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**Does It Pay to Be Green? An Integrated View of
Environmental Marketing with Evidence from the Forest
Products Industry in China**

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Abstract

Does It Pay to Be Green? An Integrated View of Environmental Marketing with
Evidence from the Forest Products Industry in China

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In the forest products marketing literature, a growing body of research has become available to study the environmental aspects of business strategy as the nexus between economic growth and sustainable development. The Chinese forest products industry has become the world's leading manufacturer and exporter. With growing environmental pressure and international competition, how to enable the industry's robust economic development to proceed in a sustainable manner is now a major concern to scholars, policy makers and industry managers. With a focus on environmental marketing at the strategic level, this study seeks to make several contributions to both practice and theory:

- 1) Based on a review of recent green movements in the industry, this study presents a three-stage evolutionary model driven by the government regulations, environmental standards, private initiatives, environmental NGOs and consumers. As the Chinese government gradually shifts its focus from direct involvement in enterprises to building market-supporting institutions, its influence on business decisions may decline in the future. Private sector demand and NGOs are expected to play an increasingly important role in driving the industry to become greener.

- 2) By integrating the natural resource-based view, the dynamic capability view and the market failure view on strategy, this study proposes a theoretical framework showing that an environmental marketing strategy (EMS) is driven by a combination of internal and external forces, including the environmental orientation and marketing capabilities as firm's specific assets, and customer pressure as an external force. As the outcome, EMS can help firms achieve superior environmental and competitive performance.
- 3) Previous research suggests that as the market environment becomes increasingly favorable toward "green" businesses, it will offer an opportunity for the forest products industry to create or regain competitive advantages by proving its green credentials. This study provides partial support for this view by suggesting that an environmental marketing strategy could create about competitive opportunities for firms, but this study also argues that some environmental practices, such as forest certification, might not improve competitive performance unless they are aligned with the firm's resources and the external environment as part of the strategy.

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Preface

This research considers the question “Does it Pay to be Green?” which has been debated by forest industry practitioners and scholars for several decades. It was the same question that I encountered from time to time during my work with local industries and communities in the Asia-Pacific region as a consultant to the Rainforest Alliance over the past few years.

The United Nations has declared 2011 as the International Year of Forests. As we enter the second decade of the 21st century, there is still a lot of skepticism and ambiguity floating around in the Asian forest products industry about “Green” and “Pay” issues. Given that limited research has been done to address these questions in a systematic approach, particularly in the context of the forest products industry in China, this study attempts to fill in the blank by investigating the drivers of environmental marketing strategies as “Green”, and their impacts on the bottom line of businesses - “Pay” - which is measured by two types of performance: environmental and competitive performance, in the context of the Chinese forest products industry.

Acknowledgement

This study wouldn't have been possible without the support of many people.

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Introduction

Since the concept of sustainable development was proposed in the Brundtland Report - *Our Common Future* (World Commission on Environment and Development, 1987), an increasing volume of business management and marketing research has become available for studying the interdependence between the natural environment and corporate performance, as well as the role of marketing in sustainable development (Polonsky & Mintu-Wimsatt 1995; Menon & Menon 1997; Banerjee 2002; Banerjee 2002; Banerjee, Iyer, & Kashyap 2003; Baker & Sinkula 2005). These studies are focused on such questions as why firms should incorporate environmentally conscious strategies into market development, what are the driving forces of environmental marketing strategy, and how a firm's environmental marketing efforts may impact its "bottom line". However, limited research has been done in the context of the forest products industry in China, which is confronting looming sustainability challenges amid robust economic growth coupled with the expansion and deepening of globalization.

The significance of this topic for China and the global forest products industry cannot be overestimated. Economic globalization has brought significant and irreversible changes to the forest products industry in China. After the recent two decades' fast and steady development, the industry has become much "bigger" and "stronger" by all economic measures. In the meantime, however, the industry is confronting a growing number of challenges such as timber security issues – the balance between domestic timber supplies, imports, and demand, and the security of timber trade and the environment (Cheng & Song 2007). How to secure industry's sustainable future while maintaining a rapid economic

growth has become a major concern of the Chinese government (Nie 2007; Cheng & Song 2007). Developing new business strategies by embracing the environmental paradigm has been advocated by industry observers as a way to achieve industry's both economic and sustainable development goals (Xu 2008; Cao & Hansen 2006).

Drawing from the natural resource-based view, the dynamic capabilities view, and the market failures view of strategy, this study aims to explore and explain how firm's environmental marketing is driven by a combination of internal factors (such as marketing capabilities, and environmental orientation) and external factors (such as customer pressure and regulatory pressure). And, as the outcome, how environmental marketing may influence a firm's environmental and business performance.

This study is structured into the following sections. Chapter 1 discusses recent economic developments in the Chinese forest products industry, challenges the industry is facing, and recent "green" trends as observed from the field. A 3-stage model is presented to illustrate how the industry has been evolving from reactively to proactively embracing the environmental paradigm as driven by various groups of stakeholders; Chapter 2 reviews strategy and environmental marketing theories so as to lay the theoretical background of this study. Three perspectives of strategy are discussed and compared: the resource-based view and its extensions—the natural resource-based view and the dynamic capabilities view, and the market failures view. An integrated perspective of environmental marketing strategy is proposed for this study. Chapter 3 presents a theoretical framework and hypotheses consisting of 7 key constructs as latent variables: marketing capability, environmental orientation, customer pressure, regulatory pressure, environmental marketing strategy,

environmental performance and competitive performance. Chapter 4 discusses the methodologies for measurement development for the key constructs. Chapter 5 presents data analysis, as well as implications of these findings to theory and practice; Chapter 6 addresses two major contributions of this study to the forest products marketing literature. Chapter 7 discusses conclusions, limitations and future research directions are discussed in this chapter.

Chapter 1. Chinese Forest Products Industry: Trends & Perspectives

China has become one of the largest forest products manufacturers and exporters in the world. Between 1995 and 2007, China's total wood products exports increased by an average of 20% per year, from US\$1.8 billion to over \$16.4 billion, with the increases coming mostly from wood furniture (42.6%) and plywood (24.3%) (Figure 1). Most Chinese exports are sold into the U.S., Japan and EU markets. The U.S. market takes about half of Chinese furniture exports, and around a quarter of Chinese plywood exports in terms of value.

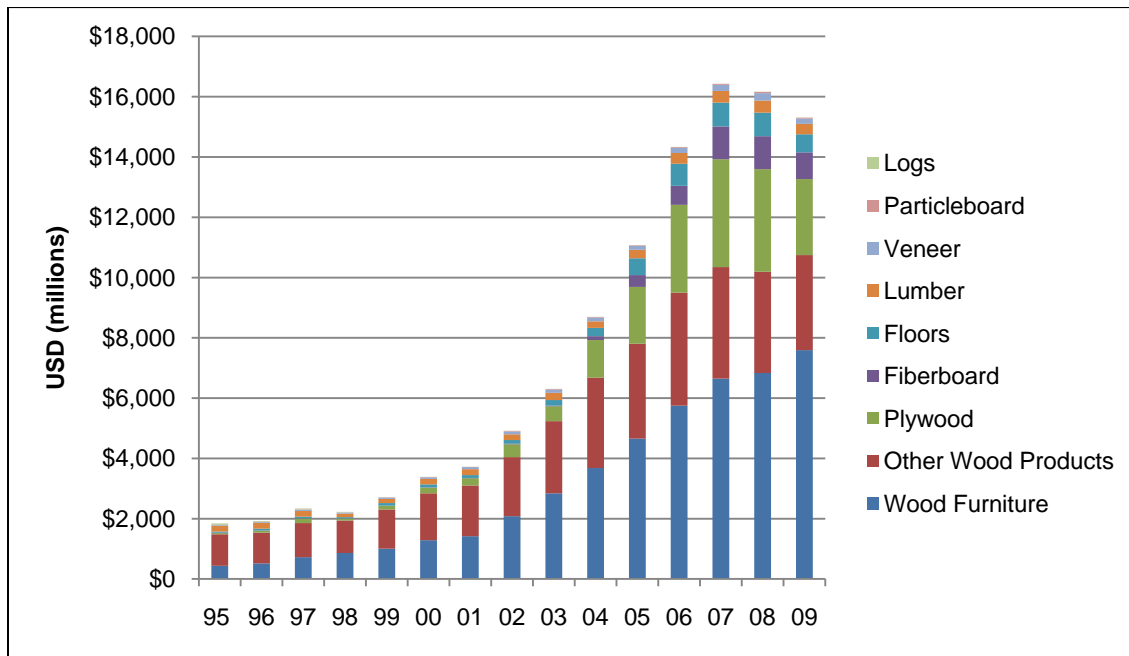


Figure 1 Wooden Furniture and Wood Products Exports from China, 1995-2009

Data Source: Global Trade Atlas

As a result of fast economic expansion but limited domestic timber supplies, particularly after the Chinese government implemented its logging ban policy in 1998, China's imports of wood fiber have been surging, primarily logs, which grew by 14.6% annually from \$1.6 billion in 1995 to \$81.3 billion in 2007 (Figure 2). Over 90% of Chinese log imports (in both

value and quantity terms) are from Russia. According to industry reports, between 2000 and 2005, domestically sourced timber in China only accounted for 17-24% of the total timber consumed. It is expected that by 2010, China will see a timber supply shortage between 160-180 million m³ and the gap is projected to increase to 300 million m³ by 2015.

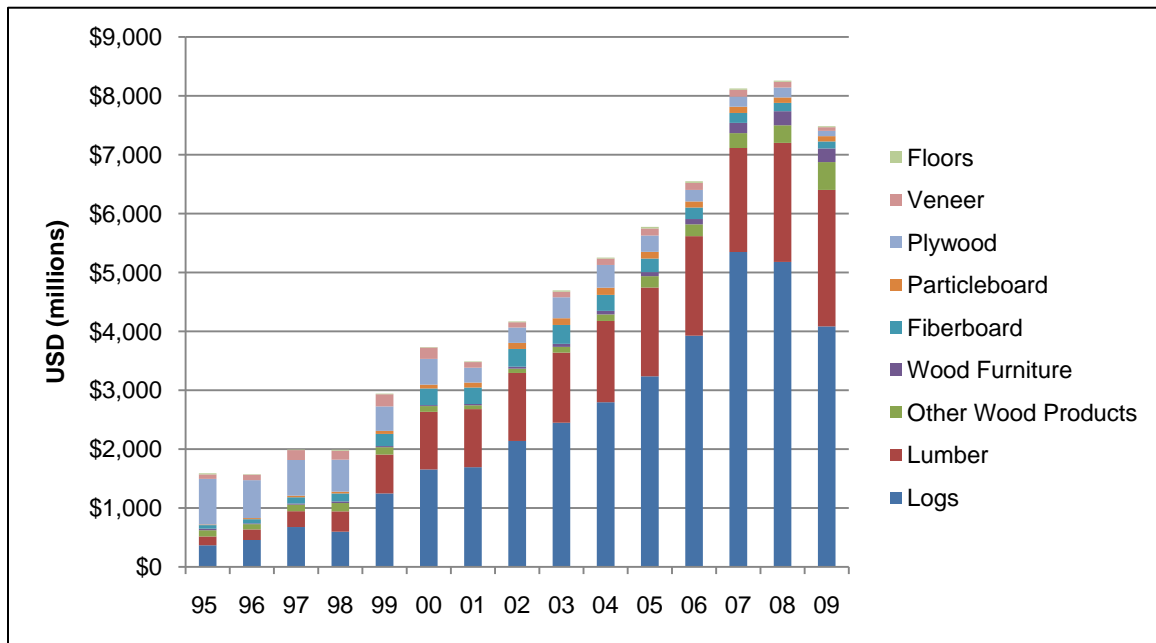


Figure 2 Wooden Furniture and Wood Products Imports to China, 1995-2009
Data Source: Global Trade Atlas

According to an analysis by RISI, a Boston-based consulting firm, by 2013, China's total demand for timber (including lumber and panel) is expected to increase by 27.5% from 2009, after experiencing a decline between 2007 and 2009 due to the global financial crisis. The domestic market will continue to be the leading driver of timber consumption. By comparison, after a sharp decline from its peak in 2007, Chinese wood products exports may recover steadily but slowly from the impact of the global economic crisis over the next a few years, with the proportion (of total timber consumption) stabilizing at around 8% of total timber consumption by volume per year (Figure 3).

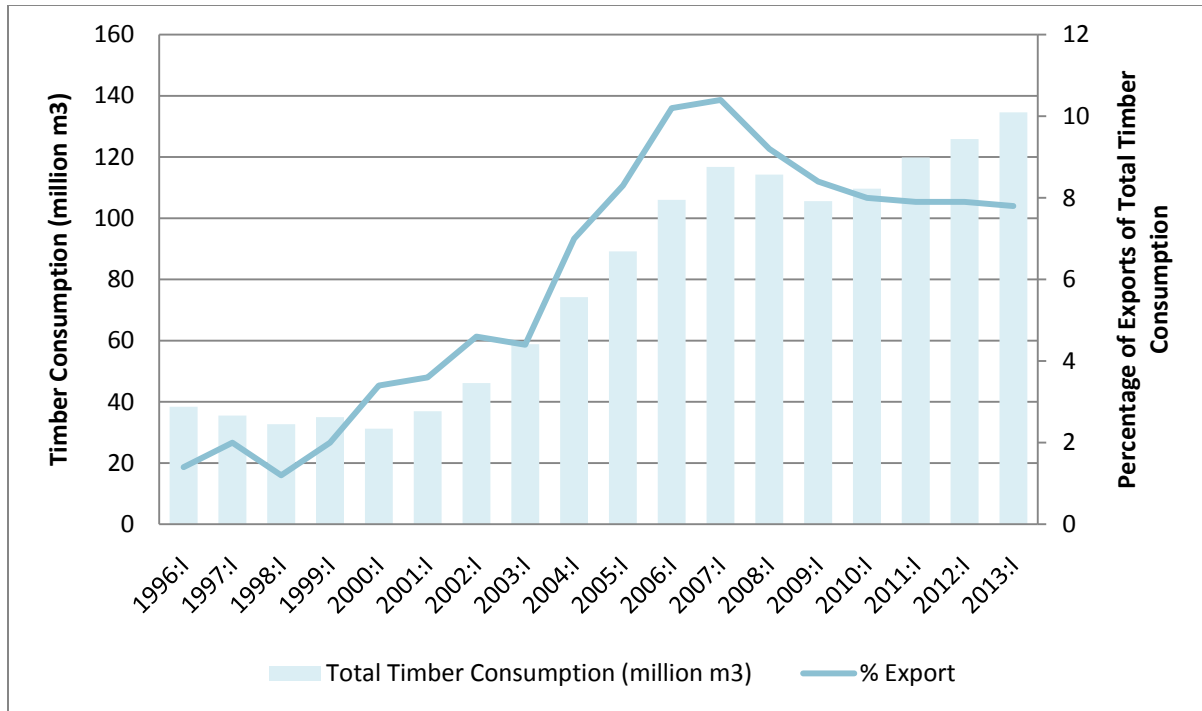


Figure 3 China's Timber Consumption and Exports

In the paper and paperboard sector, China is already the world’s second largest manufacturer after the U.S. and is expected to become No. 1 within the next decade, driven by industry consolidation and investment in capacity expansion with world-class technologies (Flynn 2006). The Chinese paper and paperboard industry has experienced rapid expansion in both production and consumption terms. According to statistics from the China Paper Association (2010), the production volume of paper and paperboard products increased by an average of 12% per year since 2000, reaching 86 million ton in 2009, while the annual consumption per capita increased by 140% between 2000 and 2009 to reach 64 kilograms, with averaged annual increase of 10%. However, like the wood industry, Chinese paper and paperboard manufacturers heavily rely on imports for raw materials (primarily waste paper, wood pulp, and wood chips) due to a lack of domestic wood fiber supplies (Flynn 2006).

It is widely believed that the fast growth of the Chinese forest products manufacturing industry and exports can be largely attributed to two major factors: First, at an early stage of industry development, government's generous subsidies such as an export tax rebate and low-cost land use rent, combined with an abundant low cost labor pool, provided Chinese manufacturers significant support in gaining international market share based on low-cost leadership (Cheng and Song 2007; Nie 2007), however, these cost advantages have been largely gone since mid-2000 (particularly for exports) after the government began to remove or reduce subsidies in order to control the size of "high pollution" and "resource-intensive" industries such as the wood industry (American Forest & Paper Association 2004, Cao & Eastin 2007); Secondly, the industry's growth has been increasingly driven by investments in capacity expansion and technology improvement as Chinese manufacturers strive to move up the value chain and become higher value-added manufacturers (Nie 2007). As a result, the industry's production efficiency and profitability have been improving steadily. As shown in Appendix 1, the average productivity of timber-processing firms more than doubled from CNY 11,800 per person in 2000 to CNY 23,700 per person in 2009 (inflation suppressed). During the same period of time, the average profitability of timber processing firms jumped by nearly 70%, from 2.85% to 4.82%.

Although the forest products industry in China accounts for an insignificant proportion of national GDP (FAO 2010), the Chinese government attaches strategic importance to the industry as a major employer and raw material supplier (Zhou 2006; Nie 2007). The relationship between the Chinese government and the industry has undergone significant changes since 1949. The forestry industry in China has been historically viewed as one of the basic industries with a close link to the development of the national economy; supplying raw

materials such as timber, bamboo, and other non-timber forest products (Zhou 2006). In the early days following the founding of the PRC in 1949, the forestry industry was highly controlled by the government through state owned enterprises, forestry bureaus. Local forest stations and forests were mostly owned by the government, while collectively owned forests (similar to community forests) were systematically developed in the south (Zhou 2006). Since the introduction of market-based economic reforms in 1978, the government has gradually shifted its focus from direct control over businesses through ownership and corporate governance toward building market-supporting institutions, while the government started to retreat from its control over enterprises through privatization, corporatization, and securitization, the transition has proceeded at a moderate speed (Qian 2000). In this initial stage, the government was mainly focused on building up the industry infrastructure by encouraging exports and attracting foreign direct investment. Since 2000, the Chinese government has initiated its new “Go Global” Strategy with the aim of encouraging firms (especially state owned enterprises) to invest overseas while continuing to expand their global market share (Cheng & Zhou 2008).

The global economic crisis has caused profound impacts within the Chinese wood products industry. According to trade Global Trade Atlas statistics, China’s imports of wood products (mostly logs), fell by 9.6% in 2009 to US\$7.3 billion from US\$8 billion in 2008, this compares to average annual growth of 13% between 2005 and 2008. China’s wood products exports (excluding wood furniture) plunged in 2009 to US\$7.7 billion from the previous year’s US\$9.3 billion, down by 17%. Chinese wood furniture exports also declined substantially during the first half of 2009, though it quickly bounced back following the government’s decision to reinstate the 15% export tax rebate in June 2009. As a result, wood

furniture exports still registered 11% growth over the previous year, from US\$6.8 billion in 2008 to US\$7.6 billion in 2009. The crisis also led to high inventories and significant price drops for wood based commodities, which put over 50% of the wood-based panel firms (approximately 3,000 enterprises) in severe financial trouble, leading to forced plant closures and stopped production. Since 2008, wood fiber prices have dropped by 15-25% in the market. High inventory levels within the wood-based panel and flooring industry exceeded 6 million cubic meters. Forest products firms located in 6 counties within the provinces of Zhejiang, Shandong, Jiangsu and Hebei have reportedly laid off a total of 3 million workers (State Forestry Administration, 2009). In the middle of 2009, the Chinese government announced its “Forest Products Industry Revitalization Plan 2010-2012” with an aim to help the industry regain its growth momentum during the global economic crisis. The Plan includes the following strategic goals (State Forestry Administration, 2009):

- 1) To support industry to maintain its position as the world’s largest producer and exporter of furniture, wood-based panels, wood flooring, and wood door.*
- 2) To help the industry achieve an average annual growth rate of 12%, reaching ¥2.25 trillion in total output by the end of 2012, from ¥1.44 trillion in 2008.*
- 3) To support top 100 state-owned forest enterprises to become vertically integrated firms*
- 4) To establish 10 specialized industry clusters to improve production efficiency.*
- 5) To promote national forest certification (CFCC) to meet the growing demands for legal and green timber products in international and domestic markets.*
- 6) To increase industry employment by 27% (from 2008’s level) to reach 57 million jobs;*
- 7) To promote eco-tourism and related services, which is to create an additional 16 million jobs.*

Over the past three decades, fast economic growth of the forest products industry in China can be largely attributed to a combination of government policy incentives to “go global” and foreign direct investments, particularly after China became a member of WTO in 2001. Meanwhile, the industry is facing looming changes, for example, global economic crisis and

rising trade barriers, which have severely impacted the ability of many Chinese forest products companies in gaining or maintaining their international market share. How to enable industry's rapid economic growth to continue into the future has become a key strategic question to be addressed by policy makers and researchers. The remainder of this chapter provides an analysis on these challenges and discusses the emerging green trends as industry's response.

1.1 New Challenges and Industry Insecurities

The forest products industry in China has reached a turning point after a steady and fast economic growth over the past 30 years. In addition to “traditional” challenges, including, rising costs of raw materials, labor and energy, and competition from lower-cost manufacturers in countries like Viet Nam (Cao and Hansen 2006), environmental and ecological challenges have emerged to become the industry’s major threats to its sustainable development. In his remarkable book “Forestry in China”, Mr. Shengxian Zhou (2006), Chinese Minister of Environmental Protection noted that:

“Great achievement has been made in forestry development in China. However, at the same time, owing to historical and social reasons, the development of the forestry sector has not been without many difficulties. Often, before the old problems are solved, new ones emerge. With the old and new problems interweaving and overlapping each other, they have seriously hampered the development of forestry and the achievement of the goals of the development... Until the present, almost all the ecological and environmental problems encountered have been contrary to expectations.”

Mr. Zhou (2006) pointed out that there is a clear need for forestry institutional reform to address looming ecological and environmental challenges, including, a deteriorating ecological environment, forest resources under pressure, structural contradictions between demand and supply of forest products, and rising costs for ecological environment development.

In international markets, a strengthening regulatory environment has presented a major challenge to the Chinese forest products industry strategy of going global. Perhaps a more immediate impact will come from legal timber trade policies. Illegal logging and timber trade is broadly recognized as one of the most critical proximate causes of deforestation and forest degradation (Scheyvens & Lopez-Casero 2010). In particular, illegal logging and timber

trade is decimating forests in tropical countries, with devastating effects on wildlife and indigenous and local communities who rely on the forests for food, building materials and medicines. For example, Indonesia has lost almost three-quarters of its natural forests – 40% of which have been totally degraded due to destructive and/or illegal logging and conversion to other uses. The social and economic impacts of illegal logging are significant, contributing to poverty, resource inequity and negatively affecting rural livelihoods by jeopardizing the natural resources that many people rely on (Scherr, White, & Kaimowitz 2004). In developing countries alone, illegal logging results in losses in assets and revenue in excess of US\$10 billion annually (World Bank 2006).

An increasing number of consuming and processing countries are adopting policies with an aim of eliminating illegal timber from the marketplace. In the US, the passage of the 2008 Amendment to the Lacey Act has made it illegal to import, sell or trade in illegally harvested wood and wood products for the first time. In the European Union, agreement was reached in July 2010 on a policy that will be implemented in 2012 require firms to trace where their timber was harvested. This program complements the EU's bilateral efforts to source legal timber from its main trading partners through voluntary partnership agreements (VPAs). Indonesia is taking steps to protect its credibility as a source of responsible timber with the introduction of a Timber Legality Assurance System in September 2010 that will require accreditation of all firms supplying wood to international markets.

As a major importer and processor of tropical timber, China is also facing growing pressure from international environmental groups who have accused China accept responsibility for the massive illegal logging activities in major timber producing regions by trafficking in and

processing illegal timber materials (EIA and Telepak 2006). In response, the Chinese government has begun to actively combating illegal logging and timber crimes internationally and domestically. According to official sources, China has signed 37 ministry-level cooperation agreements with forestry departments in 31 countries, and 10 inter-governmental conventions with 8 countries in order to stop illegal timber from entering the country. Also, the Chinese government is considering its own bilateral process with major timber exporting countries to ensure the legality of timber imports (similar to the EU's VPA approach) (Zhang 2010). Illegal timber from domestic forests in China mainly consists of over-quota harvested timber due to a lack of local enforcement of national laws. According to a recent FSC study on China (Cao, Seol, & Eastin 2010), by conservative estimations, over-quota harvested timber in 2008 accounted for at least 10% of the country's total timber production. There are also problems related to massive unlawful conversions of natural forests or high conservation value forests into plantations and non-forest commercial projects undertaken by some private firms. These problems are found in almost all forest-rich regions in China such as Fujian, Hainan, Guangdong, Guangxi, Hubei, Hunan, Jiangxi, Hebei, Shanxi, Inner Mongolia, Xinjiang, Shaanxi, Gansu, Sichuan, Yunnan, Guizhou, Jilin and Heilongjiang. As part of the solution, the Chinese government is looking to replace the logging quota system with a more scientific and market-based national forest certification system in the near future (Wang 2010).

In addition to legal timber trade policies, there are other challenges (trade barriers) such as anti-dumping tariff and environmental regulations that have forced Chinese firms to change their traditional business practices to meet international standards. According to industry reports, several major categories of wood exports from China are facing 67-300% anti-

dumping tariffs in the US and EU markets, including wood bedroom furniture (in the U.S.) and Okoumé plywood (in the EU). USITC is also investigating alleged unfair commercial practices within the Chinese hardwood plywood wood flooring industry. More recently, California Air Resources Board (CARB) Regulations have placed formaldehyde emissions ceilings on particleboard and MDF, as well as on value-added products containing particleboard and MDF (e.g., furniture) that are sold and/or consumed in California.

Facing these challenges and rising international competition, Chinese scholars and policy makers have realized that governing “industry insecurities” resulting from economic growth should be given high priority on the agenda of the Chinese government’s industry policy to ensure the industry’s sustainable economic development and maintain social stability (Cheng and Song 2007; Nie 2007). Under this view, policies have been advocated for plantation development, wood saving and substitution technologies, as well as a series of afforestation and reforestation programs, with an aim to balance timber supplies and demands and to become fully self-sufficient in the near future (Zhu, Taylor, & Feng 2004). With industry’s increasing integration into the global supply chain, dependence on international markets and imports has become another important aspect of the industry security concept. Scholars point out that it is critical to maintain the volume of wood fiber imports, the price of imported timber and the risks of transportation at a moderate level. Also, the industry should be encouraged to diversify its export markets, thereby reducing its heavy reliance on the traditional developed economies. Moreover, rising tariff and non-tariff barriers, as well as pressure from international environmental groups, as other types of industry insecurities, should also be addressed both conceptually and in policy formulation (Cheng and Song 2007; Nie 2007).

1.2 Emerging “Green” Trends

Since 2008, the Chinese State Forestry Administration, the U.S. Agency for International Development, the EU FLEGT Asia Program, and international environmental groups led by the Nature Conservancy (TNC), the Rainforest Alliance (RA), and the World Wildlife Fund (WWF) have jointly sponsored three major annual conferences under the theme “Forests, Markets, Policy and Practice” to address the region’s growing demand for forest certification and legal timber trade issues. The most recent conference was held in Beijing in September 2010 (<http://www.cfcn.cn/cmc3/indexe.asp>). These events were well attended with an average audience of 350 participants. About two-thirds of the participants were from the forest products industry in China. The fourth annual event is scheduled to be held in Shanghai in June 2011. The author of this study has had an opportunity to participate in all these events as either speaker or organizer. Based on a recent conference evaluation survey conducted by conference organizers, many industry managers reported that they are seeing a growing need to address environmental challenges in their future business plans. The top five “green” trends that are believed to impact the industry most in the near future include: forest certification, legal timber trade policies, green sourcing initiatives in the private sector, corporate social responsibility, and climate change-related forest carbon markets (REDD) (Figure 4). These trends will be examined in details in the rest of this chapter.

