An Analysis of the U.S. Wood Products Import Sector: Prospects for Tropical Wood Products Exporters

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Abstract

The U.S. has dramatically altered its wood product imports and exports during the past few years, and at present, it is the second largest wood product importer in the world. Hence, an understanding of market structures, factors in selecting foreign suppliers, and the emphasis placed on environmental issues/certification are critical to understand from the perspective of wood products importers in the U.S. This study provides an analysis of the U.S. wood products import sector with special emphasis on current and future opportunities for tropical wood products exporters to the U.S. market.

In this study, 158 wood products importers in the U.S. were surveyed using a mailing questionnaire. The adjusted response rate was 40.6 percent. Results indicated that most of the respondents were small to medium scale firms, but major importers of wood products. According to respondents, wood products to the U.S. mainly come from Brazil, Chile, and China. From the importers' perspective, Brazilian wood products ranked first for its quality followed by wood products from Chile and Finland. Product quality, long term customer relationships, on-time delivery of orders, fair prices, and supplier reputation were the factors deemed important in selecting overseas suppliers. Majority of respondents were importing certified wood products. FSC, SFI, and ISO 14000 were the mostly accepted certification programs. However, certification was not a major factor in foreign supplier selection criteria. When considered the U.S. wood products importers' tendency to diversify their products and species imported, attractive opportunities exist for wood products suppliers from tropical countries.

Keywords: Wood products, imports, exports, certified wood, tropical wood suppliers

1. Introduction

Growing demand for wood has exerted a greater pressure on primary old growth forests in the world. Therefore, many countries are resorting to secondary timber resources such as forest plantations to meet the rising demand. Other than the secondary timber resources, imports also play a key role in meeting the demand for timber and wood products in most countries (U.S. Department of Commerce, 2008). The rapid increase of domestic wood demand has driven some nations to a state where the domestic wood production is no longer able to meet the demand while forcing some countries to shift from being net exporters of wood products to net importers (FAO, 2006). Hence, the need for cross-boundary trade of wood products has intensified.

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Although policy formulators tend to encourage exports, ideas on imports are diverse and conflicting. However, imports are also vital to a country's economy in many ways. Imports can fulfill the accessible deficit of goods and services which are essential for the well being of people while often facilitating the sustainable utilization of existing resources. In addition, imports generate employment in handling, transportation, marketing, and other segments of the value chain. Wood products industry and trade accounts for approximately 1% of the world's GDP. Despite recent negative developments in the global economy, an estimated 3.4 billion cubic meters of wood was produced in 2010, and the international trade or imports in wood products was estimated at US$ 227 billion (Armstrong, 2011).

1.1. The U.S. Wood Products Imports Market

The U.S. is a major player in the global wood products market. Despite China's recent emergence as the leading importer of primary wood products such as softwood logs, lumber, and pulp, the U.S. still remains as the second largest wood product importer in the world (Flynn, 2012). The U.S. housing constructions sector is the principal driver of wood and wood products markets from the demand perspective (United Nations, 2011). After single family housing constructions, repair and remodel applications of wood sold predominantly through home-center retailers account for the second largest demand market for wood products in the U.S. (Perera et al., 2008). Housing starts, resale and repair/remodel markets are directly related to U.S. furniture and imports as well (Pirc and Vlosky, 2010). Residential and non-residential constructions, repair and remodeling, furniture and other manufactured products, and packaging and shipping end-use markets collectively account for about 80% to 90% of all solid wood products consumption in the U.S. (Howard and McKeever, 2012).

The recent collapse in U.S. housing market has heavily impacted the U.S. wood products import sector. For instance, the U.S. single-family housing starts in May 2009 dropped by 41% compared to May 2008 (Buehlman and Schuler, 2009). However, recent reports hint slow revival of the U.S. housing market and allied wood products markets (United Nations, 2011: Wood Markets, 2011). The wood products imports rose by 16% in 2010 compared to 2009, and this upturn was attributed to the 6% increase in housing starts (Wood Markets, 2011). However, the U.S. wood imports value in 2010 (reaching US$ 20 billion) was well below the value of the peak in 2005 where total wood imports exceeded US$ 43 billion (Armstrong, 2011). Softwood lumber (up by US$ 679 million), builders' carpentry (up by US$ 81 million), hardwood plywood (up by US$ 251 million), mouldings (up by US$ 115 million), and OSB (up by US$ 178 million) were the top five imported wood products in 2010 that showed noticeable growth in terms of value, compared to 2009 (Wood Markets, 2011). According to Food and Agriculture Organization (2011), U.S. was the leading importer of wood-based panels in the world for the year 2010, and was the second largest importer of sawn-wood, wood pulp, and paper products.

1.2. Tropical Hardwood Imports to the U.S.

Despite being a leading importer of wood and wood-based products in the global market, the U.S. has traditionally been a relatively small consumer of tropical hardwoods. However, wood products imports of tropical origin have steadily increased over the years Because of their unique properties and aesthetics, customer preference for tropical hardwood species has increased, and therefore, tropical hardwoods are successfully competing with domestic hardwood species in U.S. markets. For instance, the U.S. hardwood products imports in 2006 totaled US$ 3.6 billion (excluding furniture and builders' joinery) and tropical wood products imports accounted for about 30% of this value (Ekström and Goetzl, 2007). The value of tropical wood products imports to the U.S. (excluding furniture) in 2006 was nearly US$ 1.6 billion. Tropical timber imports typically find end-uses in distinct and important high-end, value-added niche markets of furniture, cabinets, flooring, architectural woodwork, decking and mouldings (Ekström and Goetzl, 2007). For instance, tropical hardwood plywood accounted for an estimated 30% of

overall hardwood plywood imported in 2006, while tropical hardwood flooring accounted for 45% of wood flooring imports (FAO. 2007).

A greater share of tropical wood products to the U.S. comes from South American region. Brazil is the largest supplier with Peru. Chile and Bolivia being the other leading South American suppliers to the U.S. (Ekström and Goetzl. 2007). Jatoba (*Hymenaea courbaril*), Mahogany *(Swietenia* spp.) and Guariuba have long been the most popular tropical species from this region (ITTO. 2011). However, recent trade restrictions due to increased environmental concerns have curtailed the supply of certain species. Malaysia. Indonesia. Vietnam. and Myanmar are the major suppliers of tropical wood products from the South-East Asian region. According to trade statistics. the US remained the largest market for Malaysian furniture exports and Vietnam wood products (Huong and Dao. 2007: Globalwood. 2011). Meranti (*Shorea* spp.). Keruing (*Dipterocarpus* spp.) and Kapur (*Dryobalanops* spp.) are the major species supplied to U.S. markets form these countries (ITTO. 2011). West Africa (mainly Ghana and Cameroon) is another major tropical hardwood supply region to the U.S. For instance. according to ITTO (2011). Ghana's tropical wood exports to U.S. were 4% of the total exports value in 2010, a 100% growth compared to 2009. African mahogany (*Khaya spp.*). Okoume (*Aucoumea klaineana*) and Sapele (*Entandrophragma cylindricum*) are among the major tropical species imported to the U.S. (Globalwood.org. 2011).

