operationalize GR and formulate hypotheses between its related theoretical constructs for investigating our research questions, thus supporting and supplementing the research models that we develop in the subsequent chapters.

3. CONCEPTUAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

In this section, we conceptualize GR to reach our first objective for identifying the different dimensions of GR. This conceptual framework provides the theoretical foundation to categorize the GR practices subsumed under GR adoption and understand the roles of retailers in greening their value chain, which are detailed in the later part of this study. After conceptualizing the dimensions of GR, we then establish a theoretical model which examines the relationships amongst the theoretical constructs. This step leads us to achieve the second and the third of our research objectives: constructing a measurement model of GR and investigating the links between the drivers, the adoption, and the performance outcomes of GR practices.

3.1. Conceptualization of GR

In the following, we conceptualize GR taking the theoretical grounds of NRBV and Porter's value chain. Natural resource-based view of the firm (NRBV) stresses a firm's relationship with the natural environment and highlights three strategies of the firm, namely *pollution prevention*, *product stewardship*, and *sustainable development*. Reducing waste is fundamental to *pollution prevention*, which focuses on minimizing waste in internal operations via, e.g., the use of pollution control equipment (Hart, 1995). The concept of waste reduction is also central to *product stewardship*, which entails integrating external stakeholders into product design and process development for eliminating waste and reducing life-cycle environmental costs such as greenhouse gas emissions. Taking containerboard packaging as an example, the amount of carbon

dioxide emitted from it throughout the production, use, and disposal of the containerboard is one of its life-cycle environmental costs (Ross & Evans, 2002).

Hart (1995) asserted that "activities at every step of the value chain - from raw materials access, through production processes, to disposition of used products - bring environmental impacts". Consistently, Porter and van der Linde (1995) considered pollution as a form of economic waste and pointed out that every step of the value chain can damage the environment. As NRBV suggests, waste reduction in the value chain is helpful for firms to gain competitive advantage through cost saving (Hart, 1995). Relating NRBV to Porter's value chain, we see that *pollution prevention* calls for waste reduction in the primary value chain activities such as operations and logistics, which are the firm's internal practices; whereas *product stewardship* is oriented towards procurement, as well as marketing and after-sales activities, involving cooperation with suppliers and customers. The third strategy advocated in NRBV, *sustainable development*, demands the firm make a commitment and take a long-term orientation towards reducing its environmental burden in order to sustain organizational growth and development. Supportive activities in the value chain such as shared top management commitment to environmental policy formulation, green technology development, and employee training on environmental protection are necessary for sustained organizational growth. As seen in Table 3.1, the three strategies from the NRBV perspective are congruent with the value chain concept in terms of "where it takes place", "how it takes place", and "who is the key party involved".

Table 3.1 Linking NRBV with Porter's value chain

NRBV Strategies in the value chain	How it takes place	Where it takes place	Who is the key party involved	Key elements summarized
Pollution prevention	***Improving*** efficiency by minimizing emissions, effluents and waste in operations	***Internal*** activities: Operations, Logistics	Employees	**Internal improvement**
Product stewardship	***Coordinating*** with stakeholders to minimize life-cycle costs of products	***External*** activities: Procurement, Marketing, After-sales service	Stakeholders	**External coordination**
Sustainable development	***Developing*** technology and human resources to support green primary activities and further growth of the firm	***Supportive*** activities: Firm infrastructure, Technology development, Human resource management	Top management	**Supportive development**

The analytical framework in Table 3.1 integrating NRBV with Porter's value chain is useful for conceptualizing GR, as retailing is viewed in a value chain as "*the set of business activities that add value to the products and services sold to consumers for their personal or family use*" (Levy & Weitz, 2007). Given the fact that environmental practices often span across functional areas in organizations (Handfield et al., 1997), it is appropriate to examine the underlying practices of GR and their performance implications by analyzing the retail value chain (Porter & Kramer, 2006). Table 3.2 identifies three mutually exclusive dimensions of GR, namely "*internal-improvement based* GR", "*external-coordination based* GR", and "*supportive-development based*

GR". The attributes "ends", "key party involved", and "function in the value chain" are used for comparisons and contrasts among these three dimensions of GR.

Table 3.2 Attributes of the dimensions of GR practices

	Dimensions of GR		
Attributes	***Internal-improvement based GR***	***External-coordination based GR***	***Supportive-development based GR***
Ends	Minimize waste in internal operations	Minimize life-cycle costs of products	Minimize environmental burden for sustained firm growth and development
Key party involved	Employees	Suppliers and customers	Top management
Function in the value chain	Primary internal activities: operations and logistics	Primary external activities: procurement, marketing and after-sales service	Supportive activities in the value chain: firm infrastructure, human resource management, and technology development

3.2. Research Model

After conceptualizing the dimensions of GR, we then establish a theoretical model comprising the antecedents, the GR adoption, and its consequential performance drawing from strategic choice theory, institutional theory, and ecological modernization theory.

"Strategy" is the coherent bundle of practices (Agarwal & Ferratt, 2001) that integrates an organization's major goals, policies, and action sequence into a cohesive whole (Quinn, 1993); while strategic management is the set of managerial decisions and actions that determines the performance of an organization (Poister & Streib, 1999).

Following this line of thought, GR is the strategic management approach integrating environmental management decisions and actions for the financial and environmental performance of a retailer; while GR strategy consists of management practices to reach this goal.

"Strategic choice" refers to the process whereby decision makers decide upon courses of strategic actions within the environment which the organization is operating (Child, 1972, 1997). The theory explains that the environment in which organizations operate influences the range of strategic choices for management and can possibly restrict the ability of firms to make strategic decisions within the organization (Child, 1972, 1997). By nurturing internal competencies and applying them to an appropriate external environment, a firm can develop a viable strategy (Russo & Fouts, 1997). Strategic choice theory is suggested to be helpful in explaining the motivational reasons and consequential performance of firms' strategy because the development of a strategy should take account of the key external and internal constraints which operate on firms (Campling & Michelson, 1998). Organizational success in performance can be explained more coherently if it is traced back to the strategy process and how its development in a company was linked with strategy (Sorge & Brussig, 2003). Strategic choice theory is thus relevant to the examination of GR antecedent-adoption-performance relationships.

Institutional theory emphasizes the role of social pressures imposed on organizations that influence organizational practices and structures. Managerial decisions are strongly influenced by three institutional mechanisms – coercive, mimetic, and normative

isomorphism – that create and diffuse a common set of values, norms, and rules to produce similar practices and structures across organizations that share a common organizational field. Organizations that constitute a recognized area of institutional life include key suppliers, resource and product consumers, regulatory agencies and other organizations that produce similar services or products (Delmas & Toffel, 2004; DiMaggio & Powell, 1983). The threats posed by the various stakeholders thus induce firms to perform green practices (Buysse & Verbeke, 2003). Hence, institutional theory is a useful theoretical lens in this study for investigating the influence of stakeholder pressures on the GR adoption.

EMT is found helpful in formulating more general explanations of current transformations of environmental practices with the idea to solve environmental problems by reducing waste and improving the efficiency (Hills, 2005; Hunold & Dryzek, 2001; Mol & Sonnenfeld, 2000). Besides economic change and changes in infrastructure and technology at the macro-economic level, efficiency improvements can also occur at the micro-level through new technologies and techniques addressing pollution problems at source (Hills & Roberts, 2001). It goes in line with the concept of GR that pollution and waste are reduced at source. EMT views technological adjustments and innovations as a means to improve market competitiveness with incidental environmental gain (Christoff, 1996). EMT is thus useful in explaining the relationships between GR adoption and economic performance, as well as between that and environmental performance, with the notion that the ecological-economic "win-win" solutions can be achieved by bringing less pollution, producing less resource-intensive

products, and improving efficiency in utilizing resources for better financial outcomes (Jänicke, 2008; Zhu et al., 2010).

Drawing from the above theories, we propose the theoretical model as shown in Figure 3.1. The underlying hypotheses are discussed as follows:

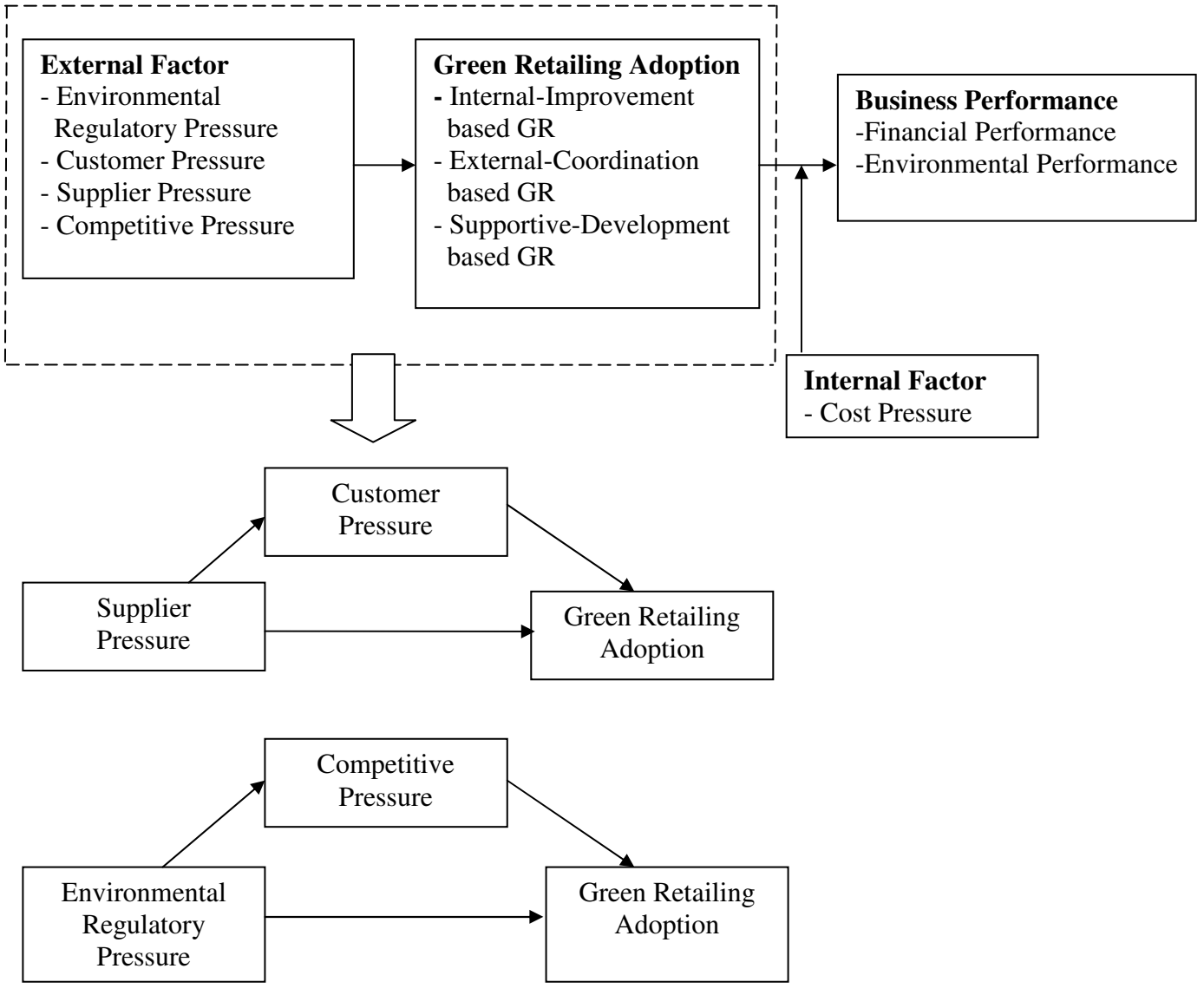


Figure 3.1 Model showing the underlying proposed relationships among GR adoption, its antecedents, and performance implications

3.2.1 Drivers of GR Adoption

3.2.1.1. Environmental Regulatory Pressure

Regulations are legal restrictions promulgated by government administrative agencies through rulemaking supported by a threat of sanction or a fine attempt to produce outcomes which might not otherwise occur (Hager & Otto, 2006). As a form of coercive power, legislation authorizes agencies to promulgate and enforce regulations (Delmas & Toffel, 2004). Coercive forces through regulations and regulatory enforcement, have been identified as the main pressures for environmental management adoption (Henriques & Sadorsky, 1996). In the retailing context, we argue that retailers are also presented with coercive pressure for compliance with set rules and obligations to embrace green practices. There are various regulatory requirements, spanning from pollution prevention in operations to recycling. For example, The Waste Electrical and Electronic Equipment (WEEE) Regulations in the United Kingdom require all retailers of electrical and electronic products to provide free take-back in store enabling consumers to return their WEEE when making a purchase of new equipment (Environmental Agency, 2008; WEEE, 2008). Clean Water Act in the United States requires retailers to have permits, mandating them to create and carry out pollution prevention plans for minimizing the discharge of pollutants into storm water runoff (Mindfully Organization, 2001). The non-compliance cost with regulations such as penalties and fines are high as discussed in the previous case study of Home Depot. Firms failing to comply with environmental regulations may also incur reputational damages (Miles & Covin, 2000). Retailers are thus pressurized to comply with environmental regulations and utilize environmental management practices for pre-

empting the regulatory threats of noncompliance and the expensive legal expenses (Bansal & Roth, 2000; Murillo-Luna et al., 2008; Sarkis et al., 2010). It is logical for retailers to adopt GR in responding to this regulatory coercive force due to the institutional pressure. It is also consistent with the perspective of strategic choice theory that firms respond to relevant forces in the external environment during decision making and environmental strategies would be the product of managerial choice (Sharma, 2000). We therefore propose that:

H1: The environmental regulatory pressure as perceived by retailers positively affects the extent to which they adopt GR

3.2.1.2. Customer Pressure

Customers have influenced companies' decision to adopt an environmental plan (Henriques & Sadorsky, 1996). For example, customers in developed countries have influenced companies in China to improve their environmental compliance and adopt the ISO 14001 Environmental Management System standard (Christmann & Taylor, 2001). In the retailing context, as retailers aspire to satisfy customer needs and wants through selling goods and services, they have to satisfy customers' demand for environmentally friendly products under the trend of green consumerism. Banerjee (2001) addressed that there is force coming from the customer perspective and customers prefer less material to dispose of after the product purchase. Customers are likely to choose and purchase products which are considered environmental friendly (Banerjee, 2001; Kangun et al.,

1991). As identified by Delmas and Toffel (2005), companies with retail customers have more comprehensive environmental management systems. It suggests that retail consumers exert more pressure on companies to adopt environmental management practices than do other types of customers. Retailers are thus presented with pressure to embrace green practices to entice customers. If such pressure does not exist, they may be less proactive toward green practices adoption (González-Benito & González-Benito, 2010). On the other hand, retailers have to develop environmental programs portraying a green image to mitigate boycotting action of environmentally conscious customers (Banerjee, 2001; Kangun et al., 1991). A customer can simply reduce the consumption of a product without conveying notice to the company. As reflected in a survey, 25% of shoppers boycott stores that are considered to be damaging the environment (Energy Saving Trust, 2007). Following this line of thought, coercive pressure from customers is also consistent from the strategic choice theory perspective that retailers respond to changing market opportunities (growing number of environmental conscious customers) and problems (boycotted by customers) to determine the firm's practices. We therefore argue that retailers are receptive to customer concerns on environmental protection with the implementation of GR.

H2: The customer pressure as perceived by retailers positively affects the extent to which they adopt GR

3.2.1.3. Supplier Pressure

Suppliers control the critical resources of firms (March & Simon, 1958). A supplier can

stop the delivery of an input to a firm if that firm does not use the input in a manner which meets the environmental standard (Henriques & Sadorsky, 1999). Buzzelli (1991) recognized the importance of active supplier participation when dealing with environmental issues as suppliers are the agents influencing the success or failure of any environmental initiative. The inter-connection of suppliers also produces normative pressure inducing retailers to behave in a similar manner. The retail literature suggests that the more important it is for the retailer to maintain the relationship with the supplier, the more likely the retailer will include that manufacturer's new products in its assortment (Palmatier, Dant, Grewal, & Evans, 2006; van Everdingen et al., 2011). It has also been suggested that suppliers can help to provide valuable ideas used in the implementation of environmental projects fostering the green practices adoption (Dong, Carter, & Dresner, 2001). Pressure results when the firm perceives that current business operations can be affected by suppliers in the activity chain. Therefore, we posit that:

H3: The supplier pressure as perceived by retailers positively affects the extent to which they adopt GR

3.2.1.4. Competitive Pressure

The retail literature indicates that the probability of adopting a new product appears to be higher if a larger number of competing retailers has already adopted the new product (van Everdingen et al., 2011). To some degree, adoption appears to be motivated when firms imitate the behavior of other organizations tied to them through networks (Delmas & Toffel, 2005). According to institutional theory, institutional bandwagon pressures

occur because non-adopters fear appearing inferior to many adopters. Bandwagons are diffusion processes whereby organizations adopt an innovation, not because of their individual assessments of the innovation's efficiency or returns, but because of a bandwagon pressure caused by the sheer number of organizations that have already adopted this innovation (Abrahamson & Rosenkopf, 1993). Through the construction of social identity, it guides firms to follow behaviors that they feel will result in positive outcomes and to avoid behaviors perceived to result in negative outcomes. The mimetic process occurs when firms replicate other organizations within their sector that they perceive to be successful (Christmann, 2004). In other words, adoption appears to be driven by the competitive pressure. Hence, we advance the hypothesis that:

H4: The competitive pressure for environmental protection as perceived by retailers positively affects the extent to which they adopt GR

3.2.2 Mediating Effect between Determinants of GR

There is a lack of studies considering the multiple and interdependent influences that simultaneously exist in the stakeholder environment (Rowley, 1997). Since stakeholder relationships do not occur unaccompanied, but rather in a network of influences, a firm's stakeholders are likely to have direct relationships with one another (Rowley, 1997). The following section discusses how one stakeholder might mediate the influence of another in the adoption of GR.

3.2.2.1. Competitive and Regulatory Pressure

Governments worldwide have developed a series of environmental protection related regulations and policies. The growth of stringent environmental regulations intensifies the competition among firms as only those who fulfill the regulatory requirements can survive. Regulatory pressure is positively related to competitive pressure because failing regulatory compliance may damage corporate reputation and devastate competitiveness due to customer/financial loss. Firms make rational choices among alternative courses of behavior to further their own best interest by maximizing rewards and minimizing adverse outcomes (Hirsch, 1997). Mimetic behavior among firms is encouraged to replicate best practices of competitors under the anxiety of operational changes and investment risk in complying regulations. We therefore posit that environmental regulatory pressure leads to the competitive pressure encountered by retailers, which in turns drive the GR adoption.

H5: The effect of the environmental regulatory pressure on retailers' GR adoption is mediated by the competitive pressure they encounter

3.2.2.2. Customer and Supplier Pressure

Retailing activities nowadays are moving from push to pull systems, meaning that customers now pull the goods or information when they need rather than receiving merchandise pushed by suppliers. Due to this operations shift from suppliers to customers, complementary network with close interaction of suppliers and customers has become one of the distinctive characteristics of retail value chain nowadays. If

supplier concerns cannot be converted into actual coercive pressures as experienced by retailers, the former may not feel the urgency to understand let alone implement GR. Considering the scenario that a supplier requests a retailer to stock in particular environmentally friendly products, it is unlikely for the retailer to buy-in the products not favored by customers. More concisely, companies will react to supplier environmental concerns by implementing GR only if there is direct coercive pressure from customers due to their determinant buying power. Provided that social pressures can allow the norms of one group to displace the norms of another group (Oliver, 1991), customers can indirectly demand changes and mediate the supplier pressure (Sharma & Henriques, 2005). Hence, we propose that:

H6: The effect of supplier pressure on the adoption of GR by retailers is mediated by the customer pressure on environmental protection they encounter

3.2.3. Effects of GR Adoption on Business Performance

As emphasized in RBV, organizational resources include all the tangible and intangible assets, capabilities, and organizational processes that enable a firm to implement strategies that improve its efficiency (Barney, 1991; Hart & Dowell, 2011; Teece, 1986). Wastes are resources inefficiency that create problems for firms such as increase in operation costs, waste disposal cost, pollution control costs, and legal cost (Berry & Rondinelli, 1998; Porter & van der Linde, 1995). As conceptualized on the basis of NRBV, GR practices target to minimize waste in internal operations, life-cycle costs of products, and the environmental burden for sustainable firm growth and development.

