

United States International Trade Commission

**Wood Flooring and  
Hardwood Plywood:  
Competitive Conditions  
Affecting the U.S.  
Industries**

Investigation No. 332-487

USITC Publication 4032

August 2008



# U.S. International Trade Commission

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# **U.S. International Trade Commission**

Washington, DC 20436  
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**August 2008**

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# ABSTRACT

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Although U.S. production, consumption, and trade of wood flooring and hardwood plywood increased significantly during the 2002–07 period, the domestic industries faced increasing competition from imports. In the midst of growing markets for both wood flooring and hardwood plywood, U.S. wood flooring producers generally increased shipments, capacity, and exports more than U.S. hardwood plywood producers. During the period, the value of U.S. imports doubled, and their share of the U.S. markets increased from one-third to nearly one-half in 2007. Factors contributing to the rise in imports included shifting U.S. market preferences and reportedly, the increased market power of wholesale distributors and large retailers whose greater logistical capabilities make them more able to source imported products. In addition, higher input costs in the United States, mainly for raw material and labor, put upward pressure on U.S. product prices at the same time that lower input costs, mainly for labor, in competitor supplier countries (other than Canada) put downward pressure on finished product prices and contributed to the rise in the import share of the U.S. market. Although there are a number of significant foreign suppliers, during the 2002-07 period China became the largest supplier of wood flooring and hardwood plywood and the most significant competitor to the U.S. industry in the U.S. markets for hardwood plywood and engineered wood flooring. Chinese producers took advantage of domestic plantation wood resources and relatively low wage rates to achieve low overall production costs, and as its currency was effectively pegged to the U.S. dollar for most of the period, China was able to increase exports to the United States and to increase its market share, partly at the expense of other foreign suppliers.



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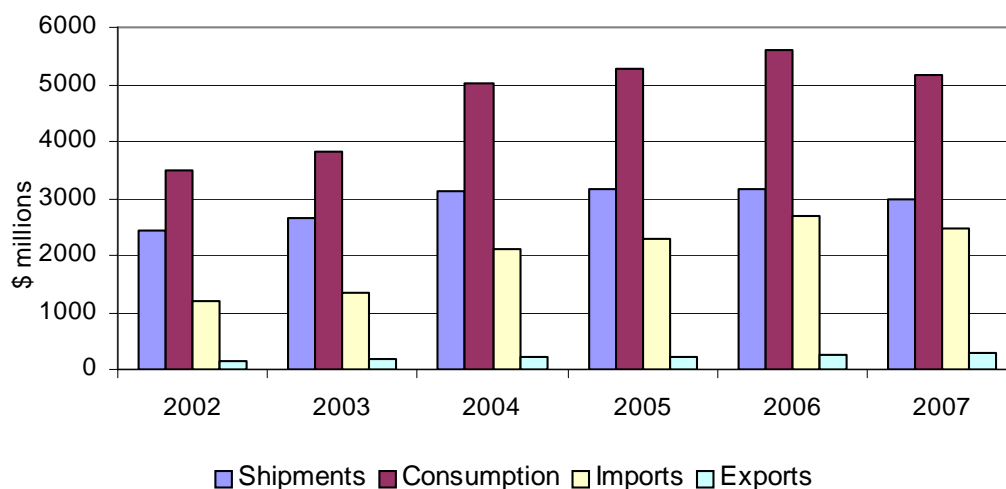
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# Executive Summary

The value of U.S. production, consumption, and trade of wood flooring and hardwood plywood all increased during the 2002–07 period. However, in the midst of a rapidly growing market, the domestic industries faced increasing competition in the U.S. market from rising imports. As imports rose from \$1.2 billion in 2002 to \$2.7 billion in 2006 before falling back to \$2.4 billion in 2007, the share of the U.S. market held by imports rose from about one-third in 2002 to nearly one-half by 2007 (figure ES.1). This increase in market share indicates a possible decline in the competitive position of the U.S. industries, particularly vis-à-vis the Chinese industries, which are now the largest foreign suppliers of these products and the most significant competitors to the U.S. industry in the U.S. markets for hardwood plywood and engineered wood flooring.

This report responds to a request by the Senate Finance Committee for information on and analysis of the trends and new developments in the global wood flooring and hardwood plywood industries that have affected the competitive position of the U.S. industries in the U.S. market. The report covers four major areas: (1) an overview of the U.S. market; (2) a description of the U.S. industries and the principal foreign industries supplying the U.S. market; (3) an examination of U.S. trade patterns and the factors affecting trade patterns; and (4) an analysis of the factors affecting the competitive position of U.S. producers and the principal foreign suppliers in the U.S. market.

**FIGURE ES.1** U.S. shipments, consumption, imports, and exports of wood flooring and hardwood plywood, 2002–07



Source: Compiled from U.S. producers and importers questionnaires.

## Major Findings

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Key factors affecting the competitive position of the U.S. wood flooring and hardwood plywood industries in the U.S. market during the period 2002–07 include the following:

### **U.S. Consumption of Wood Flooring and Hardwood Plywood Grew Rapidly**

U.S. consumption of these products rose from \$3.5 billion in 2002 to \$5.6 billion in 2006 before declining to \$5.2 billion in 2007. Consumption of solid wood flooring, engineered wood flooring, and hardwood plywood increased by 41 percent, 100 percent, and 35 percent, respectively during this period. Growing U.S. markets over most of the period for new residential housing and remodeling and consumer preferences for wood flooring over other types of flooring drove the strong increase in demand for both solid and engineered wood flooring. The strong housing market also contributed to the increase in demand for hardwood plywood in certain end-use segments (e.g., cabinetry and fixtures manufacturing). However, declining demand in other end uses (e.g., furniture manufacturing) moderated growth of overall U.S. consumption of hardwood plywood. In the U.S. housing market, a slowdown, which began in 2006, caused declines in consumption and production in 2007 of both wood flooring and hardwood plywood.

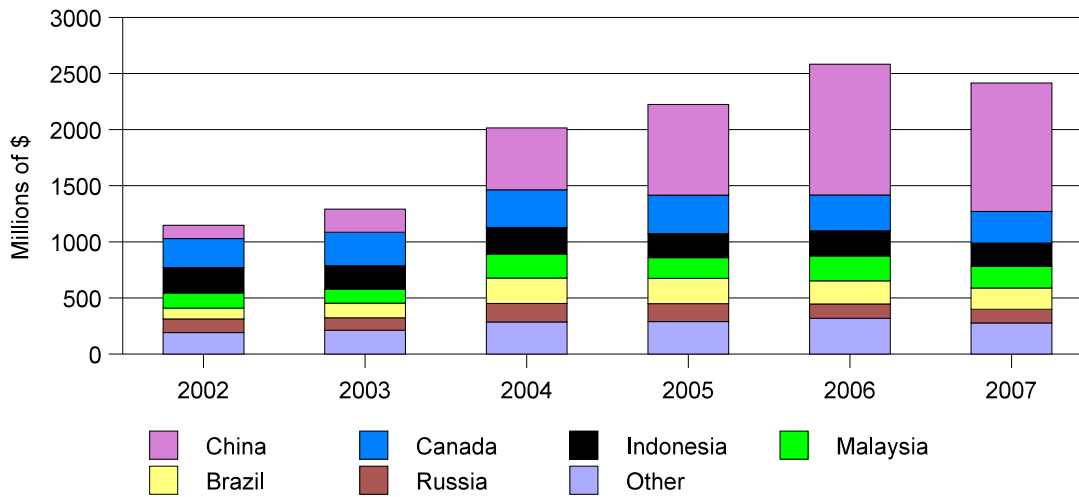
### **U.S. Production of Wood Flooring Increased Significantly While Production of Hardwood Plywood Remained Unchanged**

The performances of the U.S. industries for wood flooring and hardwood plywood were markedly different over the period. Domestic flooring producers were able to significantly increase shipments, capacity, and exports. In contrast, hardwood plywood producers did not significantly increase shipments, capacity, or exports. U.S. shipments of solid and engineered wood flooring posted an average annual increase of 6 percent during the period, increasing from \$1.5 billion in 2002 to almost \$2.2 billion in 2004, and exceeded \$2 billion for the balance of the period. By contrast, U.S. shipments of hardwood plywood posted an average annual increase of only 1 percent during the period, increasing from \$913 million in 2002 to almost \$990 million in 2005, before falling to \$939 million in 2007.

### **U.S. Imports Increased Faster Than U.S. Production**

U.S. imports of wood flooring and hardwood plywood rose from \$1.2 billion in 2002 to \$2.7 billion in 2006 before declining to \$2.5 billion in 2007. Imports of solid wood flooring, engineered wood flooring, and hardwood plywood increased by 140 percent, 350 percent, and 67 percent, respectively. The six largest global suppliers (Brazil, Canada, China, Indonesia, Malaysia, and Russia) are also the largest suppliers of wood flooring and hardwood plywood to the U.S. market (figure ES.2). Imports from Brazil, China, and Malaysia were substantially higher in 2007 than in 2002, while imports from Canada and Russia remained unchanged, and imports from Indonesia were lower.

**FIGURE ES.2** U.S. imports of wood flooring and hardwood plywood, 2002–07



Source: Compiled from official statistics of the U.S. Department of Commerce.

### **Changes in U.S. Market Preferences Benefitted Imports More Than Domestic Production**

A significant shift in U.S. market preferences toward products such as prefinished wood flooring, exotic species for solid wood flooring, and engineered wood flooring largely benefitted foreign suppliers who were able to respond to increased U.S. demand. U.S. producers of wood flooring and hardwood plywood increased their imports of finished products either to broaden product lines or supplement domestic production. U.S. producers also increased their imports of platforms (intermediate inputs) for engineered wood flooring and hardwood plywood to lower production costs. The reportedly increasing market power of large domestic retailers, coupled with their logistical ability to source products overseas, contributed to the further erosion of the domestic market share of the U.S. wood flooring and hardwood plywood industries and may also have put downward pressure on U.S. producers' prices.

### **China Emerged as a Major Global Competitor and Supplier to the U.S. Market**

Despite an expanding domestic market, the rapid growth of Chinese production and exports moved China from a net importer to a large net exporter of engineered wood flooring and hardwood plywood. China accounted for most of the growth in U.S. imports during the 2002–07 period, increasing steadily at an average annual rate of 37 percent. China is the largest hardwood plywood producer in the world and a significant producer of wood flooring.

Despite paying relatively high prices for many imported raw materials, Chinese hardwood plywood and engineered wood flooring producers have been able to take advantage of domestic plantation wood resources which provide a large portion of the material for the veneer cores and relatively low wage rates to achieve lower overall production costs as compared with U.S. manufacturers. Recently, the Chinese government attempted to temper export growth, conserve resources, and address trade frictions by reducing or eliminating value-added tax export rebates and other benefits to the wood flooring and plywood industries such as preferential tax breaks for foreign invested enterprises.

### **Global Trade in Wood Flooring and Hardwood Plywood Increased by 80 Percent, Outpacing Trade in Other Wood Products**

Global trade increased at an average annual rate of 12 percent during the 2002–06 period. The United States and the six leading foreign suppliers to the U.S. market account for more than three-fourths of global exports of wood flooring and hardwood plywood. Brazil, Canada, Indonesia, Malaysia, and Russia produce substantial surpluses of wood flooring and plywood products and are export oriented. Moreover, Indonesia and Malaysia each produce approximately three times more plywood than the United States. However, producers in all five countries are facing increasing competition from China and have lost market share to China in the United States and other major global markets.

### **Changes in Exchange Rates Yielded Uneven Effects**

The declining U.S. dollar did not affect the major U.S. suppliers' currencies equally. The value of the Brazilian real, the Canadian dollar, the Indonesian rupiah, and the Russian ruble have risen relative to the U.S. dollar faster than the Malaysian ringgit and Chinese yuan, giving Malaysia and China a definite advantage vis-à-vis the other suppliers to the U.S. market. However, for a supplier such as China, which relies heavily on imported raw materials, the declining U.S. dollar has also raised the U.S. dollar cost of imported logs and lumber (the majority of which come from non-U.S. sources), thus mitigating some of the advantage that China has when selling its final products into the U.S. market. This decline has also benefitted U.S. exports, particularly to Canada. U.S. producers increased exports of wood flooring products at an average annual rate of 16 percent by quantity and by 17 percent by value. U.S. exports of hardwood plywood were mixed with the value of exports increasing at an average annual rate of 4 percent even as quantities exported fell.



## **Illegal Logging Increases the Supply and Reduces the Cost of Raw Materials and Has Contributed to Increased Production and Consumption of Wood Flooring and Hardwood Plywood**

In addition to providing a possible cost advantage to those who use illegal logs in the manufacture of wood products, illegal logging has a negative effect on prices for all wood products by increasing the supply of wood products on global markets. The effect of illegal logging on U.S. prices, however, has been relatively small. Major studies have estimated that although illegal logging decreases world prices by 5–16 percent, it has only caused a decrease in U.S. prices of 2–4 percent. Major exporters have implemented measures designed to control and conserve forest resources and to retain those resources for their domestic producers, with varying degrees of success. Major importers of forest products, such as the United States, the European Union, and Japan, have also implemented policies or are developing policies to address illegal logging.



# CHAPTER 1

## Introduction

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### Background and Purpose

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The United States is one of the world's leading producers and consumers of wood flooring and hardwood plywood, and is an important participant in the increasingly globalized market for these products. Although U.S. exports of wood flooring and hardwood plywood have risen in recent years, the U.S. industries manufacturing these products depend primarily on the domestic market for sales. Consequently, the 105 percent increase in the value (nominal) of U.S. imports of wood flooring and hardwood plywood during 2002–07 and the resulting 48 percent share (by value) of the U.S. market now held by imports have raised concern in the U.S. industries. Although there are a number of significant foreign suppliers to the U.S. market, the inroads in the U.S. market share made by Chinese products are particularly noteworthy. China is now the largest U.S. supplier of wood flooring and hardwood plywood products and the most significant U.S. competitor in the hardwood plywood and engineered wood flooring segments of the domestic market.