Imported hardwood plywood accounts for a significant share in the U.S. plywood market. China has recently emerged as the leading tropical hardwood plywood supplier to the U.S. while Brazil, Malaysia. and Indonesia being the other leading suppliers (Ekström and Goetzl. 2007). However. the tropical wood products imports also suffered due to the recent recession in the U.S. economy, and at present showing signs of gradual regaining (United Nations. 2011).

1.3. Demand for Environmentally Certified Wood Products

Until recently. the U.S. wood products import markets have been less strict on environmental claims in comparison to European Union import markets. However. with ever-increasing environmental awareness throughout the globe. the U.S. has also introduced new laws to regulate the trade of environmentally unsustainable wood. The Lacey Act, a law banning the trade of illegally sourced plants and their products including timber and wood products is one such example (eia-global.org, 2008). In addition. market based mechanisms such as forest certification also continues to generate promise. discussion, and debate in the U.S. wood products market (Perera et al., 2008).

Recent studies on U.S. consumer perspectives and preference for certified wood suggest that overall consumer understanding and preference for environmentally certified wood has increased (Ozanne and Vlosky, 2003; Anderson and Hansen. 2004). However, for a typical individual, the importance of other product attributes tend to outweighed that of certification (Anderson and Hansen, 2004). From the supplier side. a study on non-industrial private forest (NIPF) landowners in the U.S. south further showed that NIPF landowner are quite knowledgeable about certification though they are not in favour of certifying private forest lands (Perera et al.. 2007). A comparative national study by Vlosky et al. (2009) on the U.S. value-added wood products sector revealed that certification awareness and participation have increased significantly from 2002 to 2008. Despite satisfactory awareness of consumers and wood products manufacturers/producers on forest certification. the demand for environmental certification in the U.S. seems to be driven by major retailers and environmental NGOs (Perera et al., 2007; 2008). For instance. a recent survey of top 500 home-center retailers in the U.S. found that improving the company's image and having preexisting certified suppliers as the major reasons for purchasing/selling certified wood products. Certification/eco-labeling was ranked last in wood products supplier selection criteria of U.S. home center retailers (Perera et al., 2008).

Although above mentioned studies and trade reports provide a general understanding of the U.S. wood products market. recent studies conducted specifically on the U.S. wood products importers to

provide a broader picture of the U.S. wood product import sector are relatively less evident in literature (Draffan, 2000; Oskooee and Chakrabarti, 2003). Hence, this study specifically attempts to accomplish the objectives of: (1) Identify the structure of the U.S. wood product import market based on the U.S. wood product importers' perspective (2) Explore demand factors and opportunities in the U.S. market for tropical exporters selling into the U.S. market and (3) Understand U.S. importer perceptions towards forest certification.

2. Materials and Methods

A structured questionnaire was the primary research instrument used in this study. Questionnaire items were developed carefully to address the research objectives. Respondent level of agreement or level of importance for items were measured using a 5-point Likert type scale anchored by 1 = strongly disagree to 5 = strongly agree or 1 = not important at all to 5 = very important respectively. In addition, the questionnaire collected company demographics and the current business environment from importers' perspective. It further included open ended questions that captured additional information as comments, suggestions or concerns for further analysis. The questionnaire was pretested with a subset of 20 representatives from the sample and revised before the final mailing.

During the period fall 2007 to spring 2008, a mail questionnaire was sent to 158 wood products importers in the U.S. The sample frame was selected from the Buyers and Sellers Directory of the Forest Products Industry, U.S.A. (2007). Accordingly, there were 158 wood products importers listed in the Directory, and all the listed companies were included as the sample for this study. The sample contained companies that import softwood and hardwood lumber, plywood, OSB, MDF, particleboard, fence and posts, mouldings, hardwood veneer, flooring, doors, and furniture parts.

A mail questionnaire approach was chosen considering the resource availability and simplicity. In addition, this method allows high degree of anonymity and has the ability to cover a sample dispersed in a wide geographical range. Mailing procedures followed the Tailored Design Method (Dillman, 2000) and included a pre-notification postcard, the first questionnaire mailing with a postage paid return envelope, a reminder postcard, and a second mailing to first mailing non-respondents. Personalized cover letters that accompanied the questionnaires were signed by the principal investigator and were addressed to marketing managers or marketing vice presidents by name and title.

Data Analysis

The information collected using the questionnaire included nominal, interval, and ordinal scale data as well as descriptive text responses. Data were entered into an Excel® spread sheet and were cleaned by checking for completeness, validity, reliability and consistency. SPSS® version 15.0 (Statistical Package for Social Sciences) was employed in data analysis. Both descriptive and inferential statistical techniques were used.

Nonresponse bias is often a common concern in survey research because it raises the question of whether those who did respond are different in some important way from those who did not respond (Dillman, 2000). Research has shown that late respondents typically respond similarly to non-respondents (Perera et al., 2007; 2008). Accordingly, second mailing respondents, as a proxy for non-respondents were compared to first mailing respondents. The t-test indicated no statistical difference in company size measured by gross sales (p = 0.11) or the magnitude of imports i.e. number of containers (p = 0.07) at 0.05 significance level. Hence, both first mailing and second mailing respondents were treated as one sample in all statistical analysis.

3. Results

3.1. General Profile

Out of the 158 companies of U.S. wood products importers surveyed, 71 companies responded. Seventeen companies responded to the survey did not import wood products in 2006. Therefore, the number of usable responses was 54. Furthermore, eight surveys were returned as undeliverable. Accordingly, the adjusted response rate was 40.6 percent. Majority of the respondents (52) were headquartered in the U.S. while two respondents were headquartered outside the U.S. i.e. South Korea and Finland. Of those who were headquartered in the U.S., 94% were from the Western and Southern regions (Figure 1).