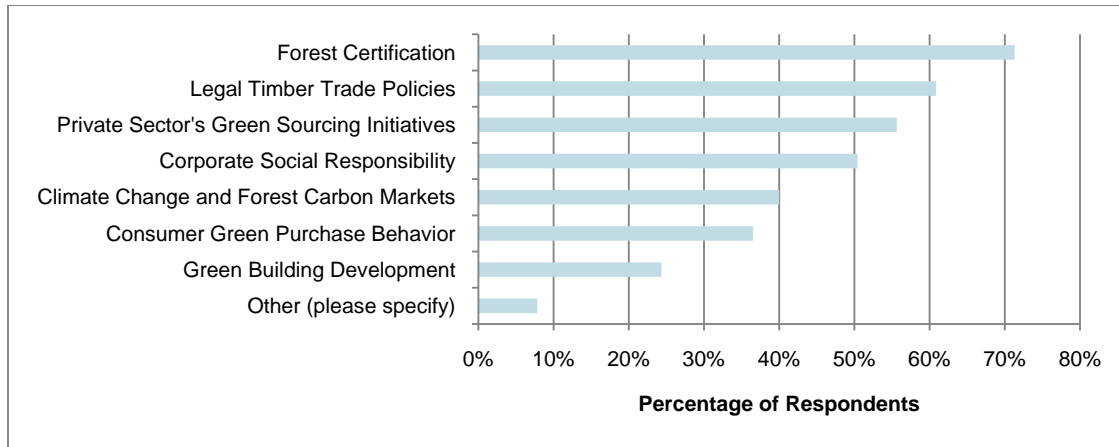


Figure 4 Top Five Green Trends Shaping the Industry's Future

1.2.1 Forest Certification

Forest certification started in the early 1990s with support from a group of environmental NGOs and industry practitioners (Cashore, Auld, & Newsom 2004). It is a system for identifying well-managed forestlands with an aim to achieve balance among the environmental, economic and social values of forests (Hansen 1998). From a forestry governance perspective, forest certification is also viewed as a “non-state market-driven” governance system aimed at influencing firms to comply with the rules and standards for sustainable forest management, through the promise of market benefits - “carrots” (e.g., global market access and potential price premiums), and “sticks”- public and market campaigns to pressure global firms to support forest certification (Cashore, Auld, & Newsom 2004). Most third-party forest certification schemes are voluntary, and consist of two types of certification: forest management (FM) certification and chain-of-custody (CoC) certification. FM is for forest managers, operations involved in growing and harvesting trees, including forest firms, government forestry agencies, mid-sized forest managers, indigenous peoples

and groups of small landowners, while CoC literally applies to all types of operations (including forest management operations) in the industry chain before the final product reaches end consumers in the marketplace (Rainforest Alliance).

Internationally, there are several standards available for certifying forests. The forerunner is the Forest Stewardship Council (FSC), established in 1993 by a group of environmental NGOs, timber traders, indigenous communities, and forest workers' associations. Forest owners and industries in a number of countries responded by setting up certification programs to compete with FSC, such as those endorsed by the Pan-European Forest Certification Scheme established in 1998, which, since 2003, was renamed as the Programme for the Endorsement of Forest Certification (PEFC) (Cashore, Auld, & Newsom 2004; Gulbrandsen 2005). FSC operates as one global system with many national standards for forest management. As of September 15, 2010, FSC has issued 1,032 forest management (FM) certificates that cover 134.6 million ha of forested land in 81 countries, and 18,714 chain-of-custody (CoC) certificates in 103 countries (FSC 2010). Different from FSC process, PEFC acts as an umbrella system by endorsing national forest certification systems developed through multi-stakeholder processes and tailored to local priorities and conditions. So far, PEFC has endorsed 28 national certification systems, including the U.S. Sustainable Forestry Initiative (SFI), the Canadian Standards Association (CSA) Sustainable Forest Management (SFM) Standard, and a variety of country standards in Africa, Europe and South America. Endorsed in May 2009, the Malaysian Timber Certification Council (MTCC) standard became the first PEFC-endorsed forest certification scheme in Asia. As of September 2010, a total of 229 million ha of forested land and 7,379 CoC operations have been certified to PEFC-endorsed schemes worldwide (PEFC 2010).

Despite sluggish timber markets amid the global economic recession, the demand for forest certification and certified products has been growing rapidly in China. FSC and PEFC are both growing fast in China in terms of the number certificates issued. But the competition scenario could change dramatically after the Chinese government launches its national forest certification scheme within the next 2 years.

FSC is currently the largest forest certification program in China in terms of both number of certificate holders and certified forest area. Thanks to significant capacity-building work by a coalition of international NGOs led by World Wild Fund (WWF)'s Global Forest Trade Network (GFTN) Program, FSC has achieved fast growth in China, and China now accounts for over 7% of CoC certificates FSC issued globally, although the proportion of certified forest area remains low (about 1.2%), as of September 2010 (FSC 2010). The number of FSC-CoC certificates in (mainland) China has reached 1,356, compared to only one in 1998 and 971 in 2009 (Figure 5). The area of forests certified by FSC has also increased to over 1.63 million ha, or approximately 0.8% of the nation's total forest area (195 million ha), with a total of 26 forest management certificates issued.

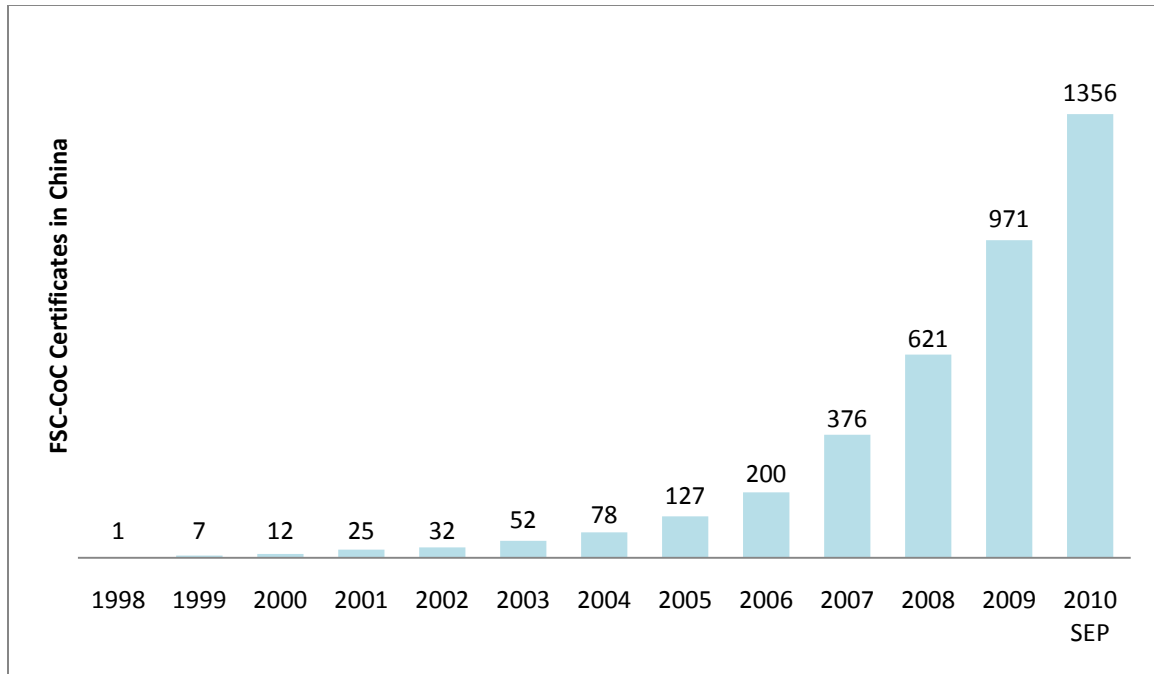


Figure 5 FSC-CoC Growth in China, 1998-2010 (September)

Source: www.FSC-info.org

FSC-certified forests in China are predominantly timber production forests. Almost all FSC-certified FMUs (19 out of 20) hold both FM and CoC certificates which allow them to sell raw materials to FSC-CoC-certified manufacturers down the supply chain. About half of these FM firms are vertically integrated enterprises with in-house timber processing facilities and well-established distribution channels. In terms of regional distribution, over 80% of FSC-certified forests are located in Northeast China, consisting of Heilongjiang (44%), Jilin (29%) and Liaoning (11%), while South China's Fujian Province accounts for 12% of certified forests (mostly in timber plantations). Plantations account for 12% of the total FSC-certified forests in China, followed by natural-plantation mixed forests (86%), and natural forests (2%). Chinese pine, Masson pine, Chinese fir, Korean pine, poplar and paulownia are the major species of these FSC-certified plantations.

The dominance of government-owned forests is another feature of FSC-certified forests in China. Over 90% of certified forests are owned by state/regional forestry bureaus and affiliated forest management units. This reflects the “top-down” approach that many international NGOs led by WWF-GFTN are taking in promoting forest certification in China. The State Forestry Administration and other relevant government agencies all have been supportive of (or at least not against) FSC’s development in China, as certification is new to China and they hope to learn from the international forest certification system in order to help with the development of national forest certification standards. Also, this trend is largely due to the fact that government-owned forest sites are normally better managed and financed than collectively-owned and private forests, and therefore are more prepared to be certified with a lower “transaction cost” – the initial investment needed for improving infrastructure and employee training in order to meet FSC requirements.

PEFC is also growing fast in China in the area of CoC, since it awarded the first CoC certificate in China in 2006. According to PEFC official source (www.pefc.org), as of October 2010, 98 CoC certificates have been issued by PEFC in China, up from 31 in 2008 and 10 in 2007. PEFC has not issued any FM certificate in China due to the absence of national forest management standards. According to an interview with Mr. Benson Yu, PEFC’s China Director (2010), since PEFC established its China country office in late 2007, its working focus has been on market promotion and government relationship development, with an aim to helping China develop national forest certification standards which can be endorsed by PEFC so as to expand the supply of certified timber from domestic forests, which has been identified to be the bottleneck that limits a wider adoption of forest certification in the industry. The State Forestry Administration has shown a certain level of

interest in the PEFC's approach and has sent delegates to participate in PEFC general assembly. The government also invited PEFC (as well as other international organizations) to participate in its national standards development. However, according to Mr. Yu, the government's attitude toward joining PEFC membership has been vague, although it has expressed a clear intention to seek mutual recognition between major international standards so as to maintain access to international markets. It remains to be seen which international standard the State Forestry Administration may eventually choose to partner with - FSC or PEFC or both. For a national standard to be fully endorsed by PEFC, it needs to go through several stages from external consultation to internal expert panel review before it can be submitted by the board to the PEFC annual assembly for final vote. The whole process may take one to several years, not to mention that there are still some technical problems to address for the Chinese scheme, including concerns as of multi-stakeholder consultation, system transparency, and logo use regulations, before it can be fully acceptable by PEFC principals. Therefore, seeking endorsement by PEFC remains an option for the Chinese scheme as means of achieving international recognition, although this may not happen in the near future.

Despite the fact that both FSC and PEFC have achieved rapid growth in China, third-party forest certification is still considered to be "illegal" by some senior government officials due to lack of related laws and institutions. Since early 2010, the Chinese government has taken a series of actions to regulate the forest certification market in China. FSC and other major international certification organizations have been requested to report to the government their client information and certification activities in China. Several foreign certification bodies have also been told by the government to suspend or stop business operations in China

pending government's approval. These actions are interpreted by industry observers as showing government's resolution to take control of the forest certification market in preparing for the launch of its national forest certification standards-CFCC. Some even believe that these actions will add pressure on the international schemes to endorse CFCC and therefore increase its credibility and expand access to international markets.

From the Chinese government's perspective, the success of CFCC has important strategic implications. As demonstrated by "Forest Products Industry Revitalization Plan 2010-2012", the government has signaled its intention to implement several major forestry reforms, including forest certification, in line with its strategy to sustain industry's fast growth and create more jobs. The government is also looking to replace its flawed logging quota system implemented in 1998 with a more scientifically sound and market-based policy instrument. CFCC meets these qualifications and is expected to replace the logging quota policy and play a key role in promoting sustainable forestry in the country (Wang 2010). Once fully implemented, CFCC could offer the local industry two major economic benefits over international schemes as perceived by many government officials – one benefit is the "perceived" low cost given CFCC's preference for using local auditors and other cost-saving procedures that are hard to match by foreign schemes, and the second benefit is the potential to expand raw material supplies from local certified forests. Currently, the majority of domestically produced FSC-certified timber is controlled by a few firms with little timber going to the marketplace, so most firms have to rely on expensive imports for production (Cao, Seol, & Eastin 2010).

In fact, the Chinese State Forestry Administration is actively preparing to launch its first national forest certification system after nearly a decade of capacity-building work since it became a member of the World Trade Organization. Following the 12th Meeting of the Montreal Process Working Group in Beijing in November 2000, the Chinese government started the process of building a national forest certification system, and established the Forest Certification Department (FCD) of the State Forestry Administration and later, the China Forest Certification Council (CFCC) to administer the system's overall development. The national scheme, which includes both forest management and chain-of-custody certification standards based on FSC, was officially released in September 2007 by CFCC. Several pilot projects have been carried out since 2005 in three phases covering 19 provinces across the country, including Jilin, Heilongjiang, Zhejiang, Fujian, Guangdong, Sichuan, Inner Mongolia, Guangxi, Yunan, Hainan, Anhui, Hebei, Jiangsu, Shanxi, Liaoning, Jiangxi, Hunan, Guizhou and Shaanxi. In September 2009, SFA established Beijing Zhonglin Tianhe Forest Certification Center (ZTCC) as the first "legal" certification body in the country accredited by the Certification and Accreditation Administration of China (CNCA) to carry out forest certification in China. By 2010, more than 700,000 hectares of forests had undergone CFCC certification pre-assessments and audits in Northern and Southern China. In January 2011, ZTCC reached an agreement with Yichun Forest Authority, which is designed to certify all fifteen forest management units under its oversight in 2011, totaling an area of 2.67 million hectares (PEFC 2011).

It has been reported that CFCC has expressed its intention at the PEFC General Assembly in November 2010 that it expects to apply for PEFC membership in 2011 and submit the scheme for endorsement so as to expand access to international markets (PEFC 2011).

According to industry interviews, a major gap between PEFC and CFCC is believed to be the lack of multi-stakeholder involvement in developing the CFCC standards. But the distance between the CFCC and FSC seems even larger in terms of gaining mutual recognition, given that such concepts as indigenous people's rights and high conservation value forests are yet to be clearly defined in CFCC, but those are FSC's core values (Cao, Seol, & Eastin 2010). From a governance perspective, the rivalry between FSC, PEFC and CFCC can be seen as a process of striking a balance in gaining rule-making legitimacy among environmental groups, industry and the Chinese government, as has been observed in other countries (e.g., Gulbrandsen 2005).

China's transitional status from centrally planned economy to a market economy suggests that the forest certification development process in China will be heavily influenced by government intervention, particularly as the Chinese government gains economic power and looks to become a "game changer" by setting its own standards to "compete with" international schemes (Long, Zadek, & Wickerham 2010). As a transition economy, market-supporting institutions, including forest certification regulations and legal timber trade policy, still lag behind and need to be fully developed in China. A successful national forest certification scheme will therefore help strengthen the government's control over the industry which has been experiencing structural and ownership changes in favor of private owners and foreign investors. Also, there are significant differences in the ways in which firms in China are organized and governed in comparison to the major industrialized countries (Long, Zadek, & Wickerham 2010). Unlike firms in developed economies, which are widely thought of as responding to the threat of a consumer boycott and environmental groups' campaign to ensure that businesses abide by stakeholder's wishes (Coddington 1993, Kochan &

Rubinstein 2000), Chinese firms consider government (particularly local government) as one of most important stakeholders. Government's attitude, as well as its relationship with the government (particularly with local government) has a strong influence on business decision making (Qian 2000, Wickerham & Zadek 2009). According to a *Fortune China's* corporate social responsibility survey (Wickerham & Zadek 2009), government policies and guidelines were identified as the most powerful drivers of industry's corporate social responsibility decisions. With many perceived economic and political advantages, it can be expected that CFCC will rapidly grow in market share in the next a few years, particularly if it is endorsed by PEFC, thereby becoming a major competitor to FSC.

1.2.2 Green Initiatives by International Buyers and Investors

Thanks to low-cost production and a fast-growing domestic market, the Chinese forest products industry has seen significant growth in outsourcing businesses and foreign direct investments (FDI) since early 2000s. According to industry sources, during 2006-2007, US-based Carlyle Group invested a total of \$30 million in a leading Chinese wood flooring firm A&W (Shanghai) Wood Products, Ltd., which was previously known as Shanghai Anxin Flooring Co., Ltd. A&W also attracted another \$20 million of investment from other private equity (PE) firms, including Pantheon Venture, Inc.--an affiliation with Russell Investment. In the retail sector, the level of FDI involvement appears to be much higher. According to industry sources, China's second largest big box retailer, Oriental Home, is in the final stage of completing its deal with London-listed ARC Capital Holdings, which includes selling 51% of its stock to the European investor. Earlier, the Home Depot successfully acquired China's other major big box retailer, Home World for \$100 million.

Driven by corporate social responsibility (CSR) movements, overseas investors and buyers have started to apply pressure to their major business partners in China to improve their environmental and social performance in areas such as improved forest management, responsible sourcing and manufacturing, labor protection and fair trade. Also, forest carbon projects (e.g., REDD+), and voluntary carbon markets, among other general environmental and social activities, are also popular among firms with CSR interests (Cao, Hayward, Baroody & Donovan 2009). For example, Kingfisher has already made third-party forest certification and verified legal timber sourcing practices an integral part of corporate policy and has asked all suppliers to comply with its goals. According to Kingfisher's CSR report (Kingfisher Group 2008), Kingfisher has set a goal to have 75% of the timber volume sold in its stores be proven to be well managed or recycled by 2010/11. This goal can be achieved in three steps as specified in Kingfisher's "Steps to Responsible Growth" program: known sources, legal sources, and forest certification. As of 2009, 71% of the timber products that Kingfisher sourced globally have met the first step of requirement (Appendix 2 presents a short case study of Kingfisher's sourcing policy in Asia). Similar policies have also been reported by other retailers such as Walmart, Unilever, IKEA, Home Depot and Staples.

Furthermore, major international financing institutions such as the World Bank and the Asia Development Bank have put in place "green credit" (loan) policies that encourage leading Chinese manufacturers to improve their environmental and social performance. A good case in point is China Flooring Holding Co., Ltd. (or Nature Flooring), which is one of the largest flooring manufacturers in China. With an ambitious plan to grow into a world class flooring manufacturer, the firm has committed to a \$120 million investment between 2007 and 2010 to expand production facilities, develop plantation forests in China, and establish an

integrated supply chain that is certified by FSC scheme. A big proportion of this funding is from the Morgan Stanley Asian Fund and the International Finance Corporation (IFC)-World Bank's member group. As part of the financing agreement, Nature Flooring promises to increase its use of certified wood, with a long-term goal of reaching 100% certification. The firm's progress on these targets will be regularly assessed by the China Forest Trade Network (CFTN), the national body of the World Wildlife Fund's Global Forest and Trade Network (GFTN) (International Finance Corporation, 2009).

As the Chinese industry continues implementing its "go global" strategy by further integrating into the global supply chain, calls by international investors to become more sustainable and responsible will exert a bigger influence on the Chinese firms. The industry has learned that economic factors such as low-cost production and high quality are not enough to secure access to high-end overseas markets. They also need to make considerable commitments to improved environmental and social performance to meet premium market expectations and requirements (Long, Zadek & Wickerham 2010).

1.2.3 NGO's Role

Since the 1990s, non-governmental organizations (NGOs) and their allies are playing an increasingly important role in pushing for sustainable development in China. From a government-market failures perspective, NGOs exist to meet the heterogeneous demands of society and improve the efficiency of resource allocation when government policy and markets fail to do so (James 1989, Williamson 1985). According to industry observers (Li, Xu, & Li), there are basically two types of ENGOS in China, namely, "truly" non-governmental organizations, and "government-controlled" NGOs (or GONGOs). There are

also many “unofficially registered” or indirectly registered groups or circles, public undertakings affiliated with various types of organizations.

Due to the transitional nature of the economy, the Chinese environmental governance network, consisting of the public sector, private sector and NGOs, is strongly controlled by the government. But a major problem within the Chinese environmental governance system, as widely known, is its weak local enforcement of environmental policies and laws developed by the central government. This is because local environmental protection agencies are more controlled by local governments (municipal or provincial governments) for their financial and personnel support, while the central government - the Environmental Protection Ministry – only “technically” supervises the operations of these local environmental protection agencies. Therefore, local environmental protection agencies respond more to the demands of local governments who are largely focused on economic growth and employment goals, instead of environmental protection. Of course, the Chinese government has realized this problem and tried several remedies, such as using the “Green GDP” as an indicator to evaluate local officials’ performance, and vertically integrated environmental protection administration system. Also, compared to developed economies, Chinese public awareness of the environment and private sector’s participation in voluntary environmental and social activities is still low, although these improved steadily in the recent years (Li, Xu & Li). The government views ENGOs in an ambiguous way: on one hand, it welcomes NGOs’ resources and expertise in affecting the environmental education needed for improving environmental practices on the ground. But on the other hand, because it is concerned about losing control of the society, the government is very careful in granting NGOs’ legal status and approving their business activities in China. For this reason, in the

forest sector, most ENGOs are operating in educational fields that focus on forest certification, legal timber trade and good forest management practices which have less political risks.

The Nature Conservancy (TNC), WWF-led Global Forest & Trade Network, Greenpeace, The Forest Trust (TFT), as well as the Rainforest Alliance, are among the most active international ENGOs in China. Despite apparently different approaches and foci, these like-minded NGOs are working closely in partnership with governments, manufacturers and local forest communities through seminars, workshops, and policy campaigns, to build local capacity for promoting sustainable forest management practices and more recently, legal timber trade, in China.

To better understand these ENGOs' perceptions of the opportunities and challenges in advancing sustainability in China, two interviews were conducted with senior leaders of TNC and TFT between June and July in 2010. Key content of these interviews is presented in Appendix 2.

1.2.4 Growing Domestic Market

With GDP growth exceeding 8 percent in 2009, China's domestic market has become an important engine driving the industrial growth while exports have fallen sharply due to the global economic crisis. Massive urbanization, strong domestic stimulus spending on infrastructure development, on-going new home construction, and building remodeling and expansion projects, will continue to drive the demand for wooden building and home furnishing products. According to a recent interview with Mr. Qingwen Jia (2010), President

of the China National Furniture Association, during the global economic crisis, the Chinese furniture industry experienced a significant decline in exports during most of 2009. However, thanks to reduced raw material and energy costs, and manufacturers' continued cost-reduction efforts, the industry reported a 29% gain in average profitability and a 12% increase in sales revenue, led by firms who have built their own brands and distribution channels in the domestic market. Similar optimism was also expressed by Mr. Jianxin Che, CEO of Red Star Macalline – one of China's top home furnishing retailing chains. Mr. Che predicted that domestic demand for furniture and furnishing products would continue to grow over the next 10 years, driven by a 2nd round of interior decoration as people start to replace furniture and refurbish their homes following the housing boom in the early 2000s (BJNews.com, 2010).

The domestic market may offer good opportunities for green products and energy-efficient technologies as the Chinese government aims to make the transition to a low-carbon economy and enhance long-term competitiveness. China is already the largest manufacturer of solar panels and wind turbines in the world. To create a large domestic market for these green technologies, the Chinese government provides subsidies to households that install solar panels and energy efficient facilities during renovation.

The green building program in China is growing slowly but steadily. China's first green building standard "Evaluation Standard for Green Building" (GB/T 50378-2006), also referred to as the Three Star System, was introduced in 2006 and is administered by the China Green Building Council. This standard complements BREEAM and LEED, which presently are used in China for office buildings for multinational firms or upscale apartments

(Eastin et al 2010). Although the GB standard has not specified the use of wood products, the Chinese government has shown a growing interest in wood building products and wood frame construction technologies as a potential solution for low-rise public buildings in earthquake zones. According to industry sources, on March 29th, 2010 the Chinese Ministry of Housing signed a memorandum of mutual understanding with the government of British Columbia, Canada which includes a cooperative project to build a six story wood-frame apartment building with materials and technologies provided by forest products firms in British Columbia. This project will provide Chinese government officials, builders, architects and developers with the opportunity to evaluate the energy and carbon savings, seismic safety, speed of construction and cost comparability of wood frame construction (relative to concrete and steel). The GB program in the future is likely to get a higher level of government support. It is reported that the government is likely to apply mandatory green building standards to all public building construction and residential building renovation projects that favor energy-saving technologies and equipment. In addition, in big cities such as Beijing, local government will enforce GB requirements for all high-end new residential projects with a focus on energy-saving. Leading developers such as Vanke have made GB development a corporate long-term strategy and set target to gradually increase the proportion of GB projects out of firm's total projects every year.

In the financing sector, the government issued a green credit policy in July 2007 in order to guide banks to shift their financing focus from high-pollution and/or energy-consuming projects to “clean” projects that favor of energy-saving and emissions reduction. The policy was jointly developed by the State Environmental Protection Agency (SEPA), the People's Bank of China (PBOC), and the China Banking Regulatory Commission (CBRC). Before

this, the Ministry of Finance and the Ministry of Environmental Protection released a green procurement policy in 2006 to encourage the use of environmentally friendly building products that are certified to China Environmental Labeling Standards – the country’s largest eco-labeling program established in 1994. The Program consists of more than 70 industry standards including wood and wood panel products, paint, and adhesives which are relevant to furniture and wood products manufacturers. So far, over 1,600 firms have been certified under this program. It is estimated that the annual sales of eco-labeled products in China has reached over CNY 100 billion Yuan (approximately US\$15 billion) (Wu 2010).

During the transition to a consumption-led economy, the Chinese domestic market is expected to offer significant opportunities for green products thanks in large part to policy incentives and the development of the green building program. The attraction of China’s domestic market will help encourage collaboration among Chinese and non-Chinese firms (Long, Zadek & Wickerham 2010), which in turn may provide further incentives for Chinese firms to pursue environmental strategies (Christmann & Taylor 2001). In the wood furniture sector, a good case in point is the partnership between US-based retailer Ethan Allan and Markor Group - China’s largest softwood furniture manufacturer and exporter, which is supplying case goods to Ethan Allen’s U.S. stores. The partnership started in 2002 when the first store opened in Tianjian – 100 miles from Beijing. So far, the joint venture has opened over 30 home furnishing stores across China. These Chinese stores offer a variety of brands owned by Markor and Ethan Allan, including high-end imports from Ethan Allan’s US factories (Cao, Braden & Eastin 2006). “We must pay attention to product’s environmental features. This firm started as an OEM exporter, environmental reputation was one of key vendor selection criteria by overseas clients. So we have incorporated environmental

concepts as part of corporate business strategy since the start of the firm as an internal resource. Our products are all certified by industry authorities, audit reports are displayed in our stores open to public inspection”, commented Mr. Chenkang Ge, Markor’s national marketing manager in a media interview (China Furniture Net 2006).

1.2.5 Climate Change and Forestry Offset Initiatives

The role of forests in reducing carbon emissions and mitigating the impacts of climate change has been widely acknowledged (Stern 2007). According to the influential “*Stern Review*”, in the carbon cycle, forests help to slow down the build-up of atmospheric carbon dioxide by absorbing GHG, thereby mitigating climate change. Specifically, forests use CO₂ to synthesize the organic molecules that are stored in trees and thereafter in organic soil matter and dead leaves (Stern 2007). When forests are damaged or cleared, the burned or decaying wood releases the carbon stored in trees as carbon dioxide, increasing levels of this heat-trapping, greenhouse gas in the atmosphere. In addition, some forests protect large quantities of carbon stored below ground. Scientists estimate that deforestation and degradation account for approximately 20% of global GHG emissions, and potential emissions reductions are therefore significant (UN-REDD). However, it requires significant funding support and resources to protect global forests. According to the “*Stern Review*”, in order to halve emissions from the forest sector by 2030, it could cost between US \$17 billion and \$33 billion per year (Stern 2007).

Forest carbon projects and transaction mechanisms were created in this context. Though some forest carbon offset initiatives started as far back as the late 1980’s and early 1990’s, the majority have been developed only very recently. One example of the activities currently

underway to help prepare for the inclusion of expanded forestry activities in the post-Kyoto regime is the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD). According to its definition “*Reducing Emissions from Deforestation and Forest Degradation (REDD) is an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon paths to sustainable development. “REDD+” goes beyond deforestation and forest degradation, and includes the role of conservation, sustainable management of forests and enhancement of forest carbon stocks.*” (UN-REDD). Officially launched in September 2008 with funding from the Norwegian government (but with the intention of raising funds from other countries as well), UN-REDD is a collaboration between the FAO, UNDP and UNEP. Nine countries, including Bolivia, Democratic Republic of Congo, Indonesia, Panama, Papua New Guinea, Paraguay, Tanzania, Viet Nam, and Zambia, have been chosen as pilot countries to receive funding from this program.