This report was prepared in response to a request by the Senate Committee on Finance (Committee) regarding competitive conditions affecting the U.S. wood flooring and hardwood plywood industries.<sup>1</sup> The report addresses, to the extent possible, the following elements of the Committee's request:

- An overview of the U.S. markets for solid and engineered wood flooring (both unfinished and factory-finished products) and hardwood plywood;
- A description of the U.S. industries for wood flooring and hardwood plywood and the industries in the principal countries (including Canada, China, Brazil, Indonesia, Malaysia, and Russia) supplying the U.S. market, including trends in production, capacity, employment, and consumption;
- An examination of U.S. trade patterns and the factors affecting trade patterns, including tariffs and other border measures;
- An analysis of the factors affecting the competitive position of U.S. producers and the principal foreign suppliers to the U.S. market, including raw materials, illegal

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<sup>1</sup> On March 6, 2007, the Senate Committee on Finance (Committee) requested that the U.S. International Trade Commission (Commission) prepare a report under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)) that provides information on the competitive conditions that affected the U.S. wood flooring and hardwood plywood industries during the 2002–06 period. A copy of the request letter is included in app. A, along with a copy of the Committee's March 10, 2008, letter amending the schedule of the investigation. App. B includes the Commission's notice of institution and notice to reschedule the public hearing, which were published in the *Federal Register*.

logging, technological capabilities, labor practices, environmental policies, government programs, and substitutes for wood flooring and hardwood plywood; and

- Views of industry, homebuilders, importers, and other interested parties on developments in the supply of and the demand for wood flooring and hardwood plywood, including the effect of imports and substitutes for each product.

## **Product Coverage**

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### *Product Descriptions*

#### **Wood Flooring**

Wood flooring, including both solid wood flooring and engineered wood flooring, is one segment of the \$24 billion U.S. market for floor coverings; other segments include carpet and rugs, resilient flooring (e.g., vinyl and rubber flooring), ceramic floor tiles, and laminate flooring. U.S. demand for wood flooring is closely tied to U.S. residential housing construction and remodeling, which account for the vast majority of sales.

Although wood flooring is predominantly made from hardwood species, softwood species are occasionally used; therefore, this report will use the terms “wood flooring” or “wood floors.” Solid wood flooring is typically milled from a solid piece of lumber and shaped to impart the characteristic tongue and groove to the edges and/or ends. Solid wood flooring is typically made in thicknesses of 3/4 inches or 5/16 inches and can be made from a wide variety of temperate and tropical hardwoods.

Engineered wood flooring is typically assembled into panels (like plywood) with 3–10 layers of wood veneer with the grain of adjacent plies perpendicular.<sup>2</sup> Once assembled, “boards” are shaped to impart tongues and grooves to the edges in the same fashion as solid wood flooring. Engineered wood flooring ranges from 1/4 inch to 3/4 inch thick, and the top (i.e., wear) layer ranges from 1/16 inch to 1/6 inch thick. Due to its multi-ply construction, engineered wood flooring is more dimensionally stable than solid wood flooring and thus can be installed in areas that were previously considered unsuitable for wood floors (e.g., directly over concrete slabs and in basements).

Both solid and engineered wood floors are sold as either unfinished or prefinished (i.e., factory finished) products. Prefinishing generally facilitates installation and increases durability.<sup>3</sup>

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<sup>2</sup> Fillets of solid wood may be substituted for veneer in the core of engineered wood flooring.

<sup>3</sup> Some wood flooring is finished by infusing it with acrylic to increase the hardness and resistance to wear and damage of the floor. Catalina Research, Inc., *Wood Flooring*, November 2005, 44.

## Hardwood Plywood

U.S. demand for hardwood plywood is principally derived from demand for cabinets, furniture, store fixtures, recreational vehicles, and manufactured homes as well as U.S. residential housing construction and remodeling. Because products made with hardwood plywood are meant to be seen, the appearance of plywood is often a defining feature.

A plywood panel is formed by applying glue to face, back, and core veneers that are then stacked on one another alternating the direction of the grain of each ply. The resulting sandwich has a face ply, a back ply and a core consisting of an odd number of plies (three or more) depending on the thickness of the veneer and the desired thickness of the finished product. Plywood production generally begins by either peeling or slicing a log into thin sheets.<sup>4</sup> Rotary (peeled) veneer<sup>5</sup> is less expensive than sliced veneer and is used for core material, as well as faces and backs, whereas sliced veneer<sup>6</sup> is used as face veneer in high-value end uses (e.g., wall paneling, furniture). Other types of panels, such as particleboard or medium-density fiberboard (MDF), are sometimes used for cores, either alone or in combination with veneer, and U.S. producers in the Pacific Northwest and Brazilian producers often use softwood veneer for core material.<sup>7</sup> A paper, vinyl, or melamine layer may be used instead of veneer for the back of a panel. Figure 1.1 summarizes the flow of raw materials and inputs for wood flooring and hardwood plywood.

## *Tariff Classification and Treatment*

Wood flooring and hardwood plywood are classified in chapter 44 (wood and articles of wood; wood charcoal) of the Harmonized Tariff Schedule of the United States (HTS). Generally, these products do not have distinct tariff or statistical categories assigned to them and are classified in several subheadings within HTS headings 4409, 4412, and 4418, based on characteristics such as species of wood, construction, and finish. Hardwood plywood is classified in heading 4412 (*plywood, veneered panels, or similar laminated wood*); more detailed classification depends on the species of wood used for the face and back of the panel, the type of core (e.g., veneer, solid, particleboard, MDF), and the construction of the panel. Wood flooring is also classified based on its characteristics, and may be classified in headings 4409 (*wood continuously shaped along any of its edges, ends or faces*), 4412 (*see*

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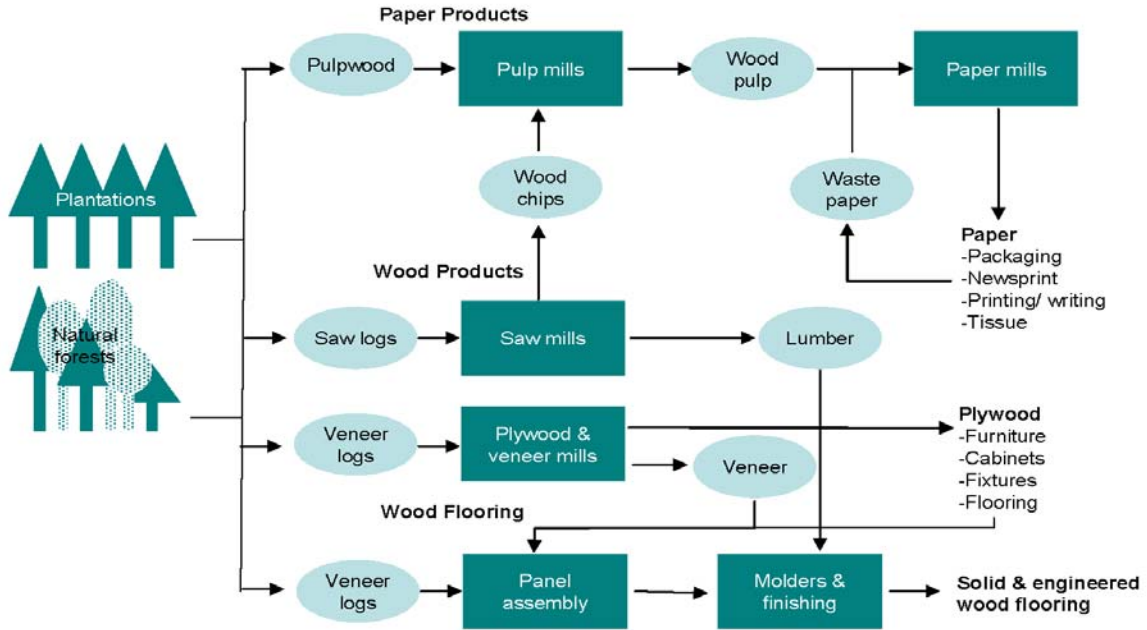
<sup>4</sup> Veneer (i.e., peeler) logs are higher in value than logs used for lumber because they are relatively large, straight, and free of defects and/or large knots. To prepare them for peeling, they are debarked, cut to length, and soaked in steam and/or hot water to soften the wood fibers.

<sup>5</sup> To make rotary veneer, a log is spun on a lathe as a long (parallel) knife is held against it, producing a continuous piece of veneer in a manner analogous to unrolling paper towels. A guillotine cuts the veneer across its width to create panel-sized pieces.

<sup>6</sup> To make sliced veneer, logs are sawn into half logs or quarter logs to create a flat surface, across which a knife is drawn. In contrast to rotary cut veneer, which is cut into panel-sized pieces, the relatively narrow leaves of sliced veneer must be spliced together to form panel-sized pieces.

<sup>7</sup> The production of plywood cores (i.e., platforms or blanks) is sometimes an intermediate step in the production of finished hardwood plywood. U.S. hardwood plywood producers may use domestic or imported platforms in the production of finished hardwood plywood. Under the Harmonized Tariff Schedule (HTS), plywood cores are generally classified in the same subheadings as finished hardwood plywood.

FIGURE 1.1 Raw material production flows for wood flooring and hardwood plywood



Source: Compiled by Commission staff.

above), or 4418 (*builders' joinery and carpentry of wood*). Although engineered wood flooring is generally more heavily processed than hardwood plywood, it is essentially plywood and is classified as such in the HTS.

Depending on the particular subheading, wood flooring and hardwood plywood imports enter the United States at normal trade relations duty rates ranging from zero to 8 percent; special rates of duty may also apply to wood flooring and hardwood plywood under certain trade preference programs or free trade agreements.<sup>8</sup> From 2002 to 2006, the annual average duty paid on U.S. imports of wood flooring and hardwood plywood was 2.4–2.9 percent.

### ***Industry and Trade Data***

Official trade statistics do not permit precise and product-specific estimates of global trade flows of wood flooring and hardwood plywood. This is due to the classification issues noted above (overlapping classification or classification in basket categories);<sup>9</sup> differing units of measure (e.g., cubic meters, square meters, metric tons);<sup>10</sup> and differences between the export data reported by one country and the corresponding import data reported by its trading partner.<sup>11</sup> Because of the overlap in classification between engineered wood flooring and hardwood plywood, the trend in global trade is discussed collectively both in the global overview in chapter 2 and in the section in chapter 3 on major foreign suppliers to the U.S. market. The global trade data shown in chapter 2 are based on official national statistics as compiled and reported by Global Trade Information Services, and are the aggregate of seven 6-digit HS subheadings that are believed to include most wood flooring and hardwood plywood trade.<sup>12</sup> Although this grouping may not include all wood flooring and hardwood plywood and may contain other wood products, it is believed that the observed trend in global trade for this group closely approximates the actual trend for wood flooring and hardwood plywood.

With respect to different units of measure, reported quantities of wood flooring and hardwood plywood trade were converted to a common unit of measure (square meters) using conversion factors obtained from industry sources. Also, apparent errors in reported quantities were analyzed and, when possible, corrected by using the corresponding data from the partner country.

The product-specific estimates of U.S. trade of wood flooring and hardwood plywood used in Chapter 3 were based on producer and importer questionnaires, in combination with official U.S. trade statistics and importers of record data.

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<sup>8</sup> Certain imports of those wood flooring and hardwood plywood products that are not normally free of duty may be free of duty under the various bilateral U.S. free trade agreements or other U.S. trade preference programs (e.g., GSP, AGOA, CBTPA, ATPA). For more specific information on tariff classifications and duty rates, see app. C.

<sup>9</sup> Global trade data for wood flooring and hardwood plywood based on the World Customs Organization's (WCO) Harmonized System (HS) also reflect the overlap in classification between engineered wood flooring and hardwood plywood. Amendments to the HS in 2007 further complicate analysis of global trade. Due to reclassification of some flooring and plywood products, 2007 trade statistics do not correspond directly to data from earlier years. Those amendments were made as a part of the normal WCO 5-year review.

<sup>10</sup> U.S. trade data are generally reported in either cubic meters or square meters depending on the particular product.

<sup>11</sup> Possible causes for the reporting discrepancies include differences in classification or units of measure, errors in data collection and compilation, inconsistent conversions, and/or illegal trade.

<sup>12</sup> The seven HS subheadings are 4409.20, 4412.13, 4412.14, 4412.22, 4412.23, 4412.29, and 4418.30.

Comprehensive global production data for wood flooring and hardwood plywood are not generally available. The estimates of global hardwood plywood production discussed in chapter 2 were based on a number of sources, including the Food and Agriculture Organization of the United Nations (FAO), the International Tropical Timber Organization (ITTO), and the European Federation of the Plywood Industry. Production of wood flooring is more difficult to assess. Because solid wood flooring is one of many end uses for hardwood lumber, it is likely that available estimates of global hardwood lumber production mask the trend in production of wood flooring.<sup>13</sup>

The estimates of U.S. annual shipments of wood flooring and hardwood plywood shown in chapter 3 are based on questionnaire data. For both products, estimates were adjusted to account for the shipments of known non-responding U.S. producers. Industry statistics were also used to estimate U.S. shipments. Partial-year shipment data for 2006 and 2007 were gathered from the Commission's questionnaires and form the basis of the estimates of 2007 U.S. shipments.

The U.S. producer and importer questionnaires solicited a broad range of information that was intended to help characterize the U.S. markets for wood flooring and hardwood plywood. However, the Commission is prevented from reporting certain data (e.g., employment and pricing), even in summarized form, in order to avoid disclosure of confidential business information. Although the Commission received a relatively large number of questionnaire responses, not all producers and importers reported information for all questions or across all pricing products and/or countries. Therefore, the actual responses for particular questions were more limited, and in several instances, the data reported by larger firms accounted for a prohibitively large portion of the total. In general, when confidentiality issues occur, the report discusses only general trends or presents information in an indexed form (e.g., pricing data) to prevent disclosure of confidential information.

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<sup>13</sup> Other uses for hardwood lumber include furniture, millwork, cabinets, railroad ties, and pallets.



## Approach

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A principal goal of this report is to identify and analyze the factors affecting the conditions of competition in the U.S. market between the U.S. wood flooring and hardwood plywood industries and major foreign suppliers. The factors noted in the Committee's letter include raw materials, illegal logging, technological capabilities, labor practices, environmental policies, government programs, and substitutes for wood flooring and hardwood plywood. Various economic factors, such as production costs, exchange rates, and pricing and marketing practices, also contribute to the competitive position of U.S. and foreign industries. Additional factors include firm concentration in production and distribution, the degree of horizontal and vertical integration, product differentiation, and consumer tastes and preferences. Data related to these factors are presented where available, but because sufficient data do not exist, not all these factors can be quantified, particularly for foreign industries. Therefore, market shares and prices in the United States, which can be estimated, are used as key indicators of industry performance in this study. Other competitive factors are assessed qualitatively to the extent possible.

