

## **An Analysis of Appalachian Hardwood Product Markets in China**

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### **Abstract**

In an ongoing effort to improve log and lumber trade between the Appalachian Region of the U.S. and China, a total of 50 Chinese firms identified as potential and current hardwood products buyers were surveyed from January to May 2008. A series of questions were posed on the importance of certain attributes of U.S. products and how to make the trading process more efficient. Specifically, information provided includes business activities, location(s), annual sales and product distribution of firms importing hardwood products, and the principal sources of supply, product types, grades, and species of hardwood products imported from the U.S., customer satisfaction evaluation, and potential barriers to trade. Results indicated that the Appalachian region of the U.S. was an important hardwood supply source and will continue to play an important role in the Chinese wood market. Red and white oaks were the most frequently imported species, followed by hard (sugar) maple, black cherry, black walnut, soft maple, and ash. The Appalachian hardwood logs primarily entered into the markets in the East and North Central China, while the hardwood lumber importers were mainly distributed in the East, South, and North Central China. The results will be an added income possibility for the exporting company and a good experience throughout the entire trade process.

**Key words:** Log and lumber export, wood trade, hardwood, survey, Appalachian region.

## **Introduction**

Economic competition in the Appalachian region among hardwood forest products producers has increased within the last decade, forcing production facility closures and an increase in lower-grade hardwood production. As a result of these pressures, the forest industry is in need of improved forest products markets and marketing promotional techniques to increase the economic competitiveness of their products.

Hardwood log and lumber markets are affected by both national and international demand and supply forces, requiring enhanced knowledge and understanding of both national and international marketing strategies (Luppold and Sendak 2004). A major overseas hardwood log and lumber market for the Appalachian region is China (Urban 2002), due in part to the Chinese furniture industry. The U.S. has become the second largest lumber (sawnwood) supplier in the Chinese market behind Russia. According to the statistics for wood products exported, the value of wood products in the Appalachian Region exported to China in 2007 reached \$197 million, accounting for 34% of the total in the U.S. (U.S. Department of Commerce 2008).

As forest product producers attempt to enter or expand into export markets, their demand for market-related information increases (Armstrong et al. 1993). However, the published information about Appalachian hardwood products in the Chinese market was limited, which impeded the exports of hardwood products for current and potential exporters in this region. Therefore, a better understanding of China's hardwood products market for the Appalachian hardwood producers is necessary before the U.S. suppliers can expand their export market. The objectives of this study are to analyze the Appalachian hardwood products in Chinese market, identify the potential opportunities to expand trade for Appalachian hardwood exporters, and enhance the economic competitiveness of Appalachian hardwood industries in the global forest product trade.

## **Methods**

This study was conducted through a formal mail survey of Chinese firms identified as potential and current hardwood products buyers from the U.S. Since there are about 1,115 log importers and 1,808 lumber importers in China, it is impractical to investigate every firm. In addition, using a survey to collect data in China is not common and many firm managers are reluctant to cooperate as they regard company information as confidential (Sun et al. 1999). The sampling frame was designed to ensure the representation of hardwood products imported in China and the size of the survey is limited to 50. The survey was managed by two agencies: a Market Research and Consultant Company and the China Timber Distribution Association in Beijing, China. Each questionnaire was numbered to record the responses. Specifically, a pretest questionnaire was sent to the representative in Beijing who talked with the managers from the sample, a few changes were made as a result of the pretest. The first bulk was mailed in January 2008. One month later, other mailings were sent to the remaining firms.

The survey data were then entered into a database and analyzed by using the Statistical Analysis System (SAS).

## Results

### Survey Response

Of the 50 Chinese firms surveyed, 48 questionnaires were returned and only two were not. Therefore, the response rate was 96 percent of delivered surveys.

### General Business Information

#### *Location of Chinese Purchasers*

In order to identify hardwood products imported by Chinese buyers on a regional basis and have enough observations to conduct a statistical analysis, the respondents were grouped into five regions by geography (Fig. 1): East China (including Shanghai, Zhejiang, Jiangsu, and Shandong provinces), North Central China (including Beijing, Hebei, and Tianjin), South China (including Guangdong and Fujian provinces), Northeast China (including Liaoning, Jilin, and Heilongjiang provinces), and West China (including Guizhou, Yunnan, and Guangxi). There were 46 companies purchased hardwood products in 2007. A majority of them were located in the East and South China, accounting for 46 and 30 percent of the total, respectively. This is partly due to the sufficient production capacity and more easy-access to imported hardwood products in these regions. Thirteen, nine and two percent of the purchasers were located in the North Central, Northeast, and West China, respectively.