There has been a growing interest in forest offset projects worldwide, particularly from private sector, driven by the notion of corporate social responsibility (CSR) and voluntary offset targets. For example, DELL launched its “Plant a Tree for Me” program in partnership with The Conservation Fund and Carbonfund.org so that its customers and communities could “go neutral” (DELL). Firms with a commitment to climate change mitigation often follow a three-step approach in achieving emission reduction targets (Winston 2008). First, they cut emissions directly through efficiency and smart redesign of processes and products. Second, they invest in renewable energy for their facilities, including solar, wind, geothermal and, yes, local landfill gas - whatever works in their region and climate. Then, in the third

step, they look for quality offsets projects elsewhere (Winston 2008). According to a Rainforest Alliance survey with major project developers, investors, and standard development organizations in the world (Cao, Hayward, Baroody & Donovan 2009), industry's interest in forest carbon projects was highest for REDD and for afforestation/reforestation project types. The resonance of biodiversity conservation and community development associated with forest carbon offset projects is attractive to private sector investors because, compared to other types of carbon credits, those from forest carbon are generally considered rich in co-benefits. The global financial downturn has put pressure on credit to the carbon markets, voluntary or compliance, with reduced investments and demand from both private and public sectors. However, some respondents believe that the economic crisis will stimulate the growth of forestry carbon projects as a low-cost alternative to other types of carbon projects. In general, those surveyed reflected a guardedly optimistic view that the higher social and biodiversity benefits associated with forest offset projects should therefore continue to be favored by firms (e.g., those with CSR programs) and individuals in the voluntary market, although the potential of REDD+ projects and credits in the compliance market largely depends upon policy (especially the outcomes of the UNFCCC) and the availability of funding mechanisms for upfront capacity building, governance, and other elements of reform.

The forest carbon market in China has the great potential to grow, driven by the Chinese government's strong investment in afforestation/reforestation, improved forest management, as well as the private sector's CSR movement to reduce their carbon footprint through internal emissions reductions supplemented with offset purchases. China implemented the world first Clean Development Mechanism (CDM) forestry (Afforestation/Reforestation)

carbon project in Guangxi, in 2006. It is the only A/R project that has so far achieved registration with the CDM Executive Board, among the World Bank's BioCarbon Fund portfolio of 16 forestry projects. To further develop the voluntary market for forest carbon credits, in July, 2007, the State Forestry Administration, China Green Foundation, China National Petroleum Corporation and Jiahan Forestry Investment Corporation jointly established the China Green Carbon Fund (CGCF) in Beijing, with an aim to "serve as a platform for the industry sector to bank carbon credits for their future's possible commitment to emission reductions and establish their social responsibility images" (Li & Yang, 2009).

1.3 A Paradigm Shift

The previous discussion suggests that the Chinese forest products industry, facing a fast-changing regulatory environment, needs to embrace the environmental paradigm to develop overall competitiveness and ensure a sustainable future. But this “paradigm shift” cannot be accomplished by firms alone. The success of the “paradigm shift” will depend on a combination of efforts by consumers, government, NGOs, environmental standard organizations, third-party certification and media scrutiny.

Coddington (1993) presents a 4-stage evolutionary model to describe how firms, driven by various forces, gradually evolve from an initial compliance mode toward a proactive stage over time (Table 1). A reactive model (or, compliance mode) can be understood as firms make changes in business practices in response to some threat or opportunity that has already occurred. For example, firms following a reactive approach may wait to pursue forest certification until they receive repeated requests from customers in order to avoid loss of business. In this stage, key drivers of a firm’s environmental practices include regulations and costs. In contrast, firms following a proactive approach would attempt to make alterations to their business practices in anticipation of a potential future threat or to capitalize on a potential future opportunity. Using the same example of forest certification adoption, a proactive firm would tend to choose to adopt forest certification as part of its risk management strategy to avoid any potential threats associated with illegal logging charges. They may also use on-product eco-label as a marketing (branding) strategy to communicate to stakeholders and customers the firm’s commitment to the environment before they raise any concerns. In this regard, proactive firms recognize that managing risk is not only the

responsibility of the technical department. Rather, risk should be managed across all levels of business functions, including, marketing, new product development, manufacturing, customer support, etc. Once risk management concepts are properly configured and integrated into the marketing strategy, it may provide firms an opportunity to improve business performance with higher quality, resilience, and predictability against market fluctuations and competition (Smith & Merritt 2002).

Table 1 Evolution of Environmental Strategy

	1970	late 1980s	1990s
Era	Compliance	Pollution Reduction	Pollution Prevention
Key Drivers	Regulation	Regulation Cost	Regulation Cost reduction Efficiency
Focus	Control effluents outside plant	Manage process on plant floor	Redesign process at manufacturing
Parts of Firm Affected	Environment	Environment Operations management	Environment Manufacturing management Supplier management
			Environmental Strategy
			Market satisfaction Regulation Competition Global Change
			Competitive positioning Product and package development Capture revenue Measure performance
			Marketing Distribution Product development Total Quality Management Finance

Adopted from Coddington (1993)

Since 1990s, the Chinese forest products industry has seen a growing awareness of environmental issues thanks in part to the pressure from ENGOs campaigns and international buyers' green sourcing policies. Industry's general attitude toward environmental strategy and forest certification is gradually changing from initial skepticism and rejection, to reactive compliance (current), and in the future, a more proactive approach can be expected as an increasing number of firms start to learn and embrace the environmental concepts into their

business strategy. Based on Coddington’s 4-step model, a 3-stage model can be used to describe the Chinese industry’s greening process (Figure 6).

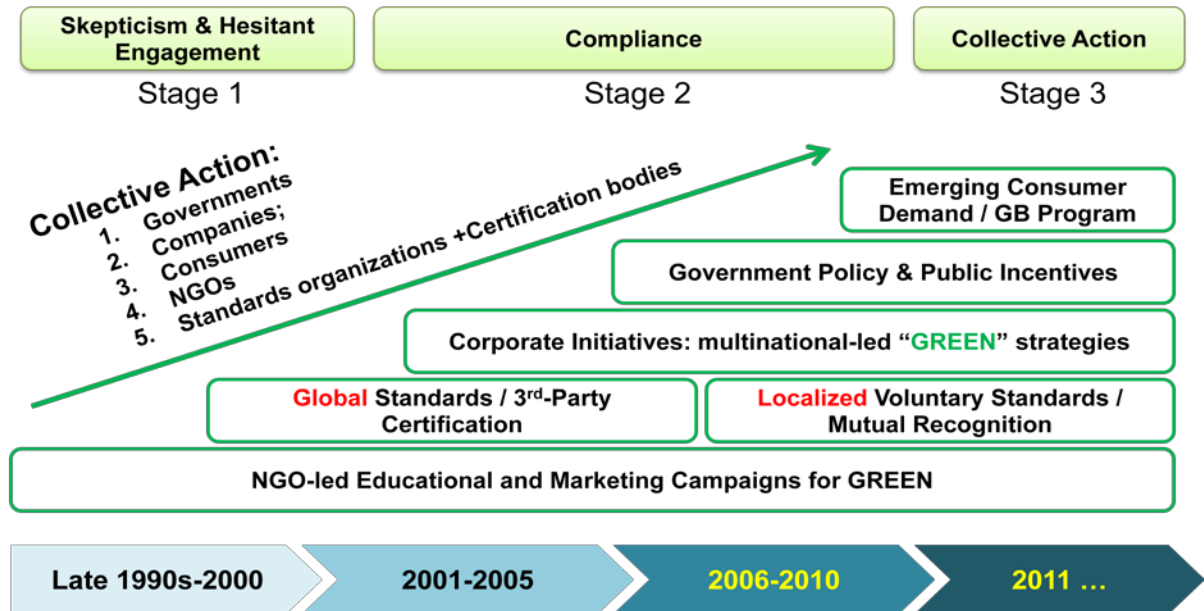


Figure 6 Industry’s Greening Model

Stage 1 - Skepticism and hesitant engagement

Due to historical and cultural reasons, Chinese firms and Chinese policy makers, in general, are reluctant to engage in any non-state driven environmental initiatives, particularly to those considered to be “imports” (Long et al, 2010). This can be observed from the introduction of the Forest Stewardship Council (FSC) forest certification program in China almost a decade ago. When FSC was first introduced into China by foreign NGOs, it faced many difficulties. First, the Chinese industry had little experience with sustainable forestry, neither was there available any comparable domestic standards or third-part certification model that the Chinese firms were familiar with. Second, the Chinese government has been following a very

cautious approach in collaborating with foreign NGOs and international environmental standards agencies in promoting sustainable forestry in the country. In contrast, the government has been actively developing its own national forest certification standards (CFCC) with an aim to use these as policy instruments to strengthen its governance over the industry and forests. Third, a lot of work needed to be accomplished by FSC to develop localized standards that embrace Chinese forest characteristics. For example, there was no established definition in China for high conservation value forests or indigenous people, which are integral parts of the FSC principles. Therefore, this stage featured a significant level of skepticism and hesitation among the industry due in large part to its unfamiliarity with these foreign concepts and standards, weak networks with the relevant organizations and a lack of guidance from the Chinese government, especially in the case of state-owned enterprises (Long, Zadek & Wickerham 2010).

Stage 2 – Compliance

As more and more Chinese firms start to realize that their economic interests will be best served through complying with internationally recognized environmental standards, the industry is approaching a tipping point that features a rapidly growing demand for environmental certification as seen with FSC and related training on compliance. In the meantime, international organizations are working with local stakeholders to develop localized standards that are more practical for the industry to follow. To seek international recognition and acceptance, the Chinese government is also working on improving its national standards and infrastructure environment to narrow the gap between domestic standards and international standards. In the case of forest certification, mutual recognition

between PEFC and the Chinese forest certification standards (CFCC) is a likely direction, as well as that between FSC and CFCC, but for either case, it will take a long time to achieve.

Stage 3 - Collective Action

Building effective public-private partnerships will eventually become the key to advance sustainability in the industry by encouraging firms to move beyond compliance with minimum standards to seek continuous improvement in both environmental and competitive performance (James 1987). A successful partnership requires a significant level of commitment from many sides. Externally, government policies, environmental groups' campaigns, voluntary environmental standards, changing consumer preferences, and global retailer initiatives will continue to advance the industry's environmental performance.

Meanwhile, public sectors and NGOs need to provide a significant level of support and capability building effort to help the industry, particularly those companies who have limited resources or expertise to meet the standards and improve environmental performance.

Internally, firms (particularly those with relatively better resource endowments) need to take a more proactive approach to develop environmental strategies that are beyond the basic level of the standards as a means of enhancing their overall competitiveness: increasing their firm's public image, reducing their business risks, and seeking new market opportunities.

Following chapters will further explore these external and internal factors, with a particular focus on environmental marketing strategies in the context of the Chinese wood products industry. The purpose of this discussion is to understand how a management team's environmental orientation and a firm's marketing capabilities, as well as external pressure from customers and policy environment may impact firm's adoption of environmental

marketing strategies, which in turn may further influence the firm's environmental and business performance.

Chapter 2. Environmental Marketing Theories

To lay the theoretical foundation for this study, this chapter will discuss environmental marketing concepts based on firm theories, particularly, from the perspective of the resource-based view (Barney 1991), and its extension – the natural resource-based view (Hart 1995) and dynamic capabilities view (Teece, Pisano & Shuen 1997; Sharma & Vredenburg 1998; Berry & Rondinelli 1998; Brush & Artz 1999; Aragon-Correa & Sharma 2003), as well as the market failures view of the strategy (Debreu 1959; Arrow & Hahn 1971; Yao 1988).

2.1 Concepts of Environmental Marketing and Environmental Marketing Strategy

Marketing can be defined generally as a value-creating process by which firms meet and satisfy customer's needs through integrated and strategic relationship building, sales, business communication, and business development activities (Kotler & Armstrong 2009). Environmental marketing can be viewed as a natural/ecological extension of marketing, by incorporating a socially- and environmentally-responsible role for sustainable development – in meeting the needs of the present without compromising the ability of future generations to meet their own needs.

There are many definitions for environmental marketing (EM) in the literature. Varadarajan (1992) coined the term “enviropreneurial marketing” and defined it as “environmentally-friendly marketing practices, strategies and tactics initiative by a firm in the realm of marketing to: 1) achieve a competitive differentiation advantage for the firm's offerings vis-à-vis competitors' offerings, and 2) influenced by the firm's view on the duties and responsibilities of a corporate citizen”.

Peattie (1995) defined environmental marketing as “the holistic management process responsible for identifying, anticipating, and satisfying the requirements of customers and society, in a profitable and sustainable way”. In his view, the key difference between environmental marketing and conventional marketing is that EM emphasizes a balance between the three responsibilities of firms - economic, environmental and social, while conventional marketing generally pays less attention to the latter two. Compared to societal marketing, EM represents a broader concept by incorporating both ecological and social considerations with more focus on the ecological side. Its focus also covers a wider

geographical scope to include the whole world, not just particular societies. According to Peattie (1995), the environmental and social responsibilities of the firm are often intertwined and difficult to separate.

Menon and Menon (1997) advanced the definition of EM and distinguished environmental marketing from other environmentally based approaches. In their definition, environmental marketing is the process of formulating and implementing entrepreneurial and environmentally beneficial marketing activities with the goal of creating revenue by providing exchanges that satisfy a firm's economic and social performance objectives. They also noted that environmental marketing can be pursued on three levels: strategic, quasi-strategic or tactical. Strategic environmental marketing requires a holistic approach, with all actions of the firm coordinated to integrate environmental issues across all functional areas. Quasi-strategic actions normally require more substantive changes in marketing activities, as well as broad-based coordination among several non-marketing activities; while tactical actions typically involve limited change and limited coordination across multiple functions. The need for a holistic approach in developing green marketing strategies has been advocated by scholars and industry practitioners (Grundey & Zaharia 2008; Smith & Merritt 2002; Skapinker 2008).

EM strategy can have two types – a reactive and a proactive strategy (Menon & Menon 1997). A reactive environmental marketing strategy is mainly driven by external factors such as regulatory and stakeholder's pressure; while a proactive marketing strategy is driven by innovation and technology solution and adopts an entrepreneurial philosophy or orientation, and represents a confluence of social performance, environmental and economic objectives.

The authors also contend that firms adopting such an approach would see environmental issues as marketing opportunities and would be willing to take risks and make both financial and non-financial commitments. Enviropreneurial marketing (EM) is therefore defined as “an entrepreneurial approach in melding ecological concerns and marketing strategy objectives” (Menon & Menon 1997).

Banerjee (2002) further refined the concept of EM by incorporating an organizational perspective - “*corporate environmentalism*” (CE). The definition for CE is “organization-wide recognition of the legitimacy and importance of the biophysical environment in the formulation of organization strategy, and the integration of environmental issues”. Banerjee et al (2003) further proposed two primary dimensions of the corporate environmentalism construct: environmental orientation (internal and external) and environmental strategic focus (corporate and marketing). Building on these concepts, Baker and Sinkula (2005) conducted the first empirical research to operationalize EM as a higher-order three dimensional construct: 1) environment as righteousness, 2) environment as opportunity, and 3) environment as opportunity. The authors contended that EM “does not exist in isolation but instead flows from an organization-wide philosophy that places the physical environment among the top concerns and potential differentiating factors of the firm”. In their view, EM is solely driven by internal forces such as management commitment to the environment and is less susceptible to the pressure of external forces such as market turbulence. Therefore, it is critical for firms to “adeptly tap the capabilities accrued from the formation of EM as a unique resource of the firm”. As the outcome, environmental marketing can lead to improved business performance, including customer satisfaction, positive firm image, advances in research and development, and enhanced competitive advantage.

From a marketing perspective, a strategy can be defined as a market-planning process that allows a firm to focus its limited resources on opportunities to pursue sustainable competitive advantages and improved business performance based on customer satisfaction (Kotler & Armstrong 2009). An environmental marketing strategy reflects the degree to which environmental issues are integrated into the generic market planning process (Banerjee 2002, Banerjee et al 2003). It is most effective when a “strategic fit” is achieved (Baker & Sinkula, 2005). To achieve strategic fit means that activities specified by the strategy should match the firm’s resources and capabilities with the opportunities in the external environment (Grant 2007), and also are consistent with the expectations of corporate managers, customers and stakeholders (Christmann & Taylor 2002).

Like most commodity industries, the forest products industry as a whole has a traditional focus on production instead of customer or market needs, and has not generated above-average returns compared to consumer goods industries (Hansen & Juslin 2005). Also, the forest products industry has increasingly important environmental and social implications given its potential impacts on the livelihood and the natural environment (World Bank 2006). Facing a fast-changing environment and growing competition, it is important for forest products firms to develop strategies to create competitive advantages that are sustainable (Hansen & Juslin 2005).

A variety of marketing and business strategies have been proposed in the forest products marketing literature. For example, Wilson & Vlosky (1998) suggest that better business performance may be achieved from successful partnerships between manufacturers, distributors and customers. Grushecky et al (2006) provided three recommendations to US

hardwood lumber mills in face of a declining domestic furniture industry, 1) find new customers for hardwood lumber such as flooring and cabinets manufacturers, 2) add value to products and 3) explore export markets. A differentiation strategy has also been advocated by scholars as a means of counteracting low-price competition and economic cycles (Schuler & Buehlmann 2003). The authors called for US furniture firms to adopt a new strategic business model, or, “paradigm shift”, through new manufacturing and supply chain technologies such as mass customization, lean manufacturing, modular production and standardization, to achieve new competitive advantages. Hansen et al (2006) studied the relationship between customer and product differentiation strategies and firm performance in the forest products industry. They found that there was a lack of a strong relationship between customer and product differentiation strategies and business performance, thereby suggesting that differentiation strategies may be less appropriate for American timber firms who are operating in a “hyper-competition” environment that is characterized by intense and rapid competitive moves by low-cost competitors (imports) and substitute products.

Brodrechtova (2008) studied the export marketing strategies of the Slovakian forest product industry which has undergone significant institutional reforms since World War II. In her study, export marketing strategy was defined as “*an outcome of a decision-making process, which may set out to change the direction in which a firm is going, and results in an export marketing strategy that stabilizes that direction, generates economic value and keeps the firm ahead of its competitors across national boundaries.*” The study suggests that the Slovakian forest product industry is pursuing a variety of export marketing strategies, including, commodity oriented strategy sales channels strategy, customer dedicated strategy, market share defender and low cost strategy. As the outcome, these export marketing strategies can

lead to corresponding competitive advantages in areas of product (including quality), pricing and channel relationship. In the wood furniture industry, researchers have called for a “paradigm shift” of the industry through adopting new technologies and innovations such as lean manufacturing, mass customization and advanced supply technologies to develop new competitiveness in the face of rising competition from imports. They suggested that an increased interest in environmentally sustainable, carbon neutral, green product in the marketplace, combined with competitors diminishing cost advantages, may also offer US furniture manufacturers opportunities to slow, stop, or even reverse its recent decline (Schuler & Buehlmann 2003, 2009, Grushecky, Buehlmann, Schuler, Luppold & Cesa 2006).

Environmental and social issues are closely intertwined (Peattie 1995) and have been examined in the forest products marketing literature as an important aspect of marketing strategy (Kärnä 2003; Hansen 2004). Kärnä (2003) defined environmental marketing strategy as “*the core of the environmental marketing*” and “*the strategic decisions in which the environmental issues are emphasized in product decisions, and environmental strengths are used as a competitive advantage*”. Hansen (2004) adopted a customer-centered approach and defined EM as a type of marketing that is based on “ethically sound values and integrates environmental issues in all decisions”. In his view, environmental marketing “*recognizes the broader environmental responsibility of the firm and helps the firm adapt to new circumstances*”. And the primary principle of environmental marketing is to “integrate all activities of the firm to satisfy the customer in a way that benefits the customer and the firm while incorporating environmental responsibility.”

Hansen & Juslin (2005) proposed a three-stage model of the evolution of marketing philosophy in the forest products industry. The first stage is referred to as production and sales orientation, at this stage, firms are focused on low cost production and sales function as key business strategies. At the second stage, customer and market orientation, building strong customer satisfaction and value (relationship marketing) is the goal of firms to pursue business success. The third stage is environment orientation, at this stage “responsible forest industry” or “responsible marketing” will become the goal of firms. The authors contend that *“the challenge of forest products marketing is to combine resource- and capability-based view with the customer relationship and value proposition”*.

Overall, previous research suggests that environmental marketing strategy, consisting of “marketing mix” and relationship building activities, is a context-specific concept and can be applied to all functional areas within a business across the industry supply chain, i.e., forest management, logging, raw material sourcing, new product development, engineering, communications, eco-labeling, distribution, pricing, and stakeholder communication, among others. Following the broad definitions by previous research, environmental marketing strategy in this study is defined as a holistic and entrepreneurial market-planning process through which a firm configures and re-configures its resources in response to opportunities imposed by the natural environment. By aligning an environmental marketing strategy with firm specific assets (resources and capabilities), expectations of stakeholders and customers, and its particular competitive situation, the firm can expect to achieve superior performance.

2.2 Inadequacies of “Old” Firm Theories

As a disciplinary root of business strategy research, the theory of the firm, consisting of many theories and perspectives, studies the nature of the firm, or corporation, including its existence, behavior, motivations, strategy, structure, and relationship to the market. Firm theories are generally structured around four fundamental questions, including, 1) Why firms exist? 2) What determines scale and scope of the firm? (Holstrom & Tirole 1993), 3) What motivates firms to adopt different strategies, and 4) Why some firms outperform others? (Rumelt, Schendel & Teece 1994).

In the literature, strategy is frequently viewed as a choice of position and an alignment of production activities consistent with that position (Porter 1980, 1998). In Porter’s theory (1998), firms may follow three types of generic strategies to achieve a competitive advantage: cost leadership, differentiation and focus. These strategies are generic because they are independent of firm or industry specific context. On the industry level, an attractive position is one where competition is less fierce, say because of high barriers to entry, significant economies of scale, and competitive upstream and downstream markets.

This positioning view of strategy has its roots in industry organization (IO) economics. IO economic theories generally follow the structure-conduct-performance approach and hypothesizes that industry structure (e.g., number of buyers and sellers, entry barriers to new firms) determines firm conduct (e.g., new product development, innovation, pricing), which then determines industry (economic) performance, while the industry structure depends on basic conditions, such as technology and demand for a product (Bain 1968; Porter 1998; Conner 1991). In Bain’s theory, for example, firms exist to restrain productive output

through the exercise of monopoly power or by colluding with other firms. Firms want to restrain output so that the market price will be driven up. From a Schumpeterian view of IO, the purpose of the firm is to seize competitive opportunity by creating or adopting innovations that make rivals' positions obsolete (Winter 1984). Chicago school economists offer efficiency-based explanations for firm strategic behavior with the assumption that firms exist to enhance efficiency in production and distribution because it is costly to devote time, effort, and resources to locate, gather, and assimilate information which is needed for making strategic decisions. Instead of government intervention as advocated in Bain's theory, Chicago school economists advocate for "free markets" and little government intervention, but their stance has been increasingly questioned by critics in the wake of the global financial crisis (Cassidy 2010). Transaction cost theory (Coase 1937) holds that it is costly to operate the economic system. Transaction costs derive from the friction associated with the economic system. Therefore, by forming a firm and allowing some authority to direct the resources with efficiency, certain transaction costs can be reduced. The determinants of transaction costs are frequency, specificity, uncertainty, limited rationality, and opportunistic behavior (Williamson 1981).

Conner (1991) provided an historical comparison of resource-based theory and five schools of thought within industrial organization economics: neoclassical perfect competition, Bain-type industrial organization, Schumpeterian competition, Chicago School responses and transaction costs theory, and concluded that the resource-based view (RBV) (Barney 1991) stands out as the most noticeable school of thought which is found to be particularly useful in explaining the purpose of the firm and its behavior (Day & Wensley 1983, 2002; Conner 1991). Conner (1991) noted that:

“A resource-based approach to strategic management focuses on costly-to-copy attributes of the firm as sources of economic rents and, therefore, as the fundamental drivers of performance and competitive advantage”

“In essence, the [strategy] concept is that a firm’s competitive position is defined by a bundle of unique resources and relationships and that the task of general management is to adjust and renew these resources and relationships as time, competition, and change erode their value. This way of looking at the firm . . . [is] useful in describing and summarizing the empirical studies of firm behavior that form the core of the business policy literature.”

Conner (1991) concluded that there are clear similarities between the resource-based view (RBV) and IO economics, as well as sharp departures. For example, theories of RBV also deal with the competitive environment facing the firm, but take an “inside-out” approach with a starting point from the firm’s internal competency (Prahalad & Hamel 1990, Day & Wensley 2002), instead of the structure-conduct-performance approach of the industrial organization (IO) economists view of the firm (Bain 1968). As another major departure from IO which holds that a firm's success is wholly determined by its external environment, RBV theorists believe that the success (the ability to attain and keep profitable market positions) relies on firm’s “underlying resources important to production and distribution” (Conner 1991).

The Resource-Based View (RBV) emphasizes firm’s strategic choice, and advocates that it is valuable, rare, inimitable and non-substitutable (VRIN) resource endowments that determine competitive advantage and performance (Barney 1991). In this domain, firms are viewed as 1) seekers of unique and/or costly-to-copy inputs for production and distribution to maximize

returns, 2) heterogeneous bundles of assets and capabilities (Conner 1991; Barney 1991 & 2001). In competitive markets, firms consistently achieve above-normal returns because they have superior systems and structures with higher efficiency, product quality and performance than competitors. Therefore, heterogeneity in resource endowments and capabilities are deemed as the fundamental determinant of the variations in firm performance.

Two original papers contributing to the formation of RBV theory are widely cited in the field of business strategy research. One is Prahalad and Hamel's "core competence" paper (1990), and the other is Barney's 1991 paper on sustainable competitive advantage (Newbert 2007). The concept of "core competence" derives from a firm's tangible and intangible assets, such as financial capabilities, human resources, R&D, tacit knowledge, and relationships with industry customers, which are valuable, rare, inimitable and non-substitutable (VRIN resources) (Barney 2001 & 1991). When these resources have complementarities, it enhances the firm's potential to create sustained competitive advantage and sustained performance (Collis & Montgomery 1995, Porter 1996). Under this view, firms should focus on developing core competencies and outsource other non-core business activities to improve the overall competitiveness and profitability (Prahalad & Hamel 1990; Hamel & Prahalad 1994).

Barney further advances RBV by establishing a conceptual model of sustained competitive advantages (Barney 2001, 1991). He argues that firm's VRIN resources are linked with sustained performance through sustained competitive advantage (Figure 7). A competitive advantage is sustainable when it enables business to survive against its competition over a long period of time (Barney 1991).

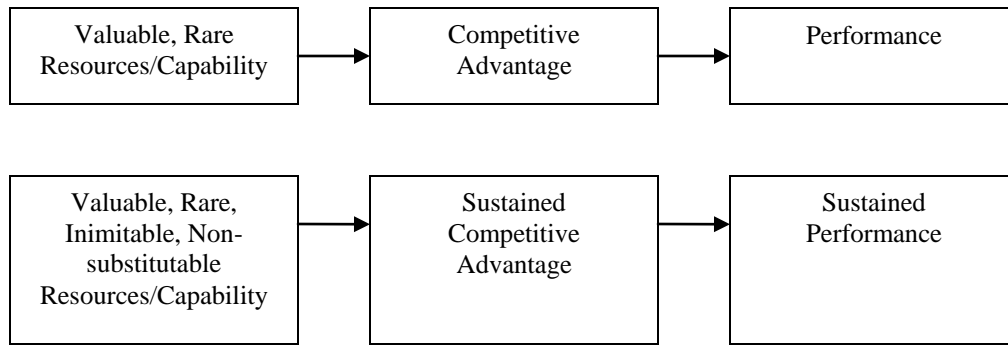


Figure 7 Barney's Sustainable Competitive Advantage Model

Adapted from Newbert (2007).

Although the resource-based view (RBV) of the firm offers many benefits in explaining the purpose of the firm and the heterogeneity in a firm's actions and performance, and has become the most widely accepted theory of strategic management (Conner 1991; Newbert 2007), it is not without criticism. A common criticism made of RBV is that it provides little insights how these resources and capabilities can be developed and how sustainable competitive advantage can be achieved (Priem & Butler 2001). Also, a notable weakness of conventional RBV theories is their lack of attention to the dynamic environment (Hunt & Morgan 1995; Priem & Butler 2001; Day and Wensley 2002; Newbert 2007). Jacobson (1992) asserts that markets will never be in equilibrium, and firms need to adapt to a changing environment to be successful. Consumer heterogeneity and variety-seeking tendency are among the fundamental drivers of the heterogeneous and dynamic market demand (Dickson 1992; Hunt & Morgan 1996; Ratner, Kahn & Kahneman 1999). Instead, RBV provides a static view of the market and tends to treat demand as exogenous. With this, although RBV accounts for heterogeneity in firm assets, it provides little implications for designing marketing strategies such as segmentation and positioning (Day & Wensley 2002).