The main data-gathering instruments for this investigation were two questionnaires developed by Commission staff. One questionnaire was designed to be completed by firms in the United States that produce wood flooring and hardwood plywood; the other was designed to be completed by firms that import wood flooring and hardwood plywood into the United States. Both questionnaires were designed to gather quantitative and qualitative information. To address the elements of the request letter, the questionnaires asked for information on trends in U.S. production of wood flooring and hardwood plywood as well as production costs, investment, prices, trade in raw materials, timber legality and certification, and competition. In addition, the questionnaires gathered information on imports of wood flooring and hardwood plywood and competitive factors such as channels of distribution and the substitutability of imported flooring and plywood products for domestic products. Finally, both the importer and producer questionnaires sought detailed information about the HTS subheadings used by importers for their U.S. imports and by producers for their U.S. exports of wood flooring and hardwood plywood. That information was used to develop estimates of U.S. trade, market size, and market shares for wood flooring and hardwood plywood.

The Commission developed a list of 280 companies believed to be producers of wood flooring and hardwood plywood and 160 companies believed to be importers of wood flooring and hardwood plywood. Copies of both questionnaires were mailed to all 440 companies, because some producers are also importers of these products. Over 200 questionnaire responses were received by the Commission.<sup>14</sup> Of those, 66 importer questionnaires and 75 producer questionnaires were compiled and analyzed to assess specific trends and issues related to factors of competitiveness during the 2002–06 period.<sup>15</sup>

As part of this investigation, the Commission held a public hearing on October 3, 2007. The information gathered at the hearing and from the questionnaire responses was supplemented by written submissions provided to the Commission by interested parties; academic and trade literature, including reports from numerous government and nongovernment organizations;

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<sup>14</sup> Includes responses by firms that indicated they were neither importers nor domestic producers.

<sup>15</sup> The questionnaires also solicited information for the first half of 2007, in addition to the 2002–06 period. Data are aggregated in this report so as not to reveal the operations of any one company.

and interviews of industry representatives. Field visits were also made to manufacturing facilities and organizations in North Carolina, Oregon, Pennsylvania, Virginia, Washington, and China.

## **Report Organization**

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Chapter 2 provides an overview of trends in global production, consumption, and trade patterns for wood flooring and hardwood plywood. Country profiles are presented for the United States in chapter 3, for China in chapter 4, and for the other major foreign suppliers to the United States (Brazil, Canada, Indonesia, Malaysia, and Russia) in Chapter 5. Each profile presents information about production, the structure and organization of the industries, trade, consumption, raw materials (logs, lumber, and veneer), supply chain/marketing channels, pricing, and other key attributes and factors affecting each industry. Chapter 6 provides an analysis of the principal factors affecting the competitive position of the U.S. industries and foreign supplier industries competing in the U.S. market. Appendices to this report contain the request letter and amending letter from the Committee (appendix A), *Federal Register* notices (appendix B), HTS descriptions and tariff information (appendix C), a list of witnesses that appeared at the Commission's public hearing (appendix D), and summaries of views of interested parties (appendix E).

# CHAPTER 2

## Global Overview

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The production and consumption of forest products have long been concentrated in the world's most developed economies. About two-thirds of industrial roundwood<sup>1</sup> has traditionally been produced in North America and Europe. With that supply of raw material, those same regions have been the major producers of downstream wood and paper products. However, this traditional pattern is changing. Growth in the production of wood products, in general, and wood flooring and hardwood plywood in particular, is shifting to developing economies, especially to China. Although global production figures for certain hardwood products are not readily available, and trade flows for these products are difficult to track, data suggest that global trade is increasing at a faster rate than global production. New sources of raw materials, new products, and low tariff barriers in the major markets for forest products have all contributed to changing trade patterns.

The United States and the six largest foreign suppliers to the U.S. market account for about three-fifths of the global production of the basic raw materials (hardwood saw logs and veneer logs) used for the manufacture of wood flooring and hardwood plywood. The United States and these suppliers also account for more than one-half of global exports of all wood products and over three-fourths of global exports of wood flooring and hardwood plywood.

Industry observers generally believe that illegal logging, which increases the supply and reduces the costs of raw materials, has contributed to increased consumption of wood products and has furthered the destruction of natural forests, particularly in the tropics. Much of the effort to reduce global forest degradation by combating illegal logging and illicit trade in forest products and increasing the amount of certified sustainable timber and forest products is being undertaken by these seven major producing countries. Major producers and exporters have implemented measures designed to control and conserve forest resources and to retain those resources for domestic producers in order to increase downstream returns. The major importers of forest products—the United States, the EU, and Japan—also have implemented or are developing policies to address the conservation of forest resources.

## Global Production

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### *Raw Materials*

Because forest products industries have historically depended upon local supplies of suitable raw material from existing natural forests, the largest global suppliers of wood flooring and

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<sup>1</sup> Industrial roundwood includes all industrial wood in the rough (logs, saw logs and veneer logs, pulpwood and chips, poles, piling, etc.) but does not include fuelwood.

hardwood plywood also tend to be large producers of the hardwood logs from which the products are made (table 2.1). According to the United Nations Food and Agricultural Organization (FAO), during the 2002–06 period, the United States and the six major suppliers of wood flooring and hardwood plywood to the U.S. market collectively accounted for over 60 percent of global production of hardwood saw logs and hardwood veneer logs.<sup>2</sup> While production of these basic raw materials in the United States and China was essentially constant over the period, Brazil, Malaysia, Canada, and Russia each increased production by more than 20 percent. Global production of hardwood logs grew at an average annual rate of 1 percent during the 2002–06 period.

Geography and climate are key determinants of the types of trees that grow in the natural forests in particular countries.<sup>3</sup> Located in the middle latitudes of the Northern Hemisphere, U.S. forests are well endowed with both hardwoods and softwoods. To date, the United States is the largest global producer of hardwood logs. Brazil, Indonesia, and Malaysia have large areas of tropical forests and are large producers of various species of tropical hardwood logs. Russian and Canadian forests are primarily softwood but are nevertheless large enough to have significant quantities of hardwood logs as well. Desirable indigenous species may confer a competitive advantage with respect to the production of wood flooring and hardwood plywood. For example, Russian birch and Indonesian or Malaysian lauan are in demand for hardwood plywood, and Brazilian exotic tropical species are in demand for flooring. China is not well endowed with natural forests,<sup>4</sup> but recently established poplar plantations provide an important supply of core veneer for China’s plywood and engineered wood flooring industries.

Trade in hardwood logs and veneer is typically limited to higher-value species that are intended for such end uses as furniture, flooring, cabinets, and paneling. Trade in lower-value species is generally restricted to relatively short, cross-border moves, for instance between Canada and the United States, between Russia and China, or within Europe. The higher-value raw material is generally used for solid wood flooring, or for face veneer for plywood, or engineered wood flooring, and the lower-value logs are generally used as core

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<sup>2</sup> FAO data are supplied by reporting countries. Data supplied by some producing countries have been challenged by other countries, as well as certain environmental groups. Comparable data from the International Tropical Timber Organization (ITTO) are not comprehensive globally.

<sup>3</sup> Softwoods typically predominate in natural forests at higher latitudes, and hardwoods predominate in natural forests at lower latitudes. Countries may supplement harvests from natural forests by establishing tree plantations, but the choice of species to be planted is still constrained by geographic and/or silvicultural factors.

<sup>4</sup> Most of China’s natural forests are in remote, mountainous regions; others have been over-harvested or converted to other land uses. Chan, “How Much Risk?” January 18–20, 2006; and Zhang, “China’s Plantation Program,” January 18–20, 2006.

**TABLE 2.1** Global production of hardwood saw logs and veneer logs, 2002–06 (Millions of cubic meters)

Country	2002	2003	2004	2005	2006
United States	61.6	55.8	61.5	61.0	61.4
EU 27	28.0	31.0	31.0	28.0	29.0
Brazil	19.6	22.4	20.9	24.7	24.9
Malaysia	17.9	21.5	23.7	23.0	21.7
Indonesia	26.5	26.0	26.0	24.2	21.6
Canada	15.6	16.1	17.3	19.8	19.8
China	18.3	18.6	18.7	18.7	18.7
Russia	13.0	13.2	13.3	14.9	15.6
Subtotal	201.2	204.5	212.3	214.5	212.5
Other	72.6	72.7	77.5	77.6	78.8
Total	273.8	277.2	289.7	292.2	291.3

Source: FAOSTAT Forestry Database.

material. The major global trade flows for non-coniferous (i.e., hardwood) industrial roundwood, which includes hardwood logs, are presented in figure 2.1.<sup>5</sup>

### ***Wood Flooring and Hardwood Plywood***

Strong global demand spurred increased production of both wood flooring and hardwood plywood during the 2002–06 period. Although data are not available for global wood flooring production, it is believed that production increased substantially, largely in response to robust residential and commercial construction activity in the major consuming markets (e.g., the United States, the EU, and China). The United States, the EU, China, Indonesia, Malaysia, and Brazil are believed to be among the top global producers of wood flooring.

Global production of hardwood plywood increased at an estimated average annual rate of 8 percent during the period, due in part to strong demand for hardwood plywood for non-structural construction purposes, as well as for furniture manufacturing.<sup>6</sup> In each year of the period, the United States and the six major suppliers to the U.S. market accounted for more than three-fourths of global production of hardwood plywood (table 2.2). However, the shift in global production of hardwood plywood toward developing economies is demonstrated by the fact that Brazil, China, India, Malaysia, and Russia accounted for virtually all the growth in global production over the period.

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<sup>5</sup> Global trade statistics are not available separately for hardwood saw logs and veneer logs.

<sup>6</sup> *Annual Report, 2006–2007*, European Federation of the Plywood Industry, June 28, 2007, various pages. Commission staff estimates of global hardwood plywood production are based on data from FAO, ITTO, and the European Federation of the Plywood Industry.

FIGURE 2.1 Non-coniferous industrial roundwood: Major trade flows, (million \$), 2006



**LEGEND**  
Major exporters  
Major importers

Source: GTIS, Global Trade Atlas Database.

**TABLE 2.2** Estimated global production of hardwood plywood (1,000 cubic meters)

Country	2002	2003	2004	2005	2006
China	9,720	17,990	17,960	21,530	23,360
Indonesia	6,550	6,111	4,514	4,534	6,111
Malaysia	4,341	4,771	4,734	5,006	5,072
Russia	1,675	1,820	2,066	2,352	2,390
India	1,600	1,760	1,936	2,130	2,312
United States	1,855	1,855	1,855	1,844	1,786
EU 27	1,611	1,580	1,689	1,677	1,712
Brazil	1,100	1,220	1,380	1,305	1,387
Japan	1,132	1,131	919	963	1,009
Taiwan	500	550	650	650	717
Canada	300	300	300	302	293
Subtotal	25,741	30,621	29,643	30,360	32,647
Other	3,503	3,602	4,034	4,093	4,061
Total	33,887	42,690	42,038	46,385	50,210

Source: Estimated by Commission staff based on data from the FAOSTAT Forestry Database, ITTO annual reports, and FEIC Annual Report 2006–07.

## Global Trade

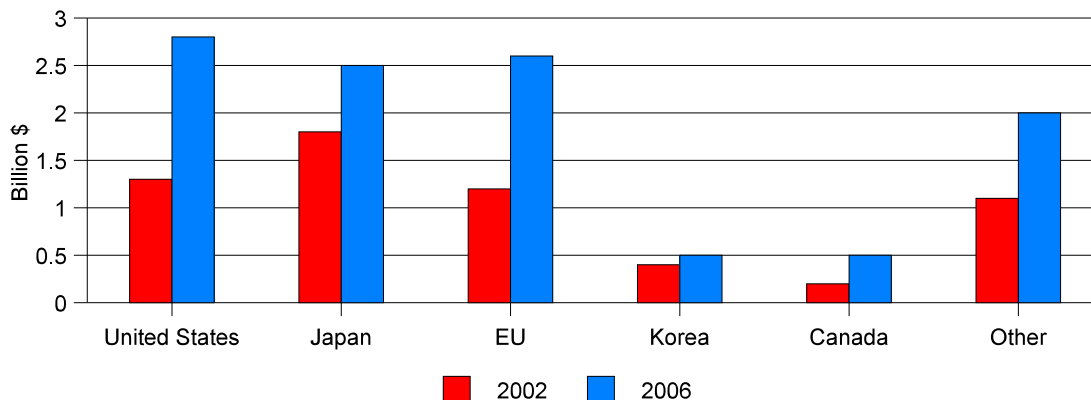
Both supply and demand factors spurred global trade in forest products during the 2002–06 period. Production capacity moved from the large consuming countries to countries with lower costs of production for wood and paper products, and the establishment of fast-growing plantations added new sources of both softwoods and hardwoods in some countries. Also, the development of new products, such as engineered wood flooring and prefinished flooring, and the demand for new, exotic species in both flooring and plywood products contributed to this changing trade pattern.

Trade in wood flooring and hardwood plywood increased at a faster pace than trade in other wood products, growing from a 12 percent share in 2002 to a 15 percent share of global wood products trade in 2006.<sup>7</sup> Global imports of wood flooring and hardwood plywood increased steadily during the 2002–06 period at an average annual increase of 12 percent, from \$6.1 billion to \$11.0 billion (figure 2.2).<sup>8</sup> Global demand for imported wood flooring and hardwood plywood products is highly concentrated; the top three import markets (the United States, the EU, and Japan) collectively accounted for 73 percent of global imports in 2006. Japan, previously the largest importer of wood flooring and hardwood plywood, was overtaken by the United States in 2004 and the EU in 2005, as U.S. and European imports expanded at faster rates (16 and 17 percent, respectively) than Japan’s imports (7 percent).

<sup>7</sup> These trade figures are based on import and export data reported by countries to Global Trade Information Services, Inc. Tracking global trade flows for these products is problematic. Regardless of the statistical source, major differences exist between data reported by importing and exporting countries. Some of the causes for the discrepancies include differences in classification and units of measure, errors in data collection and compilation, and inconsistent conversions. Illegal harvesting and trade may contribute to additional discrepancies. Goetzl, “Discrepancies in Foreign Trade Data,” 2005.

<sup>8</sup> Although this grouping contains other wood products as well, it is believed that the observed trends in global trade for this grouping closely match the actual trends for wood flooring and hardwood plywood. Owing to the overlap in HS classifications between engineered wood flooring and hardwood plywood, it is not possible to determine separate global trade flows for these products.