GR practices towards energy conservation and waste reduction can be deployed as a resource for retailers seeking efficiency improvement. For example, the LED lighting system is a tangible resource beneficial to energy efficiency. Operating procedures that ban the distribution of free plastic bags (San-A Company Ltd, 2008) and the use of reusable chopsticks instead of disposable wooden chopsticks (Yoshinoya Company Ltd, 2009) are exemplary intangible resources that create value with less environmental harm for eco-efficiency enhancement (World Business Council for Sustainable Development, 2006).

On the other hand, a retailer can deliver greater value to customers while bringing down operations cost through GR. Value is created when products are sold at higher prices due to right time and right place delivery (Lai & Cheng, 2009). Determining the needs of target customers and satisfying those needs in a more cost-effective manner than the competition has long been the major strategic goal of retailers (Levy & Weitz, 2007). Firms often need to tackle the trade-off between improved service and reduced cost, e.g., stock replenishment and inventory holding can be costly, but these expenses are helpful for the prevention of lost sales due to stock-outs (Shen & Daskin, 2005). Both inventory cost and lost sales are waste caused by transportation inefficiency as the needed items cannot reach customers at the right time, in the right place, and in the right quantities. GR practices, for example green transportation, can serve the dual goals of cost reduction and service differentiation. Lawson, one of the largest convenience store chains in Japan, has adopted double-chamber and double-temperature-management cargo vehicles to deliver merchandise that requires two different temperature conditions:

rice-related products that are stored at 20°C and dairy products, desserts, and other items that are stored at 10°C or below (Lawson, 2008). Partitioning the cargo areas of delivery trucks into different zones allows both product types to be consigned in one vehicle, reducing the idle waiting times for the delivery of different product types, maximizing the utilization of vehicles, and saving fuel costs for the retailers.

Simply put, GR creates unique attributes valued by environmentally conscious customers, making it firm specific and difficult for rivals to imitate. The profitability of a firm is expressed as: profit = price - cost. Value creation by distinctive attributes is favorable to a firm if it commands a premium price (Berman, Wicks, Kotha, & Jones, 1999) and can reduce cost through higher efficiency. Thus, GR is beneficial to retailers seeking both cost reduction and differentiation for improving their financial gains. This is also consistent with the ecological modernization perspective that reducing environmental impact can act as a way of enhancing economic competitiveness and a market opportunity to raise revenue (Berger et al., 2001; Pataki, 2009).

We therefore propose that:

H7: There is a positive relationship between the adoption of GR and the financial performance of retailers

H8: There is a positive relationship between the adoption of GR and the environmental performance of retailers

3.2.4. Moderating Effect of Cost Pressure on Performance Implications

Retailers face increasing cost pressure due to the higher fee of waste disposal and the rise of energy cost. Jabbour (2010) found companies seek cost reduction, especially the expense cuts in operations. Performing green actions, firms can lower dependency on the input of natural resources to save cost as well as reduce environmental impacts occurring at all stages of the value chain (Lai & Wong, 2012). When the cost pressure perceived by firms is high, they are prompted to devote more effort to reducing cost through reducing waste in a cost effective manner in order to gain better financial performance. This in turn reduces adverse impacts on the environment and leads to better environmental performance of the firm. As suggested by strategic choice theory, the performance of firms is very much dependent on how the firms perceive and respond to internal problems. When the cost pressure perceived by firms is high, it is more likely that they respond actively to ease this problem. Better environmental performance potentially results in the greater effort of firms to reduce waste and to achieve cost advantage from implementing environmental management practices. In other words, both financial and environmental performance outcomes from GR adoption is determined by a firm's perception of pressure level to reduce cost.

Therefore we posit that:

H9: The higher the cost pressure perceived by retailers, the stronger is the positive relationship between GR adoption and financial performance

H10: The higher the cost pressure perceived by retailers, the stronger is the positive relationship between GR adoption and environmental performance

3.3. Summary

This chapter proposes the underlying relationship between the drivers, adoption of GR, and its performance outcomes by retailers. Institutional theory and strategic choice perspective advocate that firms respond to various types of pressures from external and internal environments. Retailers respond to regulators, customers, suppliers, as well as competitors to embrace green practices. We also argue that customer pressure exerts mediating effect on the relationship between supplier pressure and GR adoption, while competitive pressure mediates the relationship between environmental regulatory pressure and GR adoption. As a result of adopting GR, we propose that retailers can achieve better financial and environmental performance outcomes based on the ecological modernization theory. In addition, we advocate that the cost pressure perceived by firms moderates the relationships between GR adoption and the performance outcomes. Moving toward the operational domain of this study, the next chapter discusses the methodologies and procedures we design for our systematic investigation of these hypotheses.

4. RESEARCH METHODOLOGY

Methodology, a mode of thinking and acting, contains a number of concepts which describe the steps and connections needed in the process of creating and searching for new knowledge (Ingeman & Björn, 2009). Research methods, are the means used to collect evidence for building or testing explanations that are being studied. There are various research methods with different purposes and characteristics (Frey, Botan, & Kreps, 2000). Through literature review, we identify six major research methods which have been employed in business research. They are: laboratory experiment, field experiment, mathematical modeling, event study, qualitative case study and quantitative survey.

4.1. Review of research methods in business studies

Laboratory experiment refers to the creation of exact conditions required in which some variables are controlled and manipulated. Observations are then made on the dependent variables (Krishnaswamy, Sivakumar, & Mathirajan, 2009). Laboratory designs permit the examination of causal relationships and the control of exogenous variables (Randall & Gibson, 1990). Laboratory experiment suggests what might happen in the field but it is not concerned primarily with behavior that occurs in natural social settings (Scandura & Williams, 2000). Manipulations of variables in laboratory experiment can be difficult and the weakness in the strength of variables may result in no measurable change in the dependent variable or different conditions (Krishnaswamy et al., 2009). The

representativeness of the sample is also extremely difficult to be accomplished even for the segments (Krishnaswamy et al., 2009). Field experiment is similar to a laboratory experiment with the difference that it takes place in a realistic situation. Hence, considerations of strong effects of variables are more easily exploited (Krishnaswamy et al., 2009).

Mathematical modeling is a description of a system or beliefs using mathematical concepts and language (Bender, 2000). Simulation model involves artificial data creation or simulation of a process (Scandura & Williams, 2000). With the use of a symbolic representation of processes, the path and flow of state transitions are determined in ways that can be made persistent, replayed, dynamically analyzed and reconfigured into alternative scenarios (Paul, Hlupic, & Giaglis, 1998). An event study is a statistical technique that estimates the stock price impact of occurrences such as mergers and earnings announcements. Its basic notion is to disentangle the effects of two types of information on stock prices - information that is specific to the firm under question and information that is likely to affect stock prices market wide (Corrado, 2011).

Qualitative case study is used to investigate a sampled unit or several sampled units in depth in order to provide a careful and detailed documentation of the practices being studied (Yin, 2008). An initial understanding is built through an iterative process of categories and meanings developed from the data. That understanding is then tested and modified through cycles of additional data collection and analysis until coherent

interpretation is reached. Qualitative methods can yield data with richer explanations of how and why process and outcomes occur (Kaplan & Duchon, 1988).

Quantitative survey can be employed to ask questions about the beliefs, attitudes, and behaviors of respondents for the purpose of describing both the characteristics of those respondents and the populations they were chosen to represent (Iraldo et al., 2009). It maximizes the representative sampling of the population being studied and neutralizes context by asking for behaviors that are unrelated to the context within which they are elicited (Scandura & Williams, 2000). Information can be standardized from the subjects being studied (Pinsonneault & Kraemer, 1993).

4.2. Research Design of this Study

Methodological fit, which is defined as the internal consistency among elements such as research design and research questions of a research project, has been emphasized in research objective achievement (Edmondson & McManus, 2007). Hence, our selection of research design should complement our research objectives: to explore the GR dimensions, empirically validate the measurement of GR and test for the hypotheses on the links amongst the antecedents, adoption, and consequences of GR.

Among the above discussed various research methods, laboratory experiment is unsuitable for our study as its precise and controlled measurement is often far different from real-life situations (Scandura & Williams, 2000). Field experiment, meanwhile, is weak in precision with measurement problems and has a high level of noise

(Krishnaswamy et al., 2009). As a high degree of understanding of the systems is necessary for mathematical modeling (Krishnaswamy et al., 2009), it is not suitable for our study which is exploratory in nature. Event study was considered incompatible as stock price was not the focus of our study.

We chose to conduct qualitative case study and quantitative survey following the mixed research approach (i.e. the use of both qualitative and quantitative approach). Combining qualitative case studies and quantitative survey research has been widely advocated and supported by scholars with its advantage in attaining generaliazability and in-depth understanding of research questions (Hurmerinta-Peltomäki & Nummela, 2006; Jick, 1979). The mixed research approach has been found beneficial in the literature particularly in overcoming the weaknesses of a common method bias by triangulating results that are found in different research methods (Teddlie & Tashakkori, 2009). It also ensures that the variance reflected that of the trait and not of the method, thus helping capture a more complete and holistic view of the studied topic (Jick, 1979).

We first carried out Study I which was an exploratory qualitative case study to understand the underlying dimensions of GR. Qualitative case study is especially appropriate in new topic areas (Eisenhardt, 1989). This helped us to have a basic understanding of the roles of retailers in greening their value chains. Study II comprised a quantitative questionnaire survey with the aim to empirically confirm the measurement properties of GR established in Study I; specifically this study stage focused on constructing and validating the measurement for the adoption of GR, and investigating

the relationships between our proposed constructs. In supplementing Study II which was based on primary survey data, we collected secondary objective data in Study III to further validate whether retailers adopting GR achieve better financial performance than their non-adopting rivals.

Research design sets up a framework for the study of relationships among variables (Kerlinger, 1978). The research design described below is helpful for achieving our research objectives and increasing the validity of our findings.

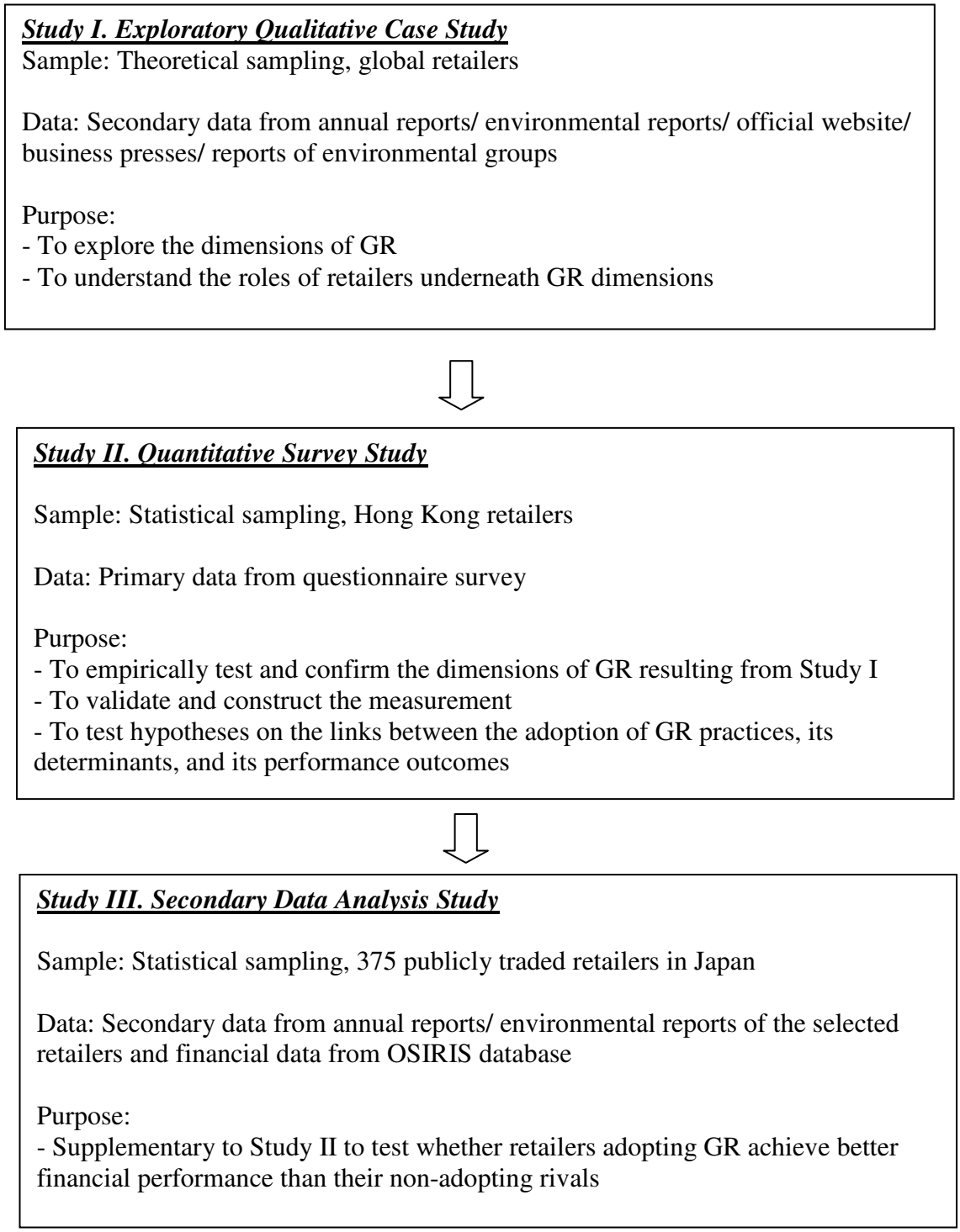


Figure 4.1 Research design to complement the research objectives

5. EXPLORATORY QUALITATIVE STUDY

5.1. Research design for exploratory qualitative study

In our investigation of the theoretical dimensions of GR, we adopted the preliminary framework grounded on the natural resource-based view of the firm (NRBV) and Porter's value chain discussed in Chapter 3 to provide theoretical guidance for our subsequent categorization of GR practices. We then employed theoretical sampling to select cases to examine the theoretical issues of our research questions rather than using statistical sampling, which is designed to be representative of a population (Bansal & Roth, 2000; Eisenhardt, 1989). We analyzed the data qualitatively using the techniques of open and axial coding to categorize the GR practices (Strauss & Corbin, 1998). Open coding is the process of identifying central concepts or categories and their properties, while axial coding is to relate categories to their sub-categories (Becker, 2005). Based on the sub-categorization derived, we modified our preliminary framework and then identified the dimensions of GR and the roles of retailers in GR dimensions.

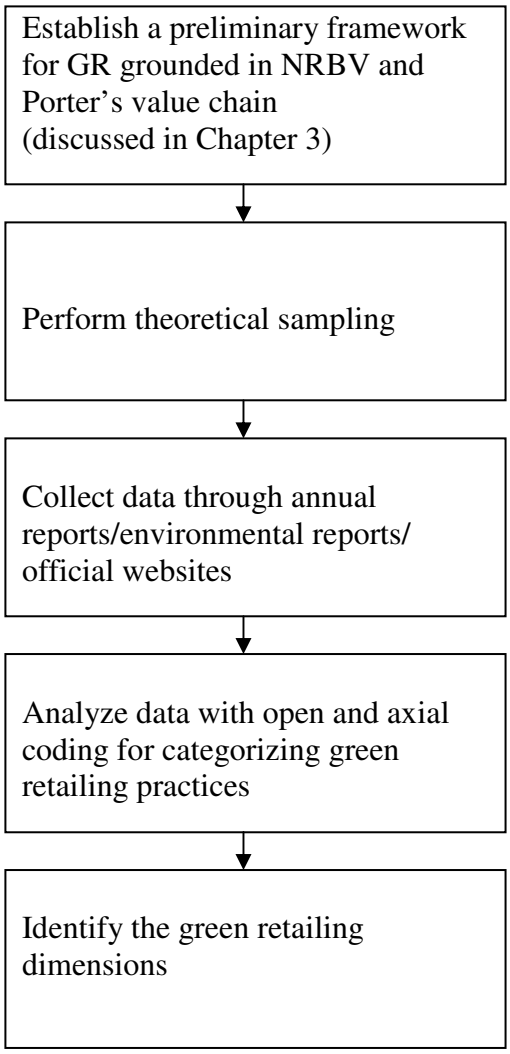


Figure 5.1 Research process for exploratory qualitative study

5.1.1. Sampling

We sampled the following retailers: *Wal-mart*, *Carrefour*, *Tesco*, *Metro Group*, *The Kroger Co.*, *Target Corp*, *Costco Wholesale Corp* and *Sears Holdings Corp* for the following reasons: 1) they are leaders in a variety of operating formats, including Apparel/Footwear Specialty, Cash & Carry/Warehouse Club, Convenience/Forecourt Store, Discount Department Store, Discount Store, Electronics Specialty, Home

Improvement, Hypermarket/Supercenter/Superstore, Supermarket, Non-Store, and Other Specialty (*STORES*, 2008); 2) their operations cover 64 countries in the world[1] enhancing the generalizability of this study; and 3) they are all publicly-listed companies, hence the information gathered from their official annual reports and websites is expected to be true to safe-guard their corporate reputation.

5.1.2. Data Validity –Threat of Greenwashing

Because companies are not required by law to publish environmental policy statements or to verify that these statements are true using independent third parties, it leads to the issue of "greenwashing" with misleading information disseminated by an organization so as to present an environmentally responsible public image (Ramus & Montiel, 2005). Companies may employ tactics that mislead consumers regarding the environmental practices of a company or the environmental benefits of a product or service (Bradford, 2007). Greenwashing happens when a company makes claims to be green through advertising and marketing rather than actually implementing business practices that minimize environmental impact (Greenwashing Index, 2012). Among numerous ways of greenwashing, Greenpeace, the largest independent direct-action environmental organization in the world, identifies four main types of greenwashing: first, touting an environmental program or product, while the corporation's product or core business is inherently polluting or unsustainable; second, using targeted advertising and public

[1] Countries with operations by the sampled retailers: Algeria, Argentina, Austria, Belgium, Brazil, Bulgaria, Canada, China, Costa Rica, Columbia, Croatia, Czech Rep., Denmark, Dominican Republic, El Salvador, Egypt, France, French Polynesia, Germany, Greece, Guam, Guadeloupe, Guatemala, Honduras, Hungary, India, Indonesia, Italy, Japan, Luxembourg, Malaysia, Martinique, Mexico, Moldova, Morocco, Netherlands, Nicaragua, Oman, Poland, Portugal, Puerto Rico, Qatar, Rep., of Ireland, Reunion, Romania, Russia, S.Korea, Saudi Arabia, Serbia and Montenegro, Slovakia, Singapore, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, Tunisia, UAE, UK, Ukraine, US, Vietnam and Virgin Islands.

relations campaigns to exaggerate an environmental achievement in order to divert attention away from environmental problems or if it spends more money advertising an environmental achievement than actually doing it; third, advertising or speaking about corporate green commitments while lobbying against pending or current environmental laws and regulations; fourth, advertising or branding a product with environmental achievements that are already required or mandated by existing laws (Greenpeace). The potential benefits of what the firms communicate may be questionable under greenwashing (Parguel, Benoît-Moreau, & Larceneux, 2011). External stakeholders often wonder when a published commitment to a policy translates into actual policy implementation (Ramus & Montiel, 2005).

Summarizing the above viewpoints of greenwashing from scholars and NGOs, the key is whether companies have done the "actual implementation" instead of "claiming" for public relations purposes. To reduce the threat of self-report bias due to greenwashing, we took precaution to ascertain the validity that actual implementation was done. The information of the content analysis we adopted must meet at least one of the following criteria to ensure data validity.

5.1.2.1. Precise Figure

We selected only information containing precise figures showing the results of green practices by retailers. For example, Carrefour stated that "We collect waste, such as neon tubing and cooking oil used at stores. 449,172 tons of waste was recycled thanks to the implementation of waste sorting and recycling at Group stores in 2007." In contrast,

Costco claimed that "We have an extensive recycling program that includes the efficient and environmentally protective recycling of cardboard and paper, photo lab silver, junk tires, and broken pallets." Due to the absence of exact figures in support of this claim by the latter, this piece of information was taken out from our subsequent data analysis to control for the potential bias problem.

5.1.2.2. Date of Implementation

The exact date of implementing the green practices was provided. For example, Target stated that "in 2006, we introduced a kid's meal box in our Food Avenue® restaurant at all Target stores that is made from 100% recycled content, with a minimum of 40% post-consumer fiber." In another piece of information from Kroger, it was stated that "we are installing variable-speed drives in air-handling fans and evaporative condenser fans that use a fraction of the energy of older equipment." In our data analysis, we excluded the latter because it did not provide the implementation date.