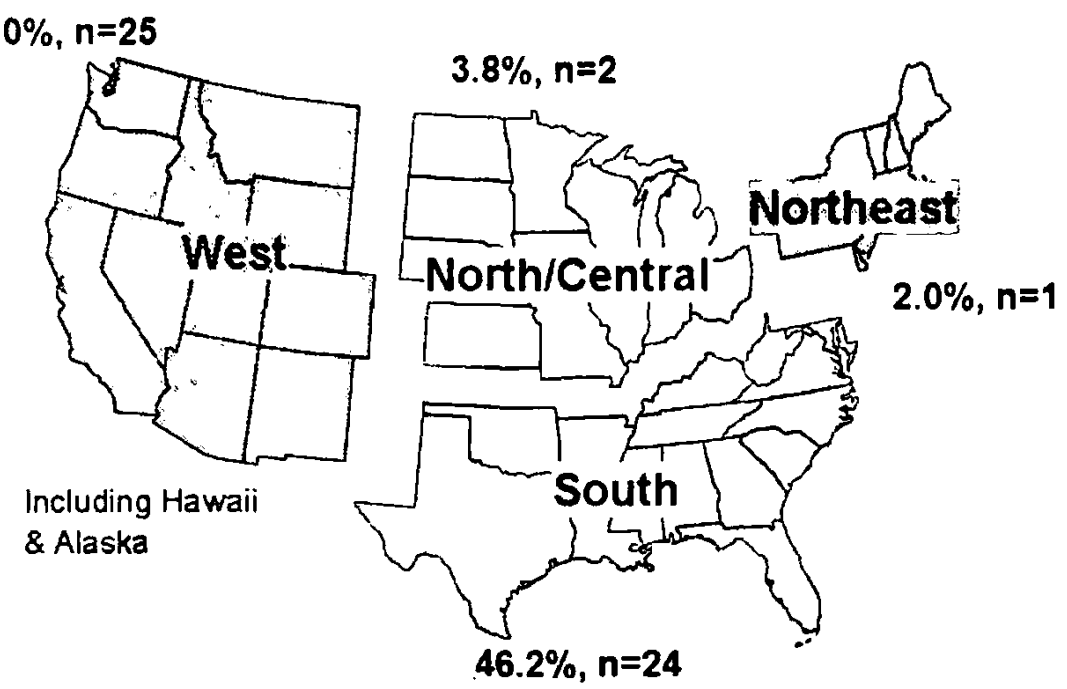

Figure 1: Distribution of respondent corporate locations, percent of respondents (n = 52)

The questionnaire gathered information on respondents' gross sales, percent of total gross sales from imports, and quantity imported in 2006. Approximately 37% of respondents had gross sales below US $5 million. Only 11% of respondents had gross sales of over US $ 100 million. A plurality (80%) had gross sales below US $50 million (Figure 2).

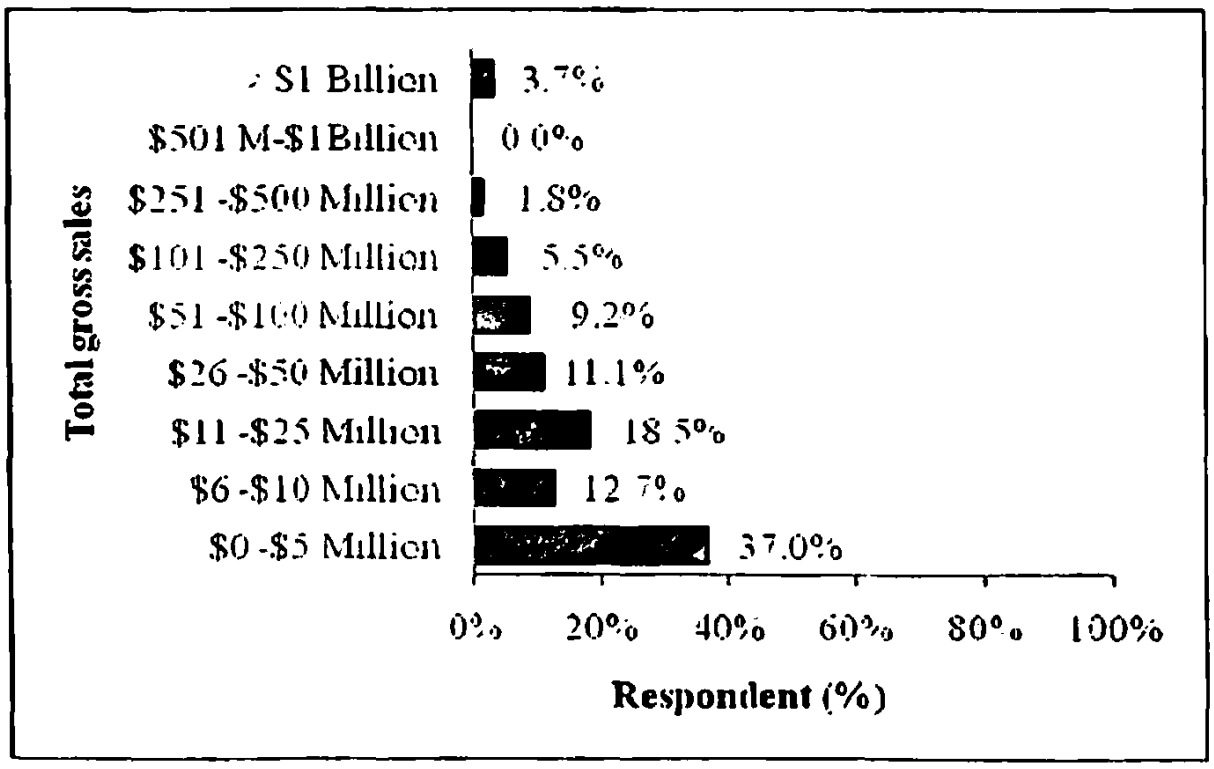

Figure 2: Total gross sales in 2006 - percent respondents (n=54)

More than half of the respondents (55.8%) indicated that over 50% of their sales were from imported wood products. Of the 54 respondents. 36.5% attributed 90% or more of their sales to imports. These may represent the major importers of wood products to the U.S. (Figure 3). Respondents were also asked about the number of wood product containers they imported in 2006 (Figure 4). Thirty-four percent of the respondents imported 1-50 containers while more than half of respondents (56%) were importing more than 100 containers of wood products. In terms of number of employees. 7.4% of the respondents had more than 500 employees. Another 7.4% respondents employed a staff between 101 to 500 workers. Nearly 72% of respondents had 25 or less employees.