**FIGURE 2.2** Reported global imports of wood flooring and hardwood plywood, 2002 and 2006



Source: GTIS, Global Trade Atlas Database.

Note: Includes HS subheadings 4409.20, 4412.13, 4412.14, 4412.22, 4412.23, 4412.29 and 4418.30.

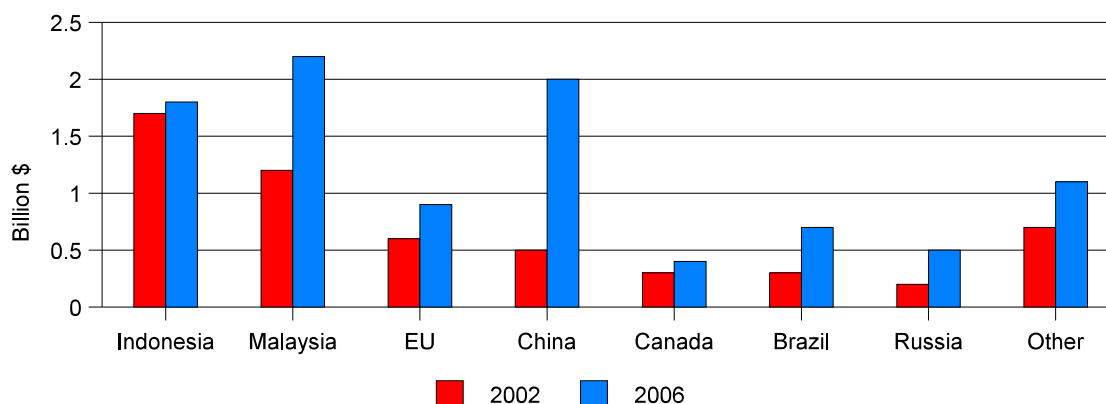
imports expanded at faster rates (16 and 17 percent, respectively) than Japan's imports (7 percent). Japan's more moderate growth was due, in part, to the relatively slow growth of the Japanese housing market during the 2002–06 by historically low interest rates, European residential construction, for both new and renovations reportedly began a strong upward trend in 2004.<sup>9</sup> In addition to the trend in residential construction, European demand for wood flooring is increasing relative to other types of flooring. Consumption of engineered solid wood flooring reportedly accelerated during the last five years, and by 2006, European

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<sup>9</sup> *Annual Report, 2006–2007*, European Federation of the Plywood Industry, June 28, 2007, various pages.



**FIGURE 2.3** Reported global exports of wood flooring and hardwood plywood, 2002 and 2006



Source: GTIS Global Trade Atlas Database.

Note: Includes HS subheadings 4409.20, 4412.13, 4412.14, 4412.22, 4412.23, 4412.29 and 4418.30.

consumption of wood flooring was approximately 114 million square meters or period.<sup>10</sup> Driven 5.5 percent of the total flooring market.<sup>11</sup> European plywood consumption by quantity increased during the period at an estimated average annual rate of 4 percent.<sup>12</sup>

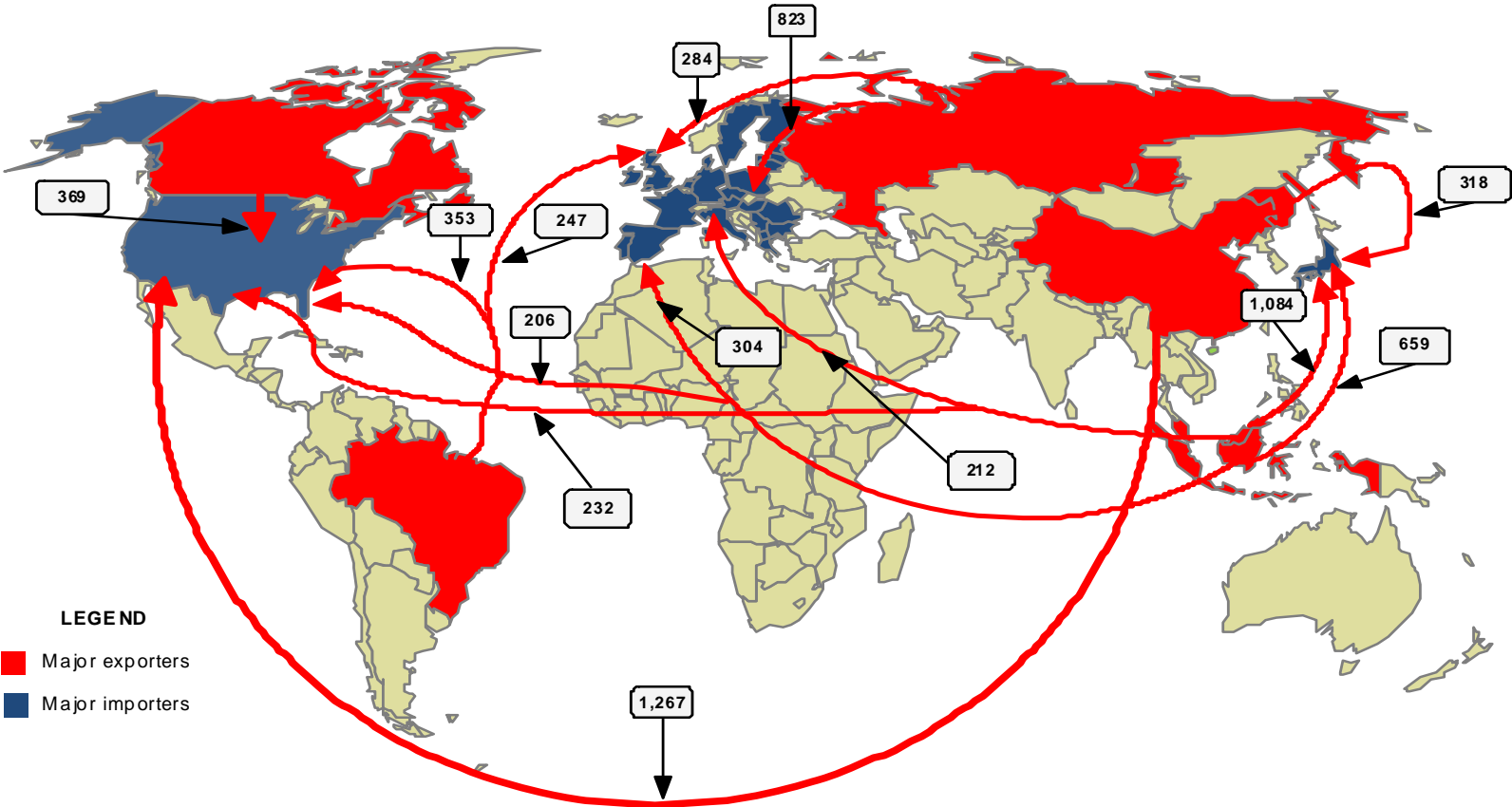
The top three exporters of wood flooring and hardwood plywood (China, Malaysia, and Indonesia) accounted for about two-thirds of global exports (by value) during 2002 (figure 2.3). Chinese exports posted the largest gain among all supplier countries from 2002 to 2006, increasing steadily at an average annual rate of 37 percent during the period, and accounted for almost one-half of the increase in global exports. In 2006, China overtook Malaysia to become the largest global supplier. Malaysian exports increased steadily at an average annual rate of 13 percent, while Indonesian exports peaked in 2004. Brazilian and Russian exports grew at an average annual rate of 15 percent, while Canadian exports expanded much more slowly (3 percent) during the period. The major global trade flows for hardwood plywood and wood flooring are presented in figure 2.4.

<sup>10</sup> During the 2002–06 period, Japanese housing starts increased at an average annual rate of 2 percent. Yasushi Okamoto, editor of *Japan Lumber Journal*, e-mail message to Commission staff, February 18, 2008.

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

FIGURE 2.4 Hardwood plywood and wood flooring: Major trade flows, (million \$), 2006



**LEGEND**  
■ Major exporters  
■ Major importers

Source: GTIS, Global Trade Atlas Database.

The quantity of global exports of wood flooring and hardwood plywood expanded at a somewhat slower rate than the dollar value of such exports during the 2002–06 period, due in part to the declining value of the U.S. dollar.<sup>13</sup> The top three exporters (China, Malaysia, and Indonesia) accounted for 60 percent or more of the volume of global exports during the period (table 2.3). Again, Chinese exports of wood flooring and hardwood plywood posted the largest gain of any country, increasing steadily at an average annual rate of 43 percent in quantity terms. The quantity of Russian exports also increased rapidly, at an average annual rate of 22 percent. Quantities of exports from Malaysia, Brazil, and Canada increased at much more modest rates, and shipments from Indonesia actually declined by an average annual rate of 9 percent. The United States is the eighth–largest exporter of wood flooring and hardwood plywood. Reported U.S. exports increased at an average annual rate of 12 percent, to \$325 million, during 2002–06 and benefitted from favorable exchange rates, especially later in the period.

**TABLE 2.3** Reported exports of wood flooring and hardwood plywood

Country	2002	2003	2004	2005	2006	<sup>a</sup> CAGR
	Thousand cubic meters					%
China	1,530	2,393	4,702	5,830	9,032	43
Malaysia	4,003	4,371	4,372	4,562	5,855	8
Indonesia	6,157	7,327	6,320	4,608	3,919	-9
Brazil	1,163	1,169	2,033	1,357	1,372	3
Russia	1,012	920	1,405	1,817	2,751	22
United States	365	423	508	743	1,168	26
Canada	514	532	555	599	562	2
Other	4,798	6,080	5,656	4,300	4,231	6
Total	19,451	23,216	25,552	23,816	28,890	8

Source: GTIS, Global Trade Atlas Database.

<sup>a</sup>Compound annual growth rate.

## Illegal Logging and Trade

Despite national forestry laws that restrict logging and establish requirements for sustainable harvesting, illegal logging remains a significant contributor to degradation of the world's remaining natural forests. According to the FAO, regions with developed economies and temperate forests generally have stable or increasing forest area, while regions with

<sup>13</sup> Analysis of the quantities of global exports of wood flooring and hardwood plywood is made more difficult because quantity data for the HS subheadings that include wood flooring and hardwood plywood are reported in different units of measure (meters, square meters, cubic meters, metric tons, and kilograms) or are not reported at all. This gives rise to apparent errors in reporting that are difficult to detect and correct or convert to a common unit of measure. Most data for these products are reported in cubic meters, square meters, or metric tons. Quantities reported in metric tons or square meters have been converted to cubic meters using average weights and thicknesses; quantities reported in meters were not included. Industry officials believe that the estimated trends closely match the actual trends.

developing economies and tropical forests continue to lose forest area.<sup>14</sup> In addition to environmental effects, illegal logging is believed to be disrupting trade,<sup>15</sup> creating unsustainable economic development, and causing lost revenue for national governments and local communities.<sup>16</sup>

In 2001, the OECD estimated that approximately 10 percent of the global trade in forest products was derived from illegally harvested or traded wood.<sup>17</sup> The World Resources Institute has estimated that illegal logging represents about 8–10 percent of global wood products production, and that about 17 percent of plywood production and as much as 23 percent of exported plywood is likely to be manufactured from illegally acquired logs.<sup>18</sup> The World Bank estimated the annual global value of losses from illegal logging on public land at more than \$10 billion and the losses of royalties at an additional \$5 billion.<sup>19</sup>

### *Definitions of Illegal Logging*

Efforts to address illegal logging are hampered by the lack of a universally accepted definition of illegal logging, other than the notion that it includes logging that violates national forestry laws.<sup>20</sup> Government agencies tend to focus on whether timber harvests are officially sanctioned and whether traded raw material and products carry valid documents.<sup>21</sup> Definitions used by nongovernmental organizations (NGOs) often incorporate other issues such as the awarding of logging concessions, sustainable forest management, compliance with labor and environmental laws and regulations, proper collection of taxes, royalties and fees, and an absence of corruption. The differences between governmental and NGO definitions may help explain some of the variation found in assessments of the extent of illegal logging.<sup>22</sup>

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<sup>14</sup> FAO, *State of the World's Forests 2007*, 2007, viii. The causes of deforestation vary by location and include logging for raw material for wood and paper products, conversion of forested lands to crop land or cattle grazing land, and the felling of trees for firewood or to be turned into charcoal. Most deforestation in the tropics is caused by conversion to other land uses rather than by logging.

<sup>15</sup> Examples of trade disruptions include import and export bans on logs and sawn timber in producing countries and government procurement policies aimed at reducing illegal logging. Some industry observers also consider certain activities of private sector entities that object to imports of some wood products to be disrupting market access.

<sup>16</sup> FAO, "Governments Making Progress in Curbing Illegal Logging," December 5, 2005, 1. For a comprehensive look at the extent of illegal logging, the environmental and other damages associated with it, and the attempts by governments, NGOs, and others to curtail the practice, see Chatham House of London, <http://www.illegal-logging.info/>.

<sup>17</sup> OECD, *Environmental Outlook*, 2001.

<sup>18</sup> World Resources Institute Web site <http://www.wri-ltd.com/marketPDFs/IllegalLogging> (accessed June 5, 2007).

<sup>19</sup> World Bank, *Strengthening Forest Law Enforcement and Governance*, August 2006, 2.

<sup>20</sup> However, there is nearly universal agreement that some tree species warrant protection, and they are specifically listed in the Appendices to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). For instance, Brazilian rosewood is listed in app. I, which prohibits commercial trade, and big-leaf mahogany is listed in app. II, which tightly controls trade.

<sup>21</sup> Miller, Taylor, and White, *Keeping it Legal*, July 2006, 11–12.

<sup>22</sup> Turner, Katz, and Buongiorno, *Implications for the New Zealand Wood Products Sector*, July 2007, i.