5.1.2.3. Third-party Data for Verification

We examined retailers' green practices that can be validated, which include the procurement of Marine Steward Council (MSC) and FSC certified products, as well as partnerships with environmental groups and government agencies. We verified the practices by checking the partner websites/business presses/reports of environmental groups to ensure the validity of the data before analysis.

5.2. Data Analysis and Findings of Exploratory Qualitative Study

5.2.1. Dimensions of GR

Study I, the exploratory qualitative study, was completed to identify and categorize the GR practices reported in the archival documents of the sampled retailers. Utilizing the analytical framework discussed in the conceptualization of GR in Chapter 3, we categorized the GR practices reported in the archival documents of the sampled retailers. The categories and sub-categories of GR practices with illustrative examples are summarized in Table 5.1. The roles of retailers in GR practices are explained below:

Table 5.1 Dimensions of GR
(continued on next two pages)

Dimensions of GR practices	**Descriptions**	**Examples**
Internal-improvement based GR	**Minimizing emissions, effluents, and waste in internal operations**	
Green store operations	Utilize system or device in the store which helps energy conservation or reducing/ recycling wastes	Through devices such as energy efficient HVAC Roof Top Units (RTU), T12 fluorescent lighting with energy efficient T8 or T5 fluorescent lighting, the reduction of energy usage in 2008 is 438 million kWh on a comparable store basis (Sears Holdings Corp.)
Green transportation	Transport goods with reduced consumption of materials or energy/ increase in effectiveness	Have used river transportation since 2004 between Anvers and Villvoorde (Brussels) to transport 3,000 containers per year, allowing a reduction of CO2 emissions by 54 tons. (Carrefour)

External-coordination based GR	**Coordinating with stakeholders to minimize life-cycle costs of products**	
Green procurement	Purchase goods from, or develop partnership with, a council which supports sustainability; purchase goods with eco-labels such as FSC and MSC, showing the environmental impact	Purchased MSC and FSC-certified products (e.g.,Wal-Mart, Tesco, and Carrefour)
Green product design	Cooperate with suppliers in designing products with environmental considerations	Developed "Extended Roll Life" products that condense several rolls of either toilet paper or paper towels into one "Extended Roll Life" roll. By selling twice as many Charmin® 6 Mega Roll packs, twice as many units can be shipped. Wal-Mart eliminated 89.5 million cardboard roll cores, 360,087 pounds of plastic wrapping and reduced diesel consumption by 53,966 gallons (Wal-Mart)
Green packaging	Cooperate with suppliers to develop packaging which can be reused and recycled or waste can be reduced	Saved 2,600 tons of glass from one supplier by lighter glass packaging; imported New World wines in bulk and bottling them in the UK has saved around 4,100 tons of carbon emissions; removed 24.8 tons of plastic packaging for electrical products (Tesco)
Green promotion	Educate/train/encourage customers to participate in recycling/ reducing waste/ reusing products	Launched Green Clubcard Points in August 2006, and since then saved over 3 billion bags (Tesco)
Green after-sales service	Provide channels for customers to participate in reducing waste and reusing products; collect disassembled products from individual customers and return them to suppliers	Helped customers recycle their bottles and cans; provided the machines servicing the need of residents to return their used bottles and cans for refunds; in 2006, nearly 207 million cans and bottles were recycled at Fred Meyer's 50 stores in Oregon (The Kroger Co.)

Supportive-development based GR	**Effective research and supportive activities for sustained green development and growth**	
Green policy	Develop missions and visions on green commitment	"Costco has always sought to be a good steward of the environment, and we continue to pursue new initiatives and implement new polices that enhance our performance in this important area" (Costco)
Green technology development	Support research, investment or co-operation with other agencies for developing technology to reduce environmental impact	Target has been a member of the U.S. Green Building Council (USGBC) since 1997, and participating in the USGBC Pilot Portfolio Program to explore retailers' unique sustainable design needs and advance the use of LEED standards (Target)
Green human resource development	Promote employee participation for green development	Organized "energy saving weeks" to show employees options for lowering energy consumption; motivated employees to reduce energy use as much as possible by measuring the energy consumption since 2002 (Metro Group)

Internal-improvement based GR practices are central to minimizing emissions, effluents, and waste in operations, which in turn help retailers reduce costs and gain in environmental performance. This is consistent with the philosophy of total quality environmental management (TQEM), which focuses on improving the efficiency of production, minimizing waste, and reducing costs throughout the entire corporate system (Shrivastava, 1995). Congruent with the "zero-defects" goal of TQEM, *internal-improvement-based GR* demands continuous improvement at every step of the operations process with a view to attaining total elimination of waste (Hart, 1995; Shrivastava, 1995). Continuous improvement is concerned with constant evaluation and

improvement of the operations process for enhancing efficiency (Hart, 1995; Zangwill & Kantor, 1998). There are several ways to gain efficiency through process improvement and innovation. They include minimizing materials input, reducing energy consumption, maximizing the use of renewable resources, and extending product durability (World Business Council for Sustainable Development, 2006). Since continuous improvement of the process is helpful for mitigating the environmental damages caused by the process activities, eco-efficiency (i.e., simultaneously maximizing productivity and environmental performance) can be improved (Burnett & Hansen, 2008).

Consistent with the notion of eco-efficiency that environmental impact should be reduced throughout a product's life cycle (World Business Council for Sustainable Development, 2006), *external-coordination based GR* focuses on coordinating with related parties to minimize the life-cycle cost of the product. This includes the environmental impact of the product from the production, usage, and disposal processes (Ross & Evans, 2002). The retailer's role as a coordinator in the value chain is critical for a green practice to succeed. The environmental efforts of retailers in the value chain can be compromised when there is no coordinated supplier and customer involvement to lessen the environmental harms caused at the different stages of a product's life cycle (Darnall, Jolley, & Handfield, 2008).

Supportive-development based GR practices refer to the research and support activities developed in support of environmental preservation for retailing. For example, Carrefour Group created the Sustainable Development Department in 2001. This department

involves a functional organization of dedicated people and a sustainability network. Each year, the Sustainable Development Report summarizes the initiatives and progress accomplished during the year. The department defines indicators that are measurable for evaluating the evolution of its environmental performance such as energy consumption and waste management of the Carrefour Group. It also provides support for cross-departmental operational networks (spanning Human Resources, Merchandise, Assets, Logistics) for better environmental achievement. The Carrefour Group reduced 9.2% of energy consumption (kWh/m^2) in 2007 favorably compared with that in 2004 (Carrefour, 2007). The Carrefour Group case illustrates how activities developed in support of environmental preservation for retailing can help better achieve environmental and economic outcomes from green practices. Firms also need to develop a long-term vision and a commitment to environmental protection. As stated by Tesco, "We are committed to cutting our carbon footprint in every area of our business. And we want to make it easier for our customers to do the same by offering greener, more sustainable choices" (Tesco, 2007). Target says, "We are committed to providing our guests with great design, which is consistent with protecting and managing our environmental resources. Target encouraged manufacturers to remove harmful Perfluorooctanoic (PFOA) chemicals from products used in fabric and garment processing and to develop PFOA-free chemical alternatives" (Target). These examples demonstrate that the environmental goals stated in the retailer's policy can influence supplier and customer behaviors by controlling, organizing, and managing resources and knowledge across the value chain. Such influences can be reinforced by the *supportive-development based GR practices*

whereby retailers furnish supportive activities to sustain environmental protection efforts in their value chains.

5.2.2. Roles of Retailers in Greening the Value Chain

Coordination theory (Malone & Crowston, 1990) is useful in explaining how retailers perform GR practices and the distinctive roles they play in the greening of their value chains. GR requires the act of managing three generic kinds of interdependence between value chain partners to achieve an environmental goal: *prerequisite* interdependence occurs when output of one activity is required by the next activity; *shared resource* interdependence refers to the situation where a resource is required by multiple activities; and *simultaneity* interdependence is when more than one activity must occur at a time. The interdependent nature of GR practices highlights the distinctive roles of retailers in greening their value chains.

Retailer Role 1: Provide an environmentally friendly physical retail environment to facilitate interaction with customers

Transactions involve the simultaneous processes of selling and buying. Coordination theory suggests that when more than one activity must occur at a time, synchronization is needed to manage interdependence. Retailers thus provide a physical place for synchronizing transaction activities. Store design has long been recognized as a major element of a retailer's operations (Babin & Darden, 1995) and the required energy consumption is fast becoming a cost concern for retailers. A survey revealed that 87.5%

of retailers experienced energy cost increase and 64% indicated taking actions to create more efficient stores for reducing energy expenses (Agriculture and Agri-Food Canada, 2007). For example, Target's stores in California use rooftop solar panels to supply 20% of their electricity needs and Fontana stores use skylights to provide up to 100% of the store's lighting needs for six hours a day (Target, 2007). When a retailer utilizes the green store, it is essential to consider customer comfort. Metro Cash & Carry has installed walk-in freezer rooms as an energy-efficient alternative to separate refrigerated display cases with constant temperature maintained at zero degree Celsius segregated by glass walls. Considering the need for customer comfort, fleece jackets are available upon request. This solution allows its stores to save up to 30% on electric power consumption for refrigeration (Metro Group).

Retailer Role 2: Transfer goods from manufacturers to consumers in an environmentally friendly way

Retailers take part in coordinating transportation logistics, where products are interdependently transferred from the point of production (manufacturers) to the point of consumption (consumers) (Fernie & Sparks, 2004). Retailers seek to ensure product availability with efficient material flows (Fernie & Sparks, 2004; Lai & Cheng, 2009). Zara, a Spanish apparel retailer, adopts automated routing systems for delivering electronically tagged garments to appropriate loading bays in its logistics centers. Such technological adoption is helpful for reducing shrinkage levels with a 98.9 % accuracy in distribution (Fernie & Sparks, 2004). Eco-efficiency is thus improved where the

goods are delivered with less consumption of materials, hence helping preserve the environment. For food items, different kinds of food ingredients require storage under different temperature controlled environments and separate delivery. MOS Burger, a Japan-based burger chain, has utilized trucks equipped with three temperature belts to serve the need for freezing, refrigeration, and normal temperature (MOS Burger). It is an example of *green transportation* whereby eco-efficiency is improved by consolidated shipments, thus reducing fuel consumption.

Retailer Role 3: Disseminate the voices of customers and provide feedback to suppliers

Wal-Mart noted that 8% of its environmental footprint comes from direct operations while the other 92% is attributable to its products sold (Bony, 2007). Hence, *green procurement, green packaging*, and *green product design* are instrumental in greening the value chain. The coordinator role of retailers in these practices is essential to connecting customers with suppliers and passing along customer needs to the latter. Environmentally conscious consumers prefer products with eco-design that have been developed with input from customers (Chen, 2001). Several studies have identified classifications of green consumers (see Table 5.2). These classifications highlight the differences in consumers' green interests and motivations. The supply of products to retail outlets has long been initiated by manufacturers (Fernie & Sparks, 2004; Nordås, 2008). Recently, the domain has shifted to retailers to gauge customers' needs and wants with the market intelligence disseminated to suppliers for their responsive actions. The two actors (supplier and customer) require the intermediation of retailers as an

information processing mechanism (resource) to transmit the information (task) to achieve the environmental goal from the coordination-theoretic perspective.

Table 5.2 Examples of studies on segmenting the green consumers

Studies	Segments	Characteristics, Interest and Motivation of the Segment
(Finisterra do Paco, Barata Raposo, & Filho, 2009)	The Green Activists	Develop a favorable position in relation to all environmental aspects, particularly towards perceived efficiency, environmental friendly buying behavior, recycling, sensitivity to the economic factor and resource saving; Question the promotional and advertising claims made by firms.
	The Undefined	The environment does not occupy a prominent position among their concerns; Their individual actions are considered not directly related to the improvement of the environment.
	The Uncommitted	Hold a negative position in relation to some environmental aspects (activism, environmentally friendly buying behavior, recycling, resource saving, and willingness to pay more to preserve the environment) despite their claim to have knowledge about the environmental issue.
(Natural Marketing Institute, 2008)	LOHAS	Values-driven trend predictors who are driven by personal and planetary health; Exhibit high influence on others, are the highest buyers of green, healthy, and socially-conscious products, and are less price sensitive; Prefer companies practicing corporate social responsibility (CSR) and boycott those who do not adhere to their standards.
	Naturalites	Driven by personal health and wellness, and adhere to a healthy lifestyle; High purchasers of eco-consumables, and want to do more for the environment; Loyal to those companies/brands practicing credible CSR.

	Drifters	Driven by trends; Currently engaged in sustainability though their behaviors are not deeply rooted; Price sensitive and are more likely to be eco concerned if affected personally.
	Conventionals	A practical segment without green attitudes but demonstrate some "municipal" environmental behaviors such as recycling and energy conservation; Driven more by cost savings or a desire to reduce waste than by environmental consciousness.
	Unconcerned	Not necessarily "against" the environment but is not actively engaged in protecting it; Other priorities in their lives simply take precedent.
(Yahoo! Green Study, 2008)	Deeply Committed	More educated; Higher percentage live in metropolitan areas; Respond most to the "positively impact the environment" message.
	Trendy	More ethnically diverse; Respond to messages about "everybody else is doing it," and newest technology.
	Practical	Motivated to be green by immediate benefits such as saving money or improving health.
	Passive	Respond to messages about providing a better life for their family.

As stated by Kroger, "We recognize that our customers are increasingly interested in making a difference when it comes to their individual efforts and choices. Our efforts in helping them extend to the products customers find on our store shelves. We recently teamed up with one of our suppliers, Tetra Pak, to use its Tetra Recart recyclable paper cartons for our Kroger brand tomato sauce and other tomato products instead of cans" (Kroger). This statement illustrates customers' desire for protecting the environment and retailers' response in *green packaging*. On the feedback reflector role of retailers, Wal-Mart introduced a new square-shaped design for milk jugs in 2008 that require no crates or racks for shipping and storage. Trucks can accommodate 4,704 more gallons per truck

or 9% of their capacity. The jugs are thus cheaper to ship and better for the environment with a saving of $0.10 to $0.20 a gallon. However, customers complained that it is very hard to pour the milk, resulting in spills everywhere (Environmental Leader, 2008c). Similarly, customer satisfaction is the key to determining whether Wal-Mart's effort in developing recycled yarn socks and bamboo fiber long-sleeve T-shirts is successful or not (Wal-Mart, 2008). Making continuous improvement by reflecting on and addressing customer feedback is essential for *green product design*. A further step is to acquire merchandise through *green procurement* or develop partnerships with NGOs (such as FSC and MSC) for certificating that the products on the shelf are sourced from an environmentally sustainable forestry and fishery.

Retailer Role 4: Economize and stimulate end-of-life product stewardship

The end-of-life product stewardship path begins with customers. Scale economy is critical for the success of end-of-life product stewardship. In particular, manufacturers find it difficult to collect waste from widely dispersed individual customers, and small-scale recycling can be costly for them (Roy & Whelan, 1992). This illustrates the dependency of suppliers and customers on retailers in take-back efforts and *green after-sales service*. Wal-Mart has formed a partnership with Samsung Electronics America. Through the Samsung Recycling Direct SM program, customers can recycle Samsung consumer electronics for free (as well as those from Wal-Mart's former private brands Durabrand and Ilo, which are no longer sold at Wal-Mart) at numerous fixed drop-off locations in all 50 American states (Wal-Mart). The retailer's role as coordinator is helpful to collect disassembled products from individual customers and return them to

the original supplier. Carrefour has developed environmental awareness for its customers in stores during events such as World Environment Day (Carrefour). A retailer's coordinator role in educating or training customers to participate in green initiatives is reflective of *green promotion*.

Retailer Role 5: Influence and support the entire value system

The coordinator role of retailers in *green technology development* is to facilitate knowledge sharing and resource monitoring among the involved parties in greening their value chains. Besides technologies such as solar power systems and energy efficient fluorescent lighting, which are devices to help save resources directly, technological deployment has the broad power to reduce the costs of coordination, communications, and information processing (Brynjolfsson & Hitt, 2000), benefiting the greening of the entire value system. As advocated by Porter, gaining competitive advantage requires exploiting a system's interdependencies, and it usually requires information or information flows that allow optimization or coordination to take place (Lai & Cheng, 2009; Porter, 1985). Information technology serves this purpose for retailers. For example, through a program called "efficient consumer response," retailers' checkout scanner data are directly transmitted to the manufacturer. Ordering, payments, and invoicing are fully automated through an electronic data interchange so that products can be continuously replenished on a daily basis (Brynjolfsson & Hitt, 2000). This helps prevent stockpiling of products, which in turn minimizes waste from excessive stocks. Further derived benefits are reduction in paper usage in transactions, decrease in labor cost from manual data-entries, and enhancement of customer service by reducing the

cycle time from order to delivery (Lai & Cheng, 2009). In particular, retailers' development of a *green policy* should not be confined to coordinating environmental management practices within organizational boundaries but should be extended to encompass all parties in the value system. Wal-Mart, the largest retailer in the world, announced a green policy in 2007 that they would sell only concentrated liquid laundry detergent at U.S. Wal-Mart discount stores, Supercenters, Sam's Clubs, and Neighborhood Markets starting from May 2008 (Wal-Mart, 2009). One of its suppliers, Unilever, developed its all® small-and-mighty® detergent, which is one third the size of the 100-oz bottle but can wash just as many loads of laundry and is easier to carry. Wal-Mart expects this move to save 430 million gallons of water in the production process, 80 million pounds of plastic resin, and 125 million pounds of cardboard during the first three years of selling only liquid laundry detergent. P&G, Unilever, Dial, Huish, and Church & Dwight responded by transforming their facilities and offering their own concentrated laundry detergent. On the other hand, customers can only buy these environmentally friendly laundry detergents when there is no other choice in the store. Customers are directed to use environmental products with less water. Natural resources are thus saved not only at the production stage, but also at the consumption stage of a product fostered by retailers.

5.3. Summary

Through the content analysis under the guidance of theoretical framework in Chapter 3, we categorized three main dimensions of GR and in total ten sub-categories of GR practices. We also provided examples of each GR practice reported in the archival

documents of the sampled retailers. The findings in this exploratory qualitative study advanced knowledge in GR by emphasizing the roles of retailers in greening their value chains and developed a multi-dimensional conceptualization that is theoretically grounded in NRBV and the value chain concept. Subsumed under each category of GR practices should facilitate the development of variables which are operationalized for measurement in our subsequent quantitative empirical study as discussed in Chapter 6.

6. QUANTITATIVE SURVEY STUDY

Empirical research, which involves systematic data gathering, can provide more generalizable evidence about trends and norms in specific populations of firms for theory building and verification (Flynn, Sakakibara, Schroeder, Bates, & Flynn, 1990). Quantitative survey research primarily involves generating quantitative descriptions for relationships between these variables and projecting findings statistically to the predefined population. This study was conducted by collecting data on structured and predefined research questions. It enabled us to collect data about GR adoption, drivers of GR, and business performance. In the following sections, we operationalized GR adoption, its determinants, and performance, for the development of quantitative survey questionnaire.

6.1. Development of Quantitative Survey Questionnaire

To reach our second research objective to construct and validate the measurement in our study, we first reviewed the previous studies which conceptualized and assessed the closely related constructs following the guideline by Clark and Watson (1995). The measurement items were refined by seeking comments from three academics and three practitioners in the areas of environmental and retail management to evaluate the survey instrument to ensure the meaning of questions is well-understood and interpreted consistently. This procedure helped to assess content validity, which is also known as face validity, concerned with the extent to which a specific set of items reflects a content

domain, and ensured that the items used to operationalize the construct measure what they are supposed to evaluate (Churchill Jr, 1979; Frey et al., 2000). Measurement items were put into a survey questionnaire employing a five-point Likert scale.

6.1.1. Operationalization of GR Constructs

As we are aware that GR adoption has never been systematically articulated nor empirically examined, following Churchill's (1979) paradigm for construct measurement, we operationalized GR adoption from the insights and findings of our qualitative research in Study I and generated a total of 34 measurement items for developing the measurement scale: three for green store operations (GSO), three for green transportation (GTS), three for green procurement (GPC), four for green product design (GPD), five for green packaging (GPG), three for green promotion (GPO), three for green after-sales service (GAS), three for green policy (GLI), three for green research development (GRD), and four for green human resource development (GHR) as summarized in Table 6.1. We assessed each of the measurement items using a five-point scale, anchoring in the range 1: very low (0 - 20%), 2: low (>20 - 40%), 3: neither low nor high (>40% - 60%), 4: high (>60 - 80%), and 5: very high (>80 - 100%). We invited the respondents to evaluate the adoption of GR practices in their companies with respect to the items on the five-point scale.