*Figure 1. Chinese hardwood product purchasers by region.*

### *Primary Business Activities of Chinese Purchasers*

The survey addressed the primary business activities of the hardwood products purchasing firms. The firms were classified as: 1) manufacturers; 2) import and export traders; 3) manufacturers and traders. Fifty-six percent of the responding firms were manufacturers, thirty-three percent were traders, and the rest were engaged in manufacturing and trading. It was also noted that about 77 percent of the manufactures and 80 percent of the traders were located in the East and South China (Table 1). Forty-one percent of the respondents were large-scale firms with annual sales of more than 10 million Chinese Yuan (about \$1.45 million) in 2007. Most of them were manufacturers and located in the East China.

*Table 1. Primary business type of Chinese importers by region.*

Region	Number of firms			
	Manufactures	Traders	Manufacture and traders	Total
East China	12(8)	7(2)	2(1)	21(11)
North Central	4(3)	0(0)	2(0)	6(3)
North East	2(1)	2(1)	0(0)	4(2)
South China	8(0)	5(3)	1(0)	14(3)
West China	0(0)	1(0)	0(0)	1(0)
Total	26(12)	15(6)	5(1)	46(19)

() is the number of large-scale firms (annual sales greater than 10 million Chinese Yuan)

### ***Purchase and Sales of Hardwood Products***

The firms were asked whether they purchased hardwood lumber and which grade they purchased most in 2007. Forty-two firms (or 87.5%) answered yes to this question. Regarding the grades, 69 percent of the respondents who purchased hardwood lumber imported Firsts and Seconds and One Face (FAS & 1F), of which 48 percent reported that more than 60% of lumber purchased were FAS & 1F. Forty-three percent of the respondents purchased Select grade hardwood lumber, and 50% of them purchased more than 50% of the total in volume. The respondents also purchased No. 1 Common (1C) (26%), and No. 2 Common (2C) (7%).

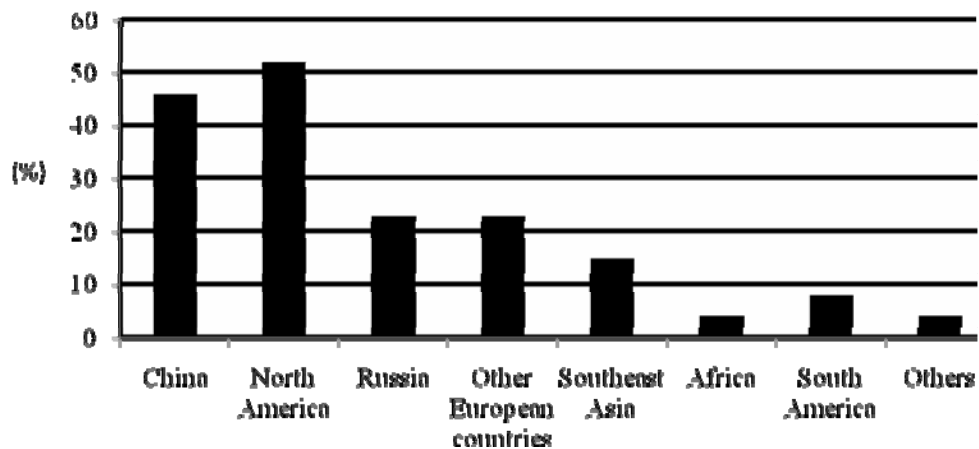
One question asked what types of businesses purchased their processed products. More than half of those responding firms sold their products to wholesalers and retailers (69%). Other organizations receiving processed products were furniture manufacturers (35%), decorative firms (27%), flooring manufacturers (21%) and architectural manufacturers (19%).

Forty-two percent of the responding firms sold their products to the domestic market, mainly in the developed regions such as Shanghai, Beijing and Guangdong provinces. The U.S., Europe, and Japan were the top 3 export destinations of processed hardwood products. About fifty-three percent, forty-four percent and eleven percent of the firms exported to these destinations, respectively.