The most commonly cited definition of illegal logging addresses many of the issues noted. Under this definition, illegal logging includes harvesting without authority in designated parks or forest reserves, harvesting in excess of concession permit limits, avoiding royalty payments or taxes, and violating international trading rules and agreements.<sup>23</sup>

### ***Estimated Rates of Illegal Logging in Production and Exports***

It is often difficult to determine the origin of logs and, thus, the legality of those logs and the downstream wood products. As noted by the OECD, reported figures for illegal logging are imprecise and subject to debate, and the amount of illegal wood entering markets is particularly difficult to estimate given the imperfect monitoring and statistical systems that exist in many countries. Raw material is available from many different suppliers and is then turned into wood and paper products by firms that may use a mix of legal and illegal material. Raw materials and downstream products are sold in domestic and international markets where further mixing may occur.<sup>24</sup>

Assessing the extent of illegal logging is made more difficult by inadequacies in the statistics for forests and wood processing industries. Official estimates of timber harvests and production of wood products are often questionable. There are also inconsistencies in statistical information produced by agencies and other entities that monitor logging and inconsistencies in the reporting of exports and imports of logs and wood products.<sup>25</sup>

Two comprehensive studies of the economic impact of illegal logging examined the available assessments of the extent of illegal logging and arrived at similar estimates of suspicious harvests and trade across the various countries. The first study, completed in 2004 by Seneca Creek and Associates for the American Forest and Paper Association, examined the ranges of estimates provided by governments, NGOs, and other sources, and sought to estimate the effect of illegal logging on the U.S. forest products industry. Seneca Creek arrived at estimates of suspicious harvests for 2002 for the producers covered by this study that ranged from 5 percent of harvested wood for Malaysia to 60 percent for Indonesia. In a study conducted for the New Zealand Ministry of Forestry, Alphametric (a consultancy) produced nearly identical estimates of suspicious harvests for the high-risk countries.<sup>26</sup> The only difference in their assessments was a slightly higher estimate for Brazil by Alphametric (table 2.4).

These two groups also provided estimates of the percentage of suspicious exports of raw materials (and imports in the case of China) commonly used to produce wood flooring and hardwood plywood, as well as for plywood itself (table 2.5). The estimates from the

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<sup>23</sup> Seneca Creek Associates and Wood Resources International, *“Illegal” Logging and Global Wood Markets*, November 2004, 4.

<sup>24</sup> Contreras-Hermosilla, Doornbosch, and Lodge, *The Economics of Illegal Logging and Associated Trade*, January 2007, 17.

<sup>25</sup> Goetzl, “Discrepancies in Foreign Trade Data,” 2005, i.

<sup>26</sup> Seneca Creek Associates and Wood Resources International, *“Illegal” Logging and Global Wood Markets*, November 2004, 11–13.

**TABLE 2.4** Estimated rates of suspicious industrial roundwood harvests

Country	<sup>a</sup> Alphabetic			<sup>b</sup> Seneca Creek	
	%			Ranges	Assumed
	Low	Most Likely	High		
Brazil	13	19	25	20–90	15
China	20	30	40	30	30
Indonesia	50	60	80	70–80	60
Malaysia	3	5	35	35	5
Russia	10	18	40	20–50	15–20

<sup>a</sup>Turner, Katz, and Buongiorno, *Implications for the New Zealand Wood Products Sector*, July 2007, ii. These percentages include both hardwood and softwood. Harvests from natural forests in Brazil, Indonesia, and Malaysia are predominantly hardwood.

<sup>b</sup>Seneca Creek and Associates and Wood Resources International, *“Illegal” Logging and Global Wood Markets*, November 2004, 11–13. The ranges represent figures reported by various authors and organizations, and the assumed figures are those used in their analysis of the impacts on the U.S. industry.

**TABLE 2.5** Estimated rates of suspicious trade

Country		% of Exports			
		<sup>a</sup> Alphabetic			<sup>b</sup> Seneca Creek
		Low	Most Likely	High	Hardwoods
Brazil	Roundwood exports	13	19	25	1
	Sawnwood exports	13	19	25	15
	Plywood exports	13	19	25	15
China	Roundwood imports	21	32	29	31
	Sawnwood imports	12	18	31	31
	Plywood imports	37	56	74	31
	Roundwood exports	21	32	39	30
Indonesia	Sawnwood exports	21	32	39	31
	Plywood exports	17	25	39	31
	Roundwood exports	100	100	100	100
Malaysia	Sawnwood exports	55	65	86	65
	Plywood exports	37	55	85	55
	Roundwood exports	7	10	35	10
Russia	Sawnwood exports	3	5	35	12
	Plywood exports	3	5	35	12
	Roundwood exports	10	25	40	25
Russia	Sawnwood exports	10	16	40	30
	Plywood exports	10	16	40	20

<sup>a</sup>Turner, Katz, and Buongiorno, *Implications for the New Zealand Wood Products Sector*, July 2007, 25.

<sup>b</sup>Seneca Creek and Associates and Wood Resources International, *“Illegal” Logging and Global Wood Markets*, November 2004, 18.

two studies are similar. Seneca Creek estimated that illegal forest activity represents 5–10 percent of global industrial roundwood production. Seneca Creek estimated the rate for softwood at 4 percent, but the rate for hardwood, the raw material of interest to this study, at 15 percent.<sup>27</sup> Seneca Creek also estimated that as much as 23 percent of hardwood lumber and 30 percent of hardwood plywood could be traced to suspiciously produced roundwood.<sup>28</sup> Alphametric also estimated similar higher rates for hardwood products.

### ***Economic Effects of Illegal Logging***

Illegal logging increases the supply of wood on the market, putting downward pressure on prices and encouraging consumption. Although the price of illegal logs may be equal to that of legal logs in some markets, traders can often sell illegal logs at lower prices by avoiding costs such as fees and taxes. Export prices would likely rise if all log production and exports were legal. However, these higher prices could lead to increased incentives for illegal logging.<sup>29</sup>

The price differential between legal and illegal logs depends on the end use of the logs, e.g., whether they are for fuel wood or for industrial products.<sup>30</sup> Illegal logs are reportedly generally of higher quality and may therefore flow to higher-value uses and draw higher prices. These higher-value products include high-quality sawnwood, which may then be made into solid wood flooring, as well as face veneers for use in higher-end hardwood plywood or engineered wood flooring.

In addition to providing a possible cost advantage to those who use illegal logs in the manufacture of wood products, illegal logging has a negative effect on prices for all wood products. Seneca Creek estimated that illegal logging results in decreased world prices by 7–16 percent and U.S. prices by 2–4 percent.<sup>31</sup> Alphametric estimated that illegal logging causes global prices to decline 5–7 percent. Although these studies do not provide direct links between illegally logged material and specific production or exports of wood flooring and hardwood plywood, there is little evidence to suggest that price impacts for these products would lie outside those estimates. However, since the model simulations performed by Seneca Creek did not distinguish between softwood and hardwood, the price effects for hardwood products may be higher.

### ***Actions to Address Illegal Logging and Trade***

Over the past decade, a number of initiatives have been undertaken to address illegal logging and associated trade. The Convention on the International Trade in Endangered Species (CITES) is the major multilateral environmental agreement that regulates trade in threatened

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<sup>27</sup> Ibid., ES-3.

<sup>28</sup> Ibid., ES-1.

<sup>29</sup> Contreras-Hermosilla, Doornbosch, and Lodge, *The Economics of Illegal Logging*, January 2007, 20.

<sup>30</sup> Ibid., 4.

<sup>31</sup> Seneca Creek Associates and Wood Resources International, “*Illegal Logging and Global Wood Markets*,” November 2004, ES-2.

and endangered species, including trade in forest products. In addition to that convention, to which the United States and the six major foreign suppliers are signatories, the foreign suppliers have their own efforts underway to reduce illegal logging. Those efforts are briefly outlined below and are more fully addressed in the respective country sections in chapters 3, 4, and 5.

## European Union

In the EU, the debate over the extent to which consumer countries contribute to forest degradation by driving the demand for timber and wood products has been especially strong and has led to policy changes at the EU Commission level and in member states. The EU is a major importer of logs, sawn timber, and wood products, including substantial imports from countries identified as high risk for illegal logging and related trade.<sup>32</sup> In 2003, the EU adopted the Forest Law Enforcement, Governance and Trade (FLEGT) action plan with the aim of developing supply-side measures that provide assistance to producer countries that export to the EU and demand-side measures to reduce EU imports of illegally logged timber.<sup>33</sup> The FLEGT action plan's key elements include voluntary partnership agreements (VPAs) between producer countries and the EU on timber licensing; the adoption of policies for procurement of timber from legal sources; the promotion of private sector initiatives such as codes of conduct; and the exercise of due diligence by export credit agencies and financial institutions when funding logging projects.<sup>34</sup> Forest products legally produced in VPA partner countries will be licensed, and only licensed products from these partner countries will be allowed access to the EU. Thus far, the EU has not yet concluded any VPAs. However, several member states are in discussions with individual producer countries on possible VPAs, including Malaysia and Indonesia.<sup>35</sup> On the demand side, several EU countries are implementing public procurement policies requiring the purchase of legal forest products. Thus far, six member states have adopted such policies, with the United Kingdom the furthest along.

## Japan

Japan imports large volumes of timber and wood products, particularly from tropical countries. During 2006, the government of Japan announced changes to its public procurement policy concerning wood-based products, including the requirement that all wood-based products procured on behalf of the national government be certified as being legal.<sup>36</sup> The policy does not require independent verification of legality and does not address sustainability. Certification schemes that are currently accepted as certifying legality under the public procurement policy in the United Kingdom are reportedly likely also to be accepted in Japan.<sup>37</sup>

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<sup>32</sup> Saunders, "EU FLEGT," undated (accessed June 22, 2007), 3.

<sup>33</sup> EC, "Council Conclusions," December 31, 2003.

<sup>34</sup> EU, *Forest Law Enforcement, Governance and Trade*, May 21, 2003.

<sup>35</sup> Saunders, "EU FLEGT," undated, (accessed June 22, 2007).

<sup>36</sup> For further information, see <http://www.illegal-logging.info/presentations/200706/Lopez-Casero.ppt>.

<sup>37</sup> For further information, see <http://www.proforest.net/cpet>.



## United States

### *President's Initiative Against Illegal Logging*

Begun in 2003, the President's Initiative Against Illegal Logging (PIAIL) is intended to assist developing countries in their efforts to combat illegal logging, including the sale and export of illegally harvested timber, and in fighting corruption in the forest sector. The PIAIL focuses on three regions—the Congo Basin, the Amazon Basin and Central America, and South and Southeast Asia.<sup>38</sup> PIAIL emphasizes four key strategies: (1) capacity building to strengthen legal regimes and enforcement of laws affecting forest management, especially those aimed at illegal logging; (2) enhancing community involvement in forest governance and related wildlife issues; (3) transferring technology to improve capabilities to monitor forest activity and conditions as well as compliance with laws; and (4) promoting good business practices, transparent markets and legal trade, including in-country capacity to implement obligations under CITES.<sup>39</sup>

### *Indonesia*

In November 2006, the United States and Indonesia signed a memorandum of understanding (MOU)<sup>40</sup> that is designed to promote forest conservation by combating illegal logging and associated trade and to help ensure that Indonesia's legally produced timber and wood products continue to have access to markets in the United States and elsewhere.<sup>41</sup> The MOU prescribes bilateral consultations and actions to promote transparent timber markets and trade in legally produced timber products, enhanced cooperation on forest law enforcement affecting trade in timber, and partnerships with nongovernmental entities. In support of this MOU, the United States and Indonesia co-sponsored the forest products resolution at the April 2007 UN Commission on Crime Prevention and Criminal Justice.<sup>42</sup>

### *China*

In December 2007, the United States and China signed an MOU under which the two countries agreed to immediately begin sharing information on shipments of timber, step up law enforcement against illegal activity, and encourage private sector partnerships to promote sustainable forest management. The United States and China plan to negotiate a detailed bilateral agreement. China recently has signed other timber protection agreements,

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<sup>38</sup> USAID, "Initiative Against Illegal Logging," May 20, 2004, 1.

<sup>39</sup> White House, "President's Initiative Against Illegal Logging," undated (accessed February 6, 2008).

<sup>40</sup> USTR, "USTR Schwab and Indonesian Trade and Forest Ministers," November 16, 2006.

<sup>41</sup> Japan, China, and Korea, major consumers of Indonesia's wood exports, have each signed an MOU with Indonesia. Indonesia also signed an MOU with the United Kingdom to address the trade in illegal timber between the two countries.

<sup>42</sup> USTR, "International Cooperation in Preventing and Combating Illicit International Trafficking in Forest Products," December 15, 2007, 2.

including agreements and memoranda with Russia on joint forest products industries development, forest fire prevention, and nature reserve protection.<sup>43</sup>

### *Peru*

The recently ratified Peru Trade Promotion Agreement (PTPA) between the United States and Peru includes new and innovative provisions on combating illegal logging. The PTPA environment chapter includes a first-ever annex on forest sector governance that recognizes the environmental and economic consequences of trade associated with illegal logging and illegal trade in wildlife, and provides for concrete steps that the parties will take to enhance forest sector governance in Peru and promote legal trade in timber products. Under a separate partnership, the United States is helping Peru and Colombia to monitor and verify the management of forests under logging concessions, including facilitating the sharing of technologies and approaches for increased forest transparency in the Amazon Basin.<sup>44</sup>

### *Food, Conservation, and Energy Act of 2008*

On May 22, 2008, Congress passed the Food, Conservation, and Energy Act of 2008 (Public Law No. 110-234). Section 8204 of the Food, Conservation, and Energy Act amended the Lacey Act Amendments of 1981<sup>45</sup> (Lacey Act or Act) to extend the Act to imports of wood and wood products harvested from illegal sources. Originally enacted in 1900 to protect wildlife, the Lacey Act was amended in 1981 to include prohibitions on importation or spread of potentially dangerous non-native plants. The 2008 amendment expands the definition of the term “plant” or “plants” in the Lacey Act to include “trees from either natural or planted forest stands”; defines the word “taken” to include, with respect to a plant, “harvested, cut, logged, or removed”; and expands the list of acts prohibited to include plants “taken, possessed, transported, or sold without the payment of appropriate royalties, taxes, or stumpage fees required for the plant by any law or regulation of any State or any foreign law.” The 2008 amendment also requires any person importing a plant into the United States to file an “import declaration” that states the scientific name of the plant, the value and quantity of the importation, and the country of origin of the plant. The Lacey Act provides for civil and criminal penalties in the case of violations of the Act.<sup>46</sup>

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<sup>43</sup> *Ibid.*, 1.

<sup>44</sup> *Ibid.*

<sup>45</sup> 16 U.S.C. 3371 et seq.

<sup>46</sup> 16 U.S.C. 3373.

## Certification and Sustainable Forest Management

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Forest product industries around the world have adopted various certification standards for sustainable forest management, usually as the result of the combined efforts of industry, NGOs, and other interested groups, and often with government support.<sup>47</sup> Certified sustainably managed forests reportedly account for only about seven percent of the global forest area, with the majority of certified area consisting of plantations rather than native forests.<sup>48</sup> National and international programs certify individual land holders, companies, and national, state, or community forests. Typically, private organizations and third-party auditors accredited by the certification programs determine program compliance. Exporting countries, particularly those in the tropics, have sometimes viewed certification programs as trade barriers because of their potential impact on market access for forest products.