Overall, a key assumption underlying the “traditional” RBV of the firm (including IO) is that firms exist to maximize economic profits and efficiency which is largely short-term oriented. Modern firm theories are needed to distinguish between long-run motivations (sustainability) and short-run motivations (profit maximization) (Ikerd 1997, 2008). And the need to incorporate a more dynamic and evolutionary perspective in future strategy research has been widely reconginzed (Day & Wensley 2002; Priem & Butler 2001; Barney 2001).

2.3 Toward An Integrated View of Environmental Marketing Strategy

2.3.1 Natural Resource-Based View

Hart (1995) expanded the resource-based view of the firm to include an element of the natural environment. He argued that few of the past economic, organizational, and marketing principles can persist very long into the future because they are not environmentally sustainable. In his theory, opportunities offered and constraints imposed by the natural environment will inevitably lead progressive firms to pursue superior returns by integrating and implementing environmentally conscious strategies into business development based on firm's resources and capabilities. Porter and Van der Linde (1995) suggested that by reengineering the production process, firms could reduce environmental impacts and simultaneously reduce the cost of inputs and waste disposal. Progressive firms are those who see environmental issues as marketing opportunities and are willing to take risks and make both financial and non-financial commitments (Berry & Rondinelli 1998). EM is viewed as a source of future competitive advantage (Hart 1995; Baker & Sinkula 2005; Menon & Menon 1997) because it helps progressive firms achieve competitive preemption in two ways (Hart 1995):

- 1) *by gaining preferred or exclusive access to important but limited resources such as customers and raw materials, and*
- 2) *by establishing rules and regulations or standards that are uniquely tailored to the firm's capability.*

Under the natural resource-based view (NRBV), a firm's sustainable competitive advantage is rooted in a broader social and environmental legitimacy context. Besides its focus on business economics and competitors (that is similar with RBV), NRBV also shares views of stakeholder theory (noticeably, Freeman 1984, Harrison & Freeman 1999) and maintains that external stakeholders play a pivotal role in driving a firm's environmental strategy and performance (Hart 1995; Banerjee, Iyer & Kashyap 2003). External stakeholders include groups of regulators, organizational members, community members, and the media. Firms need to satisfy these stakeholders in order to gain social legitimacy to operate and achieve sustainable development. This pressure drives firms to develop and deploy low-impact technologies to improve their environmental performance and social reputation (Banerjee, Iyer & Kashyap 2003).

NRBV has been increasingly adopted by environmental marketing researchers to draw insights into how firms can configure and deploy resources to develop environmental marketing strategies and improve corporate performance (Sharma & Vredenburg 1998; Graham & Havlick 1999; Baker & Sinkula 2005; Menguc & Ozanne 2005). In his seminal paper, Hart (1995) advanced two types of environmental strategies. The first is the compliance strategy, wherein firms rely on pollution abatement through a short-term, "end-of-pipe" approach, often resisting the enactment and enforcement of environmental legislation. Firms often fall short of compliance in this mode. The second type of environmental strategy is going beyond compliance to focus on prevention, a proactive and systematic approach that emphasizes pollution reduction and process innovation (Hart 1995; Russo & Fouts 1997). According to Hart (1995), these environmental strategies are inter-

connected, because they are “path dependent” on and “embedded” within other capabilities and resources of the firm that are hard to emulate by competitors.

2.3.2 Dynamic Capabilities View

The dynamic capability view (DCV) offers further insights into the “proactive” side of a firm’s environmental strategy. With root in the Schumpeterian view of innovation and evolutionary economics (Nelson and Winter, 1982), dynamic capabilities theory emphasizes the firm’s ability to integrate, build, and reconfigure internal and external competences in response to rapidly changing environments (notably Teece, Pisano & Shuen 1997). The tenet of the theory is that if the industry in which the firm operates is undergoing rapid change then the firm’s success will depend on how well it can align its internal strengths and weaknesses with the opportunities and threats in the business environment.

The emerging dynamic capabilities theory provides a “drastically new” approach to further develop RBV (Newbert 2007). Organizational learning is the underlying construct of the dynamic process (Hunt 1995). As a central concept in strategy research (Lieberman 1989), organizational learning provides the basis for forming the firm’s capabilities that are evolving with time. A learning curve in a broad sense is associated with other concepts such as "experience curve", "improvement curve", "cost improvement curve", and "efficiency curve". It provides a rationale for the pursuit of innovation, which drives cost down, dissipates “first-mover” advantages, and serves as an isolating mechanism that prevents firm-specific capabilities and resources from being copied by competitors (e.g. Schumpeter 1934; Rumelt 1987).

In the spirit of Hunt’s resource-advantage theory model, this dynamic process, or “higher-order learning process” (Hunt 1995; Hunt & Morgan 1996), is represented as the backward loop that connects performance, competitive advantages and resources. Therefore, Barney’s sustained competitive advantage framework (Figure 7) has been further developed in the sense that the learning process completes the circle that connects resources, competitive advantages and performance and evolves over time (Figure 8).

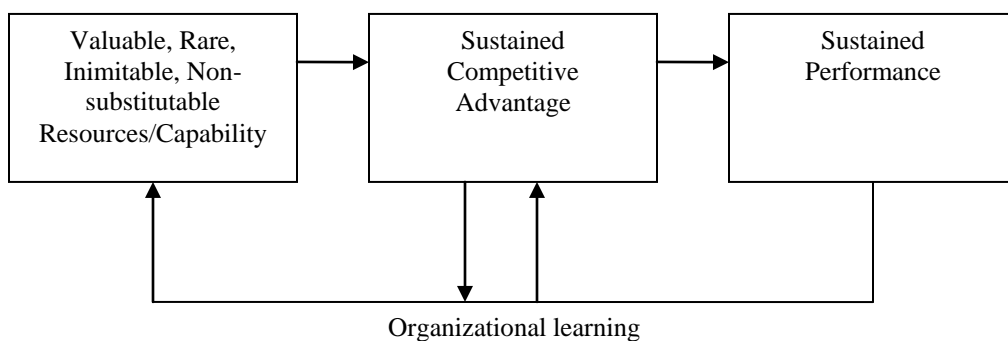


Figure 8 A More Dynamic RBV Model

(Adopted from Hunt 1995)

From the dynamic capabilities’ perspective, the competitive advantage of the firm is determined by three factors: processes, positions and paths (Teece et al 1997). “Processes” include three functions: 1) coordination/integration of existing resources and capabilities (a static concept), 2) learning (a dynamic concept), and 3) reconfiguration and transformation (an evolutionary concept). “Position” refers to a firm’s strategic posture determined by its resource endowments and external relationships with suppliers and customers. “Paths” is defined as “the strategic alternatives available to the firm, and the presence or absence of increasing returns and attendant path dependencies” (Teece et al 1997).

Eisenhardt and Martin (2000) further clarify the concept of dynamic capabilities by arguing that dynamic capabilities can be understood as individually identifiable routines, such as new product development routines (processes), strategic decision-making routines, resource allocation routines, relationship building routines, and information-acquiring routines. They also argue that in moderately dynamic markets, dynamic capabilities resemble the traditional conception of routines, which are “detailed, analytical, stable processes with predictable outcomes”, and learning mechanics guide the evolution of dynamic capabilities with an emphasis on variation. When in high-velocity markets, dynamic capabilities are “simple, highly experiential and fragile processes with unpredictable outcomes”, and the evolutionary emphasis is on selection.

In all, DCV posits that since marketplaces are dynamic, rather than simple heterogeneity in a firms’ resource endowments, it is the capability by which firms’ resources are acquired and deployed in ways that match the firm’s market environment which explains interfirm performance variance over time (Eisenhardt and Martin 2000; Morgan et al 2009).

Capabilities are dynamic when they enable the firm to implement new strategies to reflect changing market conditions by combining and transforming available resources in new and different ways (Teece et al. 1997; Morgan et al. 2009). In other words, if the market environment in which the firm operates is undergoing rapid changes, then the firm’s success will depend on how well it can align its internal strengths and weaknesses with the opportunities and threats of the environment.

Theories of dynamic capabilities provide researchers a new perspective to study environmental marketing (Aragon-Correa & Sharma 2003; Russo 2009). Proactive

environmental marketing strategy can be viewed as a dynamic capability that has the following four characteristics as proposed by Aragon-Correa and Sharma (2003):

- *It is dependent on a specific and identifiable process that connects capabilities and resources through pursuing best practices, continuous innovation and improvement and higher-order learning, and contributes to competitive advantage.*
- *It is idiosyncratic in its details. Reactive environmental strategy and investment is often driven by environmental regulations that advocate specific technologies and processes (Majumdar and Marcus 2001; Sharma 2001), but proactive approaches involve firm initiatives based on managerial discretion (Majumdar & Marcus 2001) and interpretations of environmental issues as opportunities.*
- *It is a proactive approach to the natural environment that requires path dependence and embeddedness of the capabilities of innovation, improvement, learning..a complex integration of these environmental capabilities through the use of organizational and managerial resource.*
- *It is built through a path-dependent process of integrating a series of tacit capabilities and is therefore nonreplicable or inimitable.*

Overall, under DCV, firms configure and deploy resources to reflect the firm's natural environmental orientation as key market-based knowledge assets and environmental marketing capabilities as key market-based capabilities - both would seem to be fundamental elements in enabling firms to acquire and deploy resources in ways that reflect their market environment changes.

Extant literature suggests that a proactive environmental marketing strategy (EMS) can be explained by DCV in that EMS enables firms to combine and transform available resources in new and different ways in response to market changes to pursue opportunities imposed by the natural environment. DVC explains well the "proactive" side of environmental marketing strategy, because EMS is influenced by the firm's views on corporate citizenship instead of its obligation to stakeholders (Varadarajan 1992; Baker & Sinkula 2005), and its

commitment to the environment (environmental orientation). It is this commitment to the environment (or lack thereof) that defines the strength (or weakness) of a firm's management EM efforts and its influence on organizational behavior (Menon & Menon 1997; Aragon-Correa & Sharma 2003).

2.3.3 Market Failures View

Market failures view provides additional explanation for the environmental marketing strategy, particularly to its "reactive" side –situations where firms are forced to adopt an EMS by external pressure.

Market failure is a concept within economy theory wherein the allocation of goods and services by a free market is not efficient (Winston 2006). Amid the global financial crisis, the classic view of the "capitalist market" and market failure-related theories have received much attention. A famous example of market failures are the searching costs in labor markets. The theories on this topic developed by Peter Diamond and Dale Mortensen of Northwestern University, and Christopher Pissarides of London School of Economics won the 2010 Nobel economics prize. The laureates found that buyers and sellers (employers and employees) don't always find each other immediately, this can incur additional costs (market frictions) in searching for jobs and stabilizing the job market. Economies can have both high jobless numbers and high vacancy rates simultaneously. In its announcement, the Nobel committee also noted that "*According to a classical view of the market, buyers and sellers find one another immediately, without cost, and have perfect information about the prices of all goods and services ... But this is not what happens in the real world.*" (Inman & Kollwe 2010).

The market failures view offers three major theoretical merits in studying marketing strategy in the context of the forest products industry: the market failures view compliments RBV theories by shedding light on the reactive side of EMS – why public intervention is necessary and how they can impact firm’s strategic choice. Meanwhile, the market failures view also shows the importance of pursuing proactive EMS – managers not only need to spot and pursue opportunities created by market failures, but also need to anticipate government response to these market failures so as to capture the opportunities from policy changes and benefit from them.

First, market failures view explains how firms can achieve sustainable above-normal returns in less-than-perfectly competitive markets, which could be very difficult in a fully fledged competitive environment as in equilibrium theory (Debreu 1959; Arrow & Hahn 1971). Market failures can be categorized into four distinct sources: transactions costs, information imperfections, market power, and externalities (Oberholzer-Gee & Yao 2008). Each source represents different mechanisms through which firms can obtain above-normal profits. For example, transaction costs may reduce competition between firms if customers feel transactions costs are high and they may not choose to change current business partners. Information imperfections function similarly to transaction costs and can protect firms from competition. Market power comes into play when there is no close substitute in the marketplace to the products/services offered, allowing suppliers to charge a premium for their scarce resources. Externalities can also lead to less-than-perfect competition when firms can influence their competitors’ cost or the value of competitors’ products.

Second, the market failures view holds that the existence of market failures creates inefficiency; public intervention is therefore needed to improve the efficiency of the market, which then in turn creates new strategic (market and non-market) opportunities for above-average profits for firms who are able to adapt strategies to respond quickly to the changes of market environment (Arrow & Hahn 1971; Yao 1988; Oberholzer-Gee & Yao 2008). Public intervention is commonly seen in the forest products industry in the form of government environmental policy, ENGO campaigns and consumer boycotts. In the forest products industry, recent mergers and acquisitions driven by foreign direct investment and private equity firms have increased the level of industry consolidation and also the power of global retailers and foreign investors in the supply chain. Pressure from overseas markets for sustainable and legal timber sourcing has generated major impacts. Therefore, public intervention in the Chinese forest products industry is reflected by international and domestic legal timber trade policies such as the U.S. Lacey and the EU FLEGT Due-Diligence legislation, environmental standards such as FSC certification and private sector sourcing initiatives driven by CSR that are developed to correct market failures. All these interventions can influence a firm's strategic decisions.

Also, the market failures view assumes that the general role of a firm in the marketplace is accepted by society. To maintain "social legitimacy", a firm must not take actions deemed unacceptable by society and therefore should not always seek to maximize profit (e.g., Kolstad 2007). Firms lose some legitimacy when they do not fulfill their economic role, say, by producing at the cost of natural resource supplies to make short-term profits or engage in illegal logging which infringe upon local people's rights or damage the environment. Therefore, firms will need to limit their economic interests and adopt nonmarket actions such

as self-regulation to obtain social legitimacy from a long-term perspective (Kolstad 2007; Oberholzer-Gee & Yao 2008).

The market failures view also holds that being reactive is not sufficient to achieve superior performance. Managers also need to anticipate how government will respond to correct these market failures and be able to spot and pursue business opportunities created by future policy changes to create long-term value (Oberholzer-Gee & Yao 2008). This view is particularly useful in the context of the Chinese forest products industry, which does not have fully developed market-supporting institutions. Overall, the market failures view not only helps identify opportunities for supra-normal profits, it also sheds light on the sustainability of the resulting strategies (Oberholzer-Gee & Yao 2008).

2.3.4 An Integrated View of Environmental Marketing Strategy

As Menon & Menon (1997) point out, firms adopting environmental strategies can be driven by both external and internal factors. A reactive environmental marketing strategy is mainly driven by external factors such as regulatory and stakeholder pressure; in contrast, a proactive marketing strategy is driven by innovation- and entrepreneurship-based factors including management orientation.

Perspectives of the Resource-based View (RBV) and its extensions NRBV and DCV, as well as the market failures view of strategy, once combined together, may enrich our understanding of the complexity in the process of developing environmental marketing strategies and how these efforts may in turn impact corporate environmental and business performance.

Both NRBV and DCV acknowledge that VRIN resources and capabilities provide the key sources of sustainable competitive advantage (Hart 1995). A firm's proactive environmental marketing strategy is viewed as a key source of future competitiveness which is hard to copy by competitors because it is dependent on, and embedded in, the firm's other resources and capabilities (Sharma & Vredenburg 1998).

Also, both NRBV and DCV imply specific path dependencies between resources, capabilities, and firm performance, and they have a strong focus on the links between environmental strategy and performance as the key outcome. The natural resource-based view of the firm offers environmental marketing researchers a tool for refining the analysis of how intangible assets such as management environmental orientation and marketing capabilities may influence the firm's "bottom line", while researchers adopting the DCV explicitly recognize the importance of efficiency and path-dependency in deploying and reconfiguring resources to develop proactive environmental strategies for superior competitiveness (Aragon-Correa & Sharma 2003).

However, although DCV and NRBV follow an "inside-out" approach of RBV and provide good insights into why an environmental marketing strategy can be considered to be "proactive", they seem to be inadequate for explaining the reactive side of environmental marketing strategy – the situations where firms are accused of "green wash" or adopting EMS because "since we had to clean up our production process we might as well advertise it – versus – we need to be seen as progressive, so let's clean up our processes and communicate it". Some firms still choose to adopt environmental marketing strategies even when they apparently lack the motivations to do so.

Perspectives on market failures provide a tool for analyzing this situation. Market failures are the mechanism through which above-average profits are generated as well as a significant driver of nonmarket action. Understanding this mechanism for profit generation gives the strategist insight into how changes in the market rules would impact firm's strategy.

Understanding this mechanism also highlights areas where public intervention may occur and provides a guide to possible interventions and the effects of such interventions (Oberholzer-Gee & Yao 2008). The adoption of EMS depends on the actions of market participants as well as those of nonmarket participants. Therefore, with pressure from stakeholders, firms are "forced" to invest in EMS in search for above-average returns provided by market failure mechanism.

As one reviewer of this study pointed out, firms pursuing EMS may have two distinctively different mindsets: "since we had to clean up the process, we might as well advertise it" versus "we need to be seen as progressive, so let's clean up our processes and communicate it". The difference can be explained by integrating the NRBV, DCV and market failure perspectives, as being "proactive", which will be mainly driven by internal factors, versus being "reactive" in which case firms can still pursue EMS but driven by external pressure.

From an integrated perspective, this study proposes that both environmental orientation (EO) and marketing capabilities (MC) as resources would seem to be fundamental elements in enabling proactive firms to develop environmental marketing strategies in response to market changes. External factors such as customer pressure (Varadarajan 1992; Baker & Sinkula 2005) may also impact the management decision to adopt environmental marketing strategies and vary the nature of EMS, under certain circumstances.

Chapter 3. Conceptual Model and Hypothesis

A conceptual model is depicted in Figure 9. In this model, a causal relationship extending from a firm's resources (environmental orientation, and marketing capabilities) to environmental marketing strategy, to environmental performance and then competitive performance is posited. This model assumes that environmental marketing will help generate improvements in both the environmental and competitive performance of the firm. In the meantime, improved environmental performance will also help strengthen firm's overall competitiveness. EMS is fundamentally driven by firm's environmental orientation and marketing capabilities as resources, as well as customer pressure as an external factor. This model also measures a firm's business connections with foreign firms, its environmental certification status (the number of environmental certificates a firm holds), and regulatory pressure as moderating variables in these relationships.

As analyzed in Chapter 1, firms, customers, and governments are considered as the most important players driving the development of EMS in the Chinese forest products industry context, therefore, their impacts will be examined specifically in this model. As another key stakeholder group, ENGOs are yet to make a direct major impact on the Chinese industry given the fact that most (international) ENGOs are currently working through private-public partnerships supported by international financial institutes, development agencies, and international buyers to influence Chinese companies to pursue green strategies, instead of taking a direct approach such as confrontational consumer campaigns to make an impact. As customer pressure and regulatory pressure as two major external drivers that have been specified in the model, ENGO's will not be included in this model to reduce the model

complexity and the number of parameters to be estimated, but this will not jeopardize the explanatory quality of the model.

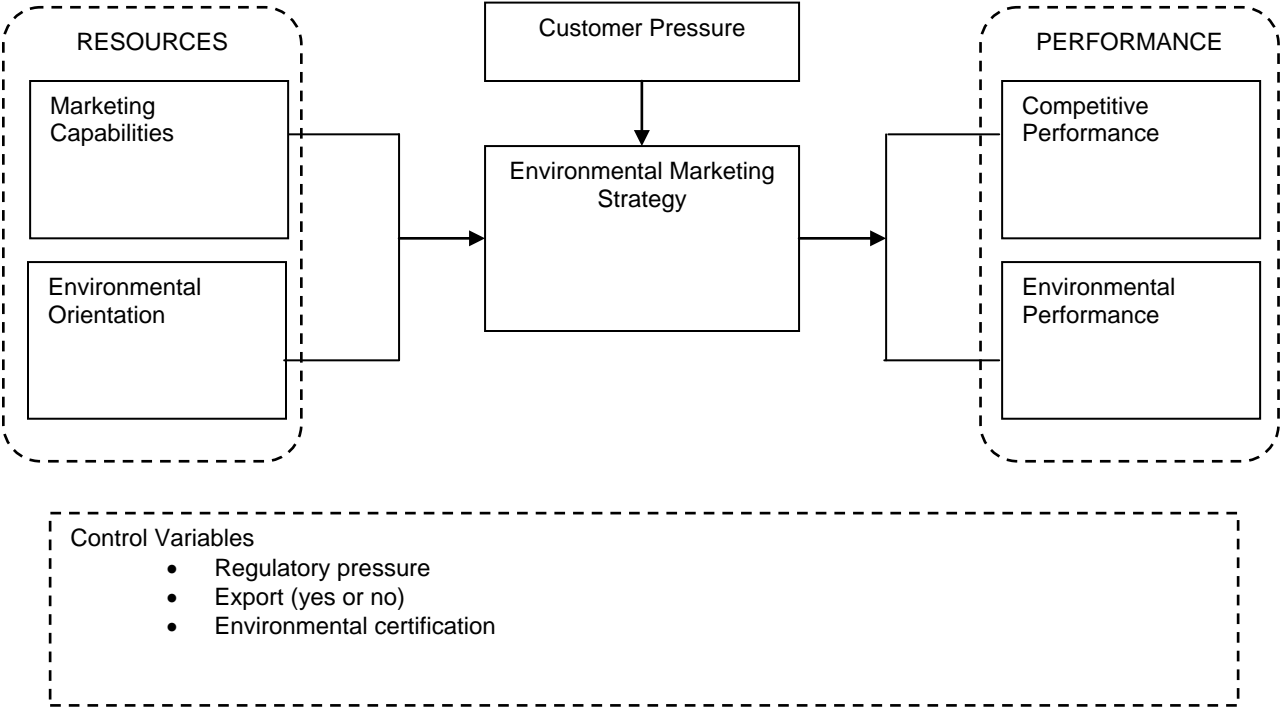


Figure 9 Conceptual Model

3.1 Relationships between Environmental Orientation, Marketing Capabilities and Environmental Marketing Strategy

In the marketing and management literature, strategic orientation is often referred to as specific managerial perceptions, predispositions, tendencies, or motivations that guide strategy formulation, and ultimately the direction of the organization (Wood & Robertson 1997; Voss & Voss 2000).

As a specific intangible organizational resource, environmental orientation (EO) is defined as the recognition by managers of the importance of environmental issues facing their firms (Banerjee, Iyer & Kashyap 2003). EO can be seen as a specific or ecological version of strategic orientation, and influences the choice of environmental strategy (Wood & Robertson 1997). On the business functional level, EO reflects the degree to which corporate management teams integrate environmental issues into the business planning process. It helps the firm's management team determine what type of business the firm should engage in, in order to meet the environmental expectations of its corporate partners, consumers and stakeholders. Strategies such as adopting new environmental protection technologies, pollution reduction, and making R&D investments to contribute to the ecological well-being of society are all examples of environmental strategies (Banerjee 2002; Banerjee, Iyer & Kashyap 2003). Environmental strategy at the marketing level involves the incorporation of environmental issues into product development and marketing mix decisions (Banerjee, 2002). Given the strong marketing focus of these decisions, this type of strategy is labeled by Banerjee as an "environmental marketing strategy" (EMS). EMS concerns offering products specifically to environmentally conscious consumers and customers, including strategies

from new product development, using environmentally friendly raw materials, removing illegal timber from supply chain, pursuing eco-labeling strategies, and communicating the firm's environmental efforts to clients. Environmental marketing involves the incorporation of environmental issues into product development and marketing mix decisions (Banerjee 2002).

Marketing capability is defined as the integrative process, in which a firm deploys and transforms its tangible and intangible resources into outputs through their marketing mix strategies which are linked to superior performance and competitive advantage (Day 1994; Vorhies & Morgan 2003 & 2005; Morgan, Vorhies & Mason 2009). In other words, marketing capabilities can be viewed as an important source of marketing strategies that drive firms to produce superior performance through individual 'marketing mix' processes, such as product development and management, pricing, selling, marketing communications, and channel management, branding, and customers relationship development. (Vorhies & Morgan 2005). Such capabilities can be rare, valuable, non-substitutable, and inimitable sources of advantage and can lead to superior firm performance. Once built, they are very difficult to imitate by competing firms (Day 1994; Vorhies & Morgan 2005).

From a dynamic capabilities perspective, environmental marketing strategy (EMS) is proactive in nature as it is derived from corporate environmental orientation (a resource) and its marketing capabilities in response to market changes (Berry & Rondineilli 1998; Aragon-Correa & Sharma 2003).

Therefore, EMS, EO and MC are three distinctly different concepts. EO is related to a firm's overall value and business philosophy about the importance of natural environment, and can

be reflected by top management's commitment to environmental issues (Banerjee, et al 2003) and is less susceptible to external pressure (Baker & Sinkula 2005). By contrast, EMS is about the strategy development process that resides on both EO and the firm's capability to coordinate and reconfigure available resources in response to market changes, and to respond to these marketing plans quickly and efficiently. An environment-oriented firm may or may not be able to develop an EMS, because the efficiency and responsiveness of the firm's cross-functional business processes are idiosyncratic to it, and hard for others to imitate (Eisenhardt & Martin 2000). EMS is different from MC because of its focus on the processes of integrating environmental concerns into marketing strategy development and execution. Similarly, firms with necessary marketing capabilities may or may not be able to develop EMS, depending on the management team's environmental strategic orientation. Therefore:

H1. EO as a resource is directly and positively related to the firm's environmental marketing strategy (EMS). Firms with a higher level of EMS (proactive) tend to demonstrate higher levels of EO than those with lower levels of EMS (compliance mode);

H2: A firm's marketing capabilities are directly and positively related to its proactive environmental marketing strategy (EMS). Firms with a higher level of marketing capabilities tend to adopt proactive environmental marketing strategies (Aragon-Correa & Sharma 2000; Hart 1995; Baker & Sinkula 2005);

3.2 Relationships between Customer Pressure, Environmental Marketing Strategy and Environmental Performance

Market and business factors play an important role in driving firm's environmental strategies (Berry & Rondinelli 1998). One determinant factor that stands out as central to all the others is the pressure exerted by the firm's stakeholders (Banerjee 2002; Delmas & Toffel 2004).

Recognizing customers' environmental concerns, firms are motivated to develop innovative business strategies that are both profitable and environmentally responsible (Graham & Havlick 1999; Baker & Sinkula 2005; Perego & Hartmann 2009). In the context of the forest products industry, power in the supply chain has been increasingly shifting from manufacturers to retailers who control market outlets. Lefaix-Durand et al (2006) studied procurement strategies in the US homebuilding industry and found that large homebuilders are gaining purchasing power and influence over suppliers in the supply chain. The authors contend that although the current purchasing agreements between homebuilders and suppliers are short-term and in favor of professional dealers, "more direct, cooperative, and long-term oriented relationships with suppliers supported by information technologies are expected to develop over the next five years". In the Chinese forest products industry, customer pressure largely comes from international buyers and investors who are seeking to improve their environmental performance and reputation and are increasingly concerned about the performance of their upstream suppliers in the value chain (Delmas & Montiel 2009).

Therefore:

H3: Customer pressure has a direct and positive impact on firm's adoption of environmental marketing strategies (Berry & Rondnelli 1998).

As the Kingfisher example shows (in Chapter 1), customer pressure may also have a direct impact on firm's environmental performance by setting mandatory responsible purchasing standards through corporate policy. Therefore:

H4: Customer pressure has a direct and positive impact on firm's environmental performance.

3.3 Relationship between Environmental Marketing Strategy and Performance

Corporate performance is determined by how effectively and efficiently the firm's business strategy is implemented (Olson, Slater & Hult 2005). In the literature, the majority of performance measures studied are market-based, such as return on investment, sales growth, and competitive advantage. Researchers have called for the use of non-business measures to evaluate overall corporate performance, as corporate performance is a multifaceted construct and non-business indicators of improvement can provide incremental information on current business performance (Hemmer 1996). This is particularly relevant to the forest products industry in China, as it is facing serious sustainability challenges that are threatening the industry's future growth.

By following this thought, this study will measure both competitive performance and environmental performance in order to better understand the impact of an environmental marketing strategy on corporate performance.