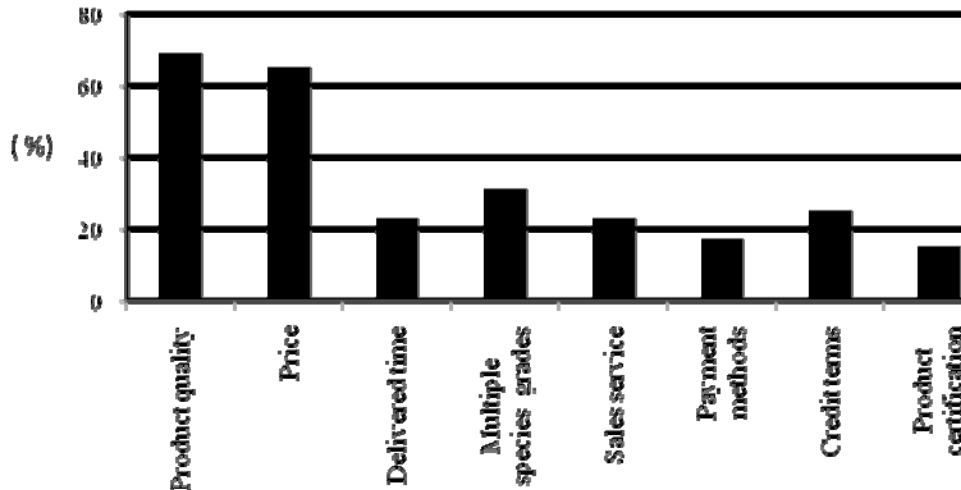
## **Hardwood Product Imports**

Thirty-nine out of 48 respondents said they imported hardwood products, accounting for 81.3 percent of the total. The primary hardwood products China imported include logs and lumber. China imported 37.1 million cubic meters of logs and 6.55 million cubic meters of lumber in 2007, of which 13.68 million cubic meters were hardwood logs and 3.82 million cubic meters were hardwood lumber (Petry and Zou 2007).

The respondents were also asked to identify the main sources of hardwood products imported by countries (including China). It has been found that respondents purchased hardwood products from multiple sources/regions (Fig. 2). About forty-six percent of the firms purchased hardwood products from the domestic market. Foreign sources include North America, Europe, Southeast Asia and Africa. About fifty-two percent, twenty-three percent, and twenty-three percent of the respondents purchased their hardwood products from North America (mainly from U.S.), Russia and other European countries. Southeast Asian and South America were also major sources. This indicated that U.S. hardwood suppliers face competition from suppliers in many countries and regions.



*Figure 2. The main source of hardwood products by region.*

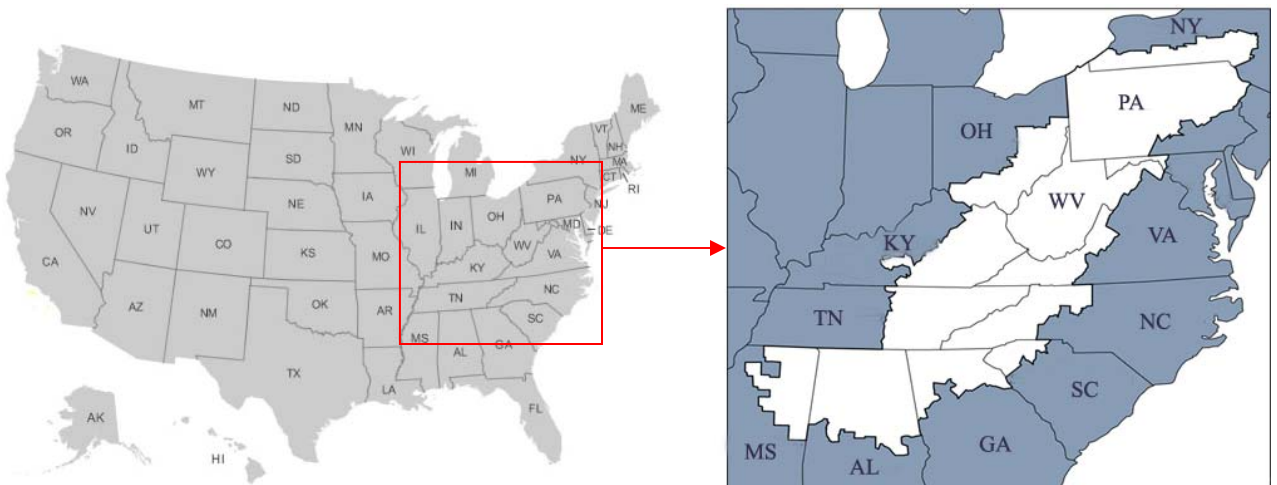


*Figure 3. Factors with Chinese hardwood purchasers most concerned.*

Respondents were asked to indicate what product and service attributes they are most concerned about when purchasing hardwood products. More than one feature can be selected. Quality and price were demonstrated as the top concerns (Fig. 3), followed by multiple species/grade and credit terms. Previous studies also showed that the Chinese bought lumber based primarily on price (Bowe et al. 2006). Thus more attention to these features should be paid if the American hardwood products suppliers want to improve their position and marketplace advantage in China.