The three most widely adopted international certification schemes—PEFC (originally Pan European Forest Certification, now Program for the Endorsement of Forest Certification); Forest Stewardship Council (FSC); and Sustainable Forestry Initiative (SFI)—account for nearly 80 percent of all certified forest land. The PEFC, adopted by both European and non-European countries, covers 23 independent national forest certification systems through mutual recognition and accounts for more than 200 million hectares (494 million acres).<sup>49</sup> As of September 2007, the FSC had certified areas in 76 countries covering about 91 million hectares (225 million acres). Of the major international programs, the FSC currently accounts for the largest portion of certified forest area in the developing countries; these forest areas account for about 20 percent of total FSC-certified forest area. One-third of FSC-certified tropical forests are commercial plantations, and the other two-thirds are natural forests.<sup>50</sup> The SFI, which is in the United States and Canada, began as a voluntary self-regulatory program promoted by the AF&PA. The SFI currently has certified about 61 million hectares (151 million acres).<sup>51</sup>

Several national certification program standards exist, particularly in the major suppliers covered by this report. The Canadian Standard Association (CSA) Sustainable Forest Management Program (CAN/CSA Z809) is the leading certification program in Canada. Other national systems include the Malaysian Timber Certification Council, CERFLOR in Brazil, and Lembaga Ekolabel Indonesia.

The vast majority of certified forest area is still in developed countries, and the demand for certified products is concentrated in the major markets of Europe and the United States. In

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<sup>47</sup> ITTO defines sustainable forest management (SFM) as “the process of managing forests to achieve one or more clearly specified objectives of management with regard to the production of a continuous flow of desired forest products and services without undue reduction of its inherent values and future productivity and without undue undesirable effects on the physical and social environment.” ITTO, “Sustainable Forest Management,” undated (accessed November 7, 2006).

<sup>48</sup> FAO, *State of the World's Forests 2007*, 2007, 94.

<sup>49</sup> PEFC, “About PEFC,” undated (accessed February 14, 2008).

<sup>50</sup> FSC, “More Than 100 Million Hectares,” April 3, 2008, 3.

<sup>51</sup> The SFI and FSC have provisions for chain-of-custody tracking and certification. Given the number of small land holdings in the United States, chain-of-custody and certification for hardwood producers may be more challenging in the United States than in other countries.

developing markets, domestic demand for certified products is much more limited, but several of these countries are substantial suppliers of hardwood products such as flooring and plywood to Europe and the United States, and are thus interested in having their products for international markets differentiated by certification. While certification does not appear to guarantee price premiums, it seems to be a growing requirement in international markets.

# CHAPTER 3

## United States

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Robust U.S. markets for new residential housing and residential remodeling for most of the period and favorable marketing trends vis-à-vis other types of flooring drove apparent U.S. consumption for wood flooring upward. In response, U.S. production capacity and production for both solid wood flooring and engineered wood flooring expanded during much of the 2002–07 period. The strong U.S. housing market also favorably influenced demand for hardwood plywood in certain end uses, but declining demand in other end uses moderated the overall growth of U.S. consumption of hardwood plywood. Contrary to the upward trend that U.S. producers of wood flooring enjoyed, U.S. production capacity for hardwood plywood remained relatively flat, and the quantity of U.S. production actually declined during the period.

U.S. imports of wood flooring and hardwood plywood grew rapidly during 2002–07. The six major global suppliers of these products identified in chapter 2 (Brazil, Canada, China, Indonesia, Malaysia, and Russia) are also the largest suppliers of wood flooring and hardwood plywood to the U.S. market. U.S. imports from China grew at a much faster pace than imports from other countries during the 2002–06 period; China became the largest supplier to the U.S. market in 2004. Estimates of product-specific trade indicate that imports have a significant presence in the U.S. markets for wood flooring and hardwood plywood, and import penetration for both products increased steadily during the period. U.S. exports of wood flooring and hardwood plywood were relatively small compared to imports, and mainly went to the NAFTA partners.

The United States is well endowed with native hardwood resources, which supply most of the raw materials for the large and technically capable U.S. industries manufacturing wood flooring and hardwood plywood.<sup>1</sup> However, despite the abundance of U.S. hardwood resources, U.S. manufacturers generally experienced higher costs for and, in some cases, decreased availability of raw materials during the 2002–07 period. This was due to sawmill shutdowns and high demand for the specific types of raw material typically used by U.S. manufacturers. During the 2002–07 period, there were no U.S. Government programs that directly benefitted the U.S. manufacturers of wood flooring and hardwood plywood.

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<sup>1</sup> The basic elements of the manufacturing processes for these products have remained unchanged for many years, and the equipment (e.g., lathes, molders, and presses) used in their manufacture are the same or very similar among most major competitors. Nevertheless, U.S. mills are relatively advanced with respect to several aspects of the manufacturing process such as the size and speed of manufacturing equipment, the level of automation, and process control systems.

This chapter presents information on the U.S. industries and markets for these products, and much of the information presented in the chapter is based on the questionnaire responses of U.S. producers and importers.<sup>2</sup> The first section of the chapter pertains to raw materials and provides general information about U.S. hardwood resources, which are the principal raw materials for wood flooring and hardwood plywood, and information specific to each product. The second section discusses trends in U.S. trade with the major foreign suppliers and foreign markets for the combined products, as it is not possible to determine product-specific trade flows across the spectrum of supplier and market countries. The final two sections provide specific information about the U.S. wood flooring and hardwood plywood industries. Within the wood flooring section, separate discussions of solid and engineered wood flooring are presented to the extent that information and data are available.

## Raw Materials

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The United States has approximately 304 million hectares (751 million acres) of forest land, of which 68 percent (208 million hectares, or 514 million acres) is available for timber production.<sup>3</sup> Well endowed with indigenous hardwoods, the United States is the leading global producer of hardwood logs, the basic raw materials for wood flooring and hardwood plywood (see table 2.3).<sup>4</sup> U.S. manufacturers reported that the domestic resource base provides them with a competitive advantage over most other producers of wood flooring and hardwood plywood.

During the 2002–06 period, the supply of U.S. logs was relatively stable with the exception of 2003, when production was reportedly hampered by wet weather (table 3.1).<sup>5</sup> U.S. log imports fluctuated during the 2002–06 period but declined subsequent to the collapse of the housing market in 2006. In general, however, apparent U.S. log consumption depends heavily on domestic logs; imported logs accounted for only 3–5 percent of consumption in each year of the period. There were no clear patterns in U.S. exports of hardwood logs during the 2002–06 period, but they consistently accounted for only 3 to 4 percent of production.<sup>6</sup>

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<sup>2</sup> The Commission received 65 usable producer questionnaires and 66 usable importer questionnaires. The reported data from these questionnaires represent an estimated 72–76 percent of total U.S. shipments of wood flooring, 85–93 percent of U.S. shipments of hardwood plywood, and 35–43 percent of U.S. imports of the combined products.

<sup>3</sup> U.S. timberlands (i.e., those available for timber production) are forest lands minus lands reserved for other uses (e.g., national parks and wilderness areas). USDA Forest Service, “Forest Inventory and Analysis National Program,” Table 1, undated (accessed May 9, 2008).

<sup>4</sup> Geography influences the composition of forests; softwoods (e.g., pine, spruce, and fir) dominate in upper latitudes and hardwoods (e.g., oak, maple, and poplar) dominate in lower latitudes. Being located in middle latitudes, the United States is well-endowed with both native softwood and hardwood forests.

<sup>5</sup> Buchanan, “What in the World Happened to Red Oak?” June 2005.

<sup>6</sup> An industry source noted, however, a recent shift in demand toward U.S. hardwood logs, rather than lumber in offshore markets. Industry official, telephone interview by Commission staff, May 8, 2008.

**TABLE 3.1** U.S. production, trade, and consumption of hardwood logs, 2002–07

Item	2002	2003	2004	2005	2006	2007
	Thousand of cubic meters					
Production	61,605	55,801	61,468	60,958	61,358	<sup>a</sup> 61,637
Imports	3,368	2,322	2,088	3,235	2,690	1,910
Exports	2,270	2,165	2,147	2,369	1,950	1,997
Consumption	62,703	55,958	61,409	61,824	62,098	61,550
Imports/consumption ( <i>percent</i> )	5.4	4.1	3.4	5.2	4.3	3.1
Exports/production ( <i>percent</i> )	3.7	3.9	3.5	3.9	3.2	3.2

Source: Compiled from FAOSTAT Forestry Database and official statistics of the U.S. Department of Commerce.

<sup>a</sup>USITC estimate based on prior year trend.

With respect to U.S. hardwood lumber, most is milled in the eastern United States, which accounted for 96 percent or more of annual U.S. production during the period.<sup>7</sup> U.S. production remained flat at about 25–26 million cubic meters (table 3.2). Likewise, U.S. consumption of hardwood lumber remained relatively flat during the 2002–06 period, as decreasing demand related to some end uses (e.g., furniture and pallets) generally offset increasing demand from other end use sectors (e.g., cabinets, flooring, and railroad ties).<sup>8</sup> Imports increased steadily until 2005 and subsequently declined. U.S. exports of hardwood lumber generally increased during the 2002–06 period, in part due to favorable exchange rates and to a general tightening of global hardwood supplies, especially in Russia, Indonesia, and Malaysia.<sup>9</sup>

**TABLE 3.2** U.S. production, trade, and consumption of hardwood lumber, 2002–07

Item	2002	2003	2004	2005	2006	2007
	Thousands of cubic meters					
Production	26,203	24,724	26,055	26,288	25,977	26,183
Imports	1,538	1,585	1,819	1,894	1,632	1,230
Exports	2,767	2,739	3,013	3,010	3,123	2,745
Consumption	24,974	23,570	24,861	25,172	24,486	24,668
Imports/consumption ( <i>percent</i> )	6.2	6.7	7.3	7.5	6.7	5.0
Exports/production ( <i>percent</i> )	10.6	11.1	11.6	11.4	12.0	10.5

Source: Compiled from official trade statistics of the U.S. Department of Commerce and USDOC, Census Bureau, *Lumber Production and Mill Stocks: 2006*, July 2007.

<sup>7</sup> The top five producing states (Pennsylvania, Tennessee, Virginia, West Virginia, and North Carolina) accounted for 38 percent of U.S. hardwood lumber production in 2006. While more than a dozen species are used for hardwood lumber, red and white oak (*Quercus spp.*) and yellow poplar (*Liriodendron tulipifera*), account for about 40 percent of U.S. production. USDOC, Census Bureau, *Lumber Production and Mill Stocks: 2006*, July 2007, 4–6.

<sup>8</sup> Hardwood lumber consumption for flooring reportedly increased by about 10 percent from 2002 through 2005 but declined in 2006. Hardwood Publishing, *Annual Forecast 2007*, 2007, 17; and Armas, “Sawmills Pressured as Furniture Plants Go Abroad,” September 15, 2007.

<sup>9</sup> Even countries with large supplies of hardwood, such as Brazil, are reportedly beginning to import more U.S. logs and lumber. The constrained supply of domestic raw materials noted by Brazilian manufacturers in part explains this trend. *Hardwood Review Global*, “World Wide Lumber Demand Is Up,” May 2006, 1; *Hardwood Review Global*, “Overseas Markets Take on Increased Importance,” August 2006, 1; *Tropical Timber Market Report*, “Brazil Raises Intake of U.S. Timber,” March 2008; and USITC hearing transcript, October 3, 2008, 222–24.

The average U.S. prices for red and white oak lumber (the most important species with respect to wood flooring) increased from 2002 until the third quarter of 2004 due to the continued strength in the housing and remodeling markets (figure 3.1). However, several factors contributed to the subsequent decrease in prices, which began in August 2004. Reportedly, the supply of available lumber increased as U.S. production recovered from a period of difficult logging conditions caused by inclement weather. Also, demand decreased in part due to the contraction of the U.S. furniture industry, a shift away from oak as a preferred species for cabinets, trim, and moldings, and a seasonal slump in export demand during the last half of 2004.<sup>10</sup>

### ***Solid Wood Flooring***

Most U.S. solid flooring manufacturers purchase lumber as opposed to logs; hardwood lumber on average accounted for 96 percent of wood purchases by responding U.S. producers in 2006.<sup>11</sup> U.S. solid wood flooring producers reported no changes in purchasing patterns during the period except in the case of production growth or the development of new products. In 2006, 97 percent of wood purchased by responding producers came from U.S. sources, with only trace amounts from Canada, South America, and Asia, indicating that U.S. producers are not heavily reliant on exotic species of wood.

Although U.S. hardwood resources remain abundant, several solid wood flooring firms reported decreased availability of lumber or longer hauls for lumber during the 2002–06 period. The principal reason cited was U.S. hardwood sawmill closures in the wake of declining demand for lumber by U.S. furniture manufacturers. Furniture is a significant end use for high-grade lumber (i.e., clear, defect free lumber), which typically constitutes about 45 percent of the production of U.S. hardwood sawmills. Declining demand for high-grade lumber reportedly constrained total U.S. hardwood lumber production, with the result that U.S. sawmills were unable to meet demand for the lower grades of hardwood lumber, which flooring producers normally use. The impact of tight supplies of low-grade lumber was exacerbated by strong demand for low-grade lumber from other end uses (e.g., railroad ties). Other factors contributing to decreased availability of raw materials included forest fires, harvesting restrictions on federal lands, scarcity of certain species or types of wood such as black walnut (*Juglans nigra*) or antique lumber (i.e., previously used lumber removed from old buildings), and increased export demand.