Table 6.1 Measurement items for GR factors

Factors	Measurement items
Green Store Operations (GSO)	(GSO-1) Use systems or devices to conserve energy in our store
	(GSO-2) Use systems or devices to reduce waste in our store

	(GSO-3) Use systems or devices to recycle waste in our store
Green Transportation (GTS)	(GTS-1) Transport goods with *less* energy consumption
	(GTS-2) Transport goods with *less* materials consumption
	(GTS-3) Transport goods using trucks with *less* harmful gas emissions
Green Procurement (GPC)	(GPC-1) Purchase goods from suppliers supportive of environmental protection
	(GPC-2) Purchase goods with eco-label (e.g., Energy Star)
	(GPC-3) Purchase goods from suppliers certified with environmental standards (e.g., ISO14001)
Green Product Design (GPD)	(GPD-1) Encourage suppliers to use biodegradable materials
	(GPD-2) Encourage suppliers to use recycled materials
	(GPD-3) Encourage suppliers to eliminate materials that cause environmental damage
	(GPD-4) Encourage suppliers to reduce total materials usage
Green Packaging (GPG)	(GPG-1) Cooperate with suppliers to reduce packaging waste
	(GPG-2) Cooperate with suppliers to introduce packaging made of recycled materials
	(GPG-3) Cooperate with suppliers to improve packaging reuse
	(GPG-4) Cooperate with suppliers to use biodegradable materials in packaging
	(GPG-5) Cooperate with suppliers to eliminate packaging that causes environmental damage
Green Promotion (GPO)	(GPO-1) Educate customers on environmental protection
	(GPO-2) Motivate customers to participate in recycling
	(GPO-3) Motivate customers to participate in waste reduction
Green After-Sales Service (GAS)	(GAS-1) Collect returned products from customers
	(GAS-2) Return disposed materials to suppliers
	(GAS-3) Provide trade-in services for new products
Green Policy (GLI)	(GLI-1) Develop vision and mission on green commitment
	(GLI-2) Communicate company commitment on environmental protection to the public
	(GLI-3) Establish time schedule in reaching environmental goals
Green Research Development (GRD)	(GRD-1) Establish department responsible for reducing environmental damage
	(GRD-2) Collaborate with other agencies on research into reducing environmental damage
	(GRD-3) Develop systems to measure and control environmental performance
Green Human Resource Development (GHR)	(GHR-1) Train staff to reduce energy consumption
	(GHR-2) Train staff to enhance operations efficiency
	(GHR-3) Train staff to reduce waste
	(GHR-4) Provide environmental guidance to direct staff in work

6.1.2. Operationalization of GR Antecedents

Based on the literature review in Chapter 2 and the results from the exploratory qualitative study, four antecedents driving adoption of environment management were identified namely, i) environmental regulatory pressure ii) customer pressure iii) supplier pressure, and iv) competitive pressure. They were operationalized according to previous empirical studies comprising the related constructs as discussed below:

6.1.2.1. Environmental Regulatory Pressure

Regulators, who mandate compliance to environmental standards spanning from limiting materials used to waste disposal, determine the actions of enterprises in environmental management practices (Banerjee et al., 2003). Regulatory pressure is concerned with regulations that are enacted by regulatory bodies to control environmental damages caused by organizational activities (Lai & Wong, 2012). Failure to yield to regulatory bodies will hurt an organization's reputation (Sarkis et al., 2010). We used items dealing with managerial perceptions of the influence of government regulation on the strategy, and on the level of environmental regulation faced by the firms to measure regulatory pressure following Banerjee et al. (2003). Considering that regulation by government influences firms' environmental strategy by forcing firms to comply with the obligation, we measured environmental regulatory pressure (ERP) with the following items:

ERP1: Non-compliance with environmental regulations can incur financial loss
ERP2: Non-compliance with environmental regulations can damage our reputation
ERP3: Stricter environmental regulations are a major reason explaining why our company pays attention to protecting the natural environment

6.1.2.2. Customer Pressure

Customer pressure comes from customers' buying power and boycott actions (Henriques & Sadorsky, 1999; Zhu & Sarkis, 2007). Firms seek to satisfy environmental requirements from customers due to their pressure, but firms are also aware that they can bring benefits within the market if their environmental requirements are appropriately responded to and fulfilled (Zhu et al., 2007). While the number of environmentally conscious customers is increasing, firms have to fulfill the green demand and present an environmentally friendly image by adopting green practices (Handfield et al., 1997). We adopted the measurement items from Lin and Ho (2011) and Banerjee et al. (2003) in measuring customers pressure (CSP) that firms face when making decisions in green practices. Their coding is as follows:

CSP 1: Adopting green practices can attract more customers
CSP 2: Adopting green practices can improve our company's image
CSP 3: Adopting green practices can help retain our customers
CSP 4: The number of environmentally conscious customers is growing
CSP 5: The demand for environmentally friendly products and services is increasing
CSP 6: Our customers will boycott our products/services that are **not** environmentally friendly
CSP 7: Our customers will switch to competitors that adopt green practices

6.1.2.3. Supplier Pressure

Suppliers can exert pressure on the firm to mandate certain green practices or else it can stop delivery of input materials (Henriques & Sadorsky, 1999). Firms face pressure to adopt green practices to make sure that suppliers will remain in business and good relationships (Zhu & Sarkis, 2007). Relationships with suppliers are important in adopting green practices (Elkington, 1994). We therefore operationalized the supplier

pressure (SPP) with the following measurement items:

SPP 1: Suppliers prefer to trade with companies that adopt green practices
SPP 2: Our relationships with suppliers will be affected if we do not meet their environmental requirements

6.1.2.4. Competitive Pressure

Firms are receptive to pressure exerted by competitors (Delmas & Toffel, 2005). When environmentally friendly practices are not an optional business practice but a competitive necessity for survival, competitor becomes one of the vital sources of pressure when companies consider environmental management issues (Handfield et al., 1997; Henriques & Sadorsky, 1999). Competitive pressure can be measured by the extent to which the firm perceives that its competitors have adopted environmental management practices (Delmas & Toffel, 2008). The measurement items of competitive pressure (CMP) and their coding are as follows:

The *main competitors of our company* that have adopted green practices ….
CMP 1. have benefited from green practice adoption greatly
CMP 2. are perceived favorably by *others in the same industry*
CMP 3. are perceived favorably by their *trading partners* (e.g., suppliers/customers)

6.1.3. Operationalization of Business Performance

Following prior studies using survey research method, perceptual performance measures were employed for evaluating financial and environmental performance (Chan, 2005; Zhu & Sarkis, 2007). Environmental performance reflects firm's effectiveness in meeting and exceeding societal expectations with respect to concerns about the natural environment (Chan, 2005). We followed the guidance of Lai and Wong (2012) on measuring environmental performance (ENP) by the reduction in emission, waste, and

pollution incurred from business activities. Financial performance (FNP) can be accessed through sales growth and earning perceived by managers (Menguc & Ozanne, 2005). Our target respondents were requested to provide an assessment on the following performance measurement items. To triangulate the survey-based data, we also obtained objective data on annual sales volume of our survey targets which could be obtained from a secondary source for listed companies.

Financial Performance
Compared with our major competitors …
FNP 1. our company has better earnings growth
FNP 2. our company has better sales growth
FNP 3. our utilization of corporate resources (e.g., inventory) is better

Environmental Performance
Compared with our major competitors …
ENP 1. our company generates *less* harmful gas emissions
ENP 2. our company produces *less* waste water
ENP 3. our company produces *less* solid waste

6.1.4. Operationalization of Moderator - Cost Pressure

The firm is concerned about the increasing consumption of resources for each unit of output as well as the dependency on the input of natural resources for continuous productivity growth (Lai & Wong, 2012). With reference to Russo and Fouts (1997) and Lai and Wong (2012), we developed a scale to measure the cost pressure (COP) perceived by firms:

Compared with our major competitors …
COP 1. our input materials cost is higher
COP 2. our process/production cost is higher
COP 3. our energy consumption cost is higher

6.1.5. Control Variables

We included two variables - firm size and internationalization - as control because of their potential effect on our research model. Larger firms often have extra resources to deal with environmental issues (Zhu & Sarkis, 2004; Zhu, Sarkis, Cordeiro, & Lai, 2008a) and it is found that firm size itself has a direct and positive influence on the adoption of environmental strategies (Chan, 2005). On the other hand, when faced with external pressures for environmental change, larger firms are more likely to use resource slack to build corporate buffers against pressures for environmental improvement (Darnall et al., 2010). Hence, we controlled for firm size in testing the hypotheses in our study.

Internationalization is a binary variable to distinguish between companies that are part of a multinational corporation or not (González-Benito & González-Benito, 2010). In classifying retailers as multinational retailers or domestic retailers, we controlled for internationalization of retailers. According to Rugman and Verbeke (1998), firms experience different environmental pressures with those based in home markets paying greater attention to domestic environmental regulations while international firms focus more on international environmental policies. International companies have to comply with international trade agreements to adopt environmental management when they have overseas investment or trade with foreign companies (Berry & Rondinelli, 1998; Slater & Angel, 2000). Hence, firms with different internationalization would encounter different levels of pressure to improve environmental performance (Christmann & Taylor, 2001). We considered firms with operations beyond Hong Kong as international firms.

6.2. Sampling and Data Collection

All retailers in Hong Kong adopting green practices represent the population of our study targets. We selected our sampling scope according to the target “prescribed retailers” in the Hong Kong SAR Environmental Levy Scheme which fulfills either item (1) or (2) below: (1) retailers which offer a) any food or drink; b) any medicine or first-aid item; and c) any personal hygiene or beauty product; and (2) retailers with 5 or more qualified outlets in Hong Kong. In other words, we restricted our samples in 6 categories: cosmetic and beauty products; convenience stores; supermarkets; department stores; drug stores; or retailers with 5 outlets or above. We chose to study the above retailers because they are targeted retailers in the Environmental Levy Scheme. In Hong Kong, the Product Eco-responsibility Ordinance was enacted in July 2008. The Ordinance is a piece of "framework" legislation that provides a legal basis for implementing producer responsibility schemes in Hong Kong. The Environmental Levy Scheme on plastic shopping bags is the first scheme to be implemented under the Ordinance. The objective of the Levy Scheme is to provide a direct economic incentive to encourage the public to switch to reusable shopping bags with a view to reducing the indiscriminate use of plastic shopping bags. The Product Eco-responsibility (Plastic Shopping Bags) Regulation which sets out the implementation details of the Levy Scheme, was approved by the Legislative Council on 23 April 2009 and came into operation on 7 July 2009. Our research results hope to provide more related policy reference to the government and handful managerial insights to retailers who are eligible in environmental management adoption.

HKSAR Census and Statistics Department provided a directory of the sampling frame which included name, categories, and address of retailers in Hong Kong. The directory consisted of 11,857 retail companies in Hong Kong. We selected the retailers which were in the 6 categories we specified above, resulting in 965 firms in our sampling frame. The questionnaire was sent to a key informant, that is, a member of an organization who, because of his or her specific knowledge, is in a unique position to report on the phenomena being studied (Campbell, 1955). Our survey target respondents were top executives, such as CEO, president, vice president, managing director, or operations manager of the sample firms.

We administered the mail survey to our target respondents with a cover letter describing the research objectives and the procedures for completing the questionnaire. We enclosed a postage-paid reply envelope in each survey package. Six weeks after the first mailing, we mailed a follow-up letter and a replacement questionnaire to the non-respondents requesting their responses. We carried out three rounds of mailing altogether. Receiving a total of 145 returned questionnaires, we discarded four of them due to significant data missing and incompleteness. The remaining 141 useable responses yielded an effective response rate of 14.6% which was comparable to prior studies of a similar nature (Christmann, 2000).

6.3. Respondents Characteristics

Table 6.2 summarizes the characteristics of the respondent retailers with respect to firm size and the categories of the retail business. The data show that 63.2% of the respondent

firms consisted of 100 employees or less. The majority of respondent firms belonged to the beauty/cosmetics sector, accounting for 20.6% of our total respondent firms.

Table 6.2 Description of sample

Firms by size:	**Frequency**	**Percentage**
Number of employees		
1-10	72	51.1%
11-50	11	7.8%
51-100	6	4.3%
101-500	27	19.1%
>500	21	14.9%
Not mentioned	4	2.8%
Total	141	100%
Type of stores	**Frequency**	**Percentage**
Beauty/cosmetics	29	20.6%
Food	13	9.2%
Convenience stores	2	1.4%
Department stores	3	2.1%
Electronic & electrical appliances/Telecommunications	5	3.5%
Drug Stores	31	22.0%
Fashion & accessories	10	7.1%
Furniture & home accessories	1	0.7%
Supermarkets	5	3.5%
Watches & jewellery	2	1.4%
Retail services	27	19.1%
Others	6	4.3%
Not mentioned	7	5%
Total	141	100%

6.4. Issues for Survey Data Collection

6.4.1. Non-Response Bias

To evaluate the potential non-response bias problem, we followed the procedures recommended by Armstrong and Overton (1977) to compare early respondents with late

respondents. The rationale is that late respondents are more similar to non-respondents than are early respondents. We compared the first half of the response received (the theoretical respondents) with those of the second half (the theoretical non-respondents). We compared the mean value differences of a random selection of the measurement items in our survey questionnaire between the two respondent groups. The mean values did not statistically differ between the early and late respondents (at the level of $p = 0.05$ or less). Hence, the threat of non-response bias problem should not be an issue for this study.

6.4.2. Common Method Variance

Common method variance (CMV) refers to the amount of spurious covariance shared among variables because of the common method used in collecting data (Buckley, Cote, & Comstock, 1990). We employed procedures to reduce common method variance (CMV) or to estimate its extent. First, the dependent variables were placed after the independent variables in the survey to diminish, if not avoid, the effects of consistency artifacts. Second, Harman's single factor test was performed. All the variable measures were subject to a single factor analysis. The results showed that more than one factor with eigenvalues of greater than 1.0 were extracted, with the first factor accounting for 21.01% of the total variance, the second factor accounting for 11.66% of the total variance, the third factor accounting for 8.08% of the total variance, and the rest of the factors accounting for the total variance that varied from 1.14% to 7.18%. The result of Harman's one-factor test suggested that common method variance should not be a problem with the data collected in this study (Podsakoff & Organ, 1986).

6.4.3. Triangulation

To increase confidence in the validity of the measures based on self-reported data, we triangulated the survey-based data with the companies' financial report and financial data in OSIRIS database whenever available. Responses regarding whether or not a firm has adopted GR, in general, were also validated by content analysis of corporate annual or environmental reports (Henriques & Sadorsky, 1999).

6.5. Summary

In this chapter, we described the research design of quantitative survey study. We developed a survey questionnaire by operationalizing GR adoption, its determinants, and performance outcomes as our study variables. We also discussed our sampling frame and data collection procedures. We evaluated and tested the potential bias problem and found our data were robust to tests for common method variance and non-response bias. We now move on to the next chapter for the empirical data validation and analysis.

7. DATA ANALYSIS AND FINDINGS OF QUANTITATIVE SURVEY STUDY

Researchers must address two important characteristics of a measure, i.e., validity and reliability when conducting multivariate analysis. Validity is the degree to which a measure represents what it is supposed to; while reliability is the degree to which the observed variable measures the "true" value and is "error free" (Hair, Black, Babin, & Anderson, 2010). Since each latent construct is measured by a multiple-item scale, tests of construct validity should be performed. Construct validity concerns the establishment of correct operational measures for evaluating the concept being studied (Hair et al., 2010). Convergent and discriminant validity are considered subcategories to measure construct validity. We assessed the validity and reliability of our measurement instruments and performed hypothesis testing using Structural Equation Modeling (SEM). SEM, a technique that allows separate relationships for examining a set of dependent variables, provides the appropriate and most efficient estimation technique for a series of separate multiple regression equations estimated simultaneously (Hair et al., 2010). It is characterized by two basic components: the measurement model and the structural model. The structural model is the path model, which relates independent to dependent variable. The measurement model enables the researcher to use several indicators for a single independent or dependent variable. Particularly, confirmatory factory analysis (CFA) though SEM is used to access the convergent and discriminant validity. In CFA, the researcher can assess the contribution of each scale item as well as incorporate how reliable the scale is in measuring the concept. The scales are then

integrated into the estimation of the relationships between dependent and independent variables in the structural model (Hair et al., 2010).

The literature suggests that a sample size varying between 100 and 200 cases is adequate for small-to medium structural-equation models (Anderson & Gerbing, 1998). Hence, our sample fit the requirement of using SEM. We used the following criteria to evaluate the fitness of our estimated model: comparative fit index (CFI) ≥ 0.90, root mean square error of approximation (RMSEA) ≤ 0.1, incremental fit index (IFI) ≥ 0.90, $\chi 2/df < 3$ (Hair et al., 2010).

In this chapter, we first validated the measurement model of GR adoption. Then, we validated other study constructs to assess whether the theoretical constructs and their underlying measurement items used in this study exhibit sufficient levels of validity and reliability. Finally, we tested our proposed hypotheses.

7.1. Validation of Measurement Model for GR

To validate the measurement model of GR, we first tested the measurement properties of the sub-dimensions of the GR construct using corrected-item-total-correlation analysis and reliability test, followed by CFA using SEM to assess how well the observed variables, i.e., measurement items, reflect unobserved or latent variables, i.e., the sub-dimensions, in the hypothesized structure (Anderson, 1987). As we first developed measures on the basis of theory and research with a confirmatory nature in Chapter 3 and Chapter 5, a strong *a priori* basis warrants the use of CFA instead of exploratory

factor analysis (Oliver, 1981; Zhu et al., 2008b). We conducted the CFA using AMOS 19.0 to examine the robustness of the factor structure.

As a quick review, there are three mutually exclusive dimensions of GR activities, namely *internal-improvement* (*I-I*), *external-coordination* (*E-C*), and *supportive-development* (*S-D*). I-I concerns the retailer's strategic capabilities of pollution prevention, which emphasize improving efficiency and minimizing waste in internal activities such as operations and logistics. E-C entails the retailer's product stewardship in terms of coordinating stakeholders, particularly suppliers and customers, to minimize the life-cycle costs of products arising from such external activities as procurement, marketing, and after-sales service. S-D requires the retailer's top management commitment to environmental protection, development of technology, and human resources in support of sustainable organizational growth. Ten GR practices are further classified into sub-categories as shown in Table 6.1 in the previous chapter.

Corrected-item-total-correlation (CITC) analysis was first performed to check whether any item was not consistent with the rest of the scale. We discarded an item if its coefficient was less than 0.50 (Churchill Jr, 1979). We eliminated GSO-1 as its coefficient was less than 0.50 and 33 items remained after the analysis. The rest of the items had coefficients ranging from 0.50 to 0.92.

Convergent validity assesses the degree to which measures of the same theoretical concepts are correlated. We examined the convergent validity in three ways as suggested

by Hair et al. (2010). First, the standardized loading estimates should be 0.50 or higher. Second, the average percentage of average variance extracted (AVE) among a set of construct items should be 0.50 or higher. Third, the composite reliability value should exceed 0.70. We computed the AVE and composite reliability by the following formulas:

$$\text{Composite reliability } (\rho_{\eta}) = \frac{(\sum_{i=1}^{n} \lambda_{yi})^2}{(\sum_{i=1}^{n} \lambda_{yi})^2 + \sum_{i=1}^{n} \varepsilon_i},$$

$$\text{Average variance extracted (AVE}_{\eta}) = \frac{\sum_{i=1}^{n} (\lambda_{yi}{}^2)}{\sum_{i=1}^{n} (\lambda_{yi}{}^2) + \sum_{i=1}^{n} \varepsilon_i},$$

where η is the construct, λ_y is the standardized factor loading for measurement item y_i, and ε_i is the measurement error for scale item y_i. The measurement error is 1.0 minus the reliability of the scale item, which is the square of the scale item's standardized loading (Hair et al., 2010). To evaluate the reliability of the constructs, we carried out reliability test with SPSS 19.0 to generate Cronbach's alpha. The reliability of a construct achieving alpha value of 0.7 or above is considered acceptable (Hair et al., 2010). Table 7.1 shows the goodness-of-fit statistics for our CFA and their complementary indices, as well as all the values of composite reliability, AVE, and Cronbach's alpha. The Cronbach's alpha values for all the ten factors were all greater than the recommended value of 0.70. The results suggested a reasonable fit of the latent factors to the data.