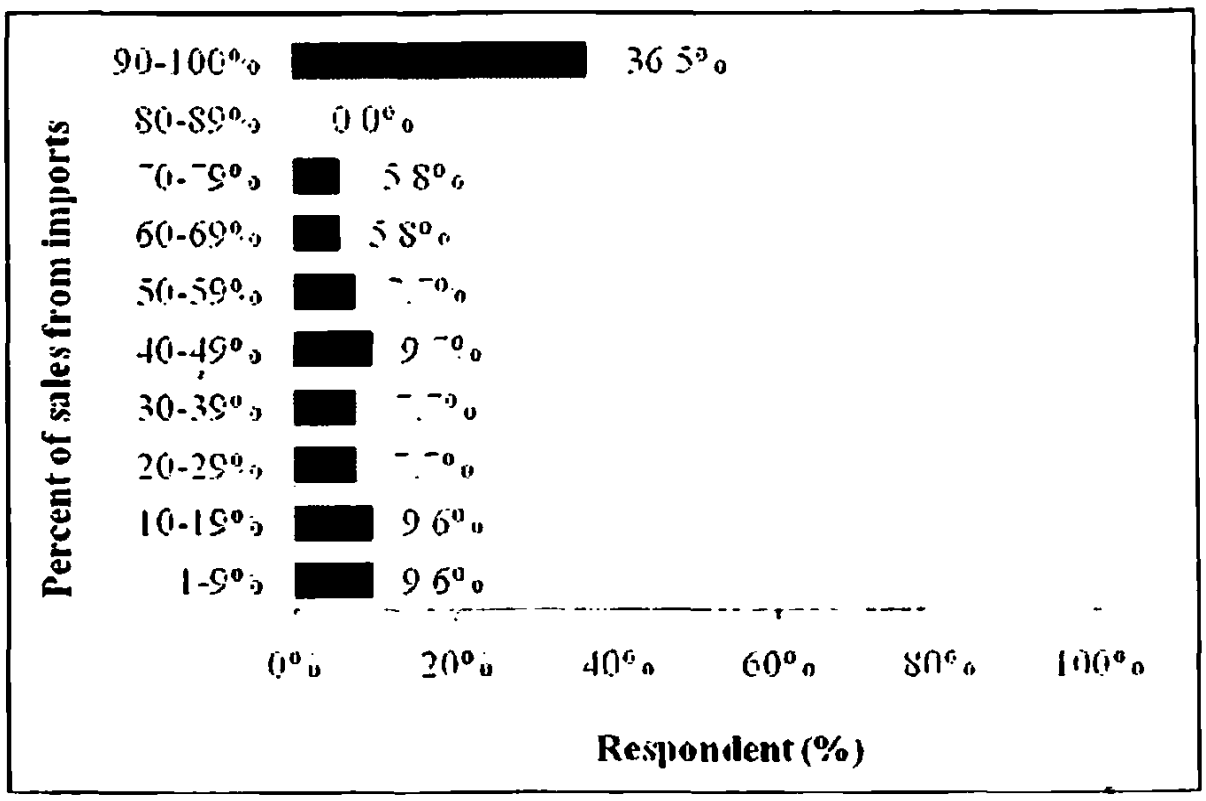

Figure 3: Percent of total gross sales from imports in 2006 (Percent of respondent, n=54)

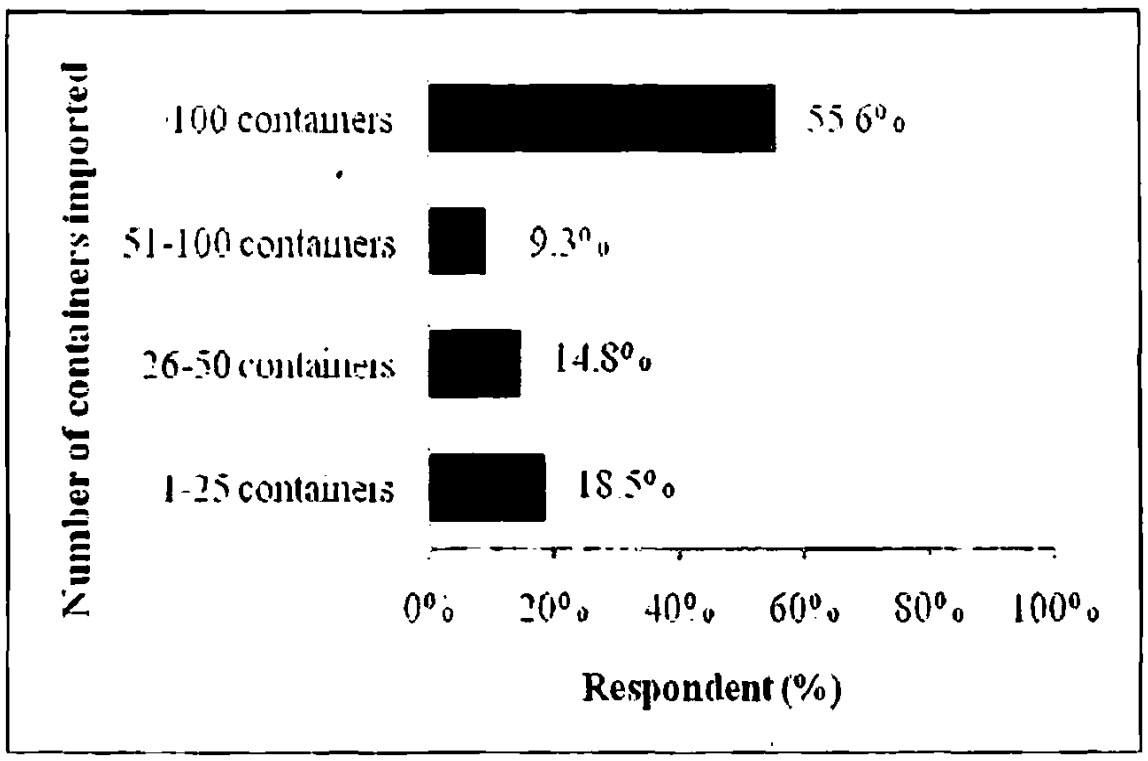

Figure 4: Number of containers imported in 2006 (Percent of respondent, n=54)

Fifty three percent of respondents were members of a trade organization or an association that has a focus on international wood products trade. When asked about their primary sources of information in selecting products and suppliers, e-mail communication was ranked first, followed by word of mouth, websites, international tradeshows, and sales representative (Figure 5). Direct mailing was ranked last from a list of 12 information and communication sources.