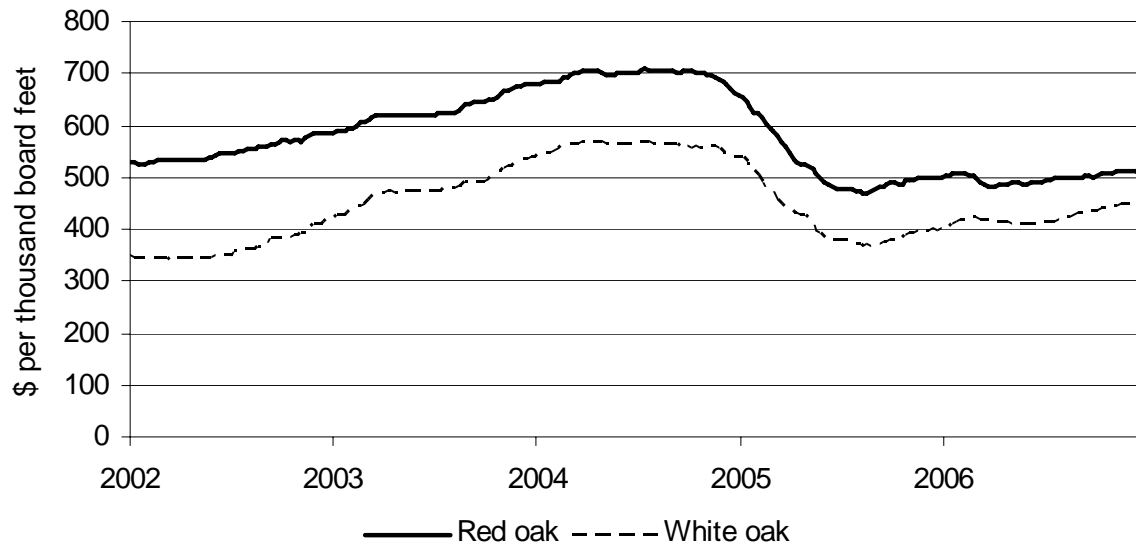
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<sup>10</sup> *Hardwood Market Report*, “2006: The Year at a Glance,” 2007, 18; and Buchanan, “What in the World Happened to Red Oak?” June 2005.

<sup>11</sup> Logs accounted for the remaining balance of U.S. producers’ purchases.



**FIGURE 3.1** U.S. composite lumber prices in dollars per thousand board feet, 2002–06



Source: Hardwood Publishing Co.

### ***Engineered Wood Flooring***

In 2006, veneer accounted for 78 percent of raw material purchases by responding U.S. manufacturers of engineered wood flooring, logs accounted for 14 percent, and platforms<sup>12</sup> accounted for 8 percent. Purchasing patterns were generally stable, with only one firm reporting nonacquisition-related changes. As with solid wood flooring, U.S. manufacturers of engineered wood flooring are largely reliant on U.S. raw materials. In 2006, responding U.S. manufacturers purchased 92 percent of their wood from domestic sources. Asian-Pacific sources accounted for about 5 percent, and trace amounts came from other countries. U.S. manufacturers of engineered wood flooring generally did not report difficulties with respect to raw material supply. In fact, one U.S. manufacturer noted that it had idled its own veneer mill because the firm could purchase veneer from other sources less expensively than it could make it. Another firm stated that it had had to force price reductions on its raw material suppliers in order to remain competitive in its markets against offshore flooring imports.

### ***Hardwood Plywood***

With respect to responding U.S. manufacturers of hardwood plywood, veneer accounted for 64 percent of wood purchases in 2006, platforms accounted for 21 percent, and logs accounted for 15 percent. Several firms noted increasing purchases of platforms during the 2002–06 period. U.S. plywood manufacturers rely mostly on domestic raw materials; in

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<sup>12</sup> Also known as blanks or cores, platforms are plywood cores to which a face ply will be affixed during further manufacturing of engineered wood flooring or hardwood plywood.

2006, responding U.S. firms purchased 72 percent of their wood from domestic sources and 19 percent from Canadian sources. South American, Asian, and African sources supplied the balance (9 percent). Yellow poplar is an important species for cores for eastern U.S. producers, while West Coast firms typically use softwood veneer for cores.<sup>13</sup>

U.S. hardwood plywood producers echoed solid wood flooring firms' concerns about decreased availability of raw materials. Reportedly, the decline in the number of U.S. furniture manufacturers also adversely affected the supply of veneer to U.S. manufacturers because there is no longer a significant domestic market for furniture-grade veneer. Other hardwood plywood producers noted that harvesting restrictions on federal lands and increasing exports had raised prices or decreased the availability of raw materials.<sup>14</sup> Several producers also noted that the elevation of mahogany (*Swietenia macrophylla*) to CITES appendix II,<sup>15</sup> which had the effect of restricting trade in that species, limited the availability of mahogany veneer.

## Trade

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This section discusses trends in U.S. trade with the major foreign suppliers and foreign markets for the combined products. Separate aggregate estimates of U.S. trade for each product are provided later in the sections for wood flooring and hardwood plywood.

### *U.S. Imports*

The estimated values and quantities of U.S. imports of wood flooring and hardwood plywood increased at overall average annual rates of 16 percent and 6 percent, respectively during the 2002–07 period (table 3.3). Steady, rapid growth of U.S. imports characterized the period from 2002 to 2006. However, the downturn in the U.S. housing market, which began in the second half of 2006, slowed U.S. imports. The values and quantities of U.S. imports from all major suppliers declined in 2007, and total U.S. imports decreased by 6 percent (by value) in 2007.

The six major global suppliers noted in chapter 2 (China, Canada, Indonesia, Malaysia, Brazil, and Russia) are also the largest suppliers of wood flooring and hardwood plywood to the U.S. market. The most notable trend during the 2002–07 period was the growth of U.S. imports from China, which in both value and quantity terms grew at average annual rates very near or exceeding 50 percent. China became the largest supplier to the U.S. market in 2004, and China's import market share among all foreign suppliers to the U.S. market increased from 10 percent (by value) of the total in 2002 to 47 percent in 2007. In comparison, the trends for the other foreign suppliers to the U.S. market were more modest during the period, posting generally small to moderate overall gains by value but overall declines by quantity.

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<sup>13</sup> On average, softwoods account for approximately 11 percent of U.S. industry expenditures for wood fiber. USDOC, Census Bureau, *Hardwood Veneer and Plywood Manufacturing: 2002*, September 2004, 9.

<sup>14</sup> From 2002 to 2007, U.S. exports of yellow poplar logs increased at an average annual rate of 11 percent, and export unit value increased from \$257 per cubic meter to \$276 per cubic meter.

<sup>15</sup> Convention on International Trade in Endangered Species of Wild Fauna and Flora. *See also Chapter 2, footnote 20 on page 2-15.*

**TABLE 3.3** Estimated combined U.S. imports of wood flooring and hardwood plywood, 2002–07

Country	2002	2003	2004	2005	2006	2007	<sup>a</sup> CAGR
							2002–07
Thousands of \$							
China	117,675	205,754	551,220	808,093	1,166,025	1,144,519	57.6
Canada	258,749	297,759	335,702	342,521	319,172	283,022	1.8
Indonesia	226,767	209,318	237,434	215,055	224,152	206,072	-1.9
Malaysia	135,129	125,117	213,231	183,913	222,161	193,633	7.5
Brazil	96,749	129,642	226,640	224,606	205,900	189,545	14.4
Russia	121,770	111,201	165,019	160,174	127,917	121,592	0.0
Subtotal	956,839	1,078,791	1,729,246	1,934,362	2,265,327	2,138,383	17.4
All Other	190,786	212,283	286,515	289,587	318,101	277,824	7.8
Total	1,147,625	1,291,074	2,015,761	2,223,949	2,583,428	2,416,207	16.1
<sup>b</sup> Thousands of square feet							
China	255,414	405,043	1,178,224	1,566,484	2,054,451	1,782,587	47.5
Canada	388,262	413,351	442,618	503,546	466,533	285,581	-6.0
Indonesia	559,574	468,044	449,667	374,320	339,069	250,192	-14.9
Malaysia	385,573	357,614	519,892	413,916	445,090	345,614	-2.2
Brazil	293,903	362,095	449,271	289,544	235,004	176,678	-9.7
Russia	350,189	321,274	428,014	355,112	295,561	197,840	-10.8
Subtotal	2,232,915	2,327,420	3,467,686	3,502,922	3,835,709	3,038,492	6.4
All Other	307,833	303,947	349,417	342,550	358,926	366,669	3.6
Total	2,540,748	2,631,367	3,817,103	3,845,473	4,194,635	3,405,160	6.0
\$ per square foot							
China	0.46	0.51	0.47	0.52	0.57	0.64	6.9
Canada	0.67	0.72	0.76	0.68	0.68	0.99	8.3
Indonesia	0.41	0.45	0.53	0.57	0.66	0.82	15.2
Malaysia	0.35	0.35	0.41	0.44	0.50	0.56	9.8
Brazil	0.33	0.36	0.50	0.78	0.88	1.07	26.7
Russia	0.35	0.35	0.39	0.45	0.43	0.61	12.1
Subtotal	0.43	0.46	0.50	0.55	0.59	0.70	10.4
All Other	0.62	0.70	0.82	0.85	0.89	0.76	4.1
Total	0.45	0.49	0.53	0.58	0.62	0.71	9.5

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note: Data shown reflect the changes to the HTS that occurred in 2007. The 2002–06 data include trade in subheadings 4409.10, 4409.20, 4412.13, 4412.14, 4412.19.5050, 4412.22, 4412.23, 4412.29, and 4418.30. The 2007 data include trade in subheadings 4409.10, 4409.29, 4412.31, 4412.32, 4412.39.5050, 4412.94, 4412.99, 4418.71, 4418.72, and 4418.79. Totals may not add due to rounding.

<sup>a</sup>Compound annual growth rate.

<sup>b</sup>Imports reported in cubic meters were converted to square measure based on an estimated average thickness of 13 mm.

## *U.S. Exports*

The value of U.S. exports of wood flooring and hardwood plywood increased steadily, at an average annual rate of almost 12 percent during 2002–07 (table 3.4). The quantity of U.S. exports peaked in 2004. U.S. manufacturers are primarily focused on the U.S. market, and U.S. exports were small relative to imports, ranging from as little as 5 percent (by quantity) to 8 percent of U.S. imports. During the period, U.S. producers benefitted from generally favorable exchange rates. Most U.S. exports went to the NAFTA partners, whose markets are easily accessible to U.S. producers. Canada alone accounted for over 60 percent of U.S. exports (by value) in each year of the period. The top three markets for U.S. exports, Canada, Mexico, and China, accounted for 80 percent or more of U.S. exports in each year of the period.

# **Wood Flooring**

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## *Industry Structure*

There are approximately 155 manufacturers of wood flooring in the United States. In 2006, the five largest firms accounted for almost 60 percent of total U.S. production. The largest firms typically make other types of flooring or floor coverings in addition to wood flooring. In general, there are fewer and somewhat larger manufacturers of engineered wood flooring, whereas solid wood flooring manufacturers are much smaller but more numerous. In 2006, there were approximately 33 manufacturers of engineered wood flooring, and the average annual shipments of responding firms was over 27 million square feet. In the same year, there were approximately 126 U.S. manufacturers of solid wood flooring, and the average annual shipments of responding firms was 9.5 million square feet.<sup>16</sup> Industry analysts report that during the 2002–06 period, U.S. manufacturers responded to the strong U.S. market for wood flooring by investing in new plants and capacity.<sup>17</sup> This observation is confirmed by questionnaire data, which indicate that the capacity of responding U.S. wood flooring producers increased during the 2002–06 period at an average annual rate of almost 10 percent.<sup>18</sup>

During the 2002–06 period, there were a number of acquisitions in the U.S. wood flooring industry. For instance, in 2006 Armstrong increased its U.S. manufacturing capacity and obtained new brands by acquiring engineered wood flooring manufacturer Capella

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<sup>16</sup> A total of 51 U.S. flooring firms submitted questionnaires to the Commission, of which 42 make solid flooring, 5 make engineered flooring, and 4 make both. Analysis of the list of U.S. producers developed for this investigation indicated that there are approximately 80 solid flooring firms and 24 engineered flooring firms that did not submit questionnaires.

<sup>17</sup> Catalina Research Inc., *Wood Flooring*, November 2005, 10.

<sup>18</sup> Over 60 percent of responding U.S. wood flooring producers reported increased capacity.

**TABLE 3.4** Estimated combined U.S. exports of wood flooring and hardwood plywood, 2002–07

Country	2002	2003	2004	2005	2006	2007	<sup>a</sup> CAGR 2002–07
	Thousands of \$						%
Canada	92,073	110,704	113,841	113,396	123,966	139,985	8.7
Mexico	15,126	11,473	18,281	19,931	18,942	39,214	21.0
China	1,321	2,707	2,896	5,122	9,442	10,277	50.7
Subtotal	108,520	124,884	135,018	138,449	152,350	189,476	11.8
All other	19,400	24,554	27,025	34,583	31,954	38,051	14.4
Total	127,920	149,438	162,043	173,032	184,304	227,527	12.2
	<sup>b</sup> Thousands of square feet						%
Canada	107,813	125,059	144,963	135,246	135,109	124,351	2.9
Mexico	33,238	27,982	49,019	44,752	28,713	73,548	17.2
China	2,075	7,235	8,858	9,784	5,495	6,055	23.9
Subtotal	143,126	160,275	202,840	189,782	169,318	203,953	7.3
All other	24,947	48,466	48,519	55,886	30,237	29,906	3.7
Total	168,073	208,742	251,359	245,668	199,555	233,859	6.8
	\$ per square foot						%
Canada	0.85	0.89	0.79	0.84	0.92	1.13	5.7
Mexico	0.46	0.41	0.37	0.45	0.66	0.53	3.2
China	0.64	0.37	0.33	0.52	1.72	1.70	21.7
Subtotal	0.76	0.78	0.67	0.73	0.90	0.93	4.1
All other	0.78	0.51	0.56	0.62	1.06	1.27	10.3
Total	0.76	0.72	0.64	0.70	0.92	0.97	5.0

Source: Compiled from official statistics of the U.S. Department of Commerce.

Note: Data shown reflect the changes to the HTS that occurred in 2007. The 2002–06 data include trade in subheadings 4409.10, 4409.20, 4412.13, 4412.14, 4412.22, 4412.23, 4412.29, and 4418.30. The 2007 data include trade in subheadings 4409.10, 4409.29, 4412.31, 4412.32, 4412.94, 4412.99, 4418.71, 4418.72, and 4418.79. Totals may not add due to rounding.

<sup>a</sup>Compound annual growth rate.

<sup>b</sup>Exports reported in cubic meters were converted to square measure based on an estimated average thickness of 13 mm.