### **Hardwood Products Imported from the Appalachian Region**

The Appalachian region (Fig. 4) is a 200,000-square-mile region that follows the spine of the Appalachian Mountains from southern New York to northern Mississippi. The region provides the world with a bounty of the valuable hardwood species such as black cherry, walnut, hard maple, and oaks (Bowyer et al. 2007).



*Figure 4. The U.S. map and the location of the Appalachian region*

Approximately sixty percent of the respondents purchased hardwood products from the U.S., of which 13 (44.8%) buyers reported that their U.S. supplier was the largest one among all the suppliers and accounted for more than 80% of the total lumber imported in value. Fifty-eight percent of the respondents purchased hardwood products from the Appalachian region.

In order to investigate whether the respondents are satisfied with their suppliers in the U.S., respondents were encouraged to rate a variety of issues related to purchase of hardwood products on a scale of 1 (not satisfied) to 5 (very satisfied). Chinese buyers were rather satisfied with the long-term supply, various species, credit terms, and total quality of products now being provided by the U.S. suppliers. However, the ratings for price, delivery time and transportation package received were lower than the previous factors (Table 2). The Chinese hardwood products purchasers were generally satisfied with their suppliers in the U.S. If the American hardwood suppliers could provide more flexible delivery schedules and shorten the lead time, the expansion of a much broader market in China is expected.

*Table 2. Evaluation of U.S. hardwood products suppliers by Chinese buyers.*

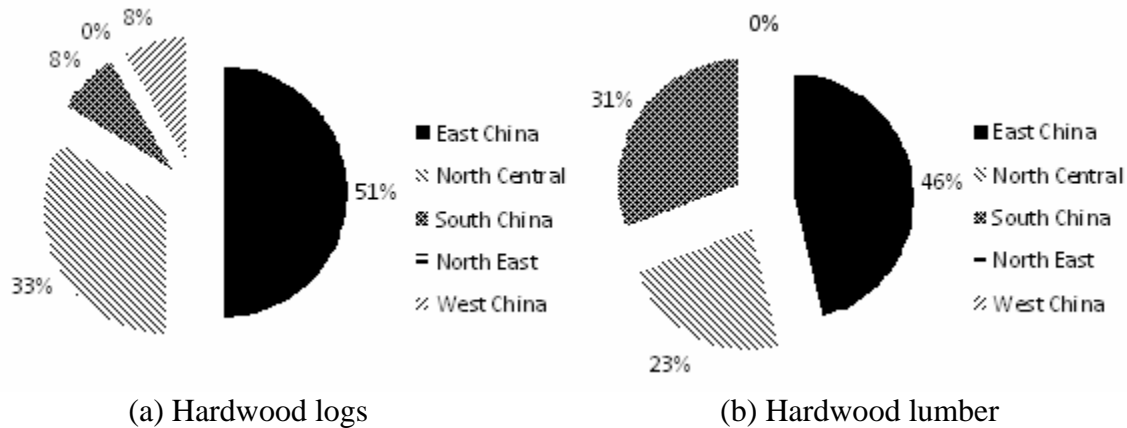
Items	Number of respondents	Mean	Standard error
Multiple species	26	3.76	1.05
Multiple grades	26	3.64	1.25
Long-term supply	26	3.84	1.14
Delivery time	26	3.28	0.94
Transportation package	26	3.36	0.99
Price	26	3.52	1.05
Credit terms	26	3.76	1.13
Product quality	26	3.72	1.14
Service quality	26	3.64	1.19

Several questions were related to the hardwood products imported from the Appalachian region of the U.S. Ninety-six percent of the respondents who imported from the U.S. (58 percent of the total number of firms surveyed) purchased hardwood products from the Appalachian region. Twenty-one percent and fourteen percent of the importers also imported hardwood products from the South and the West of the U.S. The total volumes of hardwood logs and lumber imported from the Appalachian region in 2007 were about 30 and 102 thousand cubic meters, respectively (Table 3). It should be noted that these numbers were not the total imported by Chinese customers since only approximately 60 percent of the respondents who imported hardwood logs/lumbers revealed the detailed volume.