Table 7.1 Summary of the measurement results for GR

Factor	Item	Standardized Loading	*t*-value	Cronbach's Alpha	Composite Reliability	AVE
GR practices (χ^2 = 801.083 , df = 450, p < 0.001, RMSEA = 0.075, CFI = 0.90, χ^2/df = 1.780, IFI = 0.90)						
Green Store Operations	(GSO-2)^	0.763	-	0.70	0.72	0.57
	(GSO-3)	0.741	7.508 ***			
Green Transportation	(GTS-1)^	0.941	-	0.80	0.84	0.64
	(GTS-2)	0.610	6.698***			
	(GTS-3)	0.805	9.097***			
Green Procurement	(GPC-1)^	0.811	-	0.89	0.90	0.76
	(GPC-2)	0.883	10.903***			
	(GPC-3)	0.911	11.253***			
Green Product Design	(GPD-1)^	0.882	-	0.96	0.96	0.85
	(GPD-2)	0.954	15.278***			
	(GPD-3)	0.951	15.167***			
	(GPD-4)	0.894	13.068***			
Green Packaging	(GPG-1)^	0.775	-	0.93	0.92	0.70
	(GPG-2)	0.724	8.200***			
	(GPG-3)	0.871	10.172***			
	(GPG-4)	0.917	10.805***			
	(GPG-5)	0.882	10.242***			
Green Promotion	(GPO-1)^	0.808	-	0.91	0.91	0.78
	(GPO-2)	0.893	11.813***			
	(GPO-3)	0.937	12.604***			
Green After-sales service	(GAS-1)^	0.914	-	0.82	0.84	0.65
	(GAS-2)	0.865	11.822***			
	(GAS-3)	0.595	5.984***			
Green Policy	(GLI-1)^	0.939	-	0.93	0.93	0.82
	(GLI-2)	0.874	14.555***			
	(GLI-3)	0.906	15.476***			
Green Research Development	(GRD-1)^	0.916	-	0.95	0.95	0.86
	(GRD-2)	0.926	14.257***			
	(GRD-3)	0.932	14.423***			

Green Human Resource Development	(GHR-1)^	0.917	-	0.91	0.92	0.75
	(GHR-2)	0.914	15.855***			
	(GHR-3)	0.894	14.992***			
	(GHR-4)	0.718	9.731***			

^ Item fixed to 1 to set the scale
*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Discriminant validity is the degree to which two conceptual concepts are distinct. We assessed discriminant validity by the AVE estimates where the AVE of all the constructs should be greater than the squared correlation between any pair of them. Discriminant validity was not achieved in the following pairs: GSO-GPG, GPD-GPG, GLI-GRD, and GPO-GAS. This is expected as they are sub-dimensions of GR practices and measure a higher order latent factor, i.e., GR. Out of 45 possible pairs of squared correlation, 41 pairs were smaller than the smallest value of AVE (0.57). This indicated that the measurement items shared common variance with their hypothesized constructs more than with other constructs, demonstrating discriminant validity in our study constructs. Upon obtaining satisfactory reliability and validity test results, we averaged the values of the measurement items for each sub-dimension and used these arithmetic means as single-indicator constructs to measure GR in the subsequent stages.

Table 7.2 Squared correlations between constructs of GR

Constructs			Correlations	Squared correlations
GSO	<-->	GTS	0.656	0.430
GSO	<-->	GPC	0.716	0.513
GSO	<-->	GPD	0.699	0.489
GSO	<-->	GRD	0.350	0.123
GHR	<-->	GSO	0.568	0.323
GSO	<-->	GLI	0.585	0.342
GSO	<-->	GAS	0.679	0.461
GSO	<-->	GPO	0.613	0.376
GSO	<-->	GPG	0.767	0.588
GTS	<-->	GPC	0.512	0.262
GTS	<-->	GPD	0.500	0.250
GTS	<-->	GRD	0.465	0.216
GHR	<-->	GTS	0.467	0.218
GTS	<-->	GLI	0.474	0.225
GTS	<-->	GAS	0.523	0.274
GTS	<-->	GPO	0.414	0.171
GTS	<-->	GPG	0.541	0.293
GPC	<-->	GPD	0.753	0.567
GPC	<-->	GRD	0.497	0.247
GHR	<-->	GPC	0.502	0.252
GPC	<-->	GLI	0.688	0.473
GPC	<-->	GAS	0.621	0.386
GPC	<-->	GPO	0.616	0.379
GPC	<-->	GPG	0.754	0.569
GPD	<-->	GRD	0.447	0.200
GHR	<-->	GPD	0.646	0.417
GPD	<-->	GLI	0.612	0.375
GPD	<-->	GAS	0.605	0.366
GPD	<-->	GPO	0.616	0.379
GPD	<-->	GPG	0.871	0.759
GHR	<-->	GRD	0.591	0.349
GLI	<-->	GRD	0.838	0.702
GAS	<-->	GRD	0.623	0.388
GPO	<-->	GRD	0.523	0.274
GPG	<-->	GRD	0.509	0.259
GHR	<-->	GLI	0.652	0.425
GHR	<-->	GAS	0.524	0.275
GHR	<-->	GPO	0.506	0.256

GHR	<-->	GPG	0.656	0.430
GAS	<-->	GLI	0.541	0.293
GPO	<-->	GLI	0.632	0.399
GPG	<-->	GLI	0.608	0.370
GPO	<-->	GAS	0.825	0.681
GPG	<-->	GAS	0.709	0.503
GPG	<-->	GPO	0.677	0.458

7.1.1. Testing First-Order and Second-Order Models of GR

As discussed before, I-I, E-C, and S-D are specified as *a priori* factors of GR. In the first-order model, I-I, E-C, and S-D are correlated measures of GR. Alternatively, GR may be operationalized as a second-order model, where the three dimensions are governed by a higher order factor, i.e., GR. Figures 7.1. and 7.2 show the results of the model estimation.

In using a first-order model to test the existence of GR, we assumed that the I-I, E-C, and S-D practices were correlated but not governed by a common latent factor. The fit indices $\chi^2 = 59.849$, df = 32, $p = 0.002$, RMSEA = 0.079, CFI = 0.949, IFI = 0.951, and $\chi^2/df = 1.870$ suggested a good fit for the first-order model. In sum, the test results supported the first-order model of GR.

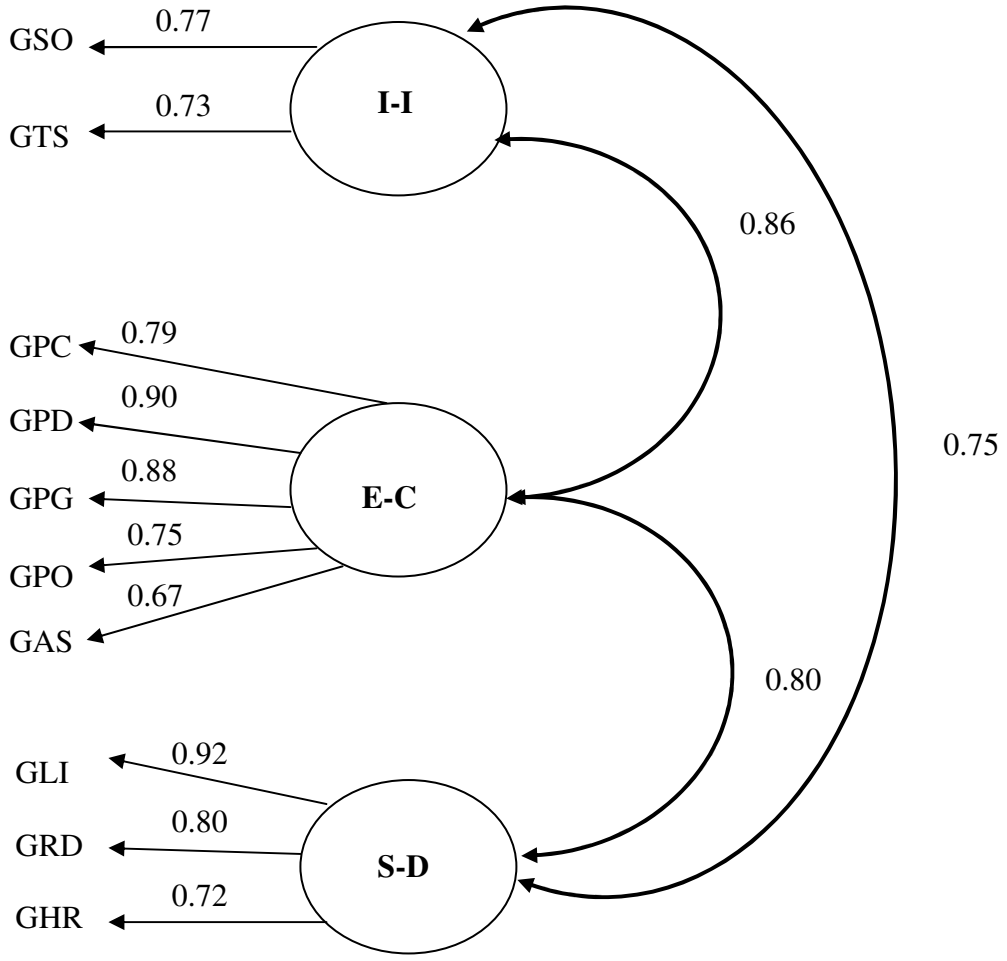


Figure 7.1 First-order factor measurement model for GR

The use of a second-order model, illustrated in Figure 7.2, assumed that a higher order latent factor, i.e., the overall trait of GR practices, governs the correlations among I-I, E-C, and S-D. The second-order model also shows a good fit with indices χ^2 = 59.849, df = 32, p = 0.002, RMSEA = 0.079, CFI = 0.949, IFI = 0.951, and χ^2/df = 1.870.

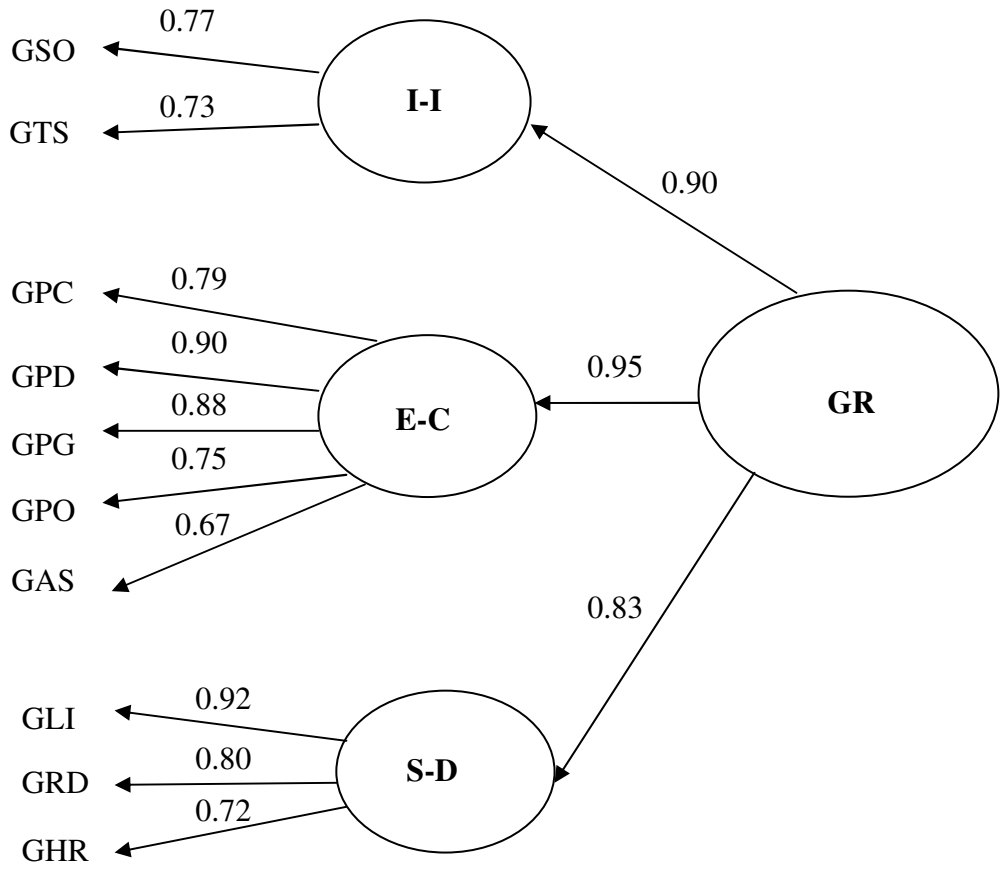


Figure 7.2 Second-order factor measurement model for GR

We measured the efficacy of the two models by comparing the χ^2 statistics of the first- and second-order models (Marsh & Hocevar, 1985). The fit indices of the two measurement models were the same. The χ^2 statistics and the related fit indices of the two models were identical because the degrees of freedom were the same when the number of first-order factors was three. The comparison indicated good model fit and no evidence of over fitting for the second-order model compared to the first-order model. The findings suggested that the addition of a second order factor does not significantly increase the χ^2 statistics and the model fit (Lai, Ngai, & Cheng, 2002). An examination

of the second-order model of the GR revealed that all the lambda coefficient estimates of I-I, E-C, and S-D, which described the relationships or paths of the three dimensions of GR, were significant. The paths between GR and its underlying first-order dimensions were 0.90 for I-I, 0.95 for E-C, and 0.83 for S-D. All the path loadings were of a high magnitude and exhibit a significantly high *t* value. Hence, GR can be conceptualized as a multidimensional measure comprising I-I, E-C, and S-D. Our second-order model was therefore tenable.

7.2. Validation of Other Constructs in the Study

We applied similar procedures for the validation of other constructs as operationalized in Chapter 3 of this study. We first conducted the CITC analysis to purify the constructs, followed by the assessment of convergent and discriminant validity through CFA, and reliability test for the measurement items.

We eliminated the item ERP3 and CSP7 from the measurement because their coefficients were less than 0.50 (Churchill Jr, 1979) after conducting CITC analysis. After the elimination, the coefficient was 0.605 for both items of environmental regulatory pressure. The coefficient range was 0.636 to 0.808 for customer pressure, 0.784 for both items of supplier pressure, 0.676 to 0.793 for competitive pressure, 0.614 to 0.845 for cost pressure, 0.571 to 0.647 for financial performance, and 0.793 to 0.908 for environmental performance.

CFA was then conducted to access the convergent and discriminant validity. In our CFA, we allowed all the factors to correlate freely in their respective measurement models (Byrne, 2009) and they all achieved reasonable model fits. The internal consistency of the factors was also evaluated by estimating Cronbach's alpha coefficient as an indication of the degree of convergence between measurement items in reflecting their respective construct. Table 7.3 shows the goodness-of-fit statistics for our CFA and their complementary indices on the composite reliabilities, AVE and Cronbach's alpha. The results illustrated that our CFA achieved reasonable model fits with all the measurement items loaded significantly with $p<0.001$ onto their respective constructs with loadings ranging between 0.679 and 0.986. The AVE and standardized loading estimate for all of our study constructs were greater than 0.50 and the composite reliabilities were all greater than 0.70. The Cronbach's alpha of our study constructs were all greater than 0.70 as suggested by Hair et al. (2010), demonstrating the reliability of our constructs.

Table 7.3 Measurement model for other latent factors

Constructs	**Items**	**Standardized Loadings**	**t-value**	**Cronbach's Alpha**	**Composite Reliability**	**AVE**
Motives (χ2=323.668, df = 188, p < 0.001, RMSEA = 0.072, CFI =0.092, IFI= 0.92, χ^2 /d.f=1.722)						
Environmental regulatory pressure	ERP1	0.738	-	0.75	0.76	0.62
	ERP2	0.833	7.631***			
Customer pressure	CSP1	0.885	-	0.90	0.91	0.63
	CSP2	0.840	12.844***			
	CSP3	0.862	13.476***			
	CSP4	0.682	9.126***			
	CSP5	0.791	11.504***			
	CSP6	0.688	9.042***			
Supplier pressure	SPP1	0.983	-	0.88	0.89	0.80
	SPP2	0.798	8.431***			

Competitive pressure	CMP1	0.755	-	0.86	0.87	0.69
	CMP2	0.901	9.479***			
	CMP3	0.836	9.029***			
Cost pressure	COP1	0.894	-	0.86	0.88	0.72
	COP2	0.958	12.414***			
	COP3	0.672	8.204***			
Financial performance	FNP1	0.820	-	0.78	0.80	0.57
	FNP2	0.700	6.968***			
	FNP3	0.738	7.183***			
Environmental performance	ENP1	0.827	-	0.93	0.93	0.82
	ENP2	0.987	12.659***			
	ENP3	0.900	11.665***			

^ Item was fixed to 1 to set the scale
*** p < 0.001; ** p < 0.01; * p < .05

On the other hand, we calculated the squared correlations between constructs to assess the discriminant validity. Our results in Table 7.4 show that the greatest value of squared correlation (0.539) was smaller than the smallest AVE value (0.57). It indicated the measurement items shared common variance with their hypothesized constructs more than other constructs, demonstrating discriminant validity in our study constructs.

Table 7.4 Squared correlations between constructs

Constructs			**Correlations**	**Squared correlations**
Environmental regulatory pressure	<-->	Customer pressure	0.734	0.539
Environmental regulatory pressure	<-->	Financial performance	0.245	0.060
Environmental performance	<-->	Environmental regulatory pressure	0.200	0.040
Environmental regulatory pressure	<-->	Cost pressure	0.031	0.001

Environmental regulatory pressure	<-->	Supplier pressure	0.501	0.251
Environmental regulatory pressure	<-->	Competitive pressure	0.600	0.360
Customer pressure	<-->	Financial performance	0.481	0.231
Environmental performance	<-->	Customer pressure	0.232	0.054
Customer pressure	<-->	Cost pressure	-0.069	0.005
Customer pressure	<-->	Supplier pressure	0.603	0.364
Customer pressure	<-->	Competitive pressure	0.552	0.305
Supplier pressure	<-->	Financial performance	0.344	0.118
Environmental performance	<-->	Financial performance	0.371	0.138
Cost pressure	<-->	Financial performance	-0.357	0.127
Competitive pressure	<-->	Financial performance	0.487	0.237
Supplier pressure	<-->	Cost pressure	-0.170	0.029
Environmental performance	<-->	Supplier pressure	0.125	0.016
Supplier pressure	<-->	Competitive pressure	0.365	0.133
Cost pressure	<-->	Competitive pressure	-0.205	0.042
Environmental performance	<-->	Competitive pressure	0.200	0.040
Environmental performance	<-->	Cost pressure	-0.123	0.015

7.3. Hypotheses Testing

Using SEM, we tested our model using maximum likelihood estimation with path analysis by AMOS 19.0. One of the unique features of SEM is the ability to provide

parameter estimates for relationships among unobserved variables, that is, the latent variables (Narasimhan & Jayaram, 1998). SEM is thus also known as latent variable analysis (Hughes, Price, & Marrs, 1986). SEM is similar to regression techniques in that there is a quantification of relationships between dependent and independent variables. Using SEM is a more comprehensive and flexible approach to research design and data analysis than a single statistical model or approach (Sroufe, 2003).

In the following, we first tested Hypotheses 1 to 4 which predicted the positive effect of environmental regulatory pressure, customer pressure, supplier pressure and competitive pressure on the GR adoption one by one. Then, we tested the mediating effects of these antecedents on GR adoption as stated in Hypotheses 5 and 6. Finally, the effect of GR on the financial and environmental performance (Hypothesis 7 and 8) and the moderating effect of cost pressure on the relationship between GR adoption and the business performance (Hypothesis 9 and 10) were tested. The control variable, company size in terms of number of employees, was incorporated in the structural models as determinants to the dependent variables (i.e., GR, financial performance, and environmental performance). Another control variable, internationalization, was also incorporated. Multinational retailer was coded with dummy code "1" and domestic retailer was coded with dummy code "0". We tested the effects using maximum likelihood estimation in AMOS 19.0.

7.3.1. Drivers of GR Adoption

We tested the effects of different drivers on the GR adoption. As shown in Table 7.5, the path estimate of environmental regulatory pressure → GR was 0.41 (t=3.370, p<0.001), customer pressure → GR was 0.48 (t=4.644, p<0.001), supplier pressure → GR adoption was 0.37 (t=3.394, p<0.001), and competitive pressure → GR adoption was 0.54 (t=4.727, p<0.001). The results supported our hypotheses H1 to H4 that environmental regulatory pressure, customer pressure, supplier pressure, and competitive pressure are positively related to the GR adoption.