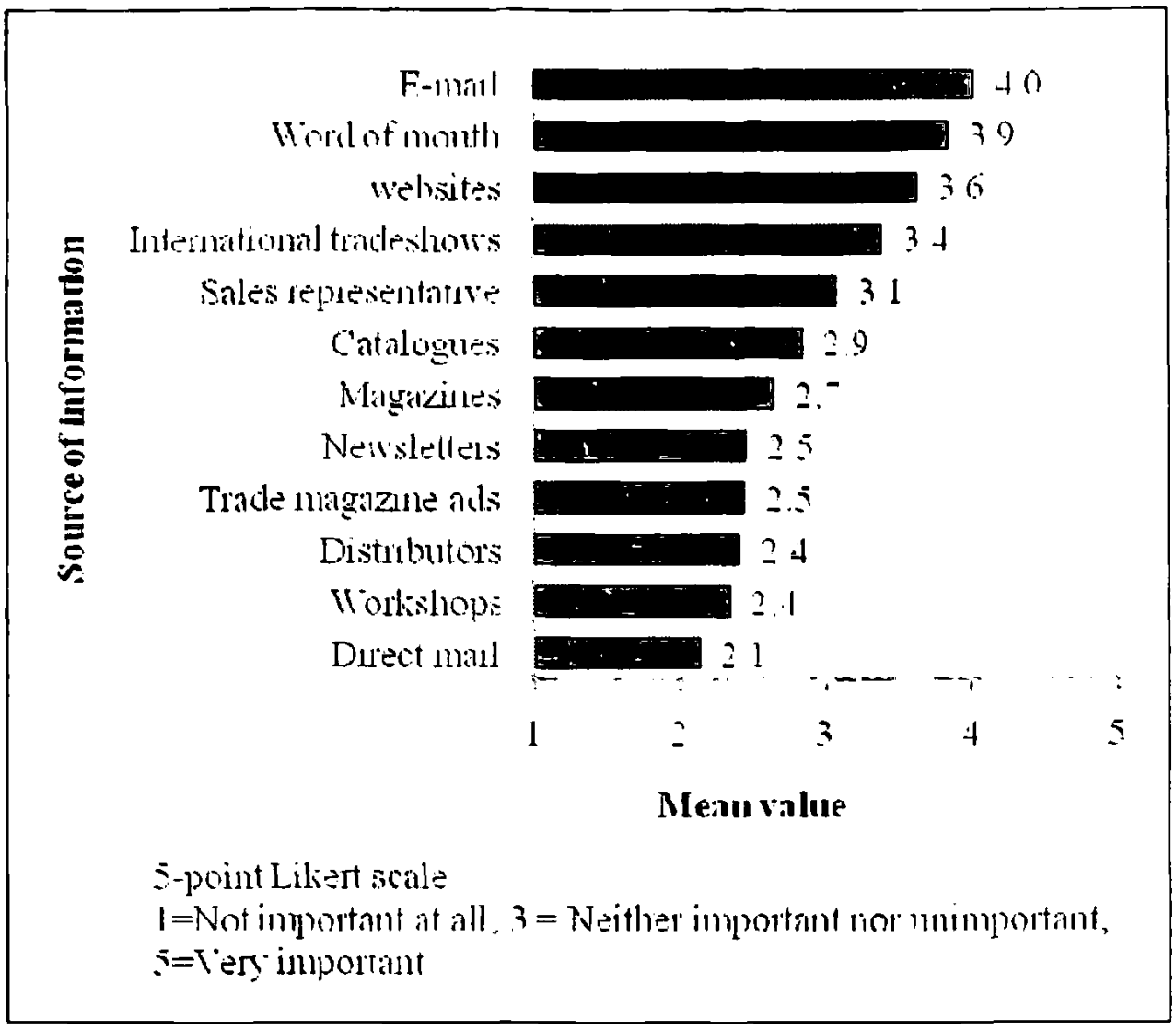

Figure 5: Ranking of sources of information utilized by the U.S. wood products importers (n=54)

3.2. Wood Products Imports

Figure 6 shows the types of wood products imported by respondents. Softwood lumber was the main product imported by most respondents (19% of respondents) followed by millwork and mouldings, hardwood plywood, hardwood lumber, softwood plywood and flooring.

In order to identify major exporters to the U.S., respondents were asked to rank the top ten suppliers that they imported wood products from by purchase value. Respondents purchased wood products from variety of supplier countries. According to the respondents, Brazil was the top wood product supplier by purchase value in 2006 followed by Chile, China and Canada. According to the results, there were 4 tropical countries among the top ten exporters to the U.S. (Figure 7). When asked about the quality of wood products originate from major supplier countries. Brazilian wood products were ranked highest (22% of respondents) followed by Chile (18%) and Finland (10%). The U.S. importers had moderate to low perception on wood products originated from tropical countries such as Bolivia, Ghana, India, Indonesia, Malaysia, Philippines and Taiwan.

The U.S. importers were especially concerned about wood products they import meeting the required phytosanitary standards. Almost 57% of respondent companies request their suppliers to conduct tests and remediation for insects and other pests and 47% require tests for microbes from their suppliers.

Approximately 53% of the respondents (n=25) stated that they are planning to diversify their wood products imports in the next 5 years. Hardwood plywood, doors, furniture, edge glued panels, agro-fiber panels, plastic composites, LVL, rubber wood lumber, engineered value added products, hardwood decking, hardwood flooring, Euclyptus plywood and lumber, glulam beams, and pallets were among the frequently mentioned products considered by respondents in diversifying their imports. When asked about their intentions on diversifying timber species they import in the next 5years, out of 46 respondents, 43% (n=20) said they are planning to do so. Beech, Alder, Red pine, African mahogany, Eucalyptus, Big-leaf mahogany, Blood-wood, Japela, and Ipe were mentioned as potential species for diversifying. About 60%

of the respondents further stated that they are currently seeking new sources/countries of supply for imported wood products.