Environmental strategy, which is proactive in nature (Aragon-Correa, Hurtado-Torres, Sharma & Garcia-Morales 2008), requires changes in routines and operations and has been identified as an organizational competence (e.g., Christmann 2000; Hart 1995) because it requires the complex coordination of heterogeneous resources in order to reduce environmental impacts and simultaneously maintain or increase firm competitiveness. By adopting environmental marketing strategies, firms can allocate more resources and specialties to deal with environmental issues, and therefore can improve their environmental performance (Branzei, Vertinsky, Takahashi & Zhang 2001). The process of implementing environmental marketing strategies addresses how environmental concerns are integrated

into marketing activities. Firms adopting and implementing environmental marketing strategies may raise their expectations for superior business and environmental performance relative to competitors, reflected by such measures as cost advantage and reputation.

Therefore:

H5: An environmental marketing strategy is directly and positively related to environmental performance and

H6: An environmental marketing strategy leads to improved competitive performance

3.4 Relationship between Environmental Performance and Competitive Performance

In the literature, there has been an on-going debate with regard to the relationship between a firm's environmental performance and its competitive performance. People with skepticism would argue that, due to the perceived high costs of improving environmental performance, and the uncertainty and long-term returns of such investments, firm's pursuit of improved environmental performance may result in a degradation of firm's competitive performance (Engardio, Capell, Carey & Hall 2007). However, Hart (1995) and his colleague (Hart & Ahuja 1996) theorized that environmental management, similar to quality management, is a process that focuses on efficiency improvement and cost reduction over the long term, and therefore improved environmental performance in such areas as pollution reduction and energy conservation will eventually improve business performance - although EM may be costly in the beginning and may take some time to realize savings. Porter shares a similar view and argues that strict environmental regulations may drive innovation and force industry to reduce costs and find innovative solutions and new markets. From the perspective of corporate social responsibility, firm's proactive environmental initiatives are analogous to reputational risk management which will help firms gain "legitimacy" to do business in the long run by establishing good relationships with the community, stakeholders, consumers and environmental campaigners (Skapinker 2008).

In the context of the forest products industry, some scholars (e.g., Buehlmann & Schuler 2009) maintain that the current market environment in favor of green products may benefit the US-based forest products industry which has been operating in a generally better managed/regulated forestry environment and therefore has a higher environmental

performance and green reputation than many exporting countries. This advantage will help the industry increase its competitive performance in the marketplace where there is seeing an increasing demand for green products and responsible trade.

This study holds that good environmental performance can translate into improved competitive performance. Performance measures will be discussed further in the next chapter.

Therefore, it is hypothesized that:

H7: Environmental performance is directly and positively related to firm's competitive performance

3.5 Moderating Variables

A moderating variable is one which alters the relationship between other variables (Hair et al 2006). Three moderating variables are included in this study: a firm's export orientation, environmental certification and regulatory pressure.

3.5.1 Export Orientation

The impact of globalization on the Chinese forest products industry is well documented (Cao, Seol & Eastin 2010). Research has suggested that increased trade links between China and the developed countries contributes to the improved environmental performance of Chinese industry. Firms owned by foreign investors or multinational firms that export to developed countries were found to be more likely to self-regulate their environmental performance. In addition, firms selling a significant proportion of their output to multinational customers within China were found to be more likely to adopt ISO 14000 (Christmann & Taylor 2001 & 2002). Seeking to improve their environmental performance and reputation, global retailers such as Wal-Mart and IKEA have developed corporate sourcing policies and set internal environmental standards with which major suppliers must comply. Therefore, the strength of the business ties that Chinese forest products firms have with foreign customers may have an impact on a firm's adoption of an environmental marketing strategy, environmental and competitive performance.

3.5.2 Regulatory Pressure

The growing number of environmental regulations now confronting the forest products industry are a reflection of public concern for the natural environment. Neo-institutional

theory has found that a strict regulatory environment as a result of strengthening governance networks often has an immediate impact on firm behavior (Cashore & Vertinsky 2000). In the context of the Chinese forest products industry, an increasingly strict regulatory environment (e.g. amended U.S. Lacey Act and EU FLEGT) is expected to exert significant impacts on all sectors of the industry's supply chain, from raw materials sourcing to exports. The potential impacts from international trade policies are viewed quite differently among the Chinese industry. Supporters believe that these policy changes have strengthened forestry governance and conservation by punishing firms that are involved in the illegal logging and timber trade. However, many Chinese firms, believing that they are not involved in any illegal activities, maintain that these policies just create trade barriers to limit Chinese firm's access to international markets. Below are two contrasting views expressed by corporate managers who spoke at the "Forests, Markets, Policy and Practices" conference in Beijing in September 2010:

"Lacey Act, EU regulation and other initiatives are changing the "rules of the game" toward mandatory legal compliance. Firms now need to know their own laws and the laws of the countries they trade with."

"China is now a big player in terms of global forest products import or export, but the industry is facing rising trade barriers such as Lacey, EU FLEGT. These policies won't work, because concepts like 'due care' and 'due diligence' are too complex for industry to compliance. All these may just end up increasing costs for consumers. There will be a need for mutually positive solutions internationally and domestically and are acceptable to the 100,000 forest manufacturers in China"

As these trade policies are still new to the industry, their impacts are yet to be observed

(Phase IV of the Lacey Act became effective on April 1, 2010, and the EU FLEGT policy won't be fully implemented until 2012). In this study, regulatory pressure will be measured

as a moderating variable in order to evaluate how forest institutions may influence industry's environmental marketing and its impact on competitive and environmental performance.

3.5.3 Environmental Certification

Different from government regulations and inter-governmental environmental agreements, voluntary environmental certification is not legally binding since it exists within a more informal framework for corporate self-regulation advocated by a wide range of stakeholders. With increasing support from the industry and NGOs, third-party environmental certification is seen as a complement to public policies (Donovan 2010). As analyzed in Chapter 1, third-party forest certification such as FSC is increasingly being adopted by Chinese firms as they need (or are requested by customers) to achieve export market recognition and access through the demonstration of their compliance with international environmental standards (Cao, Seol, & Eastin 2010). Therefore, it can be expected that environmental certification could have an impact on the relationships discussed above.

A full structural model with hypothesis are depicted below in Figure 10:

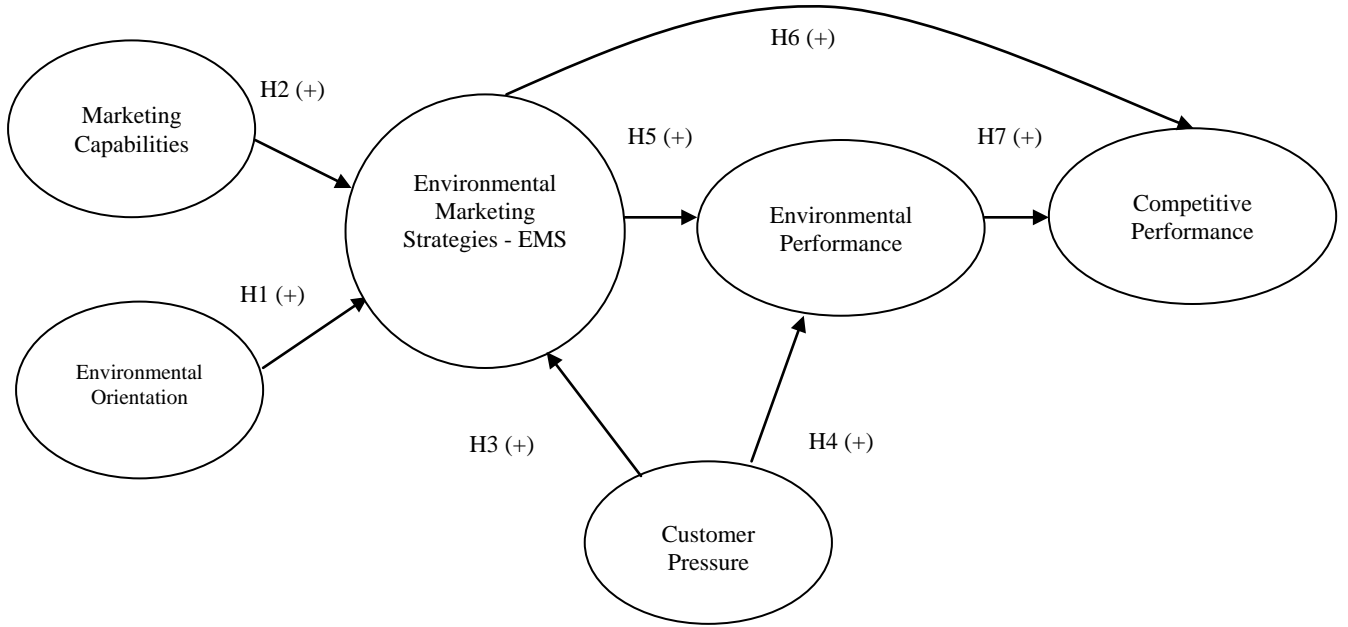


Figure 10 Full Structural Model and Hypothesis

Chapter 4. Measurement Development

This study employs a combination of primary and secondary research methods in developing measures for the key constructs, so as to combine the originality of this study with its connection to existing disciplinary knowledge and previous research.

4.1 Findings from the Field

Given limited research has been conducted on environmental marketing in the context of the forest products industry, particularly with a focus on China, it is critical to incorporate managers' insights into measurement development to increase the validity of the measurement of EM. With this, a series of managerial interviews were conducted between August 2008 and June 2009- the period when the author of this study worked as TREES program manager at the Rainforest Alliance's Asia-Pacific Regional Office (APRO) in Bali, Indonesia. APRO manages business portfolios in over 10 countries in Asia and Oceania. In China, it has over 150 FSC-certified forest products clients (as of 2009), including COC-certified manufacturers and FM-certified forest management units. This experience provided a good opportunity for the author to work with the industry, including certified and non-certified firms in various sectors of the supply chain, and to learn their opinions regarding environmental marketing, particularly, surrounding 2 key questions below:

- 1) What "good practices" are in use as firm's environmental marketing strategy? Why were these strategies/practices adopted?
- 2) Why does your firm certify (or not)?

Among a large variety of environmental marketing practices mentioned, sustainable sourcing, supplier education and communication with stakeholders on firm's sustainable practices emerged as the key components of EM, based on the conversations with corporate managers.

For example:

"My firm is pursuing a wide array of environmental marketing strategies, among which communications among suppliers and stakeholders are key issues, and there need efforts to

actively share information with suppliers, customers, stockholders and others partners that are important to your business. The firm is also working with FSC on forest certification. In addition, it is addressing labor health and accountability concerns, and purchasing carbon pool through REDD projects in the Amazon forests. We will continue to promote responsible purchasing by improving communications and cooperation between consumers and suppliers through education and public awareness campaigns, in which government has an important role.”

“We are leading the trend among global retailers to promote responsible forestry and products in China. Challenges include ensuring sustainable forest management, adequate quality and quantity of forest resources, and legal cross-border trade with Russia. As part of environmental strategy, the firm is proactively taking actions to: create demand for legal and responsible wood supply; work long-term with suppliers; develop projects with government and NGOs; and communicate with customers and the general public. It is also supporting FSC certification, in cooperation with WWF, RA, FSC and the Chinese government.”

“As a global retail leader, the firm has committed to three sustainability goals: to be supplied 100% by renewable energy; to create zero waste; and to sell products that sustain people and the environment – as a most important part of environmental marketing strategy. Regarding responsible timber procurement, the firm is engaging suppliers to improve the traceability and transparency of sustainable sourcing practices. These efforts include: developing guidelines for responsible sourcing; gaining transparency to supply chains; collaborating to align partners upstream in the supply chain; and auditing suppliers to ensure they meet legal requirements for timber procurement.”

“The reason for this choice is that there is limited or no supply of green furniture in China yet. The western market is already very mature, and there is a wide offer. As far as China is concerned, I am convinced that demand for products that are good for the environment, promote good business practice and that are good for health are the future... Chinese consumers are growing more mature and sophisticated. With an increasing disposable revenue and growing urbanization in mega-cities, they will more and more try to improve their quality of life and pay more attention to the environment of their houses. Air quality is one major gauge to evaluate the housing environment (noise is another). Products that can improve the housing environment, because they are good for health and keep the house free from toxins, will attract more attention from consumers, same for green products that inflict less harm to the environment.”

Forest certification is widely perceived as an integral part of EM as it is perceived to be closely related to all the key components of EM, for example:

“We need forest certification because it is imbedded in the firm’s CSR policy, important for the industry’s long-term future, and essential for access to some markets. Initial challenges included: no recognized standard below full certification; supplier reluctance to join; buyer indifference; and high cost of attaining timber legality verification. However, there is good

progress on these fronts: support from buyers with strong CSR policy; public sector requiring proof of legality; and movement from voluntary to mandatory compliance (e.g. Lacey Act and EU Due Diligence Regulation) resulting in equal competition. At present, the firm is meeting banking sector requirements, increasing awareness of benefits from resource owners and suppliers, and enjoying continued market access.”

“We want forest certification and environmental strategy because they represent industry’s future – the earlier we move toward this direction the better chance we can beat our competitors.”

“We use third-party certification to raise credibility of our firm, and bring more business partners into the chain-of-custody system.”

In the meantime, many firms, particularly small-medium-sized businesses, expressed their concerns of excessive cost burden associated with forest certification and legal verification that are increasingly demanded by the market and international buyers. For example:

“I see that small-medium-sized firms are operating in an increasingly difficult industry environment – both politically and economically. Trade barriers and rising production costs all the challenges they are facing. In the meantime, they lack the resources and know-how to develop any proactive environmental market strategies, just compliance with requirement of customers. This will further put them in a disadvantageous position in international competition. So a critical task for large retailers, NGOs, and the government, is not only coaching SMEs how to comply with environmental standards, but also positively influencing these SEMs taking a leadership role in developing low cost environmental market strategies as new competitiveness”

In summary, it can be seen that EM is a multi-faceted concept as perceived by industry “green” leaders. In the context of the forest products industry, sustainable sourcing, communication, vendor/supplier education, as well as third-party certification under internationally recognized standards are most relevant to EM. However, the high costs associated with these activities may prevent a wider adoption of EM in the industry, particularly among SMEs.

4.2 Measurement of Key Constructs

In addition to these interviews, this study also analyzed industry dynamics and searched the previous literature in line with the theoretical perspectives of this study. The measurement for each key construct and the moderating variables is analyzed below:

4.2.1 Environmental Marketing and Strategy (EMS)

Regarding the literature, it has been noted that environmental marketing can be either strategic (formulated and implemented at the highest level of corporate strategy), quasi-strategic (at the business strategy level) or tactical (functional) (Menon and Menon 1997). An environmental marketing strategy can be reflected in the actions at a key operational level a firm has taken to change/improve its business routines (business-as-usual) to be more environmentally friendly (Sharma & Vredenburg 1998; Chan 2005 & 2010). In the context of forest products industry, EMS has also been studied at various operational levels, including eco-labeling (forest certification), advertising, product development, and corporate social responsibility (Kärnä 2003). In a study with sawmills in North Europe and North America, Kärnä (2003) found that the development of environmental marketing is still in its infancy due to the low demand for environmentally friendly products. Based on previous research, personal observations, and in-depth interviews with managers in the Chinese forest products industry, this study measures EMS by the extent to which environmental concepts and concerns are incorporated into the following operational areas: sourcing, pricing, product development, vendor/supplier selection, communication, and customer-targeting.

In this study, the environmental marketing behavior of the firm is measured on the strategic level. Measurements of EMS consist of the following items measured with a 1-7 likert-type scale based on previous research and industry interviews:

Indicators of EMS (1= highly insignificant, 7=highly significant)	Code
1. To what extent has your firm modified its procurement (sourcing) practices to reduce impact on natural forests/environment (e.g., remove illegal timber from supply chain)	EMS_SOUR*
2. To what extent has your firm modified its pricing strategies to differentiate products made from sustainable sources	EMS_PRIC
3. To what extent has your firm modified its product strategies to encourage development of environmentally friendly products	EMS_NPD
4. To what extent has your firm emphasized environmental performance in selecting suppliers/vendors	EMS_VEND
5. To what extent has your firm emphasized the environmental aspects of your products and services in your ads / communications with stakeholders	EMS_COMM
6. To what extent has your firm incorporated environmental awareness in selecting most important (target) customer group(s)	EMS_MKTG

*dropped from final analysis

4.2.2 Competitive Performance (CMP)

Competitive performance (CMP) is measured by 5 items adopted from studies by Banerjee et al (2003), as well as the work by Fang & Zou (2009). Respondents were asked to evaluate their firms' competitive performance in relation to key competitors. All of the ratings were coded on seven-point scales:

Indicators of CMP (1 = much worse, 7 = much better)	Code
1. Realize substantial cost advantages	CMP_COST
2. Enter lucrative new markets and acquiring new customers	CMP_NMKT
3. Increase sales to current customers	CMP_SALE
4. Increase market share by making our current products more environmentally friendly	CMP_MKTS
5. Differentiate our products/services from competitors	CMP_DIFF

4.2.3 Environmental Performance (EP)

EP is measured by the following 4 items adopted from Chan (2005). Similar to competitive performance, respondents were asked to evaluate their firms' environmental performance in relation to key competitors. All of the ratings were coded on seven-point scales:

Measurement Indicators for EP (1 = much worse, 7 = much better)	Code
1. Comply with environmental regulations	EP_COMP
2. Reduce environmental impact beyond regulatory compliance	EP_BYND
3. Prevent and mitigate environmental crises	EP_PREV
4. Educate employees and the public about the environment	EP_EDU

4.2.4 Marketing Capabilities (MC)

Marketing capabilities refer to a firm's ability to transform available resources into valuable outputs (e.g. competitive advantage) through integrated marketing mix strategies (e.g., Day 1994; Vorhies & Morgan 2003&2005). Because forest products firms are largely "selling organizations" that depend on skills and capabilities that can generate leads and then

convince industrial customers to purchase products, the notion of marketing capabilities is relatively new to forest products firms, particularly to export-oriented wood products manufacturers in China as OEMs. Relevant marketing capabilities have yet to be comprehensively catalogued. Synthesizing insights from managerial interviews with those in the literature (ref. Day 1994; Vorhies & Morgan 2003; Vorhies, Morgan & Autry 2009), nine distinct types of marketing capabilities are suggested. A 1-7 liker-type scales was used to measure how well a responding firm performs the marketing activities relative to its closest competitors:

Indicators of MC (1 = much worse, 7 = much better)	Code
1. Advertising and promotion	SMC_ADS
2. Personal selling	SMC_PESL
3. Pricing	SMC_PRIC
4. New product/service development	SMC_INN
5. Supply chain management	SMC_SCM
6. Environmental scanning	AMC_SCAN
7. Market planning	AMC_PLAN
8. Marketing implementation	AMC_IMPL
9. Internal coordination and communication	AMC_COMM

4.2.5 Environmental Orientation (EO)

EO was measured by asking respondents to evaluate statements relating to their firm's environmental policy and the importance of the natural environment to the firm, with measurements adopted from the work by Banerjee et al (2003):

Indicators of EO (1 = strongly disagree, 7 = strongly agree)	Code
1. At our firm, we make a concerted effort to make every employee understand the importance of environmental preservation	IEO_EMP
2. Our firm has a clear policy statement urging environmental awareness in every area of operations	IEO_OPER
3. Preserving the environment is a central corporate value in our firm	IEO_VAL
4. The financial well being of our firm is directly related to the state of the natural environment.	EEO_DIRE*
5. Our firm's responsibility toward environmental preservation is less important than our responsibility to its customers, stockholders, and employees.	EEO_LESS (R)*
6. Environmental preservation is vital to our firm's survival	EEO_VITA*

*dropped from final analysis; R – reverse coded

4.2.6 Customer Pressure (CP)

Measures of CP were also adopted from research by Banerjee et al (2003). Three items were used to measure customer pressure:

Indicators of CP (1 = strongly disagree, 7 = strongly agree)	Code
1. Our customers have clearly communicated their environmental policy to us	CP_POLY
2. Our customers are increasingly demanding environmentally friendly products and services	CP_PROD
3. Our customers expect our firm to be environmentally friendly	CP_EXPE

4.2.7 Moderating Variables

In this study, regulatory pressure (RP) is treated as a first-order construct with 4 measures adopted from the research by Banerjee et al (2003):

Indicators of RP (1 = strongly disagree, 7 = strongly agree)	Code
1. Regulation by government agencies has greatly influenced our firm's environmental strategy	RP_STRG
2. Environmental legislation can affect the continued growth of our firm	RP_GRW
3. Stricter environmental regulation has become major driver of our firm's environmental practices.	RP_PRAC
4. Environmental regulation has been increasingly strengthened in our industry.	RP_INDU

Export Orientation (EXP) is measured as percentage of total revenue derived from exports in 2009, ranging from 0 to 100%. Environmental Certification (CERT) is measured in terms of the number of environmental certificates that a firm is holding.

Chapter 5. Data Collection And Analysis

After the preliminary survey were developed, a group of scholars and senior managers who are knowledgeable on the topic were invited to evaluate the relevance of these measures to forest products industry as a way to ensure content validity. A questionnaire survey was subsequently developed and tested with 3 senior managers working in the forest products industry in China, with satisfactory results. While English was initially used to develop the questionnaire, it was subsequently translated into Chinese to facilitate respondents' understanding. The linguistic equivalence between the two versions was also ensured by employing the back-translation technique (Bhalla & Lin 1987). The survey questionnaire is presented in Appendix 4.

5.1 Data Collection

Survey data was collected during three major industry events between March 23-30, 2010, which included 2 trade shows - Domotex ChinaFloor (Shanghai) and Interzum Furniture (Guangzhou) - and an international conference - World Flooring Forum in Shanghai. At each event, three to four student interns were hired as survey staff to distribute survey questionnaires and collect responses. All staff had generally good survey experience and interpersonal skills, and all received a 2-hour training specifically for this survey on methodology and communication skills before the survey, to ensure data was collected in a consistent manner.

At each trade show, staff visited an exhibiting firm's booth and invited managers to participate in the survey. In cases where the managers agreed to take the survey right away, researchers would sit down with them and walk through the questions to make sure that every question was well understood and answered properly. For those who agreed to take part in this survey but could not complete during the same visit, appointments were made at a later time of the day so that researchers would return to the booth to pick up the survey completed. At the WFF conference, researchers distributed surveys to all participants, and collected the completed surveys during meeting breaks.

A total of 720 surveys were distributed at these three events, 207 were collected, 153 of which were fully completed, representing a total response rate of 21.25% (Table 2). Although lower than what was expected, this response rate is not unusual in today's business environment (e.g., Baker & Sinkula 2005). The length and difficulty of the survey, and

comparable response rates in similar studies all suggest that the sample was adequate for the purposes of this study.

Table 2 Survey Response Rates for Three Events

Events	Survey collected	# Completed	% Completed
Domotex ChinaFloor	72	41	56.9
WFF	61	35	57.4
Interzum Guangzhou	74	67	90.5
TOTAL	207	153	73.9

5.2 Respondents Profile

By estimation, there are at least 100,000 wood manufacturing firms operating in China, most of which are located in the east and the south. Like in North America and most places in the world, the majority of Chinese forest products firms are SMEs, but there are also many billion-dollar giants such as Lacquer Craft, Dare Group and Shandong Chenming Group who rank among the world's largest manufacturers and exporters. Wood-based panel and furniture are major sectors of the wood industry in terms of timber consumption. According to statistics (State Forestry Administration, 2009), in 2007, the wood-based panel sector accounted for nearly 41% of the total industry output of US\$51 billion, followed by furniture-manufacturing 22.5%. Over 20% of wood manufacturers are located in South China's Guangdong Province - which is the country's furniture-manufacturing base and accounts for roughly one-third of the country's total wood furniture production (by volume), and 40% exports in terms of value. Recently, due to fast-rising labor and land costs in South China, an increasing number of wood manufacturers are moving production facilities to North China, East China's Zhejiang Province and the interior province of Sichuan or even overseas to Russia, Southeast Asia, Latin America and Africa . Figure 11 provides an illustration of the Chinese wood industry regional distribution based on statistics from government sources.

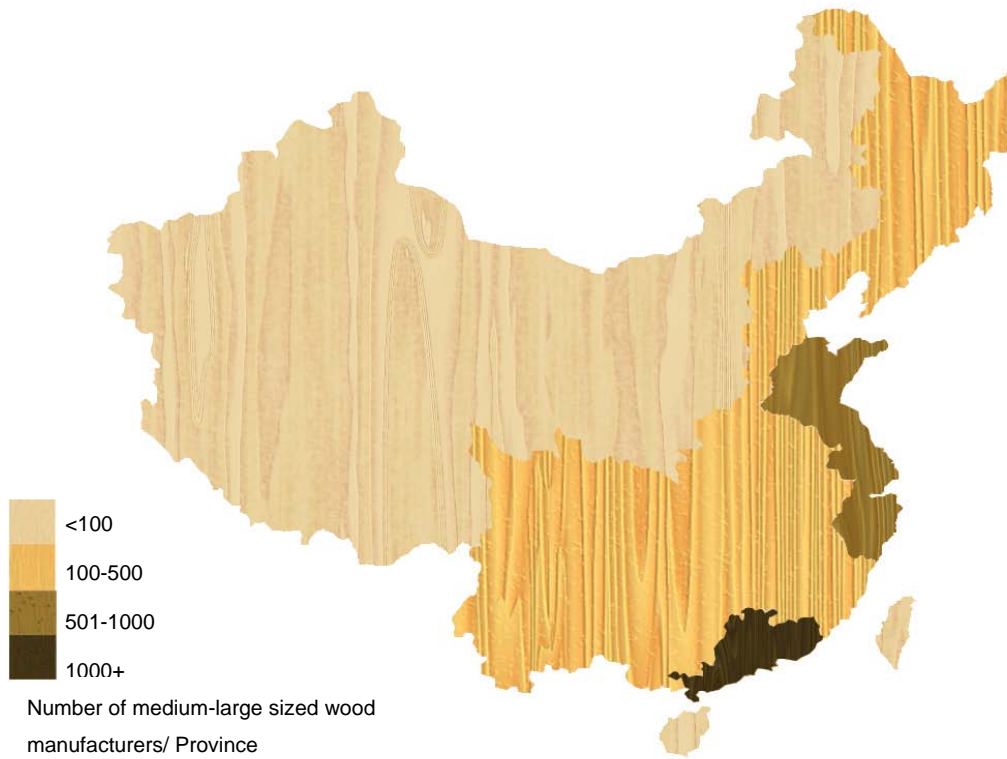


Figure 11 Wood Industry Regional Distribution in China (Mainland)

Among 207 survey respondents, nearly two thirds (66%) were wood products manufacturing firms (primarily, flooring and furniture firms), followed by distributors (11%) and importers and exporters (9%) (Figure 12).

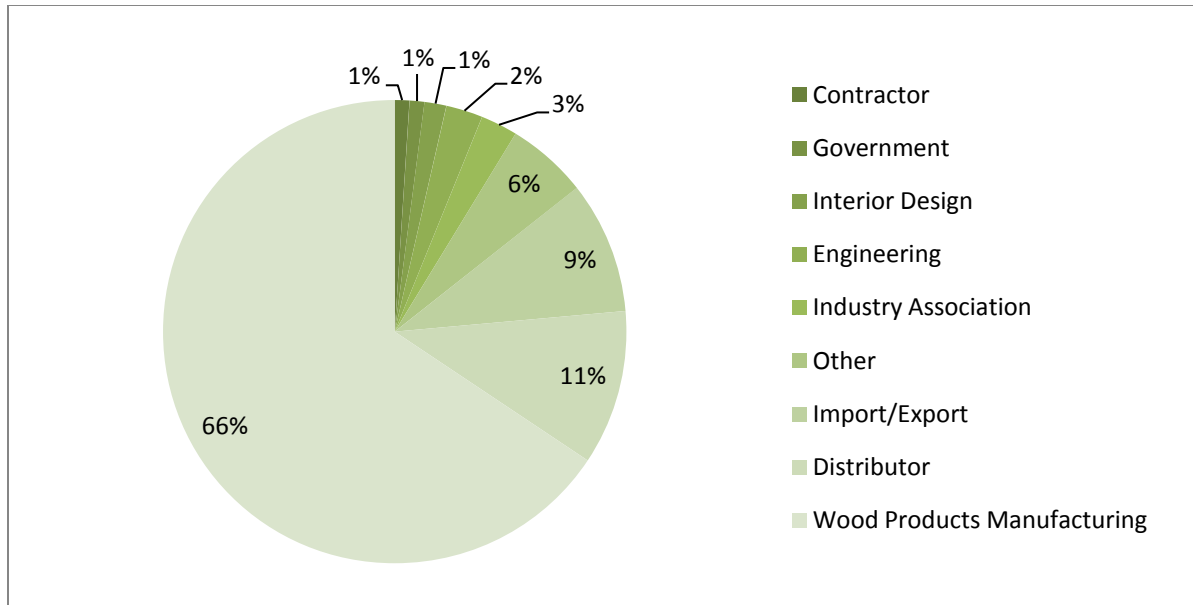


Figure 12 Respondents by Business Types

These firms are distributed in 20 provinces/autonomous cities, led by the provinces of Guangdong (29%), Shanghai (19%), Zhejiang (11%) and Jiangsu (8%) (Figure 13). Figure 14 presents a graphical illustration of the location of responding firms on the regional level. These regions are also major manufacturing areas for the industry (Figure 11), suggesting that the sample collected through this survey provides a reasonable representation of the industry population. ANOVA tests did not reveal any significant difference in key variables among the samples collected from the 3 events, thereby ruling out the possibility of serious cross-regional bias.