Table 7.5 Results of hypothesis testing for drivers of GR adoption

Description of path	Path coefficients	t-value	χ^2	d.f.	χ2/df	CFI	IFI	RMESA
Environmental regulatory pressure→ GR	**0.41**	**3.370*** **	**99.350**	**70**	**1.544**	**0.94**	**0.95**	**0.062**
Customer pressure →GR	**0.48**	**4.644*** **	**207.419**	**128**	**1.620**	**0.93**	**0.93**	**0.067**
Supplier pressure →GR	**0.37**	**3.394*** **	**101.829**	**70**	**1.455**	**0.96**	**0.96**	**0.057**
Competitive pressure →GR	**0.54**	**4.727*** **	**118.839**	**83**	**1.432**	**0.96**	**0.96**	**0.056**

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Firm size and internationalization were controlled. They had non-significant effects on the dependent variable.

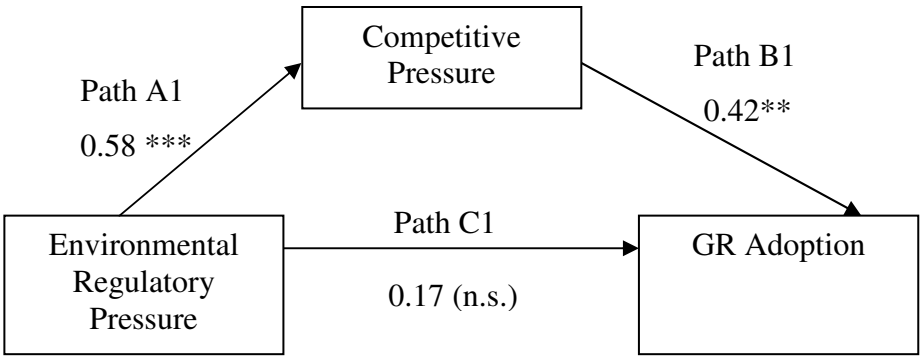
7.3.2. Mediating Effect of Stakeholder Pressures

We tested the mediating effects in steps according to Baron and Kenny (1986). As suggested by Baron and Kenny (1986), the following conditions must hold: first, the independent variable must affect the mediating variable (path A); second, the mediator must affect the dependent variable (path B); and third, the independent variable must be shown to affect the dependent variable (path C). Evidence of mediation exists if a

previously significant relationship between the independent and dependent variables is no longer significant when paths A and B are controlled.

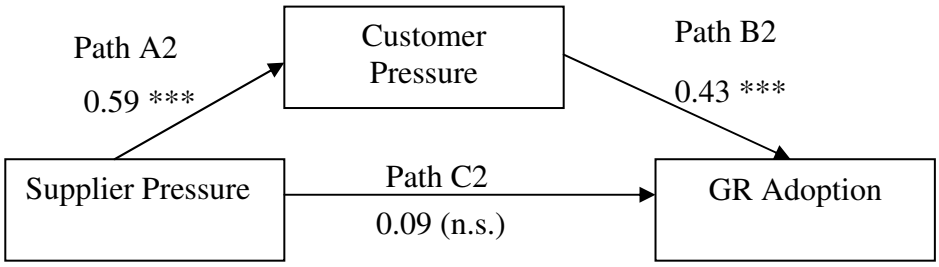
To begin with, we tested if environmental regulatory pressure affected competitive pressure and found that this relationship was significant. The relationship is shown as path A1 in Figure 7.3. Second, we assessed if competitive pressure affected GR adoption (path B1) and found that they had a significant relationship. Third, we found environmental regulatory pressure and GR adoption (path C1) was significantly related. When we controlled path A1 and B1, the previously significant path of environmental regulatory pressure on GR adoption (path C1) was no longer significant. These test results suggested the presence of competitive pressure mediated the relationship between environmental regulatory pressure and GR adoption.

Similarly, we adopted the above approach to test the mediating effect of customer pressure on the relationship between supplier pressure and GR adoption in Figure 7.4. The relationship which is shown as path A2, B2, and C2 were first found significant respectively. We then tested if supplier pressure affected GR adoption (path C2) with the control of the relationship supplier pressure and customer pressure (path A2) and the relationship between customer pressure and GR adoption (path B2). The results showed the previously significant path of supplier pressure on GR adoption (path C2) was no longer significant, indicating the mediating effect of customer pressure on the relationship between supplier pressure and GR adoption.



$\chi 2$=151.089, df = 108, RMSEA = 0.053, CFI =0.95, IFI=0.95, $\chi 2$ /d.f=1.399
*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$
Firm size and internationalization were controlled. They had non-significant effects on the dependent variables.

Figure 7.3 Results of mediating effect of competitive pressure on the relationship between environmental regulatory pressure and GR adoption



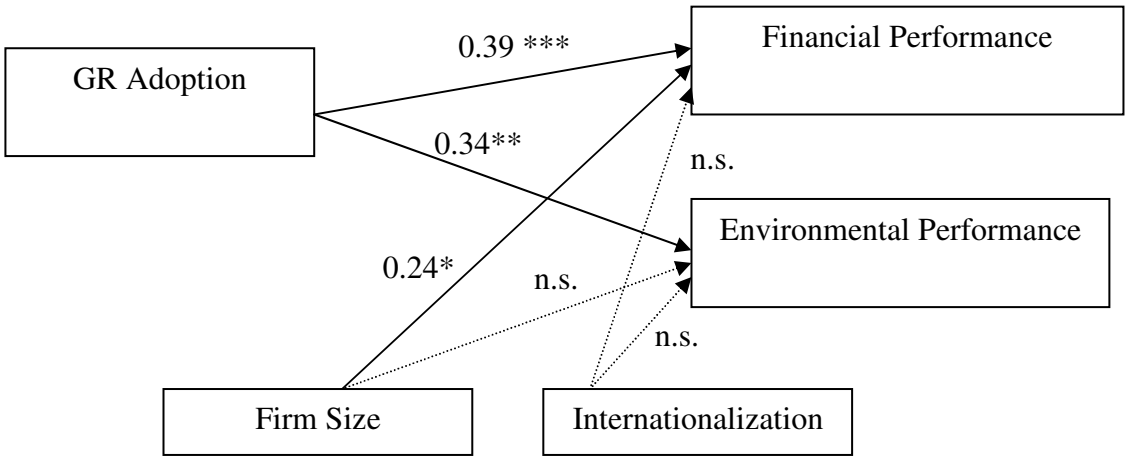
$\chi 2$=249.950, df = 159, RMSEA = 0.064, CFI =0.93, IFI=0.93, $\chi 2$ /d.f=1.572
*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Firm size and internationalization were controlled. They had non-significant effects on the dependent variables.

Figure 7.4 Results of mediating effect of customer pressure on the relationship between supplier pressure and GR adoption

7.3.3. Effects of GR Adoption on Business Performance

We tested the effect of GR adoption on financial and environmental performance with the control of firm size and internationalization. The results indicated that the estimated model was reasonably fit to our survey data with fit indices $\chi 2$=197.625, df = 125, $\chi 2$/ df= 1.581; CFI = 0.93; IFI=0.93; RMSEA = 0.064. The path estimate of GR adoption to financial performance was 0.39 (t=3.422, p<0.001). The path estimate of GR adoption to environmental performance was 0.34 (t=3.054, p<0.01). The results lent support for our hypothesized positive effect of GR adoption on financial and environmental performance.



$\chi 2$=197.625, df = 125, $\chi 2$/ df= 1.581; CFI = 0.93; IFI=0.93; RMSEA = 0.064

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Figure 7.5 Results of hypothesis testing for performance implications of GR adoption

7.3.4. Moderating Effect of Cost Pressure on the Relationship between GR and Business Performance

For hypotheses 10 and 11 which test the cost pressure perceived by firms moderates the relationship between GR and performance, we utilized the hierarchical moderated regression analysis. Following the variance partitioning procedures advocated by Jaccard et al. (1990) and previous empirical environmental management studies (Zhu & Sarkis, 2004; Zhu et al., 2008a), we conducted the analysis with the following steps: Initially the control variables, firm size and internationalization, were entered into the regression. Then the independent variable, GR, was entered into the regression. Third, the moderator was entered as a block. Finally, the interaction term of GR with the moderator was entered as a block. Evidence of moderation exists when interaction terms account for significant incremental (step) variances in a dependent variable, either individually, signified by the values of the betas, or collectively, signified by the values of the incremental F-statistic (Dean Jr & Snell, 1991). If the interaction accounts for a significant amount of incremental variance in the dependent variable, then there is evidence to support the hypotheses that there is a significant moderating effect of the cost pressure on the given GR adoption. Multicollinearity, which refers to the correlation among three or more independent variables, can be a serious problem in moderated regression analysis (Hair et al., 2010). One factor tends to have high correlations with other factors and aspects, leading to inflated standard errors and misinterpretation of the statistical significance of the regression results (Jaccard et al., 1990). We employed the "centering" method, i.e., the raw score minus the mean of the independent variables to mitigate any potential multicollinearity (Aiken & West, 1991). We also examined

variance inflation factors (VIF) to determine the existence of multicollinearity. All of the resulting VIF scores in all of the models were ranged from 1.036 to 1.508, which were well below the maximum level of 10.0 suggested by Mason and Perreault (1991), indicating that multicollinearity should not be a problem with our data.

We carried out the moderating test with GR as independent variable; cost pressure as the moderator; and financial performance and environmental performance as dependent variables respectively. The results are shown in the tables below.

Table 7.6 Moderating test of cost pressure on the relationship between GR and financial performance

	Dependent variable: Financial performance	
Independent variables	**Model 1**	**Model 2**
Main effect GR	0.135*	0.136*
Moderator: cost pressure	-0.260***	-0.259***
Interaction term GR x cost pressure		0.006
Control Variables:		
Firm size	0.108**	0.108**
Internationalization	0.140	0.141
F	9.187***	7.276***
R^2	0.275	0.275
R^2 change	0.187***	0.000

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

Table 7.7 Moderating test of cost pressure on the relationship between GR and environmental performance

	Dependent variable: Environmental performance	
Independent variables	**Model 1**	**Model 2**
Main effect GR	0.228*	0.260*
Moderator: cost pressure	-0.141	-0.160
Interaction term GR x cost pressure		0.271*
Control Variables:		
Firm size	0.076	0.060
Internationalization	-0.022	-0.023
F	1.939	2.592*
R^2	0.083	0.132
R^2 change	0.074*	0.050*

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

We found insignificant moderating effect of cost pressure on the relationship between GR and financial performance as indicated in Table 7.6. Nevertheless, we found significant moderating effect of cost pressure on the relationship between GR and environmental performance as indicated in Table 7.7. The results showed that the interaction term of cost pressure and GR adoption was positively linked to environmental performance ($p<0.05$) and the R^2 increased significantly from Model 1 to Model 2.

The discussion of the findings will be detailed in Chapter 9.

7.4. Summary

In this chapter, we examined the data for evidence of the relationships on the antecedents of GR adoption and its consequential performance. Our test results indicated the positive effect of environmental regulatory pressure, customer pressure, supplier pressure, and competitive pressure on GR adoption. We also found the effect of the environmental regulatory pressure on retailers' GR adoption was mediated by the competitive pressure retailers encountered, and the effect of supplier pressure on the GR adoption was mediated by the customer pressure on environmental protection. We further found empirical evidence on the positive effect of GR adoption on financial performance and environmental performance of the firms. We found significant results for the cost pressure of the firms moderating the association between GR adoption and environmental performance but insignificant results for the cost pressure moderating the association between GR adoption and financial performance. Table 7.8 summarizes the results of hypotheses tested in this research. In the next chapter, using secondary archival data, we further examine whether GR adoption leads to better financial performance for strengthening retailers' competitive edge.

Table 7.8 Summary of the results of hypotheses tested

Hypotheses	**Results**
H1: The environmental regulatory pressure as perceived by retailers positively affects the extent to which they adopt GR	Supported
H2: The customer pressure as perceived by retailers positively affects the extent to which they adopt GR	Supported
H3: The supplier pressure as perceived by retailers positively affects the extent to which they adopt GR	Supported
H4: The competitive pressure for environmental protection as perceived by retailers positively affects the extent to which they adopt GR	Supported
H5: The effect of the environmental regulatory pressure on retailers' GR adoption is mediated by the competitive pressure they encounter	Supported
H6: The effect of supplier pressure on the adoption of GR by retailers is mediated by the customer pressure on environmental protection they encounter	Supported
H7: There is a positive relationship between the adoption of GR and the financial performance of retailers	Supported
H8: There is a positive relationship between the adoption of GR and the environmental performance of retailers	Supported
H9: The higher the cost pressure perceived by retailers, the stronger is the positive relationship between GR adoption and financial performance	Not supported
H10: The higher the cost pressure perceived by retailers, the stronger is the positive relationship between GR adoption and environmental performance	Supported

8. SECONDARY DATA ANALYSIS STUDY

In supplementing the findings of Study II, we conducted a study to test whether retailers adopting GR achieve better financial performance than their non-adopting rivals. Annual reports are important documents that can be publicly accessed to inform stakeholders about the strategic actions of firms (Judd & Tims, 1991; Lemak & Reed, 1997). We compiled a list of 375 publicly traded retailers in Japan from *Yahoo! Japan Finance* and categorized them as GR adopters or non-adopters based on content analysis of their published information, including corporate annual reports, and environment reports. In the content analysis, we adopted a systematic and replicable technique that classifies many words of text into a few content categories based on explicit rules of coding (Krippendorff, 1980). We obtained the data for analysis from the OSIRIS database, which contains the financial data of publicly listed companies worldwide.

We carried out this study on retailing in Japan due to its environmental and economic impact on the world. Producing approximately 5% of the total global CO_2 emissions, Japan is the fourth largest polluter in the world (The Ministry of the Environment (Japan), 2008). Emissions of greenhouse gases by the Japanese commercial sector jumped by 39.5% from 1990 to 2005 (Kiko Network, 2008). Japan also boasts the second largest consumer retail market worldwide, which was valued at US$1,124 billion in 2007 (Japan External Trade Organization, 2009). Investigating Japanese retailers is worthwhile as store operations and inventory replenishment have long been their major expenses where the land cost and electricity price in Japan are comparatively higher than

the rest of the world. Ginza in Tokyo, for instance, is one of the world's most costly retail areas for consumer merchandise which ranges from school uniforms and kitchen wares to holiday souvenirs and elegant gifts (Cushman & Wakefield, 2009; Japan External Trade Organization, 2003). Japan also bears high electricity prices. Among the Organization for Economic Co-operation and Development (OECD) countries, (which consists of a group of 30 member countries such as the United States, the United Kingdom, and Denmark), Japan bears the highest electricity prices due to high fuel prices and high capital costs attributable to expensive land, compensation payments made to local communities, and high safety standards for earthquake resistance (OECD, 2003). On the other hand, 31 retail companies based in the Japan ranked among the 250 largest retailers in the world (STORES, 2011). This illustrates the prominence of Japanese retailers worldwide and the potential value to investigate the GR practices of Japanese retailers. The environmental awareness of the Japanese is relatively high and Japanese firms are pioneers in adopting environmental management practices actively in their business operations (Euromonitor International, 2011). Japanese environmental policy puts a strong emphasis on self-regulation of industry by means of voluntary agreements (Studer, Welford, & Hills, 2006). The recommendations and guidelines provided by the Japanese government on environmental accounting and indicators have increased both the frequency and conformity of reporting in Japanese companies (Kolk, 2003). Hence, most of their environmental management practices are reported in their CSR/sustainability reports comprehensively with concrete objective data supported (e.g., what practices they adopted, how/when they adopted them and the results of the adoption such as the amount of waste reduced). High quality of data source enhances the

validity of our secondary data analysis. It also helps us to evaluate whether they really "did" the practices or they merely "claimed" for "greenwashing".

8.1. Independent Variable

We operationalized the two important elements of GR, namely green store operations and green transportation, following the content-analytic procedure by Judd and Tims (1991) to search for key words in the annual reports of companies. Due to the possible bias due to "greenwashing" as discussed earlier in 5.1.2, we determined if retailers had done the "actual implementation" of green store operations and green transportation instead of "claiming" for public relations purposes using the criteria summarized in Table 8.1.

Table 8.1 Criteria for categorizing adopters and non-adopters of green store operations and green transportation

Measure	Green Store Operations - Utilize systems or devices in the store for energy conservation or waste reduction/recycling	Green Transportation - Transport goods with reduced consumption of materials/energy or increased efficiency
Criteria A: Third-party environmental certification	ISO 14001, Eco-shop, or EcoAction21 certification	Membership of Green Logistics Partnership
OR		
Criteria B: Precise data and date	e.g., In September 2008, 14 escalators in a Nagoya outlet were renewed to install a highly efficient type of motor and power consumption was reduced by 277,000kwh in a year. In March 2007, a high-pressure chiller was introduced in the Ueno outlet and power consumption was reduced during the year by about 110,000kWh (J. Front Retailing Co. Ltd)	e.g., "As of February 29, 2008, Circle K Sunkus had an eco-friendly fleet of 64 compressed natural gas (CNG) vehicles and 11 hybrid vehicles." (Circle K Sunkus Co. Ltd)

Using a dichotomous variable, we coded retailers satisfying criterion A or criterion B as "1" and categorized them as adopters of the corresponding GR practice, and we coded the other retailers as "0" and categorized them as non-adopters. It is possible that retailers purposely claim green practices to project an environmentally friendly image, which is appealing to the general public. To reduce the threat of self-report bias and greenwashing, we only categorized those retailers reporting precise figures reflecting their achievements in GR practices from 2007 to 2009 as "adopters". Alternatively, they must have acquired environmental certification ISO14001, Eco-shop, EcoAction21, or were members of nongovernmental organizations such as the Green Logistics Partnership to qualify as adopters. It should be noted that ISO 14001, Eco-shop, or

EcoAction21 compliance and membership of the Green Logistics Partnership are not legally required in Japan. The description of the environmental certification is shown in Table 8.2.

Table 8.2 The common environmental certification in Japan

Name of Environmental Certification	Description
ISO 14001[1]	ISO 14001 is an environmental-based certification program sponsored by the International Organization for Standardization that specifies the requirements for an environmental management system.
Eco-shop [2]	Eco-shop is an environmental recognition system proposed by non-profit organizations (NPO) in Japan recognizing reduction and recycling of rubbish by shops.
EcoAction21 [3]	EcoAction21 was established in 1996 by the Ministry of the Environment in Japan with the objective to promote environmental activities among small and medium enterprises (SME); the certification and registration system is implemented by the Institute of Global Environmental Strategies' Centre for Sustainability.
The Green Logistics Partnership Council [4]	The Green Logistics Partnership Council was established in 2005 by Japan's Ministry of Economy, Trade and Industry (METI) and Ministry of Land, Infrastructure, Transport and Tourism (MLIT), in collaboration with the Japan Institute of Logistics System, the Japan Federation of Freight Industries, and the Japan Business Federation. Members of the council are required to follow the guidance of the Council, committing to reduction in fuel consumption through partnerships and increased efficiency in distribution networks.

[1] International Organization for Standardization. 2004. http://www.iso.org . Accessed 15 April 2010.
[2] EcoShop. http://eco.soc.or.jp/eco-shop/index.html . Accessed 14 April 2010.
[3] EcoAction21. http://www.ea21.jp/eco21/eco01.html . Accessed 14 April 2010.
[4] Green Logistics Partnership Council. http://www.greenpartnership.jp/about/aim.html . Accessed 15 April 2010.

8.2. Dependent Variable

We measured financial performance by Tobin's *q*, which is calculated by dividing the sum of firm equity value, book value of long-term debt, and net current liabilities by the book value of total assets (Chung & Pruitt, 1994; King & Lenox, 2002). Tobin's *q* is a forward-looking indicator of firm performance popularized by economists because it represents investors' expectations about the risk-adjusted future cash flows of the firm (Lewellen & Badrinath, 1997; Morgan & Rego, 2009). Tobin's *q* has the advantage of capturing short-term performance and long-term prospects, allowing the operationalization of both short- and long-term performance effects using a single performance variable (Uotila et al., 2009). We obtained and calculated the Tobin's *q* value of Japanese retailers from 2007 to 2009 with data obtained from the OSIRIS database.

8.3. Analysis and Findings of Secondary Data Analysis Study

To test the hypotheses, we first conducted the *t*-tests and the Mann-Whitney U-tests to determine whether there were significant differences in financial performance between adopters and non-adopters of green store operations and green transportation. The *t*-test is a parametric test for examining the equality of means while the Mann-Whitney U-test is a non-parametric test for examining the equality of the medians (Palepu, 1985; Siegel, 1956). In performing the *t*-tests, since the arithmetic mean can be affected by extreme values that are far removed from the rest, we took note of outliers by applying the "explore statistics" function to identify the extreme values that are designated with asterisks (*) by SPSS (Norusis, 2008). We excluded the outliners and re-ran the *t*-test.