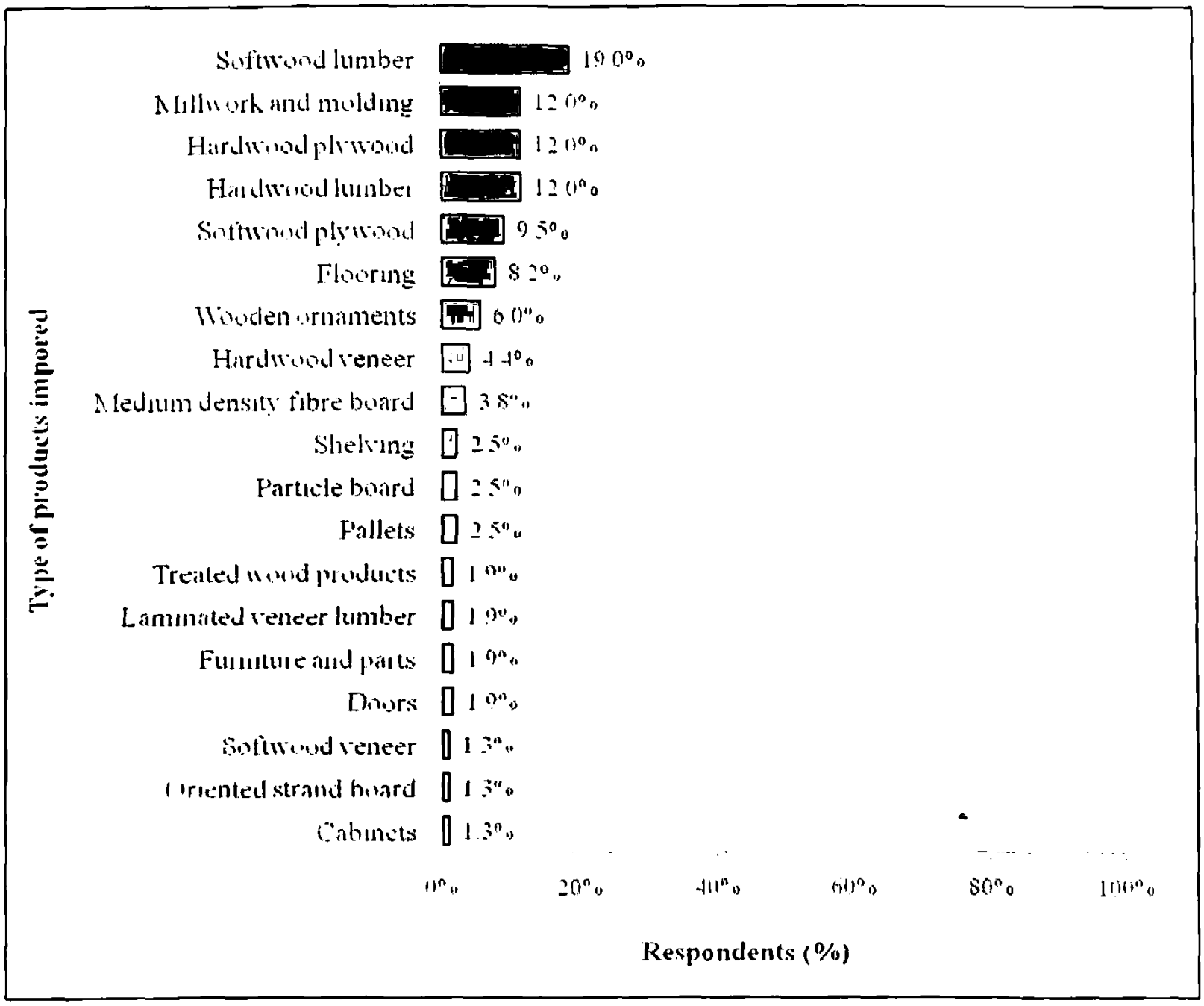

Figure 6: Wood products imported in 2006 (n=54, multiple responses possible)

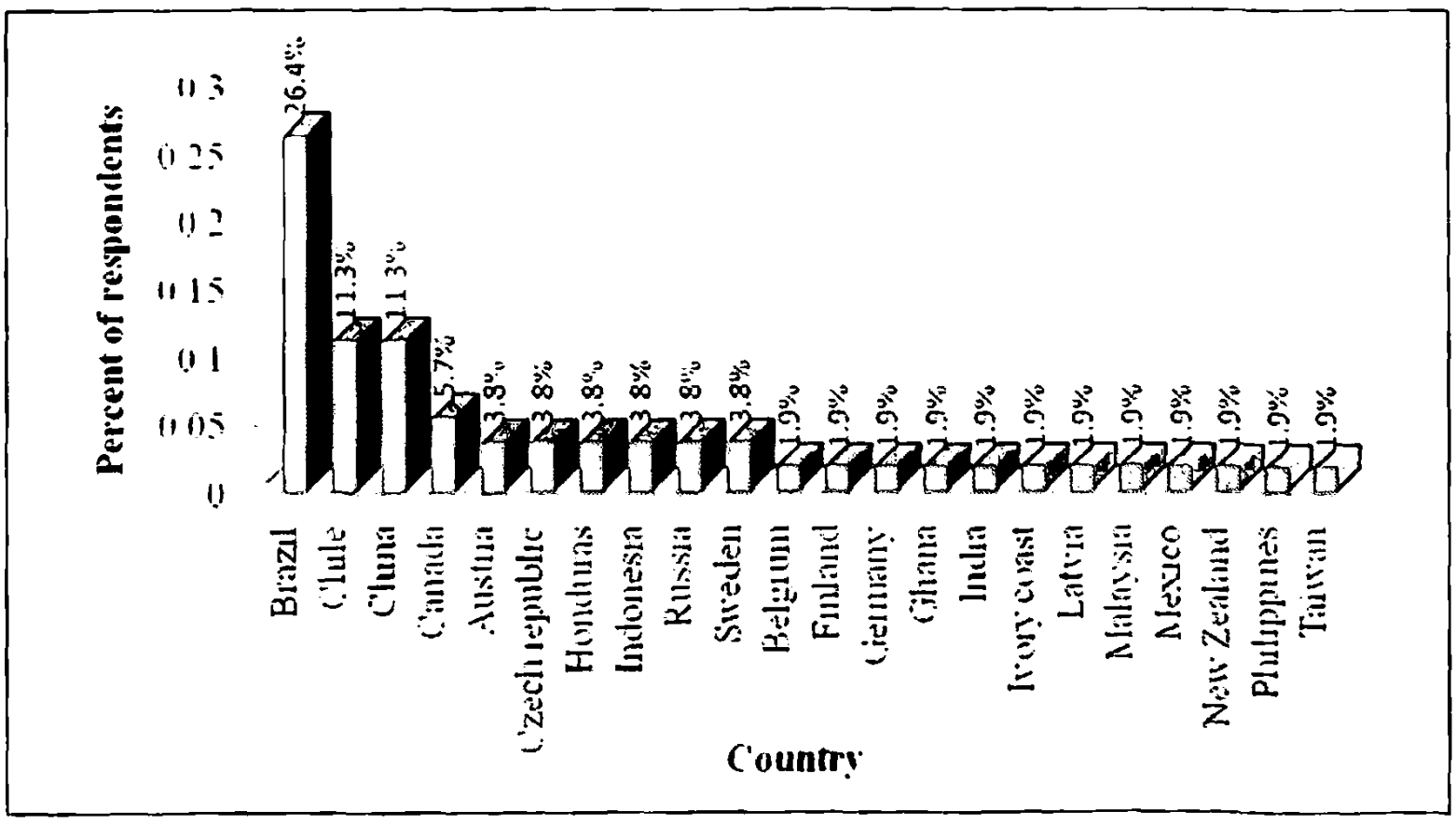

Figure 7: Origin of wood products imported by purchase value as ranked by the respondents (Percent of respondents, n=54)