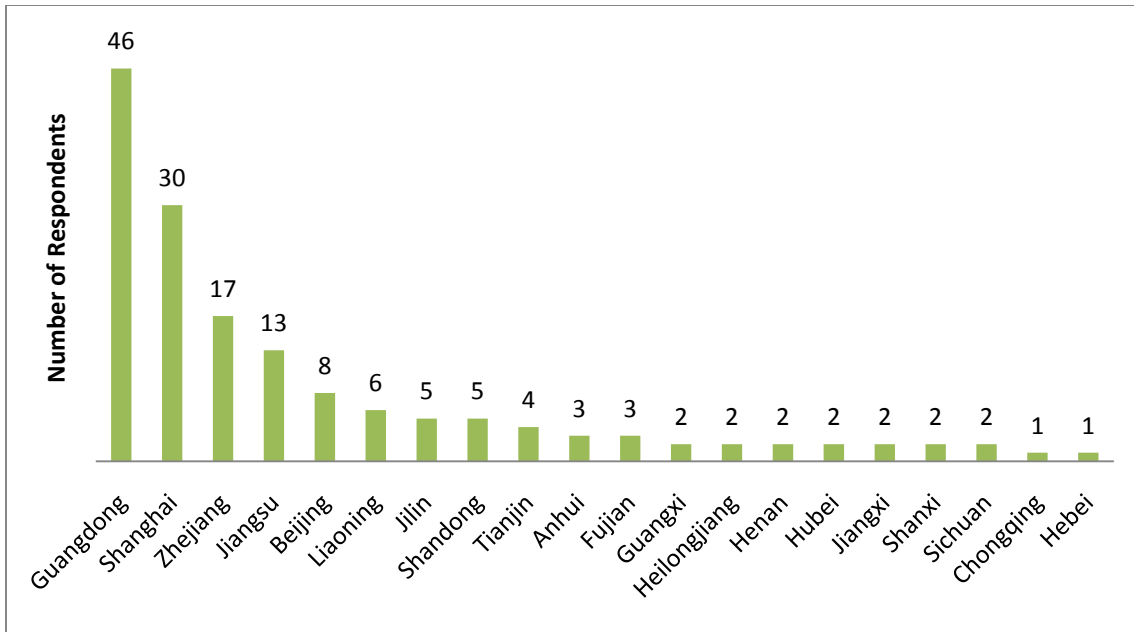


Figure 13 Distribution of Respondents by Province

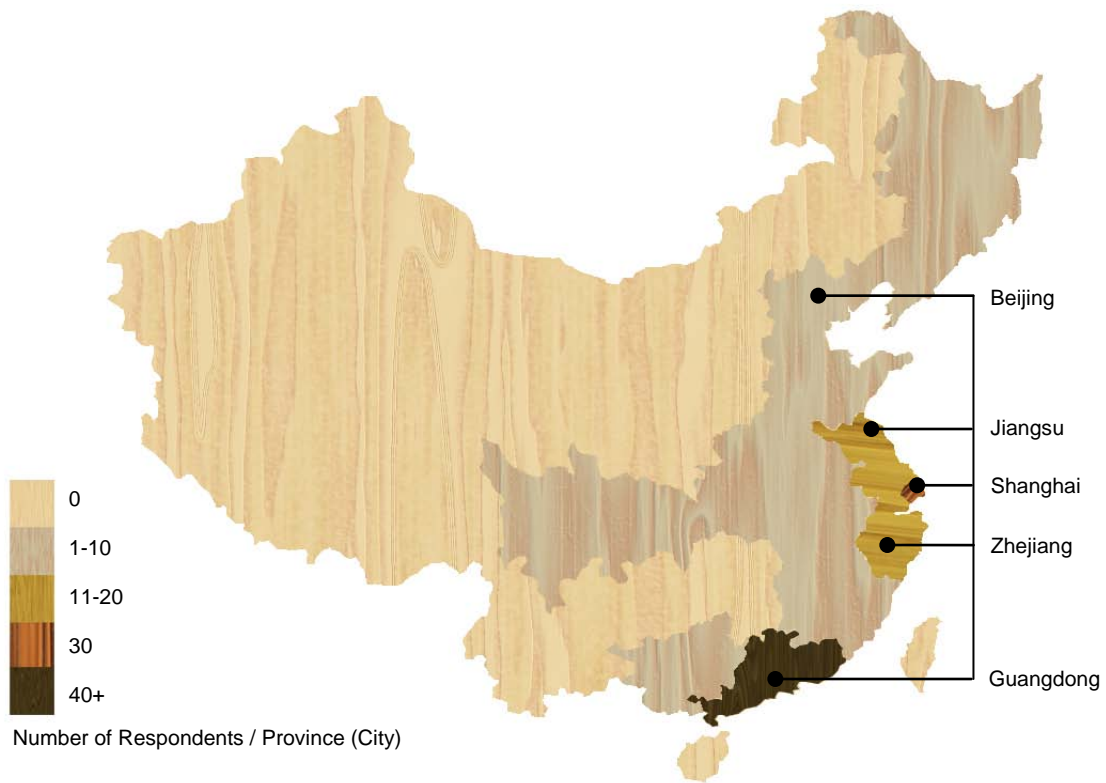


Figure 14 Distribution of Respondents by Region

In terms of size, small- and medium-sized firms (with less than 500 employees) together accounted for over 70% of the sample (Figure 15), which is a good representation of the industry's demographics. These firms reported an average of 14.6 years of business experience, with the oldest firm being 60 years old. Only a quarter of these firms reported zero sales to either overseas markets or China-based foreign firms during the past year. In the follow up analysis, bi-variate correlation between firm size and all key constructs in the model was examined. No significant (at $p < .05$ level) correlation was found. This suggests that an environmental marketing strategy, which is commonly viewed by the industry as a "privilege" of bigger firms, is erroneous. Smaller firms, although limited by the availability of resources and expertise, can still develop successful environmental marketing strategies to improve the bottom lines of their businesses. Similar opinions were also expressed by previous research (e.g., Aragon-Correa, et. al. 2008)

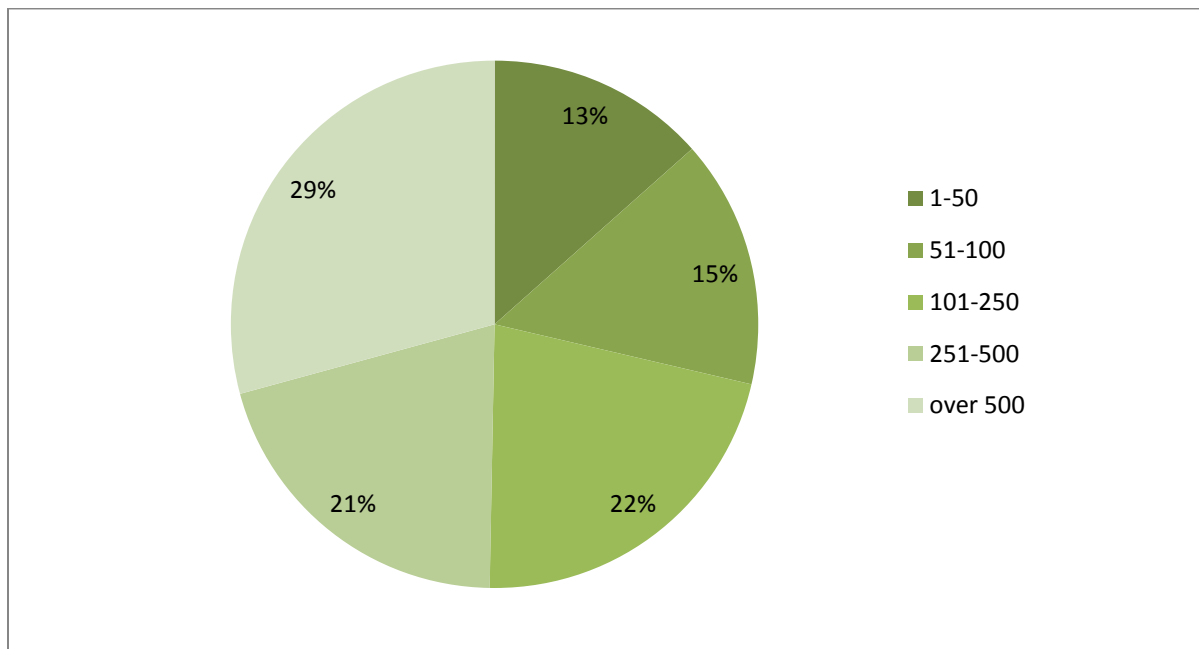


Figure 15 Respondents by Firm Size

In the survey, respondents were asked to choose from a list of major environmental certificates that their firm hold (Figure 16). The results show that most firms hold at least one type of environmental certificate, and many are holding two or more. Only 20.4% (40) of respondents indicated their firms didn't have any environmental certificate. This suggests that environmental certification has become quite widespread in the forest products industry in China.

Among these environmental certification schemes, environmental management system certification (ISO14001) was the most popular, checked by 58% (113) of respondents. China Environmental Labeling Program (widely recognized for its "ten ring" logo) is a government-led environmental certification program mainly designed for domestic public purchasing projects. It enjoys a high level of popularity and was selected by 37% (73) of respondents. About 27% (52) of responding firms hold FSC certificates. The increasingly popular CARB certification for formaldehyde emission was held by about 13% of the respondents. PEFC accounted for less than 7% (13) of the total respondents. The ratio of FSC- and PEFC-certified firms in this sample (4:1) is smaller than the actual gap in industry population. As of December 2009, there were over 1,000 FSC-CoC firms in China, while the number of PEFC-certified firms was about 100. Other environmental certifications selected by responding firms include UKAS.

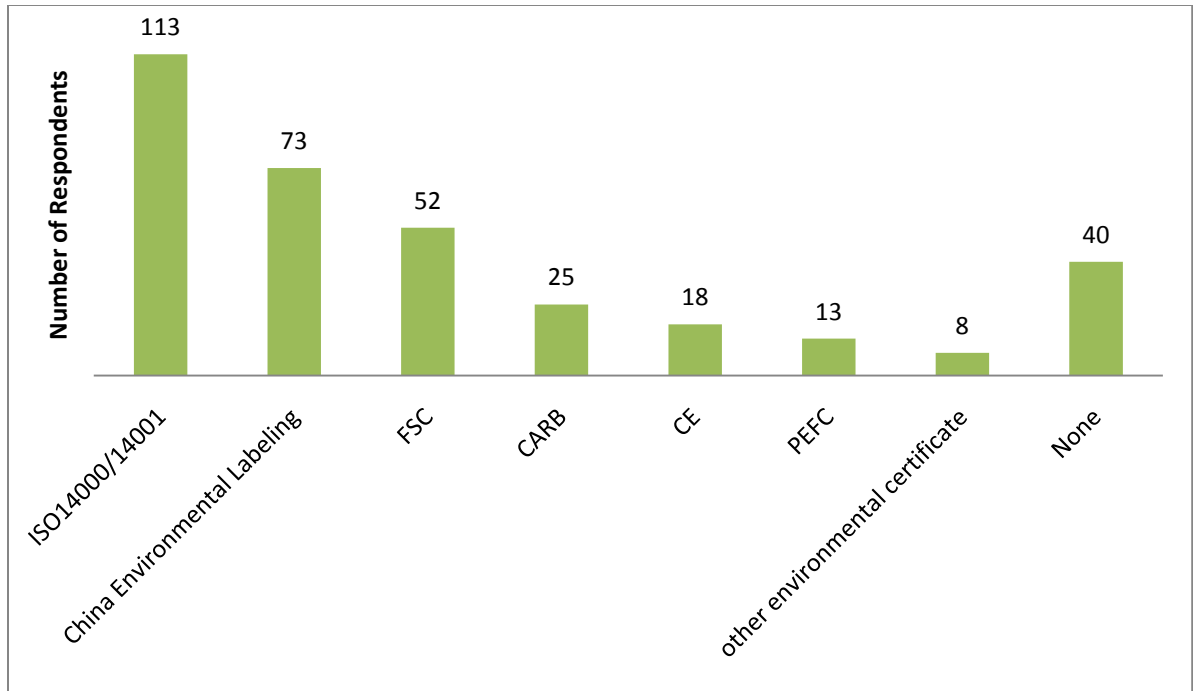


Figure 16 Environmental Certificates Held by Responding Firms

ANOVA test did not reveal any significant difference among responses from different trade shows or regions, thereby ruling out the possibility of serious cross-event bias. Also, a t-test was performed and showed no significant difference between partially completed responses and fully completed responses, thereby suggesting that possibilities of serious non-response bias can be ruled out.

In terms of export orientation, which is measured as the percentage of total revenue from the past year that was achieved by from exporting directly or selling to foreign owned businesses operating in China, this survey reveals that only 16% of the responding firms are domestic sellers, with the rest reporting an average of 45% of their sales were achieved through businesses with foreign-owned firms in China or overseas buyers (Figure 17).

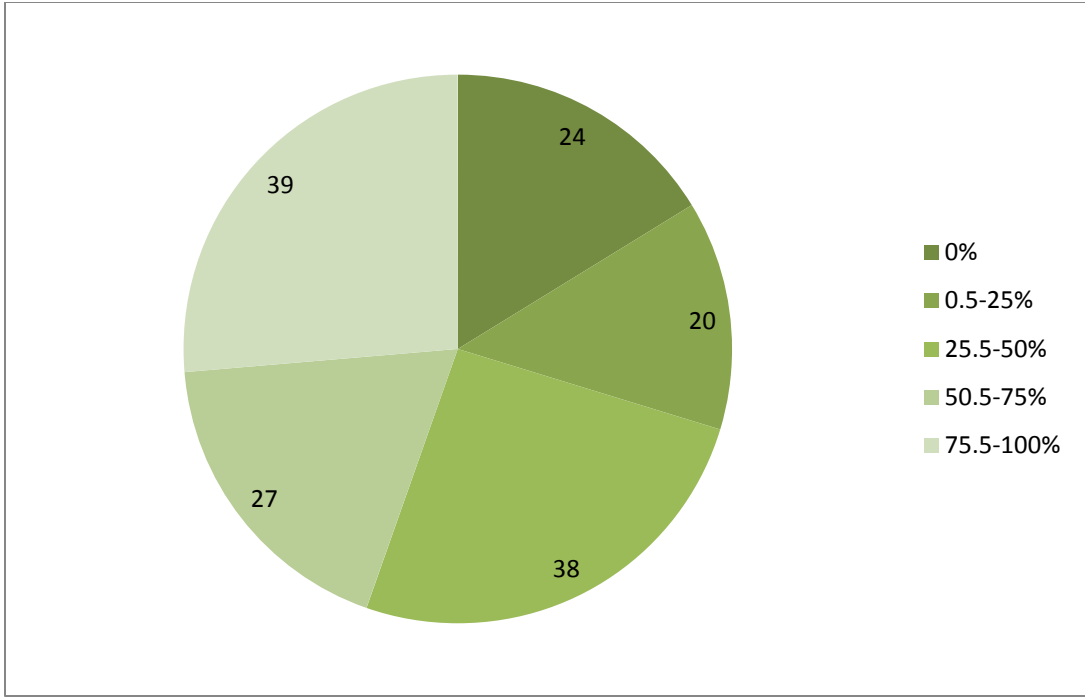


Figure 17 Respondents by Export Orientation

5.3 Data Analysis

5.3.1 Structural Equation Modeling

Structural equation modeling (SEM) is a powerful multivariate analysis technique that emerged in the mid-late 1980's in the social sciences arena for modeling complex relationships between latent variables (Bollen 1989). A full structural model consists of latent variable model and measurement model, which can be specified as below.

Latent Variable Model:

$$\eta_{(mx1)} = B_{(mxn)} * \eta_{(mx1)} + \Gamma_{(nx1)} * \xi_{(nx1)} + \zeta_{(mx1)}$$

Where:

Symbol	Dimension	Definition
Variables		
η	$m*1$	Latent endogenous variables
ξ	$n*1$	Latent exogenous variables
ζ	$m*1$	Latent errors in equation
Coefficients		
B	$m*n$	Coefficient matrix for latent endogenous variables
Γ	$m*n$	Coefficient matrix for latent exogenous variables
Covariance Matrices		
Φ	$n*m$	$E(\xi \xi')$ covariance matrix of ξ
Ψ	$m*n$	$E(\zeta \zeta')$ covariance matrix of ζ

Measurement Model

$$Y_{(px1)} = \Lambda_{y(px1)} * \eta_{(mx1)} + \varepsilon_{(px1)}$$

$$X_{(qx1)} = \Lambda_{x(qxm)} * \xi_{(nx1)} + \delta_{(qx1)}$$

Where:

Symbol	Dimension	Definition
Variables		
y	p*1	Observed indicators of η
x	q*1	Observed indicators of ξ
ε	p*1	Measurement errors for y
δ	q*1	Measurement errors for x
Coefficients		
Λ_y	p*m	Coefficients relating y to η
Λ_x	q*n	Coefficients relating x to ξ
Covariance Matrices		
Θ_ε	p*p	$E(\varepsilon \varepsilon')$ covariance matrix of ε
Θ_δ	q*q	$E(\delta \delta')$ covariance matrix of δ

Adopted from Bollen (1989)

A major strength of SEM is the ability to construct latent variables: variables which are not measured directly, but are estimated in the model from several observed variables each of which is predicted to indicate the latent variables (Bollen 1989).

Confirmatory factor analysis (CFA) and structural regression models are both special cases of SEM. Confirmatory factor analysis tests whether a pre-existing theoretical model underlies a particular set of observations. When SEM is used as a confirmatory technique, the model

must be specified correctly based on the type of analysis that the researcher is attempting to confirm. A model that fits the data well does not mean that the model is necessarily correct.

An important concept in SEM is the number of “observations” which relates to the degrees of freedom. Different from traditional regression analysis, the number of observations in SEM is calculated based on the number of covariance in the variance or covariance matrix, instead of the sample size (or number of subjects in the raw data). The function for calculating the number of observations in SEM is below:

$$\text{Observations} = v(v+1)/2$$

where v is the number of variables in the model.

Therefore, in SEM, the number of degrees of freedom is the difference between the number of observations and the number of parameters estimated in the model. The total number of estimated parameters is the total number of variances and covariances of exogenous variables (either observed or unobserved) and direct effects of observed variables on endogenous variables. In order to increase the number of degrees of freedom in an SEM model, it is not helpful to increase the sample size. It is necessary to increase the number of variables or to decrease the number of parameters modeled in any given example (Kim 2005; Bentler 2005).

The SEM modeling approach generally requires a large dataset. For small datasets, the robust maximum likelihood estimation (MLR) can be used for confirmatory factor analysis and structural equation modeling. It provides test statistics and standard errors that are robust to non-independence of observations and non-normality to formally test a structural equation

model and to generate corresponding factor scores. This method is available in EQS v 6.1 for Windows (Byrne 2008).

5.3.1 Univariate and Multivariate Normality

Skewness and kurtosis values for univariate normality were checked for all indicator variables, combined with P-P plot and Q-Q plot. Shapiro-Wilk and Shapiro-Francia tests were also employed to test normality. Initial screening of summary statistics suggests that skewness and kurtosis values for all items can be considered satisfactory in general (within or close to +/- 1.5 range), which satisfy the normal distribution assumptions of multivariate regression techniques.

However, there was a significant departure from multivariate normality. Multivariate normality is required by maximum likelihood estimation (MLE), which is the dominant method in SEM for estimating structure (path) coefficients. Specifically, MLE requires normally distributed endogenous variables. The multivariate kurtosis value of the whole sample (Z-statistics) is 43.3 which is significantly higher than 5.0 as the upper limit value suggested by Bentler (2005). So the dataset cannot be considered as multivariate normally distributed. Violation of multivariate normality could inflate the computed chi-square value which in turn could lead researchers to think their models required more modification than they actually did. The violation of multivariate normality also tends to deflate (underestimate) standard errors moderately or even severely. These smaller-than-they-should-be standard errors mean that regression paths and factor/error covariance will be found statistically significant more often than they should be (Byrne 2008). Therefore, maximum likelihood using a robust computation (ML Robust) method should be used for confirmatory factory

analysis and structural equation modeling methods as recommended by Kline (2005) and Byrne (2008).

5.3.2 Validation of Measurement

Following the data normality check, the scales for dimensionality, reliability and validity were tested in a confirmatory factor analysis approach using EQS Windows version 6.1. Owing to its user-friendly nature, EQS is considered to be one of the best alternatives to the more traditional LISREL software (Hair, Black, Babin, Anderson & Tatham 2006). Another important advantage is that EQS v 6.1 offers a Maximum Likelihood (ML) Robust estimation approach and allows for the attainment of correct statistics which are quite stable even in relatively small samples (Bentler 2005; Byrne 2008). These features make EQS suitable for this study.

The original 33-item measurement model was specified and tested in EQS. The fitting indexes suggest that it does not provide a reasonably good fit to the data (CIF=.90, NNFI=.89, chi-square=888 with 593 d.f., $p < .001$, RMSEA=.059). Four items (EEO_LES, EEO_DIRE, EEO_VITA, EMS_SOUR) that exhibited low R-square (≤ 0.4) were removed following recommendations by Anderson and Gerbing (1988) for content and statistical reasons. The refined 29-item model resulted in an improved fit (CIF=.94, NNFI=.93, chi-square=505 with 362 d.f., $p < .001$, RMSEA=.051).

The results of the final 29-item measurement model, including variable means, standard deviations, average variance extracted, construct reliabilities, parameter estimates, and fit indexes, are reported in Table 3. For each set of indicators, the standardized factor loadings

are all relatively high and statistically significant at $p < .01$ level, which suggests convergent validity.

Table 3 Summary Statistics of the Final (29-item) Confirmatory Factor Model

	Mean	Standard Deviation	Variance Extracted	Composite Reliability	Factor Loadings ^a
Environmental Orientation (EO)	5.44	.87	0.65	0.85	.75-.85
Marketing Capabilities (MC)	6.11	1.22	0.59	0.93	.68-.85
Customer Pressure (CP)	6.17	1.51	0.74	0.90	.82-.91
Environmental Marketing Strategies (EMS)	5.19	1.18	0.58	0.87	.64-.86
Competitive Performance (CMP)	4.64	1.26	0.67	0.91	.59-.94
Environmental Performance (EP)	5.25	1.11	0.74	0.92	.84-.89
Fit Indices					
Chi-square	505				
d.f.	362				
CFI	.94				
NNFI	.93				
RMSEA	.051				

^aAll factor loadings are significant at the $p < .01$ level

Several methods were employed to further inspect discriminant validity following the recommendations by Farrell (2010). First an exploratory factor analysis (PCA without rotation) was conducted to identify cross-loadings and found that all indicators are loaded on the corresponding constructs as expected. Six factors were extracted which explained 75% of the total variance. Two more tests were conducted to assess discriminant validity, including:

1) Paired Constructs Test

Anderson and Gerbing (1988) suggest that the parameter estimate for two factors be constrained to 1.0 (constrained model) and compared to a model where this parameter is freely estimated (unconstrained model). This test is then run for every possible pairing of constructs in a study. If the unconstrained model, with the drop of one degree of freedom, returns a chi-square value that is at least 3.84 lower than the constrained model, then a two

factor solution provides a better fit to the data, and discriminant validity between A and B is supported.

Following this approach, all possible pairs of constructs in this study were analyzed in a series of two-factor CFA models. Each CFA model was run twice, once constraining the phi coefficient to 1, and once freeing this parameter. A chi-difference test was performed on the nested model to verify that the chi-square was lower for the unconstrained model (Anderson and Gerbing 1988). The critical value ($\Delta\chi^2_{(\Delta d.f.=1)} > 3.84$) was exceeded in all cases (the lowest $\Delta\chi^2_{(\Delta d.f.=1)} = 40.2$ was found between EO and CP) (Table 4).

Table 4 Paired Constructs Tests

	EO	MC	CP	EMS	CMP	EP
EO		130.5	6.0	35.91	29.20	30.83
MC	214.1		126.0	153.1	160.6	132.0
CP	46.2	232.9		40.06	25.90	26.01
EMS	97.6	251.1	114.7		60.7	68.5
CMP	133.7	395.6	176.0	174.3		38.8
EP	83.8	194.5	103.6	130.3	228.0	

Chi-square values for constrained model of each pair of constructs are reported below the diagonal and chi-square values for corresponding unconstrained models are above the diagonal.

2) Average Variance Extracted (AVE) vs. Shared Variance Test

As another method to assess the discriminant validity of two or more factors, Fornell and Larcker (1981) suggest comparing the AVE of each construct with the shared variance between constructs. If the AVE for each construct is greater than its shared variance with any other construct, discriminant validity is supported. In their book, Hair et al (2006, p. 778)

note that “the variance extracted estimates should be greater than the squared correlation estimate” and also, Fornell and Larcker (1981) indicate that for any two constructs, A and B, the AVE for A and the AVE for B both need to be larger than the shared variance (i.e., square of the correlation) between A and B. Average variance extracted for each construct was calculated and displayed in Table 5. The results show that AVE for each construct was higher than the corresponding shared variance for all possible pairs of constructs. This suggests that discriminant validity for these constructs is present.

Table 5 AVE vs. Share Variance Test (n=150)

	EO	MC	CP	EMS	CMP	EP
EO	0.65	0.17	0.35	0.27	0.17	0.26
MC	0.41**	0.59	0.26	0.28	0.16	0.56
CP	0.59**	0.51**	0.74	0.32	0.23	0.37
EMS	0.52**	0.53**	0.57**	0.58	0.32	0.45
CMP	0.42**	0.40**	0.48**	0.57**	0.67	0.29
EP	0.51**	0.75**	0.60**	0.67**	0.53**	0.74

*p<.05 (2-tailed) **p<.01 (2-tailed)

Correlations are reported below the diagonal, shared variance (squared correlations) are above the diagonal and average variance extracted (AVE) estimates are presented on the diagonal. The sample size is n=150 for all correlations.

Common Method Variance Test

The potential inflation of correlations between measures assessed via the same method (e.g., self-report) is widely acknowledged (Podsakoff, MacKenzie, Lee & Podsakoff 2003), although there are different views regarding the magnitude of CMB in behavioral and organizational research (e.g., Meade, Watson & Kroustalis 2007).

Harmon's single-factor test, as one of the most widely used methods in behavioral research, was employed in this study to assess whether or not a substantial amount of common method variance was present (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The rationale for this test is that if CMV poses a serious threat to the analysis, 1) a single factor would account for all observed variables in a principal component analysis, or, 2) one general factor will account for the majority of the covariance among the measures. The relevant principal components factor analysis revealed that neither a single factor emerged nor was a general factor identified in the unrotated factor structure (6 factors were extracted in CPA with Eigenvalues larger than 1, and the largest one in this analysis accounted for 44.7% of the total variance of the data), providing evidence that there was no common method bias in the data. However, it should be pointed out that Harmon's single-factor test is not the most rigorous method due to its lack of sensitivity to data that have many variables. Also, the technique is largely diagnostic because it has nothing to do with statistical control for (or partial out) method effects. Instead, partial correlation- and structural equation modeling-based approaches are generally preferred over Harmon's test to assess the extent of common methods bias (Podsakoff, MacKenzie, Lee & Podsakoff 2003). However, these rigorous methods generally require adequate sample size and therefore make it inappropriate for this study.

Taken together, the finalized CFA results demonstrate sufficient evidence that the six reflective constructs and their purified items are reliable and valid within the setting of this study. We can also rule out the possibility of any "serious" common method variance and support the presence of convergent validity and discriminant validity.

Table 6 below shows the correlations between these key constructs and moderating variables.