Table 8.3 and 8.4 show the results of the *t*-tests and the Mann-Whitney U-tests, respectively.

From the *t*-tests, we found that the financial performance of adopters of green store operations was significantly better at $t = 2.256$ ($p < 0.05$) in year 2007, $t = 2.793$ ($p < 0.01$) in 2008, and $t = 3.117$ ($p < 0.01$) in 2009 than the non-adopters throughout this three year period. Results of the Mann-Whitney U-tests with $Z = -2.528$ ($p < 0.05$), $Z = -3.025$ ($p < 0.01$), and $Z = -3.457$ ($p < 0.01$) for years 2007, 2008, and 2009, respectively, also provided further evidence in support of retailers adopting green store operations performing better than that of non-adopters.

We obtained similar findings from the *t*-test and Mann-Whitney U-test results for the adopters of green transportation with significant performance differences at $t = 2.253$ ($p < 0.05$) and $Z = -2.572$ ($p < 0.05$) in 2007, $t = 3.365$ ($p < 0.01$) and $Z = -3.285$ ($p < 0.01$) in 2008, and $t = 2.863$ ($p < 0.01$) and $Z = -3.524$ ($p < 0.001$) in 2009 relative to the non-adopters.

Table 8.3 Financial performance (Tobin's *q*) comparisons between GR adopters and non-adopters from 2007 to 2009 by *t*-test

	Year	2007 (n = 323)		2008 (n = 349)		2009 (n = 348)	
	Measure	Green Store Operations	Green Transportation	Green Store Operations	Green Transportation	Green Store Operations	Green Transportation
Mean	Adopters	0.9152	0.9635	0.7187	0.8050	0.6554	0.7168
	non-adopters	0.7658	0.7747	0.5786	0.5839	0.5167	0.5241
Standard deviation	Adopters	0.50010	0.48361	0.34890	0.38825	0.31238	0.32767
	non-adopters	0.47438	0.47921	0.38142	0.37162	0.40417	0.39336
t-test	d.f.	321	321	347	347	133.520	346
	t	2.256*	2.253*	2.793**	3.365**	3.117**	2.863**

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

Table 8.4 Financial performance (Tobin's *q*) comparisons between GR adopters and non-adopters from 2007 to 2009 by Mann-Whitney U-test

	Year	2007 (n = 329)		2008 (n = 354)		2009 (n = 350)	
	Measure	Green Store Operations	Green Transportation	Green Store Operations	Green Transportation	Green Store Operations	Green Transportation
Mean rank	Adopters	191.21	202.33	210.35	229.80	212.56	230.11
	non-adopters	158.30	160.13	169.26	171.40	166.07	168.85
Sum of ranks	Adopters	12811.00	7688.50	14934.50	8502.50	15091.50	8744.00
	non-adopters	41474.00	46596.50	47900.50	54332.50	46333.50	52681.00
Mann-Whitney U-test	Z	-2.528*	-2.572*	-3.025**	-3.285**	-3.457**	-3.524***

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

As the results of both tests indicated significant statistical differences, adopters of green store operations and green transportation performed financially better than their non-adopting rivals. This supplementary result supported the findings in our study II that GR adoption was positively correlated to financial performance.

8.4. Summary

Based on analyses of the financial data of publicly listed retailers in Japan, we found that retailers adopting GR financially outperformed their non-adapting rivals. There have been calls for environmental management practices that can profitably benefit business enterprises (Siegel, 2009). Plaza-Ubeda et al. (2009) argued that if an environmental investment is profitable, the firm will implement it voluntarily. Our results substantiate the belief that green store operations and green transportation are financially beneficial to retailers, revealing to retailers what management practices they should adopt for greening their operations.

As GR is still a novel concept, the availability of related archival data is rather sparse. In this study, we therefore evaluated only two practices of GR, green store operations and green transportation, which are more commonly adopted in the industry. Future studies can extend our work to examine other dimensions of GR and other contexts, such as developed and developing countries, to determine if particular GR dimensions work well under certain business environments.

9. CONCLUSIONS

9.1. Discussion of research findings

There has been growing evidence of firms' engagement in CSR and sustainability activities with the aims to reap the financial, social, and environmental benefits. The pathway to low-carbon economy is of utmost importance under the escalating deterioration of the environment such as diminishing raw material resources, overflowing waste sites, increasing levels of pollution, and global warming. GR, an approach that utilizes environmental protection measures in the retail value chain, has been initiated and increasingly popularized among retailers.

In the following, we consolidate findings from the previous chapters. We revisit our research objectives/questions and evaluate what we have learnt in this research and the research objectives achieved about GR.

What is Green Retailing? What are the theoretical dimensions that underpin the adoption of GR practices? What are the roles of retailers in performing these green practices?

Environmental management is an emerging research area tackling environmental issues such as pollution and waste production. Our study attempts to fill the research gap by identifying and specifying the practices that are attributable to GR. Driven by the theoretical framework of NRBV and Porter's value chain, we developed the theoretical

framework for GR with three dimensions namely, *internal-improvement based GR*, *external-coordination based GR*, and *supportive-development based GR.* This framework provided theoretical guidance for our subsequent categorizations of GR practices in our exploratory qualitative study using content analysis targeting the world-class retailers (*Wal-mart*, *Carrefour*, *Tesco*, *Metro Group*, *The Kroger Co.*, *Target Corp*, *Costco Wholesale Corp* and *Sears Holdings Corp).* We used the techniques of open and axial coding to categorize the GR practices reported by these retailers in annual reports/environmental reports/official websites to further derive ten practices subsumed under the three main dimensions:

Internal-improvement based GR practices are based on the notion of pollution prevention with waste reduction or minimization of resource inefficiencies. Waste reduction is possible from raw materials access, through to production processes, and even disposal of products (Hart, 1995). Pollution prevention can increase efficiency by various means which include lowering the inputs required, simplifying processes, and reducing compliance and liability costs (Hart & Dowell, 2011). Pollution prevention is popularized in the boardroom because not only does it aim to prevent damage to the environment, but it also enables the firm to save resources that would be needed for the disposal, storage, and clean up of waste (Cronin et al., 2011). In GR, pollution prevention calls for waste reduction in the primary value chain activities such as operations and logistics aligned with the "zero defects" goal of quality control. A "zero discharge" objective focuses organizational efforts on eliminating waste in pursuit of total quality environmental management (Shrivastava, 1995). Elimination of waste in

internal-improvement based GR requires continuous improvements in two sub-dimensions: *green store utilization* and *green transportation*. *Green store utilization* refers to the use of devices or systems in the store that help energy conservation or reducing/recycling of waste. *Green transportation* entails the movement of goods with reduced materials or energy consumption, as well as greater efficiency.

External-coordination based GR practices are congruent with product stewardship expanding the scope of pollution prevention to the entire value chain or "life cycle" of the firm's product system. Product stewardship entails integrating external stakeholder perspectives into product design and development processes for eliminating waste and lowering life-cycle environmental costs (Hart, 1995). Product stewardship creates the potential for competitive advantage through two means: by gaining preferred or exclusive access to important resources (e.g. raw materials, locations, or customers); or by establishing rules, regulations, or standards that are uniquely adapted to the firm's capability (Hart, 1995). Realizing product stewardship suggests that firms take an environmentally proactive position towards suppliers, and cultivating close working relationships among environmental staff, marketing staff, and customers, in a concerted effort to reduce the environmental impact of the product-in-use and the spent product reused or recycled (Hunt & Auster, 1990). Hart (1995) argues that product stewardship provides opportunity for sustained competitive advantage through the accrual of socially complex resources, involving fluid communications across functions, departments, and organizational boundaries. In GR, product stewardship is inclined towards external coordination processes such as procurement, marketing, and after-sales activities,

involving cooperation with suppliers and customers. Consistent with the notion that environmental impact should be reduced throughout a product's life cycle, this dimension of GR involves coordinating with related parties to minimize the life cycle cost of the product, including the environmental impact from the production, usage, and disposal processes. The pivotal role of the retailer as a coordinator between suppliers and customers in the value chain is fundamental for a green practice to thrive. There are five sub-dimensions underpinning *external-coordination based GR practices. Green procurement* entails the purchasing of goods from, or developing partnerships with suppliers that support sustainability; or purchasing goods with eco-labels which clearly show the environmental impact of the product. *Green product design* involves cooperating with suppliers in designing products with environmental considerations. *Green packaging* concerns cooperation with suppliers to develop packaging which can be reused and recycled, or has lower waste. *Green promotion* aims to educate and encourage customers to participate in recycling, reducing waste, and reusing products. *Green after-sales service* provides channels for customer participation in reducing waste, reusing products, and collecting disassembled products from individual customers for return to suppliers.

Supportive-development based GR practices are congruent with Hart's sustainable development strategy which possesses two differentiated characteristics from pollution prevention or product stewardship strategies. First, a sustainable development strategy does not simply aim at reducing environmental damage, but secondly, targeting to produce in a way that can be maintained indefinitely into the future (Hart & Dowell,

2011). Sustainable development pertains to making a commitment to take a long–term orientation while reducing economic burden with a view to achieving sustainable organizational growth and development (Hart, 1995). Sustainable development requires a long-term vision shared among all relevant stakeholders and strong moral leadership, which constitute a rare resource. *Supportive-development based GR practices* refer to the research and supporting activities developed backing environmental preservation for retailing. Firms need to develop a long-term vision and commitment to environmental protection and preservation through the three sub-dimensions of this GR practice. It includes shared management commitment to a *green policy*, *green research development*, and *green human resource development*, all of which are necessary for fostering organizational growth. *Green policy* concerns developing missions and visions focused on green commitment. *Green research development* supports research, investment, or cooperation with other organizations for developing technology to reduce environmental impact. *Green human resource management* promotes employee participation in green development.

We further operationalized and validated the above model of GR by quantitative survey research carried out in Hong Kong. We first confirmed the measurement properties of the dimensions of GR construct using corrected-item-total-correlation analysis, reliability test and CFA. The model fit with significant path loading in our first-order and second-order models empirically validated our conceptualization that GR is a multidimensional measure comprising three main dimensions and ten sub-dimensions.

Our case studies also highlighted the five roles of retailers in greening the value chain comprising suppliers and customers. Retailers provide an environmentally friendly physical retail environment to facilitate interaction with customers and they transfer goods from suppliers to customers in an environmentally friendly manner when performing GR. Retailers can also act as a coordinator to disseminate the voices of customers for greening and provide feedback to suppliers. Economizing and stimulating end-of-life product stewardship, retailers can also influence and support the entire value system comprising suppliers and customers to go green.

What factors lead retailers to adopt GR and what determine the extent of their adoption?

What influences strategic plans is not simply the degree of stakeholder environmental pressure but the degree to which environmental stakeholder pressure is perceived by managers in charge of strategic decision making (González-Benito & González-Benito, 2010). Prior work has shown that the key pressures for environmental initiatives originate from regulatory, customer, supplier, and competitive pressure. Our case studies and empirical findings substantiate this argument. Specifically, our empirical evidence shows that the environmental regulatory pressure, customer pressure, supplier pressure and competitive pressure as perceived by retailers are positively associated to with the extent to which they adopt GR. Under today's increasing and ever-changing regulations, retailers have to comply with environmental regulations under the coercive force. Lawsuits resulting from noncompliance can incur financial loss and reputational damage.

While the concerns of environmental protection and the number of environmentally conscious customers are growing, retailers are urged to adopt green practices so as to retain the business relationships with their customers and suppliers. The growing consumer concern about the environmental impact of retailers is manifested in view of the burgeoning demand for environmentally friendly products, services, and more such as the related delivery processes. Suppliers expressed their concerns that their downstream retailers can perform up to their environmental standards. Retailers also intend to follow the actions of competitors who have benefited from green practices adoption with the fear that their competitiveness will shrink. It is also consistent with the retail literature that retail adoption decisions are influenced by the upstream and downstream of partners as well as the retail competition environment. The above findings echoed with the institutional and stakeholder theory that stakeholders impose social pressures on organizations to shape the organizational practices with widespread of values and norms. Our empirical results further reveal that the effect of supplier pressure on their GR adoption is mediated by the existence of the customer influence on environmental protection they encounter. A similar effect is also found that competitive pressure mediates the effect of environmental regulatory pressure on GR adoption. It supports the conviction that stakeholders are likely to have direct relationships with one another, affecting firms in a network of influences (Rowley, 1997). While scholars have long been advocating that environmentally conscious customers directly influence the behavior of firms, new insights are obtained in this study that customer pressure is valuable for mediating supplier pressure on the implementation of green practices of retailers due to the normative isomorphism. On the other hand, we also shed light on

how competitive pressure mediates the relationship between regulation compliance and GR adoption with the grounds that noncompliance penalties, fines, and reputational damage become more unaffordable for firms in a highly competitive environment. Weighing of stakeholders concerns in addressing environmental problems becomes pivotal in each retailer business decision.

What are the consequential performance outcomes of adopting GR? Does GR adoption lead to better financial and environmental performance for retailers?

Our quantitative survey results suggest the positive associations of GR adoption and financial performance as well as environmental performance. The secondary data analytic results in Study III further support that GR adopters have better financial performance than non-adopters. Consistent with the literature (Porter & van der Linde, 1995), "green" can be a competitive weapon and help firms stand out from the competitors. The positive link between environmental performance and economic performance goes along with the EMT notion that better utilization of resources favor economic improvement with environmental benefits in chorus. Service goes hand-in-hand with product availability from the retailers' perspective. This is rooted in the simple notion that if a product is not there when the customer walks into the store, then a sale is lost. GR, which is cost-effective and procedure-efficient, enhances the competitiveness of the firm through waste reduction, superior reliability and responsiveness to the market changing needs. Better service, meanwhile, enhances customer satisfaction which indirectly contributes to enterprises' economic performance

in various ways, e.g., a satisfied customer buys more of a particular product or service from the company, makes recommendations to their peers, and has a higher price tolerance (Anderson, Fornell, & Mazvancheryl, 2004). Higher customer satisfaction implies customer loyalty is cultivated, thus enhancing the firm's ability to generate an above-normal rate of economic return and sustain its profitability (Yee, Yeung, Cheng, & Lai, 2009).

Our results show significant moderating effect of cost pressure on the relationship between GR adoption and environmental performance. It indicates the positive effect of GR adoption on the environmental performance is stronger when the cost pressure perceived by retailers is higher. Retailers feel higher urgency and attach greater importance to GR in saving cost which in turns improves the environmental performance. Nevertheless, we find insignificant moderating effect of cost pressure perceived by retailers on the relationship between GR adoption and financial performance. As mentioned by Testa and Iraldo (2010), firms may consider green practices as expense. Hence, under the circumstance where retailers feel high cost pressure, they may not perceive better financial performance to be gained from GR.

Summarizing our theoretical model in examining the antecedents-adoption-performance relationships of GR, it coincides with strategic choice theory that business decisions and outcomes are determined by the interaction of environmental pressures and internal consideration. Managers identify problems and opportunities during decision making and the outcome performance is reflected in acting upon these opportunities and

problems. Retailers respond to forces such as increasing regulations, competitive pressures and higher requirements from customers and suppliers in adopting GR which shape their financial and environmental outcomes through improved efficiency and waste reduction. After the discussion of findings in our study, we now move to the academic and managerial contributions as well as the policy implications of this research, identifying the limitations of our results, and highlighting opportunities for future research.

9.2. Academic Implications

The literature on CSR practices and sustainability garnered attention on environmental preservation in which retailers have a crucial role to play. Relatively little attention has been specifically paid to green practices of retailers although a sufficient amount of studies have been confined to environmental strategies in the manufacturing context and CSR practices employed by retailers. We find the literature gap that the measurement model of GR and the antecedent-adoption-performance relationships are under-investigated. This study advances knowledge in the literature by developing a multi-dimensional GR conceptualization that is theoretically grounded. This also answers the call in the literature that specific conceptualization should be given to match the particular development and practices of organizations among the broad and overlapping CSR and sustainability literature (Montiel, 2008; van Marrewijk & Werre, 2003). From the methodological perspective, this study contributed to future research by validating a measurement instrument for evaluating GR. We empirically examined first-order and second-order models of the GR construct, embracing a 33-item measurement scale for

evaluating GR practices. Our work on constructing and validating GR constructs should lay a foundation for future development of GR research by drawing the attention of researchers to this area.

It is indicated that a holistic model that depicts all the major antecedents and consequences involved in environmental strategy adoption is yet to be fully developed in the literature (Chan, 2005). We contribute to the theoretical advancement in environmental studies by establishing an integrative model which consists of the determinants, adoption, and consequent performance of GR. The positive effects of environmental regulatory pressure, customer pressure, supplier pressure, and competitive pressure on GR, as well as the financial and environmental advantages leveraged from GR are evidenced in our real-life example case studies and empirical survey study.

Our study also fills in the literature gap that few studies examined the mediating effect among the drivers of green practices. We find the effect of the environmental regulatory pressure on retailers' GR adoption is mediated by the competitive pressure they encounter, and the effect of supplier pressure on the GR adoption is mediated by the customer pressure. This sheds light on the literature that retailers face pressures from various stakeholders and the stakeholder pressures affect each other when driving retailers to adopt GR. Our findings provide insight for future studies that indirect effects should be considered when studying the antecedents of environmental practices implementation. We also indicate that cost pressure perceived by retailers moderates the

relationship between GR adoption and environmental performance. It responds to the call in the literature of what moderator may affect the performance outcomes of green practices.

9.3. Managerial Implications

Understanding the attributes of GR is essential for managers to develop procedures, perform evaluations, and adopt management practices which integrate environmental concerns. However, retailers often do not have a clear and precise picture of what they can do in their retail activities for environmental protection. The GR scale with three main dimensions and ten sub-practices, derived from our qualitative and quantitative analysis, is a useful and practical reference for retailers to design and plan for greening operations. Our study provides retailers with actionable reference for GR adoption at the sub-dimension level and precise practice level, helping them to identify areas for green improvement in their planning and implementation of GR. For example, retailers may begin at the I-I level, i.e., carry out internal improvement to identify waste reduction opportunities within their operational processes. This level is considered as a beginning step because it helps managers pinpoint where waste is generated. They can then formulate environmental protection plans specifically to target the identified areas. Green store operations and green transportation are relatively easier to implement as mangers have a high degree of control over the internal procedures of their own firms. The E-C level emphasizes coordination with stakeholders to minimize life-cycle costs. Managers can put effort into developing a good communication environment to facilitate the transfer of green knowledge and feedback with upstream suppliers and downstream

customers. Precise practices such as green procurement, green product design, and green packaging require solid networking with suppliers to reduce environmental damage starting from the production stage of a product. Wal-Mart, for instance, has a strict requirement for its suppliers in product design and packaging with environmental considerations. While customer behavior is now shifting from "passive reaction" to "active interaction" (Mathwicka, Malhotra, & Rigdon, 2001), customers are keen to know the environmental footprints of their purchased products and they look for ways to participate in green recycling activities. Green promotion and green after-sales service should thus be targeted at satisfying customers' environmental needs by providing channels for customers to return and recycle used products, and forging relationships with customers by delivering high quality environmental services and products. The S-D level requires a long-term commitment and investment in green technology and putting resources in training staff with a view to reducing the environmental footprint and sustaining environmental protection efforts. S-D also serves as a core mission and vision of the firm that direct its future development striving to attain sustainable goals.

On the other hand, depending on the nature of their businesses, retailers need to determine which sub-dimensions they should accord a higher priority. For example, retailers of fast moving consumer goods (FMCG) may focus on green transportation as they require frequent replacements of stocks through efficient and green transport channels. Department and specialty stores may stress green promotion and green after-sales service because of their frequent interaction with customers, with the aim of

providing customer-desired services while reducing the environmental footprints in their operations.

Our discussion of GR with illustrative real-life examples would help retailers better understand the current state of implementing green practices in the retailing sector. As performance is always the top concern of business firms, this study gives empirical findings and reference to retailers on the performance outcomes of GR. Practitioners can take our empirical results as reference whether stakeholder pressures would affect the adoption and what are the possible performance outcomes of GR. These would be useful for them to evaluate their own situation, formulate action plans for GR, and make adjustments in various areas in the value chain to improve performance outcomes.