*Table 3. Statistics of Appalachian region hardwood products imported in 2007.*

Products	Number of importers	Number of respondents	Volume imported (1,000 cubic meters)
Hardwood logs	12	7	30.39
Hardwood lumbers	25	15	102.56

The Chinese purchasers by regions were used to further investigate which market imported Appalachian hardwood products in 2007 (Fig. 5). The Appalachian hardwood logs primarily entered into the markets in the East and North Central China, although the hardwood lumber importers were mainly distributed in the East, South, and North Central China. Shanghai and Shenzhen, the main metropolitan areas in the East and South China, were the leading ports of entry for tropical and temperate hardwood lumber in 2002 (Sun et al. 2008).



(a) Hardwood logs (b) Hardwood lumber  
*Figure 5. Chinese importers of Appalachian hardwood products by region.*

Various species of hardwood products were imported from the Appalachian region. Red and white oaks were the most frequently imported species, imported by 44 percent of the total respondents, followed by hard (sugar) maple (23%), black cherry (19%), black walnut (15%), soft maple (15%), and ash (13%). Red oak has become one of the most popular species of hardwood for construction of interiors, furniture, and decoration, especially in southern China. According to the U.S. trade statistics, the top hardwood lumber species exported to China in 2007 in terms of value are yellow-poplar, red oak, red alder, white oak, maple, ash, black walnut and black cherry (USDA 2008). Since yellow-poplar represents a significant percentage of the growth and production in the Appalachian region, potential opportunities for expanding yellow-poplar market share in China is enormous.

Respondents were also encouraged to report the grades and corresponding proportions imported from the Appalachian region. About 31.3 percent and 25 percent of the respondents imported FAS & 1F and Selects hardwood lumber, respectively. Of this total, approximately 60 percent and 50 percent of those respondents imported more than 50 percent of the total hardwood lumber. Only a few surveyed Chinese purchasers imported No. 1 Common (8.3%) and No. 2 Common (6.3%). This result is slightly different from the previous study (Bowe et al. 2006), which indicated that FAS and No.1 Common were the top two grades imported from the U.S.

### **Conclusions and Discussion**

Although the sample size in this study is relatively small, the data obtained from the survey can reflect the U.S. hardwood products purchased in China to some extent.



China imported 1.07 million cubic meters of sawnwood (lumber) from the U.S. (IHB 2008) in 2007. The Appalachian region of the U.S. is an important hardwood supply source for the Chinese wood market. The total volume of hardwood lumber imported was greater than that of hardwood logs imported from the Appalachian region.

The Appalachian hardwood species are characterized by sustainability, consistent quality, and greater yield, which mean to wood manufactures. Red oak, the most abundant hardwood species in this region, was the primary species imported by Chinese purchasers, followed by white oak, hard maple and black cherry. It was indicated that Chinese buyers imported mostly FAS & 1F or Selects from the Appalachian region. More high quality hardwood products will be needed for interior decoration, flooring and furniture manufacturing with the development of the economy and improving standard of living in China, while either quality or quantity of hardwoods produced domestically in China cannot meet the demand of production.

Although the price of the hardwood products in the international market has been increasing, seventy-five percent of the purchasers said they will maintain the same of purchases or increase their purchases from the U.S. in the near future. Only two firms said they will decrease their imports because of higher production costs. This can be explained by the following reasons: (1) despite growth in all types of forests, China still faces a severe lack of forest resources, especially for hardwood products which primarily rely on imports. (2) Russia, the largest wood supplier has increased its export tariff on logs; (3) the exchange rate of U.S. dollars to Chinese Yuan has decreased 16% since 2005, making U.S. hardwoods more competitive in Chinese market; and (4) the major hardwood suppliers in the Southeast Asia are decreasing exports due to increasing international pressure on environment and illegal logging in those countries.

The customer satisfaction investigation showed that Chinese buyers were mostly satisfied with the long-term supply of hardwood products. The limited domestic supply of hardwood products in China and unstable sources abroad were the main reason for choosing U.S. hardwood suppliers. However, there are still some ongoing issues such as slightly higher prices, transportation packaging and delivery time that need to be improved. Other barriers in the process of hardwood products imports indicated by the Chinese purchasers include the complexity of import procedures, the longer fumigation time, communication difficulties, and others. Developing better communication channels could be essential for U.S. hardwood suppliers to keep existing markets and to identify new customers in the Chinese market.

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