EXP appears to bear a direct but negative influence on competitive performance ($p < .05$).

This suggests that a domestic-market focus (non-export) may help firms achieve superior competitive performance rather than exports, which also suggests that a fast-growing domestic market is becoming increasingly attractive to Chinese businesses, particularly during the recent years when exports have experienced severe setbacks due to the global economic crisis and an appreciating currency against US dollar.

It is worth noting that certification status (CERT) bears a strong and positive correlation with almost all of the key constructs, except for customer pressure (CP) and competitive performance (CMP), suggesting that the adoption of environmental certification is independent of customer pressure and firm's competitive performance. It is strongly associated with management's environmental orientation ($p < .01$). Regulatory pressure is strongly associated with customer pressure ($p < .05$), suggesting that firms responsive to customer pressure tend to be responsive to regulations as well.

Table 6 Sample Descriptive Statistics and the Person Correlation Matrix

	Mean	S.D.	EO	MC	CP	EMS	CMP	EP	RP	Cert	Exp
EO (F1)	5.44	.87	1.00								
MC (F2)	6.11	1.22	0.41**	1.00							
CP (F3)	6.17	1.51	0.59**	0.51**	1.00						
EMS (F4)	5.19	1.18	0.52**	0.53**	0.57**	1.00					
CMP (F5)	4.64	1.26	0.42**	0.40**	0.48**	0.57**	1.00				
EP (F6)	5.25	1.11	0.51**	0.75**	0.60**	0.67**	0.53**	1.00			
Regulatory Pressure (RP)	0	1.0	.19*	.23**	.33**	.29**	.28**	.27**	1.00		
No. Certificates (Cert)	1.66	1.28	.26**	.21*	.10	.19*	.13	.16*	.19*	1.00	
Export (EXP) (%)	44.65	31.43	-.07	-.09	.04	-.12	-.23*	-.16	.18	-.18	1.00

* $p < .05$; ** $p < .01$

5.4 Testing Hypothesis and Moderating Effects

Two methods were used to test hypotheses and moderating effects, respectively: structural equation models (SEM) was used to test the full model and conventional multivariate regression analysis was used to test for moderating effects.

5.4.1 Full Structure Analysis

After satisfactory reliability and validity had been established for the constructs, an SEM approach was employed to test the hypotheses. SEM offers a good framework to test correlations between constructs in a broader context (factorial models, regression models) and to test them more accurately – SEM is preferred when multiple indicators and latent variables are present. The main advantage of SEM is to clearly distinguish the true variance (variance of factor) and the “error” variance (residual variance). The parameter estimates for the causal paths and standardized factor loadings on each construct in the structural model are presented in Tables 7-8 and Figure 18. Using indicators as the discrepancy ratio (chi-square/d.f. = 1.48), Bentler’s CFI (.92), the Bentler-Bonett’s non-normed fit Index (.91) and the RMSEA (.057), the fit of each model to the data appears to be good.

Table 7 Overall Model Fit Index and Parameter Estimates for the Causal Paths

Parameter	Hypothesis	Path	Standardized Estimate ^a
γ_1	H1	Environmental Orientation (EO) → Environmental Marketing Strategy (EMS)	.29 (2.66)*
γ_2	H2	Marketing Capabilities (MC) → Environmental Marketing Strategy (EMS)	.36 (3.76)*
γ_3	H3	Customer Pressure (CP) → Environmental Marketing Strategy (EMS)	.24 (2.11)*
γ_4	H4	Customer Pressure (CP) → Environmental Performance (EP)	.32 (3.64)*
β_1	H5	Environmental Marketing Strategy (EMS) → Environmental Performance (EP)	.57 (5.35)*
β_2	H6	Environmental Marketing Strategy (EMS) → Competitive Performance (CMP)	.46 (3.18)*
β_3	H7	Environmental Performance (EP) → Competitive Performance (CMP)	.22 (1.76)
Goodness-of-fit Index			
χ^2 (367df)	543.7		
χ^2/df	1.48		
CFI	.92		
NNFI	.91		
RMSEA	.057		

^a *t* values from the unstandardized solution are shown in parentheses

*Estimated standardized path coefficient significant at $p < .05$

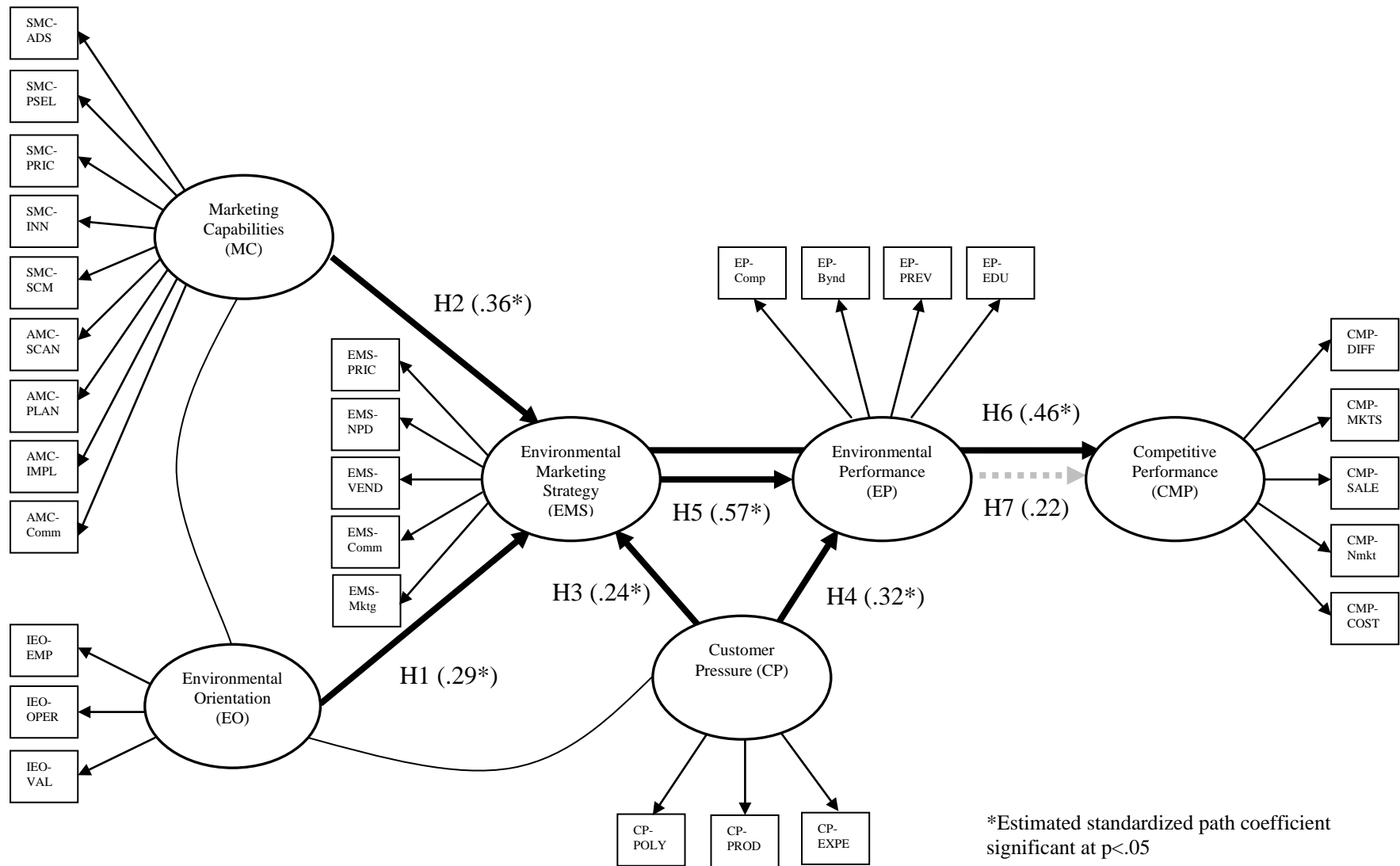


Figure 18 Full Structural Model and Standardized Path Coefficients

Table 8 Standardized Factor Loadings for Each Construct in the Structural Model

Indicator/Item	Factors/Constructs					
	Environmental Orientation (EO)	Marketing Capabilities (MC)	Customer Pressure (CP)	Environmental Marketing Strategy (EMS)	Competitive Performance (CMP)	Environmental Performance (EP)
IEO_EMP	.805^a					
IEO_OPER	.856*					
IEO_VAL	.748*					
SMC_ADS		.684^a				
SMC_PSEL		.809*				
SMC_PRIC		.710*				
SMC_INN		.720*				
SMC_SCM		.716*				
AMC_SCAN		.789*				
AMC_PLAN		.848*				
AMC_IMPL		.857*				
AMC_COMM		.743*				
CP_POLY			.848^a			
CP_PROD			.903*			
CP_EXPE			.827*			
EMS_PRIC				.638^a		
EMS_NPD				.710*		
EMS_VEND				.850*		
EMS_COMM				.788*		
EMS_MKTS				.777*		
CMP_COST					.589^a	
CMP_NMKT					.876*	
CMP_SALE					.859*	
CMP_MKTS					.939*	
CMP_DIFF					.776*	
EP_COMP						.851^a
EP_BYND						.856*
EP_PREV						.879*
EP_EDU						.855*

a – initially fixed at 1.0 for estimation purposes (Byrne 2010)

*Estimated standardized factor loading significant at $p < .05$.

To strengthen the conclusions regarding hypothesis testing, full structural analysis of the model without the EP → CMP path was also performed. While all of the model fitting indices remained unchanged, the coefficient of EMS → CMP was increased from the original .46 to .65, and all other paths estimates of this revised model only slightly changed. The results support the rejection of Hypothesis 7, as well as the deletion of the EP → CMP path from the subsequent analysis (Table 9).

Table 9 Overall Model Fit Index and Parameter Estimates for the Revised Model

Parameter	Path	Standardized Estimate ^a
γ1	Environmental Orientation (EO) → Environmental Marketing Strategy (EMS)	.28 (2.68)*
γ2	Marketing Capabilities (MC) → Environmental Marketing Strategy (EMS)	.37 (3.87)*
γ3	Customer Pressure (CP) → Environmental Marketing Strategy (EMS)	.25 (2.21)*
γ4	Customer Pressure (CP) → Environmental Performance (EP)	.29 (3.32)*
β1	Environmental Marketing Strategy (EMS) → Environmental Performance (EP)	.60 (5.55)*
β2	Environmental Marketing Strategy (EMS) → Competitive Performance (CMP)	.65 (5.31)*
Goodness-of-fit Index		
χ ² (368df)	545.1	
χ ² /df	1.48	
CFI	.922	
NNFI	.914	
RMSEA	.057	

*p<.05

To summarize, the above full structural analysis indicates that a firm’s marketing capability combined with management’s environmental orientation will facilitate the adoption of environmental marketing strategies, which will in turn be conducive to improved environmental and business performance. However, there is no significant direct relationship between environmental performance and business performance (Table 10).

Table 10 Summary of Hypothesis Testing

Hypothesis	Relationship	Finding
H1	Environmental Orientation → Environmental Marketing Strategy (EMS)	Supported
H2	Marketing Capabilities → EMS	Supported
H3	Customer Pressure → EMS	Supported
H4	Customer Pressure → Environmental Performance (EP)	Supported
H5	EMS → Environmental Performance (EP)	Supported
H6	EMS → Competitive Performance (CMP)	Supported
H7	Environmental Performance → Competitive Performance	Not Supported

5.4.2 Testing Moderating Effects Using Multivariate Regression Analysis

A final set of analysis was conducted to examine the possible moderating effects of regulatory pressure (RP), and the status of firm's export (EXP) and environmental certification (CERT) on the significant structural relationships identified above

Compared to SEM, multivariate regression analysis does not control for measurement error, however, it offers some complementary benefits, in particular, 1) it offers a pragmatic way to model the interaction between latent variables (first estimate factor scores of two latent variables, center them, calculate the product between them, and then follow the MLR procedure), and 2) it is easier to test the effects of moderating variables without losing much information as seen in the multi-group comparison approach (Byrne 2008) used in other studies.

Therefore, multivariate regression analysis was adopted to test the moderating effects using SPSS. Three models were constructed to analyze the three variables separately, as specified below:

$$\text{Model 1 (EMS)} \quad EMS = b_0 + b_1EO + b_2MC + b_3CP + b_4(MC*M) + b_5(EO*M) + b_6(CP*M)$$

$$\text{Model 2 (EP)} \quad EP = b_0 + b_1EMS + b_2CP + b_3(EMS*M) + b_4(CP*M)$$

$$\text{Model 3 (CMP)} \quad CMP = b_0 + b_1EMS + b_2(EMS*M)$$

where b_0 = intercept

b_1 thru b_6 = regression coefficients

M = moderating variables: RP , EXP , $CERT$

Multicollinearity is a statistical phenomenon in which two or more predictor variables in a multiple regression model are highly correlated. With the presence of a high level of multicollinearity, it becomes difficult to distinguish the coefficients of independent variables (main effects) on the dependent variable, among other computational and sampling stability problems (Echambadi & Hess 2007). Aiken & West (1991) recommend mean-centering because it may help avoid computational problems by reducing the covariance between the linear and the interaction terms. However, recent research suggests this method does not help mitigate collinearity as previously expected because mean-centering does not change the computational precision of parameters, the sampling accuracy of main effects, simple effects, interaction effects, nor the R^2 (Echambadi & Hess 2007). In this study, a moderated regression model was run with uncentered but standardized data. To diagnose multicollinearity, variance inflation factors associated with each regression coefficient were examined. The results ranged from 1.23 to 6.21, far below the acceptable threshold of 10

(Hair, Black, Babin, Anderson & Tatham 2006), suggesting no serious problems with multicollinearity. The results are presented in Tables 11-13.

In Table 11, Model 1 (EMS), the interaction terms EO*RP and MC*RP were found to be insignificant. This indicates that regulatory pressure (RP) does not moderate the relationships between firm's resources (in this case, marketing capabilities-MC and environmental orientation-EO) and firm's adoption of environmental marketing strategies (EMS).

Table 11 Analysis of the Moderating Effects of RP (n=150)

	Model 1 (EMS)	Model 2 (EP)	Model 3 (CMP)
<i>Independent Variables</i>			
EO	.279**		
MC	.298**		
CP	.221*		
EO*RP	.120		
MC*RP	.064		
CP*RP	-.220*		
EMS		.474**	
CP		.335**	
EMS*RP		.061	
CP*RP		-.057	
EMS			.590**
EMS*RP			.155*
Model F-statistics	20.39	40.05	39.03
F significance	0.000	0.000	0.000
Degrees of Freedom (model)	6	4	2
Adj. R2	.438	.512	.338

Figures corresponding to independent variables are standardized regression coefficients

*p<.05; **p<.01

But the interaction between customer pressure and regulatory pressure was found to be negatively correlated with EMS at p<.01. Recall in Table 6, there was a positive correlation between CP and RP ($r(148)=.33$, $p<.01$), and both CP and RP by themselves bears a positive correlation with EMS. This suggests that firms that are responsive to pressure from customers to improve environmental performance tend to be responsive to regulatory

pressure as well. CP and RP, by themselves, can have a positive impact on a firm's environmental strategy development. But taking together, the results can be reversed. The findings suggest that when firms are already exposed to high pressure from customers to be green, extra pressure from government regulations may discourage these firms from adopting proactive environmental strategies. Implications will be discussed in the next section of this chapter.

In Table 11, Model 2 (EP), no interaction was found to be significant, suggesting that RP does not moderate the relationship between EMS and environmental performance (EP), neither does it moderate the relationship between customer pressure (CP) and EP.

Analysis from Table 11, Model 3 (CMP), shows that regulatory pressure (RP) has a positive moderating influence on the relationship between firm's adoption of environmental marketing strategies (EMS) and competitive performance (CMP) at $p < .05$. The influence is reflected by the presence of a significant and positive interaction term between EMS and RP. This suggests that firms with environmental marketing strategies are more likely to achieve superior competitive performance in a tightly-regulated business environment, compared to those operating in loosely regulated markets.

Results presented in Table 12 suggest that having business connection with foreign markets/clients (EXP) does not have a moderating effect on the relationships among key constructs measured in this study.

Table 12 Analysis of the Moderating Effects of EXP (n=150)

	Model 1 (EMS)	Model 2 (EP)	Model 3 (CMP)
<i>Independent Variables</i>			
EO	.277		
MC	.352*		
CP	.177		
EO*EXP	-.068		
MC* EXP	-.056		
CP* EXP	.105		
EMS		.646**	
CP		.273	
EMS* EXP		-.198	
CP* EXP		.056	
EMS			.352*
EMS* EXP			.239
Model F-statistics	11.75	26.59	26.70
F significance	0.000	0.000	0.000
Degrees of Freedom (model)	6	4	2
Adj. R2	.37	.48	.32

Figures corresponding to independent variables are standardized regression coefficients

*p<.05; **p<.01

Similar to EXP, environmental certification (CERT) does not have any significant moderating or direct influence on the key constructs, as indicated in Table 13. This suggests that compliance with minimum environmental standards, by itself, does not necessarily lead to improvement in environmental or competitive performance. Further implications will be discussed in the next section.

Table 13 Analysis of the moderating effects of CERT (n=150)

	Model 1 (EMS)	Model 2 (EP)	Model 3 (CMP)
<i>Independent Variables</i>			
EO	.295*		
MC	.357**		
CP	.296*		
EO*CERT	-.083		
MC*CERT	-.066		
CP*CERT	-.031		
EMS		.562**	
CP		.196	
EMS*CERT		-.084	
CP*CERT		.162	
EMS			.535**
EMS*CERT			.044
Model F-statistics	19.20	41.04	35.23
F significance	0.000	0.000	0.000
Degrees of Freedom (model)	6	4	2
Adj. R2	.42	.52	.32

Figures corresponding to independent variables are standardized regression coefficients

*p<.05 **p<.01

5.5 Summary of Hypothesis Testing and Implications

By applying structural equation analysis to the data collected from three major industry gatherings in China, this study reveals that a proactive environmental marketing strategy (EMS) is fundamentally driven by corporate management's environmental orientation (EO) and the firm's marketing capabilities (MC) as a specific resource. Externally, EMS can also be influenced by pressure from customers. Taking together, it is the combination of internal and external factors that drive firm's environmental marketing strategic decisions.

Marketing capabilities (MC) are found to play a significant role in enabling forest products firms in China to develop and implement proactive environmental marketing strategies. Management team's environmental orientation (EO) as another type of specific resource also has a direct and positive impact on the firm's adoption of environmental marketing strategies. These findings support Hypothesis 1 and Hypothesis 2, thereby confirming the propositions under the natural resource-based theories and DCV concerning the importance of internal resources in enabling firms to proactively execute strategies in response to a changing market environment (e.g., Eisenhardt & Martin 2000).

Customer pressure, as an external factor, has a significant and positive impact on environmental marketing strategy and also environmental performance. Hypothesis 3 and 4 are supported. This supports the market failures view of the strategy and matches Menon and Menon (1997)'s description of a reactive environmental strategy. The importance of customer pressure on supplier's adoption of environmental strategy has been acknowledged in previous studies (e.g., Delmas & Montiel 2009, Delmas & Toffel 2004). In the forest products industry, global retailers such as Wal-Mart and IKEA have significant power in the

supply chain. These firms can make positive impacts on the supply chain through corporate environmental policies, particularly to reactive firms who are not prone to adopting environmental strategies proactively.

Interestingly, as the moderated regression model suggests (Table 10), regulatory pressure (RP) has a significant negative moderating effect on the relationship between customer pressure (CP) and environmental marketing strategy (EMS), suggesting that when firms are already exposed to high level of customer pressure, additional regulatory pressure may have a negative impact on firm's adoption of an environmental marketing strategy. This finding can be explained by environmental governance theories (notably, Vogel 1995, Cashore et al, 2004, Cashore & Stone, 2010). In environmental governance theory, firms operating in markets with high level of environmental standards (known as the "California effect") tend to seek alternative markets with lower standards (known as the "Delaware effect") to reduce costs and risks. In this study, the trade-off between customer pressure and policy regulations in driving firm's environmental marketing strategy suggest that strict environmental regulations, combined with high customer pressure, may discourage firms from adopting environmental marketing strategies, and instead lead many firms switch to relatively less stringent environmental regulations or lower entry barriers. This is also supported by observations from the industry which show that Chinese firms are increasingly switching their market focus from traditional developed economies to emerging markets in Southeast Asia and the Middle East, as well as the domestic Chinese market. This "market leakage" phenomenon may persist until all markets/countries "ratchet up" their environmental standards.

The moderated regression model (Table 11) also reveals that regulatory pressure (PR) has a significant positive moderating effect on the relationship between EMS and competitive performance (CMP). This finding provides some support for the market failures view of strategy (Oberholzer-Gee & Yao 2008), suggesting that government intervention in markets through establishing standards and policies can improve environmental performance. In the forest products industry, the timber market has been long dominated by low-value added commodities, and most consumers (even in developed economies) lack the knowledge to distinguish legal vs. illegal or sustainable vs. un-sustainable timber products (DIYWeek, 2010). Due to the lack of customer discrimination, supplies of sustainable and legal products are prone to fail in this market because they have to invest more to meet legal and sustainability standards, thereby pushing up their costs. By setting up legal trade policies, governments correct these market failures by granting monopoly positions in the form of market entry permit to firms who are willing to adopt sustainable and legal practices.

From the above findings, this study reveals two contradictory views toward the role of government regulations in influencing industry's environmental marketing strategy decisions. It can be seen that regulations can have both positive and negative impacts, depending on the level of customer pressure. This requires that policy makers, NGOs, standards organizations, global retailers, and other key stakeholders make more concerted efforts to fine-tune existing policy instruments and make them more acceptable to the industry.

This study attempts to address a simple but critical question "Does it Pay to be Green?" which has been debated by forest industry practitioners and scholars for several decades. It was the same question that I encountered from time to time during my work with local

industries and communities in the Asia-Pacific region as a consultant to the Rainforest Alliance during the past a few years. Obviously, as we enter the second decade of 21st century, there is still a lot of skepticism and ambiguity floating around in Asian forest products industries about “Green” and “Pay” issues. In this study, in the context of Chinese forest products industry, “Green” was studied in the form of environmental marketing strategies (EMS), and “Pay” was measured by two types of performances: environmental and competitive performance. According to hypothesis testing results (Figure 18), EMS bears a direct and positive relationship between an environmental marketing strategy and competitive performance as revealed in the structural model, suggesting that an environmental marketing strategy can help firms enhance its overall competitive performance in market competition. These findings support Hypothesis 5 and 6 (Table 10). This also provides partial support to the view held by some scholars in the forest products industry (e.g., Buehlmann & Schuler 2009) that a growing market demand for “green” products may help the U.S. forest products industry create or regain a competitive advantages in the marketplace against imports, thanks to the industry’s sustainability culture and green reputations.

But simply using eco-labeling as an environmental claim may not always improve businesses’ bottom line. This study didn’t find any significant relationship between environmental certification (CERT) and a firm’s environmental or competitive performance (Table 13), although environmental certification such as FSC may offer many benefits to the forest products firms such as market access, accountability and other economic benefits as identified by previous studies (e.g., Cao, Seol & Eastin 2010).

This study also found that export orientation does not necessarily improve a firm's environmental or competitive performance as shown in Table 12. The perception that business connections with global customers may increase self-regulation pressures on Chinese firms who are operating in low-regulation countries, and therefore increase their environmental performance as held by many scholars such as Christmann & Taylor (2001) is not supported by the findings of this study. Taking together, these findings suggest that compared to EMS, environmental certification and business ties with foreign customers have a limited impact on a firm's competitive and environmental performance. A further implication to the forest products industry is that, environmental marketing strategy works equally for export- and domestic-selling firms, as well as certified and non-certified firms, in driving up the firm's competitive performance.

Hypothesis 7 is not supported given the absence of a significant relationship between environmental performance and competitive performance. This could be attributed to several reasons. Measurement error can limit the researcher's ability to identify any true relationships (to be discussed later). It could also be the case that, as argued by some scholars, environmental performance requires a significant level of commitment of skills and resources such as physical assets, technologies, and people (Ramus and Steger 2000; Russo and Fouts 1997; Sharma 2000; Shrivastava 1995), therefore, it may be difficult for firms, particularly for SMEs with limited resources, to achieve improvements in environmental and competitive performance at the same time.

In all, these findings suggest that, in the context of the Chinese forest products industry, firms may expect to achieve better an environmental and competitive performance by adopting an

environmental marketing strategy – in this sense, it does pay to be green. However, the strength of the relationships between environmental marketing strategy and performance could be moderated by regulatory pressure. Environmental certification and export orientation do not always help improve environmental and competitive performance as many expected.

Chapter 6. Contributions to Literature

In the forest products marketing literature, increasing research has become available to study the environmental aspects of marketing strategy, however, limited research has been conducted to explore the impacts of both external and internal factors in driving a firm's environmental marketing decisions, even less in the context of China as a transitional economy.

As such, this study aims to make two major contributions to the state of knowledge of forest products marketing as summarized below.

Contribution I. Based on a review of current green movements and trends in the Chinese forest products industry, this study proposes a three-stage industry evolution model driven by a collation of forces.

Environmental issues didn't become a driver of business strategy until the 1970s, with the beginning of a consumerism movement and growing pressure from government regulations in western developed economies (Menon & Menon 1997). Recent developments suggest that the initial adverse relationships between business, environmental groups and regulators are gradually evolving into a more collaborative alliance as environmental groups start to work closely with business groups and help them develop environmental strategies, improve environmental and business performance and communication with stakeholders (Berry & Rondinelli 1998).

Similar trends are also observed in the forest products industry in China, Based on a literature review and the author's direct industry experience from consulting, this study identifies

several key emerging “green” trends that could transform the forest products sector in China from its current “high pollution” and “resource-intensive” business model toward a more environmentally- and socially-responsible paradigm. These trends include forest certification, legal timber trade policies, global retailers’ green sourcing policies, corporate social responsibility movements, development of forest carbon markets and a pent-up domestic market.

However, one crucial institutional dimension of the Chinese forest products industry differs from those in the developed economies is that it is still in the transition from a centrally planned economy to a market economy, and as a result, the government has had a strong influence on business decisions. Government’s tight control over firms can be attributed to its institutional imperfections of a transition economy (e.g., Qian 2000) and industry insecurities perceived by the government (e.g., Cheng and Song 2007). At the current stage, the industry’s institutional environment is relatively under-developed compared to its economic status. For example, there is a lack of internationally recognized or credible industry environmental standards and questionable local enforcement of forestry laws. Meanwhile, growing international competition for natural resources and rising products costs, as well as rising trade barriers, are well recognized by the government as major threats to the industry’s security and long-term development (e.g., Cheng and Song 2007). These institutional imperfections and economic insecurities have become a bottleneck for the industry to proceed further with its “go global” strategy and have generated urgency for the government to improve the institutional environment by, for example, developing its own national forest certification scheme and enforcing forest management laws. Therefore, the Chinese government strives to maintain its strong control over the industry as the “second-best”

institutional arrangement in order to seek comparative advantages during this transitional process. This is also observed in other industries in China and other transition economies (Qian 2000). Qian (2000) finds that government's control on corporate governance may offer several merits during an earlier stage of economy transition, such as increased tax revenue and social stability. As market-supporting and legal institutions are increasingly built and become mature, government control of firms tend to decline or disappear, because of the increased costs to government as well as increased international competition that requires more institutional flexibility. Following this thought, it can be expected that as the Chinese government gradually shifts its focus from direct control over businesses through ownership and corporate governance toward building market-supporting and legal institutions, and the industry becomes increasingly corporatized and integrated into the global supply chain, the government's influence on the industry's green movement may decline in the future, although this change might occur at a moderate pace.

In contrast, environmental NGOs and market demands are gradually gaining momentum in driving the industry to become greener, although their impacts currently remain comparatively minor. Forest certification and legality verification programs are increasingly demanded by the industry, mainly driven by the need to access international markets and green sourcing initiatives by global retailers. Forestry-related climate change mitigation regimes such as Reduced Emissions from Deforestation and Forest Degradation Plus (REDD+) may offer additional incentives for Chinese businesses with serious CSR commitments to pursue environmental strategies with an aim to reduce forest loss and degradation as well as contribute to poverty reduction and income generation. In addition, as green building programs and consumers become more sophisticated, the domestic market

may encourage Chinese firms to be proactive in developing an environmental marketing strategy.