9.4. Policy Implications

The rapidly rising pollution has become a major issue for Hong Kong with its economy focusing more and more on services rather than the manufacturing industry (Hills & Barron, 1997). There is an obvious need for the government to develop a comprehensive guidance for the industry balancing the economic development with environmental protection. In light of the Japanese environmental policy which emphasizes self-regulation of industry by means of voluntary agreements and the guidelines provided by the Japanese government on environmental accounting (Kolk, 2003; Studer et al., 2006), we suggest the Hong Kong government adopt a similar approach and facilitate communication with retailers. Through forums or workshops, our GR scale can be adopted as a framework to educate as well as evaluate the retailers' performance.

Our study also provides a reference for policy makers to formulate proper voluntary measures for the retail industry. Our results indicate that GR is financially and environmentally beneficial to retailers, revealing to retailers what management practices they should adopt for greening their operations. Policy makers will find our results useful in that legislation is not the sole mechanism to promote green behaviors in the retail sector. As revealed in our Study III, utilization of energy saving devices in stores and trucks are not legally mandatory for retailers to operate in Japan. Yet some Japanese retailers have moved ahead of legislation to adopt pertinent GR strategies and reap financial gains. Governments generally should provide measures such as sponsoring the purchase of compressed natural gas (CNG) trucks and installation of LED lighting to promote green practices in retailing. These measures can be complementary to government regulations on environmental protection, particularly for those countries suffering from weak environmental governance and enforcement of related regulations. The government might also consider corresponding policies to drive retailers to identify and reduce waste in their retail chains through incentives and regulations; or provide support for the GR development of retailers, e.g., allocating research funds for green product design and green technology development. This study thus can provide a timely reference for government policy makers to facilitate their tasks in formulating environmental legislations as Green Economy is emphasized in the *Hong Kong SAR Government Budget Speech* consecutively in the years 2009-2010, 2010-2011, and 2011-2012.

9.5. Limitations of This Study

This study is subject to some shortcomings that limit the interpretation of the results.

First, we initially only focused on eight major theoretical constructs, i.e., GR, environmental regulatory pressure, customer pressure, supplier pressure, competitive pressure, financial performance, environmental performance and cost pressure which were indicated as critical constructs in the environmental management literature and case studies.

Second, our quantitative study was based on a cross-sectional survey, which was limited in explaining the long-term effects and demonstrating the pure causal relationships. In an attempt to overcome this limitation, we conducted case studies to strengthen the evidence on the associations among our study variables.

Our survey data were mainly perceptual in nature requesting questionnaire responses from our study targets. Objective financial and environmental performance data should be used for evaluating the performance outcomes. However, as most respondents are reluctant to disclose objective and concrete financial data (Menguc & Ozanne, 2005), we decided to acquire perceptual data for firm profitability and environmental outcomes. It is also desirable to collect data from their customers and suppliers to examine the extent of GR adoption which involves the cooperation of customers and suppliers. To ease the problem due to perceptual responses in questionnaires, we tested for potential existence of common method bias and found no threat of it to this study. We also triangulated the

survey-based data with the companies' environmental report and financial data in OSIRIS database whenever available. We also carried out Study III, which was a secondary data analysis, using objective financial performance to support the positive relationship between GR adoption and financial performance in different country contexts.

Regarding the analyses in Study III, we focused on data in recent years between 2007 and 2009 due to an absence and incompleteness of environmental reports in earlier years. Yet, the data from recent years should be more relevant and critical to reveal the contemporary situation among practitioners. On the other hand, as GR is a relatively novel phenomenon in the industry, we only focused on the examination of green store operations and green transportation practices which are more widely adopted in the industry at the current stage.

In terms of research scope, this study was limited to the strategic aspect to examine the extent of using GR at firm-level under the influences of stakeholder pressures and the performance outcomes, which have not been intensely examined in the previous literature. Specific green practices such as green purchasing and eco-design which are more operational in nature were not investigated in detail. We did not collect data on cultural and social factors of firms, which might limit our understanding on how the differences in cultural and social characteristics of firms affect the relationships hypothesized in our model.

Finally, the sampling frame of the survey study focused on six categories of retailers in Hong Kong: cosmetic and beauty products, convenience stores, supermarkets, department stores, drug stores, and retailers with five or more outlets operating in Hong Kong. The study results could be different if a wider range of categories were targeted or retailers across countries were invited to take part in this study.

9.6. Directions for Future Research

There are plenty of opportunities for future research on the topic of GR.

First, the GR constructs and its theoretical model are first developed in this study. As validity is established only over a series of studies that further refine the measurement items (Goldsmith, 1992), subsequent studies across categories of retailers help the development of valid and reliable measurements. Future studies can adopt, modify, and extend the GR measurements operationalized in this study. Researchers can also extend by investigating each dimension of GR and their different impacts on business performance. In our study, the mediating effect of competitive pressure on the relationship between environmental regulatory pressure and GR adoption; and the mediating effect of customer pressure on the relationship between supplier pressure and GR adoption were tested separately with the former one relates to the broader environmental context while the latter one relates to the narrower environmental context of firms. Future studies can examine these stakeholders' effects holistically with path analysis to gain an overview picture and understanding.

To broaden the scope of this study, it is valuable for future studies to explore other factors such as leader's individual values, attitudes, and leadership to examine whether they may influence the adoption and performance outcomes of GR. Such findings are valuable for firms considering the adoption of GR and to better understand how they contribute to business performance under different circumstances. As the products sold by retailers are truly green only when their suppliers and their upper suppliers materials are also green (Roberts, 2003), the roles played by sourcing companies in greening the supply value chain is critical. Future studies can examine how sourcing companies impact the adoption of GR and the roles played by these sourcing companies in greening the supply value chain. On the other hand, since outsourcing production to suppliers in a variety of countries and factory-less brands is an emerging trend in globalization, studies are suggested to investigate how it creates challenges when greening the supply chain or pursuing more rigorous CSR practices. Studies focusing on SMEs can also be carried out to examine how green practices can be diffused among them given the difference of characteristics between SMEs and the large companies.

Future studies can contribute to the literature by improving the methodologies used in this study such as carrying a longitudinal survey across a period of time to demonstrate the causal relationships. Particularly, the causal relationship between GR adoption and financial performance can be examined to understand whether firms gain financial benefits from green practices or firms adopt green practices because they have richer resources. Such findings not only can contribute to the understanding of the stages of

GR development, but also advance knowledge on how GR impacts the financial and environmental value over time.

Last but not least, further research is encouraged for extension to other retail settings and countries to enhance the generalizability of the results and gain a better understanding on the implementation of GR in different retail settings and cultural contexts.

9.7. Conclusion Remarks

Today's retailers face the challenge of incorporating environmental protection in their retail operations. A review of the literature reveals that there is a gap with few studies devoted to studying the theoretical construct of GR and its measurement scale. As GR is a rising concern for practitioners and scholars, this study investigated the phenomenon of GR through multiple research methods with different sample scopes. We first carried out exploratory qualitative research to explore the phenomenon of going green among the world-class retailers to understand different dimensions of GR. Quantitative survey research with Hong Kong retailers as the targeted sample was then performed to validate the measurement construct and test the hypotheses grounded from theories and literature. A secondary data qualitative analysis in Japan was further conducted to support our advocate that GR adopters perform better financially than GR non-adopters. Combining different in-depth studies and survey research helped us gain better generaliazability and in-depth understanding of the research questions under our investigation.

This study theoretically conceptualizes and empirically examines first-order and second-order models of the GR construct, embracing a 33-item measurement scale for evaluating GR practices. Such operationalization of GR constructs establishes a solid empirical ground for future research in GR.

GR is found to be driven by environmental regulatory pressure, customer pressure, supplier pressure, and competitive pressure. In addition, the effect of the environmental regulatory pressure on retailers' GR adoption is mediated by the competitive pressure they encounter. On the other hand, the effect of supplier pressure on the GR adoption is mediated by the customer pressure on environmental protection. Consistent with our theoretical reasoning, our findings show that GR leads to better financial and environmental performance of the firm. We also find under the circumstance that retailers feel higher cost pressure in managing activities, the better environmental performance is achieved from the adoption of GR.

Our findings provide a positive answer to the frequently asked question by retailers, "Whether going green can help financial and environmental outcomes?" and we also provide managerial reference to practitioners on how they can plan for greening their retail activities subject to their nature and feature of business. The government can use our findings as reference in planning the policy for promoting green development in the retail industry.

We believe these findings are useful for researchers and practitioners striving to understand the antecedents, the adoption, and the impact of GR. We hope that this study triggers a series of follow up investigations into the application of various GR for managing retail chain activities.

APPENDIX A – SURVEY QUESTIONNAIRE

Green Retailing Survey

Green retailing is defined as the incorporation of environmental protection measures into retail activities. This questionnaire is designed to investigate the adoption level, the contributing factors, and the adoption outcomes of green retailing in Hong Kong. This questionnaire will take about 15 minutes to complete. Thank You.

Part A The extent to which our company performs the following green retailing practices …	Very low 0-20%	>20-40%	Neither low nor high >40%-60%	>60%-80%	Very high >80%-100%	Not applicable
Green Store Operations						
1. Use systems or devices to conserve energy in our store (e.g., LED/ energy saving light bulbs)	1	2	3	4	5	n/a
2. Use systems or devices to reduce waste in our store	1	2	3	4	5	n/a
3. Use systems or devices to recycle waste in our store	1	2	3	4	5	n/a
Green Transportation						
4. Transport goods with *less* energy consumption	1	2	3	4	5	n/a
5. Transport goods with *less* materials consumption (e.g., use less paper cartons to carry goods)	1	2	3	4	5	n/a
6. Transport goods using trucks with *less* harmful gas emissions	1	2	3	4	5	n/a
Green Procurement						
7. Purchase goods from suppliers supportive of environmental protection	1	2	3	4	5	n/a
8. Purchase goods with eco-label (e.g., Energy Star)	1	2	3	4	5	n/a
9. Purchase goods from suppliers certified with environmental standards (e.g., ISO14001)	1	2	3	4	5	n/a
Green Product Design						
10. Encourage suppliers to use biodegradable materials (e.g., T-shirts that are bio-degradable)	1	2	3	4	5	n/a
11. Encourage suppliers to use recycled materials	1	2	3	4	5	n/a
12. Encourage suppliers to eliminate materials that cause environmental damage	1	2	3	4	5	n/a
13. Encourage suppliers to reduce total materials usage	1	2	3	4	5	n/a
Green Packaging						
14. Cooperate with suppliers to reduce packaging waste (e.g., use less paper to wrap products)	1	2	3	4	5	n/a
15. Cooperate with suppliers to introduce packaging made of recycled materials (e.g., recycled paper cartons)	1	2	3	4	5	n/a
16. Cooperate with suppliers to improve packaging reuse (e.g., reuse plastic trays)	1	2	3	4	5	n/a

17. Cooperate with suppliers to use biodegradable materials in packaging	1	2	3	4	5	n/a
18. Cooperate with suppliers to eliminate packaging that causes environmental damage	1	2	3	4	5	n/a
Green Promotion						
19. Educate customers on environmental protection	1	2	3	4	5	n/a
20. Motivate customers to participate in recycling	1	2	3	4	5	n/a
21. Motivate customers to participate in waste reduction	1	2	3	4	5	n/a
Green After-sales service						
22. Collect returned products from customers	1	2	3	4	5	n/a
23. Return disposed materials to suppliers	1	2	3	4	5	n/a
24. Provide trade-in services for new products	1	2	3	4	5	n/a
Green Policy						
25. Develop vision and mission on green commitment	1	2	3	4	5	n/a
26. Communicate company commitment on environmental protection to the public	1	2	3	4	5	n/a
27. Establish a time schedule in reaching environmental goals	1	2	3	4	5	n/a
Green Research Development						
28. Establish a department responsible for reducing environmental damage	1	2	3	4	5	n/a
29. Collaborate with other agencies (e.g., universities, environmental groups) on research into reducing environmental damage	1	2	3	4	5	n/a
30. Develop systems to measure and control environmental performance	1	2	3	4	5	n/a
Green Human Resource Development						
31. Train staff to reduce energy consumption	1	2	3	4	5	n/a
32. Train staff to enhance operations efficiency	1	2	3	4	5	n/a
33. Train staff to reduce waste	1	2	3	4	5	n/a
34. Provide environmental guidance to direct staff in work (e.g., turn off all the electronic appliances when leaving the store)	1	2	3	4	5	n/a

Part B The extent to which I agree or disagree with each of the following statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Not applicable
1. Non-compliance with environmental regulations can incur financial loss	1	2	3	4	5	n/a
2. Non-compliance with environmental regulations can damage our reputation	1	2	3	4	5	n/a
3. Stricter environmental regulations are a major reason explaining why our company pays attention to protecting the natural environment	1	2	3	4	5	n/a
4. Adopting green practices can attract more customers	1	2	3	4	5	n/a
5. Adopting green practices can improve our company's image	1	2	3	4	5	n/a
6. Adopting green practices can help retain our customers	1	2	3	4	5	n/a
7. The number of environmentally conscious customers is growing	1	2	3	4	5	n/a
8. The demand for environmentally friendly products and services is	1	2	3	4	5	n/a

increasing						
9. Our customers will boycott our products/services that are **not** environmentally friendly	1	2	3	4	5	n/a
10. Our customers will switch to competitors that adopt green practices	1	2	3	4	5	n/a
11. Suppliers prefer to trade with companies that adopt green practices	1	2	3	4	5	n/a
12. Our relationships with suppliers will be affected if we do not meet their environmental requirements	1	2	3	4	5	n/a
The *main competitors of our company* that have adopted green practices ….						
13. have benefited from green practice adoption greatly	1	2	3	4	5	n/a
14. are perceived favourably by *others in the same industry*	1	2	3	4	5	n/a
15. are perceived favourably by their *trading partners* (e.g., suppliers/customers)	1	2	3	4	5	n/a

Part C	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Not applicable
Compared with our major competitors …						
1. our input materials cost is higher	1	2	3	4	5	n/a
2. our process/production cost is higher	1	2	3	4	5	n/a
3. our energy consumption cost is higher	1	2	3	4	5	n/a
4. our company has better earnings growth	1	2	3	4	5	n/a
5. our company has better sales growth	1	2	3	4	5	n/a
6. our utilization of corporate resources (e.g., inventory) is better	1	2	3	4	5	n/a
7. our company generates *less* harmful gas emissions	1	2	3	4	5	n/a
8. our company produces *less* waste water	1	2	3	4	5	n/a
9. our company produces *less* solid waste	1	2	3	4	5	n/a

Part D	Very low	Low	Neither low or high	High	Very high
1. The knowledge I have about managerial decisions on green practices in our company is	1	2	3	4	5
2. The knowledge I have about implementation of green practices in our company is	1	2	3	4	5
3. My involvement in the green retailing initiatives/practices of our company is	1	2	3	4	5

4. Number of employees in our company (please mark *one* only):

☐ 1 - 10	☐ 11 – 50	☐ 51 – 100	☐ 101 - 500	☐ > 500

5. Number of outlets in our company (please mark *one* only):

☐ 1	☐ 2-4	☐ 5 or above

6. Our company is a multinational corporation.

☐ Yes	☐ No

7. Our company's primary type of stores is (please mark *one* only):

☐ Beauty products/Cosmetics	☐ Catering/Food
☐ Convenience stores	☐ Department stores
☐ Electronic & electrical appliances/Telecommunications	☐ Drug stores
☐ Fashion & accessories	☐ Furniture & home accessories
☐ Supermarkets	☐ Watches & jewellery
☐ Retail services	☐ Others (please specify): _____

8. Number of years our company has adopted green practices (please mark *one* only):

☐ <5	☐ 5-10	☐ >10

9. The turnover of our company in the last fiscal year is approximately (HK$)

_____

10. Our company has environmental certification (e.g., ISO14001)

☐ Yes (please specify): _____ _____ _____	☐ No

We would appreciate it if you could return the completed questionnaire *within* two weeks to Dr Mike Lai, Department of Logistics and Maritime Studies, The Hong Kong Polytechnic University, Hung Hom, Kowloon, by mail: using the attached pre-paid envelope, or by fax: 2330-2704, or by email: lgtmlai@

Please call Dr. Mike Lai at 2766-7920 or Miss Ailie Tang at 9888- if you encounter any problems with this study.

If you would like to receive a copy of the study results, please attach your business card.

Thank you very much for your participation in this study.

APPENDIX B – SURVEY COVER LETTERS

Cover letter for the first wave of survey questionnaire mailing

Date

Dear NAME OF EXECUTIVE,

Have you ever wondered what can be done to improve retail chain activities with the use of environmental protection practices? "Green Retailing" is the incorporation of environmental protection measures into retail activities. This is a challenging issue facing executives in today's business and industry.

A group of researchers in the Department of Logistics and Maritime Studies, The Hong Kong Polytechnic University, we are pursuing a study of the association between the adoption level, the contributing factors, and the adoption outcomes of green retailing practices in Hong Kong. To provide data for our study, we are conducting a questionnaire survey to gather input from practitioners and professionals in the retailing sector.

We cordially invite you to participate in this survey, which should take you approximately 15 minutes to complete. Please choose to answer ***either the English or Chinese version of this questionnaire*** according to your preference. Both questionnaire versions contain the same content.

We will appreciate it if you can return the completed questionnaire *within* two weeks to Dr. Mike Lai by mail: using the attached pre-paid envelope, or by fax: 2330-2704, or by email: lgtmlai@ . Please call Dr Mike Lai at 2766-7920 or Miss Ailie Tang at 9888- if you encounter any problems with this study.

Your response will be treated in strict confidence, and all the collected data will be analyzed and reported in aggregate with those of many others and used only for research purposes. We thank you very much in advance for your participation in this study, and look forward to receiving your response.

Yours sincerely,

Ailie Tang
PhD Candidate
Department of Logistics and Maritime Studies
The Hong Kong Polytechnic University

Cover letter for the second wave of survey questionnaire mailing

Date

Dear NAME OF EXECUTIVE,

Approximately a month ago, we wrote to you about our research study investigating what can be done to improve retail chain activities with the use of environmental protection practices. We attached a questionnaire inviting you to participate in this research. We have not received your completed questionnaire yet. Appreciating that you are a busy executive, we cordially request your assistance in answering our questionnaire again.

For the research results to be more meaningful and truly representative of firms in your industry, we need your participation in this research. Your input will enhance understanding of "Green Retailing" - the use of environmental practices in managing retail chain activities. We are confident that the research results will be useful to you and your peers who wish to excel in the environmental and productivity performance of retailers. This questionnaire requires only a short time to complete (no more than 15 minutes) as it seeks your opinion and information you already possess, which requires no investigation and elaboration.

We will be very grateful if you can return the completed questionnaire by the 21th November 2010. You will be making a valuable and timely contribution to a research topic that appears to have a territory-wide interest. Replacement questionnaires are enclosed in case our previous correspondence did not reach you. Please choose to answer either the English or the Chinese version of the attached questionnaire as you prefer. Both questionnaire versions contain the same content.

We will be very happy to answer any questions you might have about this study. Please call Dr. Mike Lai at 2766-7920 or Miss Ailie Tang at 9888- .

Your response is vital to the success of this study. We look forward to receiving your response. Thank you for your help in accomplishing this study.

Yours sincerely,

Ailie Tang
PhD Candidate
Department of Logistics and Maritime Studies
The Hong Kong Polytechnic University

Cover letter for the third wave of survey questionnaire mailing

Date

Dear NAME OF EXECUTIVE,

This follows our earlier invitation for you to participate in our research, which aims at investigating "Green Retailing" - the incorporation of environmental protection measures into retail activities.

We are writing to you again because your input is of great significance to our study. Whether we are able to explain how the use of Green Retailing can improve retail activities and performance critically depends on your opinions. Your participation will ensure that retailers of different sizes and nature are fairly represented in our survey sample. Your assistance in answering the questionnaire is essential to generate results that are truly representative of the subject being studied in this research.

In the event that your questionnaire has been misplaced, we enclose a replacement copy of the questionnaires for your attention. Please choose to answer **either the English or the Chinese questionnaire** as you prefer. Both questionnaire versions contain the same content.

May we urge you to have the questionnaire completed and returned to us as soon as possible. Your response is **vital** to the success of this study. Should you have any questions about this research project or encounter any problems with this study, please call Dr. Mike Lai at 2766-7920 or Miss Ailie Tang at 9888- .

Thank you very much for your time and kind assistance.

Yours sincerely,

Ailie Tang
PhD Candidate
Department of Logistics and Maritime Studies
The Hong Kong Polytechnic University

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