3.3. Supplier Selection Criteria

One of the main objectives of this study was to identify factors that the U.S. importers deem important in selecting foreign wood product suppliers. Respondents were asked to indicate the level of importance in a 1 to 5 Likert scale for a set of 21 possible factors or criteria used in supplier evaluation. Product quality, long term customer relationships, on-time delivery of orders, fair prices, and supplier reputation were the factors deemed highly important by respondents in selecting their suppliers. Environment related factors were ranked as moderately important by the respondents with criterions "provide certified products" and "products from sustainably managed forests" receiving mean scores of 3.58 and 3.51 respectively (Table 1).

Table 1: Means and standard deviations for foreign buyer selection criteria

Criterion	Responders (N)	Mean	Std. deviation
Product quality	52	4.79	0.49
Long term customer relationship	52	4.71	0.49
On time delivery	52	4.63	0.56
Fair prices	53	4.57	0.75
Supplier reputation	51	4.35	0.77
Customer relationship	51	4.31	0.91
Customer service	50	4.28	0.73
Fast response to inquires	50	4.16	0.77
Knowledgeable sales people	50	3.92	1.16
Supplier speaks English	51	3.69	1.30
Provide certified products	52	3.58	1.32
Product from traditional species	50	3.52	1.15
Products from sustainably managed forests	51	3.51	1.33
Fast delivery	48	3.42	1.18
Warranty	49	3.27	1.29
Computer capabilities	48	3.21	1.27
Distribution capabilities	48	2.96	1.25
Product design	48	2.9	1.39
Uniqueness	50	2.8	1.36
Marketing skills	49	2.65	1.22
Products from lesser used species	49	2.53	1.00

Items represented in Table 1 may represent different underlying dimensions in supplier selection. To explore these dimensions, factor analysis with principal axis factoring was performed. The Kaiser-Meyer-Olkin test statistic of 0.63 suggested the sampling adequacy to perform a factor analysis while significance (p = 0.001) for Bartlett's test of sphericity indicated that selected measurement items are correlated. Only items with loadings greater than 0.5 were retained for analysis, i.e. 18 items were retained (Table 2). Accordingly, five factors were extracted from principal axis factoring accounting for almost 68% of the total variance. These factors/dimensions were named "Certification and marketing", "Product attributes", "Customer relations", "Quality products supply" and "Timber species and supplier reputation" respectively based on factor loadings from criterion items (Table 2).

3.4. Perceptions on Environmentally Certified Forest Products

At the time that the study was conducted, 61% of respondents (out of n = 44) said that they import certified wood products, while the rest (39%) did not. Respondents were also asked about their company's approximate percentage of certified wood products sales of their total wood products sales. For the 13 respondents that answered this question, certified products did not exceed 29% of the total wood product

sales by value. More than half of the respondents (51%) were accepting FSC certification followed by SFI (21%), ISO 14000 (11%), and PEFC (7%) certification. When asked about their involvement in certification promotion, only 19% of respondents who imported certified products (n=27) said their company actively promotes its products as certified, while 30% (n=8) have requested their non-certified foreign suppliers to become certified. Another 26% (n=7) said their certified products carry eco-labels. 41% (n=11) said they do not, while 33% (n=9) were unsure if their certified wood products carry an eco-label.

Table 2: Underlying dimensions of supplier selection extracted from factor analysis

Variable	Factor				
	Certification and marketing	Product attributes	Customer relations	Quality products supply	Timber species and supplier reputation
Products from sustainable managed forests	**0.893**	-0.041	0.089	0.151	0.058
Ability to provide certified products	**0.837**	0.263	-0.029	-0.018	-0.002
Uniqueness	**0.614**	0.365	0.446	-0.055	0.273
Distribution capabilities	**0.555**	0.445	0.269	0.178	0.162
Marketing skills	**0.508**	0.434	0.404	-0.029	0.147
Warranty	0.096	**0.852**	0.034	0.160	-0.003
Design	0.300	**0.712**	0.062	-0.058	0.330
Fast delivery	0.330	**0.546**	0.168	0.362	0.071
Supplier speaks English	0.024	0.089	**0.844**	-0.156	0.086
Long term customer relationship	-0.007	-0.356	**0.738**	0.154	0.290
Computer capabilities	0.262	0.277	**0.713**	0.178	0.055
On time delivery	0.000	0.110	0.052	**0.897**	-0.043
Quality	0.235	-0.031	-0.124	**0.730**	0.330
Consistent supply	-0.033	0.184	0.214	**0.625**	0.139
Products from traditional species	0.054	-0.085	0.273	0.012	**0.820**
Supplier reputation	-0.026	0.163	-0.088	0.288	**0.644**
Products from lesser used species	0.142	0.296	0.372	-0.046	**0.579**
Fast response to my inquiries	0.187	0.323	0.007	0.260	**0.540**

Using a 5-point scale (1 = strongly disagree; 3 = somewhat agree; 5 = strongly agree), respondents were asked to state their level of agreement to different statements related to certification. Summary results are provided in Table 3. Mean scores did not exceed 3.25 for any of the statements. Results indicate that respondents are unlikely to pay price premiums for certified products (Table 3).

Table 3: Respondents' mean scores for statements on certification

Statement	Responders (N)	Mean	Std. deviation
Certified products help to protect environment	44	3.25	1.118
Certified products help my company reach diversified markets	43	3.08	1.187
If available, I would seek out for certified products	39	2.92	1.288
I would like to get information about forest certification	44	2.46	1.206
Certified products can capture price premiums	42	2.43	1.099
I would pay a premium for certified products	44	2.08	1.096

4. Discussion and Conclusions

The present study provides a better understanding on the U.S. wood products import sector. Study results better frame various import related issues and important aspects in wood products importing from the perspective of wood product importers in the U.S. When considered the value of sales, volume of imports, and number of employees, most of the respondents were small to medium scale firms in size, but major importers of wood products. Softwood lumber was the leading wood product import category in terms of volume followed by hardwood lumber, hardwood plywood, and millwork and mouldings. According to the respondents, Brazil, Chile, and China were the large scale wood product suppliers to the U.S. market in terms of volume. However, trade reports for 2006-2007 indicate China, Canada, Brazil, Chile, and Mexico as the top wood products exporters to the U.S. (U.S. Department of Commerce, 2008). This may be attributed to the sample of wood products importers responded to the survey. From the importers' perspective, Brazilian wood products ranked first in terms of quality, followed by wood products from Chile and Finland.