In all, these observations suggest that industry's greening process would likely evolve through several stages, from an initial reactive and hesitant compliance stage driven mainly by government policies to an increasingly proactive stage as firms start to realize the benefits associated with an environmental strategy – increased market share, sales, business reputation, and reduced risks, for example. The industry evolution model highlights the dynamic and changing roles of driving forces: manufacturers, governments, environmental organizations, environmental standards, and international (and domestic) customers. Industry's greening future will depend on close collaboration among these groups. These trends also lead us to the view that firm's environmental marketing strategies (at current stage at least) are driven by a combination of internal and external factors.

Contribution II. This study presents a theoretical framework to show the dynamics of internal and external forces in driving environmental marketing strategy and the outcome – environmental and business performance.

From an integrated perspective with a theoretical base on the natural resource-based view (NRBV), dynamic capability view (DCV) and market failures view on strategy, this study proposes a theoretical framework to show that an environmental marketing strategy (EMS) is driven by a combination of internal and external forces, including the environmental orientation and marketing capabilities as firm specific assets, and customer pressure as an external force. Firm's specific assets (management environmental orientation and marketing capabilities) are identified as the fundamental drivers of EMS, which is consistent with

resource-based theories (e.g., Barney 1991; Hart 1995). The integrated perspective offers a useful explanation on why non-market forces (public intervention) can be a significant driver of a firm's adoption of EMS. This is because public intervention is always needed to correct market failures in less-than-perfect markets. These interventions change the competitive environment, thereby creating opportunities for firms who are able to either respond quickly to, or anticipate, them with an EMS. From this perspective, EMS can be pursued by both reactive and proactive firms, which represents a theoretical departure from the dynamic capabilities perspective of EMS proposed by Aragon-Correa & Sharma (2003) who only emphasize the proactive side of EMS.

As evidenced from the recent forest certification development in China, the Chinese government has a strong influence on business decisions in China, although the forest sector has been largely transformed during the past few decades by foreign direct investment and privatization. The moderated regression model yields contradictory views of the impact of government policies (regulatory pressure) on industry's adoption of an environmental marketing strategy and its link to competitive performance. An implication to forest products marketing researchers interested in transition economies such as China is that government's role should not be left out of marketing models, particularly in an industry environment where there is a lack of transparency in policy making and market-supporting institutions lag behind industry economic development. In the current industry environment, management's ability to anticipate (or respond to) policy changes may often be a key factor in determining the firm's marketing strategy and competitive performance.

This study also reveals that EMS can contribute to firm's superior environmental and competitive performance. Many scholars hold that as the market environment becomes increasingly favorable toward "green" businesses, it will offer an opportunity for the forest products industry to create or regain competitive advantages by proving its green credentials. This study provides partial support to this perception by showing that an environmental marketing strategy can bring about competitive opportunities for firms. However, there is no evidence that some environmental practices such as forest certification may influence competitive performance. Therefore, this study argues that it is the strategic alignment between EMS and firm's resources and external environment that determines competitive performance. It is not sufficient for firms to achieve superior performance by simply adopting green certification for branding or communication purposes.

Chapter 7. Conclusion, Limitations, and Future Research

Moving toward a green economy, the forest products industry will play an ever-increasing role by mitigating the adverse effects of the climate change, by creating “green” jobs, and by improving people’s quality of life through a balanced development process.

The forest products industry in China is at a turning point. Over the past three decades, the industry has undergone significant economic development, as driven by economic globalization, technology improvements and a growing domestic market. However, these economic achievements are believed to be built largely on the industry’s low-cost and resource/investment-intensive approach which lacks sustainability (e.g. Xu 2009). In the coming year, the industry may expect growing pressure from environmental regulations and international competition that will impact the industry’s capacity to continue growing and in pursuit of its “go global” strategy. There is an urgent need for Chinese firms to consider a paradigm shift and attune economic goals toward sustained growth.

A most important conclusion of this study is that, in the context of the Chinese forest products industry, the environmental marketing behavior of firms, to a substantial degree, is driven by both internal and external factors, and therefore can be pursued by both proactive and reactive firms. Firm’s adoption of an environmental marketing strategy appears to be explainable by integrating theories of resource-based view of the firm and market failures perspectives: internally, the firm’s environmental orientation combined with its corresponding VRIN resources such as marketing capabilities, will enable firms to pursue an environmental marketing strategy (EMS). An EMS can be also driven by external pressure such as customer requests and government policies. As the industry evolves further to

become more proactive, as the three-stage model predicts, the impact of external forces on EMS are expected to decline.

The results of this study also reveal that “It Does Pay to be Green” - firms adopting an environmental marketing strategy may expect to achieve improved environmental and competitive performance. In another word, firms with an environmental marketing strategy may expect to achieve superior environmental performance by complying with environmental regulations, reducing environmental impacts, preventing and mitigating environmental risks, and educating employees and the public about firm’s efforts to protect the natural environment. An environmental marketing strategy may also substantially improve the competitive performance of the firm by providing cost advantages, provide access to lucrative new markets, help acquire new customers, increase sales and market share, and differentiate product offerings from competitors.

This implies that, for Chinese forest products companies to compete successfully in international markets, it is critical for them to comply with international environmental standards and establish their green credentials. It is also important for them to take a more proactive approach to adopting environmental marketing strategies in response to policy and market changes. Meanwhile, environmental issues are viewed by the Chinese policy makers as industry “insecurities” that threaten the nation’s sustainable economic development and its target to build a harmonious society. The Chinese government is doing its best to develop domestic environmental policies to push the industry to become greener. As China begins to transition into a consumption-led economy, the industry’s green movements will and should

be driven by a combination of private initiatives and policy incentives that apply to both international and domestic markets.

These research findings and conclusions should be viewed in light of several limitations. The main limitation of this study arises from the use of cross-sectional data to measure environmental performance and competitive performance, which could have obscured the possible time-lagged effect of environmental achievement on competitive performance. In future studies, it would be desirable to adopt a longitudinal approach to further explore the relationship between these two performance variables. Second, the result may also be attributed to the method used to operationalize environmental performance in the survey. Although the measurement was adopted from the established work by Banerjee et al (2003) and empirically validated by industry experts, it may still leave out some important indicators of such performance.

In future studies, a more comprehensive measure of environmental performance should be employed. Also, a detailed study of the long-term relationship between environmental marketing strategy, external pressure, environmental performance and competitive performance is needed to provide more insights into how to build more effective public-private partnerships as the industry moves beyond compliance toward collaborative action.

In addition, further research is needed to examine firm's proactive and reactive responses to environment changes. Previous studies suggest that firm's responsiveness to external pressure from customers and regulations may vary, thereby influencing the effectiveness of customer and regulatory pressure on environmental strategy and performance (Delmas & Montiel 2009). Future research could explore factors such as specialized assets, relationships

with customers and governments, and industry experience, and their impacts on business decisions. The transitory nature of the Chinese forest products industry along with a changing institutional environment both domestically and internationally will make such studies much valuable to both firms and theorists.

Last but not least, I would like to invite colleagues to think about two questions in the light of the nascent environmental movements within the Chinese forest products industry, as China prepares to assume a leadership role in addressing international problems, 1) When will China exert new environmental leadership? 2) How will the rest of the world respond?

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Appendix 1 Economic Index of the Chinese Forest Products Industry, 2000-09

INDICATOR	SECTOR	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Productivity*	Timber Processing	1.18	1.32	1.26	1.19	1.20	1.35	1.64	1.85	2.14	2.37
	Furniture	1.14	1.21	1.21	1.20	1.08	1.07	1.22	1.37	1.63	1.93
	Paper and Pulp	1.46	1.41	1.50	1.51	1.69	1.85	2.03	2.11	2.93	2.76
Profitability**	Timber Processing	2.85%	3.15%	3.22%	3.58%	4.35%	4.63%	4.70%	5.02%	4.81%	4.82%
	Furniture	4.45%	4.50%	4.00%	4.33%	4.42%	4.51%	4.45%	3.87%	3.65%	4.37%
	Paper and Pulp	2.76%	3.82%	4.77%	4.70%	4.72%	4.76%	5.17%	5.73%	5.35%	5.23%
Debt-Asset Ratio	Timber Processing	65.84%	63.13%	62.44%	59.18%	56.43%	54.85%	54.69%	54.03%	51.46%	49.23%
	Furniture	55.76%	56.30%	56.86%	56.95%	57.65%	58.19%	57.12%	57.75%	57.71%	54.46%
	Paper and Pulp	65.21%	64.21%	63.39%	63.21%	61.41%	61.01%	60.74%	59.43%	59.28%	57.95%
Return on Investment**	Timber Processing	n.a.	n.a.	n.a.	29.91%	29.51%	28.36%	26.56%	23.45%	24.15%	23.58%
	Furniture	n.a.	n.a.	n.a.	37.45%	37.80%	31.77%	29.05%	20.55%	18.20%	19.76%
	Paper and Pulp	n.a.	n.a.	n.a.	36.43%	33.53%	34.52%	38.84%	38.38%	34.73%	30.00%

*Productivity was calculated using Industry Total Output / No. Employees, with unit ¥10,000 / person- year, inflation suppressed;

**Profitability was calculated using Industry Total Profits / Sales Revenue;

***Return on Investment was calculated using Industry Total Profits / Total Investment in Fixed Assets

Raw data source: China Data Center & China Statistics Bureau (2010)

Appendix 2. Case Study - Kingfisher's Green Sourcing Initiative in Asia

Asia is a strategic market for Kingfisher where a growing middle-class with increasing household income is creating a corresponding growth in consumer demand, particularly in emerging economies such as China. The region is also a major sourcing hub for Kingfisher, for local as well as global markets.

Kingfisher has set a goal at the corporate level to have 75% of timber volume sold to be proven as well managed or recycled by 2010/11, which can be achieved in three steps as specified by Kingfisher's "Steps to Responsible Growth" program: known sources, legal sources, and forest certification. (According to Kingfisher's CSR report (2007/2008), 71% of timber products sourced globally has met the first step of requirement).

In Asia, Kingfisher's sourcing task is carried out by two directly-managed sourcing offices with bases in Shanghai and Hong Kong, respectively. Kingfisher has been recently working with TFT and GFTN-China on supply chain development issues as a corporate member.

Shanghai Office is highly aware of the potential environmental and social impacts of forest products manufacturing, from furniture to solid wood items, and is already asking suppliers to verify their sources. As of Feb 2009, Shanghai Office has completed the first step toward corporate sustainability goal with 100% wood products sourced by Shanghai Office as known sources, including mainly toolboxes and aluminum boxes made from MDF, and potentially recycled paper products for packaging in the near future, with a total timber volume of between 1700-1800 m³ per year.

However, the process appears to be much more complicated on the part of Kingfisher's Hong Kong Office, which is responsible for sourcing the majority of wood products (furniture) supplies for

Kingfisher with total timber volume significantly larger than that from Shanghai. Therefore, supply chain development and training efforts should be focused on Hong Kong Office.

After several rounds of discussions with environmental groups and suppliers, the following actions were proposed to Kingfisher management as key to achieve its sourcing goals:

Step 1. Staff and Supplier Education:

It is necessary to let Kingfisher's staff and suppliers in Asia become fully aware of corporate responsible timber purchasing policy and goals. Educational workshops and course materials should be developed and delivered.

Step 2. In-depth Sourcing Review:

The objectives of a sourcing review are to understand the supply chains for forest products currently purchased from Asian region, including identifying where raw material is actually harvested and highlighting any "red flags" as they arise. With a focus on 3-5 key product lines, the sourcing review identifies strengths and weaknesses within supply chains; identifies product flows that may require more detailed analysis as a follow-up; identifies producers that have the potential to work with Kingfisher to improve practices and achieve certification in the near future. To do this, it is important to engage primarily Kingfisher's Hong Kong Office in a thorough sourcing review of Kingfisher's current supply chain in Asia for major forest products (including solid wood, MDF, and paper/packaging if desired by Kingfisher), in order to map existing forest products supply chains and associated risks, and to train Kingfisher's key vendors in Asia on forest certification, and to move them toward achieving tier-one status as specified in Kingfisher's timber policy. Meanwhile, it is important to start searching for new suppliers with the potential to meet Kingfisher's sustainable sourcing requirements.

Step 3. Market communication. This mainly includes 1) use on-product eco-label and third-party certification logo to distinguish Kingfisher's products from others in the marketplace to show how Kingfisher and its customers are benefiting local communities (indigenous people) and resources; 2) Corporate Social Responsibility Report: the development of Kingfisher's annual Corporate Social Responsibility/Sustainability report has important implications as means of outreaching to consumers, stakeholders and vendors carrying the message about Kingfisher's commitments to sustainable forestry and corporate responsibility policy. This report emphasizes the progress achieved with respect to implementation of Kingfisher's responsible purchasing policy. It is also important for this report to be verified and endorsed by a third organization that has prestigious environmental reputation.

Appendix 3 Interviews with International NGO Executives

Interview with Scott Poynton – TFT Executive Director.

Scott has worked in international forestry issues for more than 25 years, predominantly with the private sector and for a short period as Managing Director of the world's largest wooden outdoor furniture manufacturing firm. He founded TFT in 1999.

Q: Please describe TFT's approach to promote sustainable forestry and legal timber trade, and its recent development in China and the region

Since our founding in 1999 our main focus has been to provide solutions to the issue of deforestation and the empowerment of forest dependent communities. We have helped firms transform their timber supply chains and stop forest destruction. Through the same model, we involved institutional donors and individuals looking to build capacity on the ground thus giving communities and local firms the tools to provide responsible wood products to world markets. With offices in 13 countries, one of which is in Beijing, we're now expanding our work to a broad range of products using our supply chain expertise to identify and address the social and environmental issues embedded in them with a strong focus on natural resource management and traceability.

Q: What are the opportunities and roadblocks you see in this process?

The opportunities that I see in China is that as the world's largest importing and processing nation of timber, TFT can have a very real impact in worldwide forests by supporting the industry to purchase timber only from responsible sources, thereby reducing the pressure of illegal logging and deforestation. A significant roadblock in this process is that demand from Europe and the US, which have or are implementing policies to exclude products containing illegal timber represent a fraction of the market compared to domestic or other market nations that do not enforce these such controls. As

such there is little commitment from Chinese producers to invest in their supply chains and source responsible forest products. However, the tide is starting to turn in China and events such as this, which raise awareness of the issues as well as strong consumer demand in purchasing countries will demonstrate to firms that responsible purchasing of timber will help the sustainability of their business.

Q: What efforts TFT and its members have taken to address these opportunities and challenges?

TFT assists its members to source responsible products for their supply chains and in by doing so helps differentiate their products in the market from those sourced irresponsibly. By doing so our members are promoting their credentials as responsible firms, managing their risk and maintaining their market access in the face of legislation such as the EU's Timber regulation and the USA's Lacey Act. In addressing the issue of illegal timber in their supply chains and committing to excluding it through the assistance of TFTs technical capacity of supply chain management, we are addressing many of the challenges faced. However, in order to level the playing field a single clear message is required from all countries and buyers that only responsible products will be accepted. To date this is not the case but TFT is working hard with our members to achieve this.

Q: What are the impacts of these efforts on the forest products industry (in China and internationally)?

TFT through the TTAP project, helped Sainty Bancom, a plywood producer achieve the first ever Verified Legal Origin (VLO) certificate out of China from SmartWood. This was a significant success demonstrating to the industry that it is possible to bring verified composite products made from multiple species and sources to market. Sainty Bancom achieved this by working with domestic poplar farmers and peeling mill to legally verify the core of the plywood and combined this with tropical face and back from a Malaysian forestry firm that TFT also help to achieve VLO and complete the supply chain through to a buyer in the UK. With this success Sainty Bancom have

managed to keep their trade links open with EU by demonstrating due diligence in their supply chain but they do not want to stop there but rather push ahead to work towards achieving FSC certification.

Q: What are your strategic recommendations and thoughts for moving forward?

Chinese industries exporting to the USA and the EU must see that the legislation implemented has teeth – without this, business as usual will continue in many Chinese firms where no questions are asked about responsible sourcing of their raw material and forests worldwide will be prone to illegal logging activities and deforestation. Regardless of whether this is achieved there are other importing regions that do not yet have similar legislation to exclude products containing illegally logged timber and exports to these areas could increase, negating the hard work implemented in the EU and USA. A level playing field is therefore required across the board from all buying nations. Where this is one side of the picture the industry should also see that acting responsibly does reward those that commit to this end and others will follow. TFT is already seeing the positive effects of increased order inquiries from Saintry Bancom for their VLO plywood and an example such as this will help promote their success and encourage others to do the same.

Appendix 3 Interviews with International NGO Executives

Interview with Jack Hurd, Director of The Nature Conservancy's Regional Forest Program in Asia-Pacific.

Jack leads TNC's regional forest-carbon /REDD+ efforts as well as the USAID-funded Responsible Asia Forestry and Trade (RAFT) Program, a 5-year effort designed to influence the public policies and corporate practices that drive the global trade in forest products. Previously he was the Director of TNC's Forest Trade Program which addressed the U.S. dimension of this work, and the Conservation Director with TNC's Washington Chapter, overseeing forests, freshwater, grasslands and marine work across the state. Prior to joining TNC Jack worked in a number of capacities with the World Wildlife Fund (WWF) in both Asia and Europe: in Washington, DC with Pact, an international development organization and in Bangkok with Thailand's Population and Community Development Association (PDA). Jack holds a Masters in Public Administration (MPA) from the University of Washington and a Bachelors of Arts (BA) in Economics from the University of Vermont.

Q: Please describe TNC/RAFT's approach to promote sustainable forestry and legal timber trade, and its recent development in China and the region:

TNC's broad approach in Asia Pacific is to advance innovative and sustainable forest management solutions for the benefit of both people and nature. We work with governments, communities, corporations and landowners to protect core forest reserves and to ensure the responsible management of "working forests" that give us timber, jobs, sustainable economies, wildlife habitat, fresh water and a stable climate.

The Responsible Asia Forestry and Trade Program, or RAFT, is a regional program, managed by TNC and implemented together with 6 partner organizations, working in 8 countries including China, with the specific objective of reducing deforestation and forest degradation and thereby CO2 emissions by targeting forest management and trade.

To achieve this objective, the RAFT program does 2 central things:

We inform the development of policy and market requirements for legal and sustainable forest products; and we demonstrate practical responses to these emerging drivers for responsible forest management and trade.

The approach we use to do this effectively includes the following key elements:

- We work as a partnership – We capitalize on existing networks, expertise and resources by strategically bringing together partners working toward a common goal.
- We work across the supply chain - We support and align efforts all along the supply chain that are needed to encourage and put into practice responsible management and trade.
- We connect policy and practice – We inform regulators and market players with practical findings and help turn positive drivers into improvements on the ground.
- In China specifically, our focus under RAFT has been 3-fold:
- Working to facilitate cooperation between the Chinese State Forestry Administration (SFA) and the Indonesian Ministry of Forestry (MoF) and various United States Government (USG) agencies under a series bilateral MOUs concerning cooperation in combating illegal trade of forest products.
- Building industry awareness of and capacity to comply with policy and market requirements for legal and sustainable products, through trainings, providing support to achieve

independent chain of custody certification and events such as the upcoming Forests, Markets, Policy & Practice – China 2010 conference Sept 7&8 in Beijing.

- Working with the Beijing-based Asia Pacific Network for Sustainable Forest Management and Rehabilitation (APFNet) in the development of a long-term strategy to strengthen human resources and institutional capacity in forest management and the governance of the forest products industry throughout Asia-Pacific

Q: What are the opportunities and roadblocks you see in this process?

There are 2 major opportunities right now that are increasing the demand for the kind practical solutions TNC and the RAFT partnership provide:

- Emerging policy and market requirements for legal and sustainable forest products
- Recognition of the importance of improved forest management in REDD+ negotiations and national program planning

It should be noted, however, that there are strong economic and political incentives that continue to support deforestation and forest degradation activities. Until the net benefits of legal and sustainable forest management are greater than those for illegal or unsustainable forest management the former will remain the exception rather than the standard business practices in the forest sector in Asia.

Q: What efforts TNC/RAFT and its members have taken to address these opportunities and challenges?

We are doing a lot of different things, but I will highlight a couple specific efforts that are very closely linked to the opportunities and challenges mentioned above:

Lacey Act – TNC along with RAFT partners and others worked very hard to bring about the 2008 amendments to the US Lacey Act which have made it illegal in the US to import, sell or trade in

illegally harvested wood and wood products for the first time. Now that the amendments are law, we are working with the US government and both governments and the private sector in producing and processing countries in Asia, including China, Indonesia, Malaysia and Vietnam, to raise awareness of what US buyers require. RAFT has developed materials and a training series to provide producers and processors with the information they need to protect their market access by maintaining compliance with domestic laws. We are also working with the partners in the EU and Australia to keep the industry in this region up to speed on emerging legality requirements in these 2 major markets and to strengthen the message that this trend of more stringent requirements for legal and sustainable wood products really is global.

Quantifying CO2 emissions reductions achievable through improved forest management – We know from our research with concessions in Indonesia that large unnecessary emissions are occurring directly as a result of poor management practices on the ground. The emission reduction potential from improved management practices, such as Reduced Impact Logging and High Conservation Value Forest set-asides is significant, on the order of 30-50%. Research to quantify specific reductions achieved in the concessions we are working with is ongoing. This will help strengthen the case that improving forest management practices is a necessary and viable component of a comprehensive REDD+ strategy. At the same time we are supporting experimentation with low carbon technologies in the forest by working with concessionaires in Indonesia to test a monocable winch system which is one example of a RIL technique which reduces emissions and operating costs, creates jobs and enables timber extraction with minimal damage to the surrounding environment.

There are 2 of a whole suite of activities that you can get more information about from our staff and website (www.responsibleasia.org), as well as from our partners.

Q: What are the impacts of these efforts on the forest products industry (in China and internationally)?

The development of policies (e.g. Lacey Amendments, SVLK or Indonesia's TLAS) – TNC and RAFT partners have been directly involved in encouraging and informing the development of several of the policies introduced to promote trade in legal and sustainable forest products. We can see from a recent study conducted by Chatham House

(http://www.chathamhouse.org.uk/files/16979_0710bp_illegallogging.pdf) that policies introduced in consumer countries have been effective at reducing illegal logging and trade. These efforts have combined with efforts in producer and processor countries, and followed by the private sector, to protect up to 17 million hectares (42 million acres) of forest from degradation and to avoid at least 2 billion tons of carbon dioxide in recent years.

Hectares of tropical forest in Asia certified – By the end of 2011, RAFT will have supported FSC certification of 1 million hectares (2.47 million acres) of tropical forest in Asia, with another 2 million hectares (4.94 million acres) in a stepwise approach working toward independent certification. This supports producers in Asia to maintain and expand their access to major international markets. At the same time, this creates the supply that international buyers need to comply with their laws and meet growing demand.

The overall trend we are seeing of countries all along the supply chain putting in place more stringent and enforceable requirements for legal and sustainable products is an impact that all of the organizations working in this area have helped bring about. This has created significant opportunities and incentives for regulators and market players that reinforce and better enable us to advance our work on the ground. I look forward to seeing impacts of this new enabling environment over the next decade.

Q: What are your strategic recommendations and thoughts for moving forward?

Work to support improved forest management and trade practices is a necessary and effective part of the solution to deforestation and forest degradation in Asia. And, it presents one of the most straightforward and cost-effective ways to reduce global CO₂ emissions, with potential reductions of 30-50% when compared with conventional logging, which is still the norm in many places. Globally, we cannot ignore this possibility. If our goals are to preserve the multiple functions of healthy tropical forests in Asia and to harness the contribution of forests to global efforts to maintain a healthy global atmosphere and climate, focusing on improved forest management presents the most strategic way forward.

Policy and market requirements are an effective way to bring about changes on the ground when they are well informed and supported with feasible practical responses for business. It will be important for producing, processing and consuming countries to follow the lead of the EU member states and the US, specifically, Australia, China, Japan and Vietnam.

Appendix 4 Survey Questionnaire

Thank you for participating in this survey! The purpose of this survey is to evaluate how manager perceptions of the natural environment may impact business strategy development in the context of Chinese forest products industry, and how this strategic choice may impact firm's environmental and business performance. It may take about 10 minutes to complete this survey. Your support is critical to the success of this research! Your answers will be kept with strict confidentiality. If you have any questions about this survey, please contact Mr. Jeff Cao (Email: caoxz@u.washington.edu), thank you very much!

1. Please indicate your business type:

- Distributor
- Contractor
- Importer/Exporter
- Architect
- Engineer
- Interior Designer
- Industry Association
- Government
- Wood Products Manufacture
- Other, specify: _____

2. Does your organization currently hold any environmental certificate as below? (choose all that apply)

- China Environmental Labeling Program
- FSC certification
- PEFC certification
- Environmental Management (ISO14001)
- CARB certification
- CE certification
- Other, specify: _____
- None

3. Please evaluate the following statements based on 1-7 scale (1=strongly disagree, 7=strongly agree):

	1	2	3	4	5	6	7
	Strongly Disagree Strongly Agree						
Our firm has made concerted efforts to...							
make employees understand the importance of environmental preservation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
urge environmental awareness in every area of operations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
establish environment preservation as a central corporate value.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our firm's responsibility to the nature environment...							
directly relates to the financial well being of our firm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
is <i>less</i> important than its responsibility to customers, stockholders, and employees.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
is vital to our firm's survival.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our customers...							
have clearly communicated their environmental policies to us	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
are increasingly demanding environmentally friendly products and services.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
expect our firm to be environmentally friendly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government environmental regulations have...							
greatly influenced our firm's environmental strategy.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
affected the continued growth of our firm.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
been the main driver of our firm's environmental practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
been increasingly strengthened in our industry.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Compared to the past, to what extent has your firm modified its strategies in the following business areas in order to be more environment-friendly? (1=insignificantly, 7=significantly)

	1	2	3	4	5	6	7
	Insignificantly..... Significantly						
Sourcing (e.g., remove illegal timber from supply chain)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pricing (e.g. charge more for those made from sustainable sources?)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
New product development (e.g., to encourage development of environmentally friendly products)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vendor selection/evaluation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advertising / communications with stakeholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Market segmentation and positioning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Please evaluate the impacts of environmental marketing strategy on your business, based on 1-7 scale (1=strongly disagree, 7=strongly agree):

	1	2	3	4	5	6	7
	Strongly Disagree Strongly Agree						
By pursuing “green” marketing strategies, our firm has / or will ...							
realize substantial cost advantages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
enter lucrative new markets and acquiring new customers.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
increase sales to current customers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
increase market share	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
differentiate our products/services from competitors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**6. How well does your organization perform the following activities relative to competitors?
(1=much worse, 7=much better)**

	1	2	3	4	5	6	7
	Much Worse Much Better						
Advertising and promotion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal selling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pricing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supply chain management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental scanning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Market planning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marketing implementation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internal coordination and communication	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Complying with environmental regulations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Limiting environmental impact beyond regulatory compliance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Preventing and mitigating environmental crises	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Educating employees and the public about the environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. How many full-time employees your firm has?

- 1-50 51-100 101 -250 251-500 Over 500

8. How many years your firm has been operating in this industry? Years.

9. Is your firm currently selling to overseas customers (export) or foreign-owned firms/joint venture in China?

- Yes. Please indicate the percentage of revenue achieved last year (2009) for:
 1) _____% from overseas customers (export)
 2) _____% from foreign owned firms/joint ventures operating in China.

No

Thank you very much!

Vita

With deep insights and solid theoretical understanding of the Chinese forest products industry and international markets, Xiaozhi (Jeff) has been working closely with businesses, government agencies, research institutes and environmental groups across the Asia-Pacific region to promote sustainable forestry and responsible timber trade through forest certification and environmental marketing research. During his PhD studies, Jeff lived in Southeast Asia (primarily in Indonesia) for one year working for an international environmental NGO as its regional program manager to develop and facilitate industry-oriented training on forest certification, timber legality verification, good forest management practices, climate policy, and forestry carbon offset projects. Jeff also facilitated two major international conferences entitled “Forests, Markets, Policy and Practice” in China in 2009 and 2010, which were sponsored by a consortium of international development agencies, the State Forestry Administration of China, and leading international environmental groups.

In addition, Jeff has keen interest in graphic design and foreign language studies. He has developed logos and promotional materials for several publications/programs and organizations. He speaks Chinese (mandarin) and English fluently, as well as conversational level Korean and Bahasa Indonesian.

Jeff holds an MSc in Wood Science (with focus on forest products marketing) from Oregon State University, USA, an MSc and BA in Furniture Design from Nanjing Forestry University in China. He received his PhD degree in Forest Resources (with focus on forest products marketing) from the University of Washington in 2011. Jeff has over 20 publications with either peer reviewed or trade journals.