Product quality, long term customer relationships, on-time delivery of orders, fair prices, and supplier reputation were the factors deemed highly important by respondents in selecting their overseas suppliers. Therefore, it is highly important that wood products exporters to the U.S. focusing on providing quality wood products in a timely mummer and maintaining better customer relationships to ensure sustainable business partnerships. According to factor analysis results, "superior product attributes", "better customer relationships", 'efficient logistics/supply", "reputation of the supplier and its products (species)" and "environmental claims associated with the product" can be recognized as the main dimensions that the wood products exporters should focus on, if they wish to achieve better success in the U.S. markets. Results further indicate that U.S. wood products importers prefer electronic sources such as emails and websites as convenient sources of information, as well as means of communication with their foreign suppliers. Hence, from the perspective of wood product suppliers, it is worth shifting to web-based driven advertising and communication strategies. In addition, timber products are increasingly traded via e-commerce in modern markets. However, word of mouth reputation, international tradeshows, and sales representative are still important sources of information.

Results indicate that majority of respondents (61%) are importing certified wood products. This can be attributed to the increased legislative restrictions on import of illegally sourced wood products, and pressure from environmental organizations, rather than due to the demand coming from consumer side (eia-global.org, 2008; Perera et al, 2008). Respondents were in disagreement with certified products capturing price premiums in the market, and were not in favour of paying price premiums for certified products. Results further indicate that most respondents are not actively involved in promoting or marketing certified products. A study conducted by Perera et al. (2008) on top 500 U.S. home center retailers found certified products being the only products available, and to improve the company's image as the most cited reasons for purchasing/selling certified wood products rather than customer demand. Results of the present study are also comparable with Perera et al. (2008). FSC, SFI, and ISO 14,000 were the most popular certification programs among respondents. Despite the demand for certified products not coming from actual customers, it is likely that certification will continue to be an important factor in accessing U.S. markets due to direct and indirect regulations. Hence it is advisable for wood product exporters to ensure the legality and source of their wood products, and certification may be an important option available to them.

Opportunities for tropical wood products exporters

According to ITTO reports, the U.S. tropical lumber imports plunged by nearly half between 2008-2009 recession. However tropical lumber supply and demand in the U.S. have stabilized in 2010, and expected to remain the same (mongabay.com, 2010). Recovering housing markets in the U.S. have

opened up new opportunities for tropical wood product exporters. Moreover, lower cost, improved quality and efficient logistics have forced U.S. firms to source wood products offshore.

After softwood lumber, hardwood plywood, millwork and mouldings, hardwood lumber, and wooden flooring were the main products imported by most respondents. In fact, these are among the major wood products imported to U.S. from tropical countries (Ekström and Goetzl, 2007). Results further indicated that there were 4 tropical countries among the top ten exporters to the U.S. i.e. Brazil, Chile, Honduras, and Indonesia. Wood products originated from Brazil and Chile were ranked highest in terms of quality by respondents. The success of tropical suppliers such as Brazil and Chile may be attributed to their capacity to supply quality products in sufficient volumes. However, U.S. importers rated wood products originated from tropical countries such as Bolivia, Ghana, India, Indonesia, Malaysia, Philippines and Taiwan as moderate (to low) in terms of quality. Hence, these suppliers should focus on key supplier selection dimensions deemed important by U.S. importers.

Results further indicate that U.S. importers are looking to diversify their wood products as well as timber species imported. African mahogany, Eucalyptus, Big-leaf mahogany, Blood-wood, Japela, and Ipe were mentioned as potential species for diversifying. Hardwood plywood, hardwood flooring and decking, furniture, and tropical hardwood lumber products are likely to have better markets. Since tropical wood species can compete successfully with U.S. domestic species because of their unique properties and aesthetics, exporters of above mentioned products may enjoy better success in the U.S. wood products markets (Ekström and Goetzl, 2007).

In order to successfully accessing the U.S. markets, suppliers of tropical wood products need to further understand other trade and legal requirements such as meeting required phytosanitary standards, and documentation to authenticate the legality and source of wood. Tropical lumber exporters may need to be knowledgeable about the National Hardwood Lumber Association (NHLA) grading standards.

As wood products manufacturing sectors of many tropical countries are dominated by small to medium scale manufacturers, the U.S. tropical wood products market is off-limits largely due to the scale of manufacturing, marketing complexity, and capital requirements (FAO 2007). Hence, greatest opportunities for such countries seem to exist in value-added niche markets especially for outdoor hardwood plywood, furniture, wood flooring and decking, and mouldings and millworks. Small to medium scale tropical wood products manufacturers shall further look into building strong customer relationships with importers to acquire specific market information and product requirements so that they can tailor-made products for specific niche markets (Perera et al. 2006). Partnering with other local manufacturers of similar capacity is another option to meet volume requirements in accessing certain U.S. tropical wood products markets.

Study limitations and avenues for future research

The data for this study was collected during 2007-2008 period, which is just before the beginning of recession in the U.S. economy. The U.S. tropical timber imports market was also affected by the recession. Hence, the validity of findings of this study may be limited due to the dynamic nature of markets. Yet, this study will be an important reference in comparing and assessing trends in the U.S. tropical timber imports market, as handful of previous studies can be found in literature on analysis of U.S. tropical timber imports markets. Aspects such as U.S. importers' foreign supplier selection criteria, species preferences, product categories as well as interest on certified tropical timber are relatively less explored by previous research. The U.S. importer perceptions on tropical timber products are important as demand for certified wood seems to gradually increase. This study further provides insights to U.S. tropical timber imports markets which are important from tropical timber exporters' perspective. On the other hand, certain reports indicate that tropical lumber supply and demand in the U.S. have stabilized, and indicate no severe changes in demand/preference in comparison to pre-recession levels (mongabay.com, 2010).

Authors of the paper further believe that present study will provide numerous pathways for future research where future works can be streamlined to study each aspect covered by this study in a more detailed manner. Periodical comparative studies are further recommended to understand market trends where present study can be used as a basis for comparison.

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