Engineered Wood and solid wood flooring manufacturer HomerWood.<sup>19</sup> Two notable acquisitions occurred in 2007. Reportedly seeking increased participation in the U.S. wood flooring market, U.S. flooring firm, Mohawk, purchased the wood flooring assets of Columbia Forest Products,<sup>20</sup> and U.S. firm, Shaw Industries acquired Anderson.<sup>21</sup>

Large U.S. flooring firms often manufacture other types of flooring such as vinyl flooring or carpet. Smaller U.S. wood flooring firms often make other wood products in addition to wood flooring, such as hardwood lumber, stair treads, and moldings, as well as certain products made from the byproducts of flooring manufacture such as fuel pellets, fire logs, and animal bedding.

<sup>19</sup> Armstrong Industries, “Armstrong Announces Investments in Hardwood Flooring,” March 15, 2006.

<sup>20</sup> *Wood Digest*, “Mohawk Industries, Inc. Announces Purchase of Wood Flooring Assets,” June 26, 2007.

<sup>21</sup> Anderson, “Shaw Industries Agrees to Acquire the Anderson Family of Companies,” September 14, 2007.

The level of vertical integration of individual U.S. flooring plants varies. Although some plants are vertically integrated, other plants perform just one step of the manufacturing process. For example, with respect to engineered wood flooring, separate plants may perform veneer production, panel production, and flooring production.<sup>22</sup>

### ***Solid Wood Flooring***

The production capacity of responding U.S. solid wood flooring producers increased at an average annual rate of 9 percent during the 2002–06 period but declined slightly thereafter, coincident with the market downturn. The capacity utilization of responding firms increased from 91 percent in 2002 to 93 percent in 2004 but declined thereafter to 81 percent.<sup>23</sup> The average annual capacity of responding solid wood flooring firms increased from 31 million square feet in 2002 to 38 million square feet in 2006, with some smaller firms reporting annual capacities of less than 100,000 square feet. Because of differing size and degree of plant integration, the required capital expenditure for new capacity varied widely, from less than \$1 million to over \$100 million. The average capital expenditure for larger firms was \$46 million, while the average for smaller firms was about \$3.5 million. During the 2002–06 period, employment of production workers by responding U.S. solid wood flooring manufacturers increased at an average annual rate of about 3 percent, but in 2007 reported employment declined to below 2002 levels.

U.S. shipments of solid wood flooring posted an overall gain during the 2002–07 period, increasing at an average annual rate of 6 percent.<sup>24</sup> The estimated value of U.S. shipments peaked at over \$1.5 billion in 2004 (table 3.5).<sup>25</sup> Although the estimated quantity of U.S. shipments continued to increase through 2006, both the value and quantity of U.S. shipments of solid wood flooring declined in 2007 in response to the slowdown in U.S. housing.

During the 2002–07 period, imports of wood flooring increased significantly, as did import penetration; imports of engineered wood flooring increased more quickly than solid wood flooring. U.S. imports of solid wood flooring increased rapidly through 2005, and import penetration had almost doubled by 2006 (table 3.5). However, with a decline in U.S. demand, imports and import penetration declined in 2007.<sup>26</sup> Reported direct imports of

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<sup>22</sup> Miller, “Mannington Floors the Competition with Product Diversity,” April 2007, 48.

<sup>23</sup> Estimates of capacity utilization are based on the reported production and capacity of responding solid wood flooring producers. Most reporting firms calculated capacity on the basis of one shift per day and five days per week.

<sup>24</sup> Reported shipments from producer questionnaires were adjusted to account for the shipments of nonresponding U.S. producers. Most responding U.S. wood flooring producers reported that there was no particular seasonality to their shipments of wood flooring, although on average the shipments of responding firms in 2006 were somewhat larger in the third quarter and less in the fourth quarter.

<sup>25</sup> Industry sources indicate that U.S. shipments of solid wood flooring decreased in 2006, after a record year in 2005. *Hardwood Market Report*, “2006: The Year at a Glance,” 2007, 68.

<sup>26</sup> U.S. solid wood flooring imports from Brazil, a major supplier to the U.S. market, declined in 2007 primarily because of the decline in the U.S. housing market. Brazilian flooring manufacturers noted additional factors in the decline including higher European demand for Brazilian wood flooring, increasing consumption in Brazil, and timber supply constraints in Brazil. USITC hearing transcript, October 3, 2007, 222–24.

**TABLE 3.5** U.S. solid and engineered wood flooring: Shipments, consumption, and trade, 2002–07

Item	2002	2003	2004	2005	2006	Estimated	<sup>a</sup> CAGR
						2007	2002–07
							%
<b>Solid wood flooring:</b>							
Millions of \$							
U.S. shipments	1,104	1,284	1,561	1,520	1,493	1,412	5.1
Imports	190	296	496	605	597	460	19.4
Exports	90	104	147	135	160	169	13.5
Consumption	1,204	1,475	1,910	1,990	1,930	1,703	7.2
Imports/consumption ( <i>percent</i> )	15.8	20.1	26.0	30.4	30.9	27.0	
Exports/shipments ( <i>percent</i> )	8.1	8.1	9.4	8.9	10.7	12.0	
Millions of square feet							
U.S. shipments	516	552	613	627	631	613	3.5
Imports	152	229	350	407	370	263	11.6
Exports	49	55	68	62	71	72	8.3
Consumption	619	726	895	973	930	804	5.5
Imports/consumption ( <i>percent</i> )	24.6	31.5	39.1	41.9	39.8	32.8	
Exports/shipments ( <i>percent</i> )	9.4	9.9	11.0	9.9	11.2	11.8	
Millions of \$							
<b>Engineered wood flooring:</b>							
U.S. shipments	427	485	621	662	675	613	7.5
Imports	115	142	249	367	537	518	35.2
Exports	28	19	29	25	25	84	24.5
Consumption	514	608	842	1,004	1,187	1,047	15.3
Imports/consumption ( <i>percent</i> )	22.3	23.4	29.6	36.6	45.3	49.5	
Exports/shipments ( <i>percent</i> )	6.6	3.9	4.7	3.8	3.7	13.7	
Millions of square feet							
U.S. shipments	179	193	245	251	258	243	6.3
Imports	86	88	136	204	377	244	23.3
Exports	50	32	82	61	45	137	22.2
Consumption	215	250	299	395	590	350	10.3
Imports/consumption ( <i>percent</i> )	39.9	35.3	45.5	51.8	63.9	69.6	
Exports/shipments ( <i>percent</i> )	28.0	16.4	33.4	24.2	17.4	56.3	
Millions of \$							
<b>Total wood flooring:</b>							
U.S. shipments	1,531	1,768	2,182	2,182	2,168	2,025	5.8
Imports	305	438	746	972	1,135	978	26.3
Exports	118	123	176	160	185	253	16.5
Consumption	1,718	2,083	2,752	2,994	3,117	2,750	9.9
Imports/consumption ( <i>percent</i> )	17.7	21.0	27.1	32.5	36.4	35.6	
Exports/shipments ( <i>percent</i> )	7.7	7.0	8.1	7.3	8.6	12.5	
Millions of square feet							
U.S. shipments	695	745	858	878	889	856	4.2
Imports	238	317	486	612	748	507	16.3
Exports	99	86	149	123	116	209	16.2
Consumption	834	976	1,195	1,367	1,521	1,154	6.7
Imports/consumption ( <i>percent</i> )	28.5	32.5	40.7	44.7	49.2	44.0	
Exports/shipments ( <i>percent</i> )	14.2	11.6	17.4	14.0	13.0	24.5	

Source: Compiled from producer questionnaires and official statistics of the U.S. Department of Commerce.

<sup>a</sup>Compound annual growth rate.

solid wood flooring by U.S. wood flooring manufacturers increased during the period but accounted for less than 3 percent of total U.S. imports of solid wood flooring in each year of the period.<sup>27</sup>

Traditionally, U.S. manufacturers of most forest products, including solid wood flooring, have focused primarily on the relatively large domestic U.S. market and have had a limited presence in export markets. Nonetheless, with favorable exchange rates, U.S. exports increased steadily throughout the period, rising from 8 percent of shipments in 2002 to 12 percent in 2007.

With the strong U.S. housing market and favorable demand trends, apparent U.S. consumption of solid wood flooring, both by value and quantity, climbed steadily during the 2002–06 period, at average annual rates of 13 and 11 percent respectively, but declined in 2007 subsequent to the market downturn. Growth in solid flooring consumption was somewhat less than that for engineered wood flooring, in part because engineered wood flooring can be used in areas of a home not suitable for solid flooring.

Raw material is the biggest component of the cost of goods sold for U.S. solid wood flooring producers, accounting for over 60 percent of the total costs. The average cost of goods sold increased from \$2.10 per square foot in 2002 to \$2.25 per square foot in 2004, before declining to \$2.15 per square foot in 2006 (table 3.6). Consistent with the peak in U.S. lumber prices in 2004, the reported average industry cost of raw material likewise peaked in 2004 at 66 percent of total cost. Direct labor as a percent of total cost of goods sold increased steadily over the period, increasing from 15 percent to 17 percent of total cost of goods sold.<sup>28</sup> Other costs (e.g., energy, administration) ranged from 19 percent to 24 percent of total cost of goods sold and generally decreased during the 2002–06 period.

## **Engineered Wood Flooring**

The annual capacity of responding U.S. producers of engineered wood flooring increased steadily during the 2002–07 period at an average annual rate of more than 10 percent, but unlike solid wood flooring, engineered wood flooring capacity continued to expand in 2007. The reported average capacity of U.S. engineered wood flooring firms increased from 32 million square feet in 2002 to over 41 million square feet in 2006. Estimated capacity utilization increased from 82 percent in 2002 to 95 percent in 2004 and declined to 84

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<sup>27</sup> These data and those reported in subsequent sections for engineered wood flooring and hardwood plywood only reflect imports for which U.S. manufacturers were the importers of record and do not include foreign products that they may have purchased through importers.

<sup>28</sup> Specific wage data for the wood flooring and hardwood plywood industries are unavailable. However, data for average hourly earnings of production workers in the U.S. wood products manufacturing sector indicate that wage rate increases were relatively moderate during the 2002–06 period, with hourly earnings increasing at an average annual rate of about 2 percent, from \$12.33 per hour in 2002 to \$13.67 per hour in 2007. USDOL, BLS, “Average Hourly Earnings of Production Workers,” undated (accessed June 12, 2008).



**TABLE 3.6** U.S. wood flooring producers: Average cost of goods sold, 2002–07

Item	2002	2003	2004	2005	2006	2007
	\$ per square foot					
Solid wood flooring:						
Raw material	1.29	1.31	1.49	1.33	1.36	1.36
Direct labor	0.31	0.31	0.34	0.35	0.36	0.36
Other factory costs	0.50	0.48	0.43	0.41	0.43	0.43
Total	2.10	2.10	2.26	2.09	2.15	2.15
	%					
Raw material	61.4	62.4	65.9	63.6	63.3	63.3
Direct labor	14.8	14.8	15.0	16.7	16.7	16.7
Other factory costs	23.8	22.9	19.0	19.6	20.0	20.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
	\$ per square foot					
Engineered wood flooring:						
Raw material	0.97	0.97	0.91	1.10	1.03	1.03
Direct labor	0.27	0.28	0.27	0.30	0.30	0.28
Other factory costs	0.55	0.56	0.44	0.49	0.54	0.59
Total	1.79	1.81	1.62	1.89	1.87	1.90
	%					
Raw material	54.2	53.6	56.2	58.2	55.1	54.2
Direct labor	15.1	15.5	16.7	15.9	16.0	14.7
Other factory costs	30.7	30.9	27.2	25.9	28.9	31.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Compiled from U.S. producer and importer questionnaires.

Note: Percentages may not add due to rounding.

percent in 2006.<sup>29</sup> The average reported capital expenditure for new engineered wood flooring capacity was \$38 million. As with solid flooring, the expenditure for new capacity varied widely, depending on plant size and the degree of vertical integration. The number of production workers reported by U.S. engineered wood flooring firms increased at an average annual rate of 10 percent during the 2002–06 period. However, compared with the solid wood flooring industry, the subsequent decline in production workers among U.S. manufacturers of engineered flooring was relatively small.

During the 2002–07 period, the value of estimated U.S. shipments of engineered wood flooring grew at an average annual rate of 7 percent, slightly faster than that of solid flooring shipments, and accounted for an increasing percentage of total U.S. wood flooring shipments (table 3.5). Both the value and quantity of U.S. shipments of engineered wood flooring increased steadily from 2002 to 2006, before declining in 2007.

Estimated U.S. imports of engineered wood flooring also increased at a faster rate than imports of solid wood flooring, and import penetration for engineered wood flooring was somewhat higher than for solid wood flooring (table 3.5). Direct imports of engineered wood flooring by U.S. producers as a percent of total imports also grew quickly, from a relatively small amount in 2002 to almost 10 percent in 2004, but declined in 2007, largely in response to the housing downturn. Estimated U.S. exports of engineered wood flooring exhibited no clear patterns during the 2002–07 period, but nonetheless accounted for less than 10 percent of shipments in each year until 2007.

<sup>29</sup> Estimated capacity utilization for the first half of 2007 was 80 percent. Responding U.S. engineered wood flooring firms typically calculate plant capacity based on two or three shifts per day.

Reflecting the favorable trend in demand relative to solid wood flooring, estimated U.S. consumption of engineered wood flooring grew more rapidly than that for solid flooring during the 2002–06 period, and engineered wood flooring as a percentage (by value) of total U.S. wood flooring consumption increased from 30 to 38 percent (table 3.5). Nonetheless, U.S. consumption of engineered wood flooring decreased 9 percent by value and 6 percent by quantity in 2007.

Raw material is also the largest component of the cost of goods sold for engineered wood flooring, but it accounts for a smaller percentage than it does for solid flooring (table 3.6). During the 2002–06 period, the average cost of goods sold for U.S. engineered wood flooring producers increased from \$1.79 per square foot in 2002 to \$1.89 per square foot in 2005 and remained flat thereafter. The average cost of raw material increased steadily to peak at 58 percent of total cost in 2005. Direct labor as a percent of total cost of goods sold increased steadily but remained in the 15–17 percent range during the period.

Most responding U.S. wood flooring producers reported that production can be adjusted relatively easily only in the short term, within the limits of raw material supply and their existing employees' capacity to work overtime. Several producers noted that longer-term changes would likely be constrained by the availability of additional labor and/or supplies of logs or lumber. This was a special concern of solid wood flooring manufacturers, 40 percent of which indicated that production could not be easily expanded or contracted. For readily available species, these manufacturers reported that additional supplies of logs would take a minimum of 18 months to procure and that additional supplies of lumber would take at least 13–18 weeks. New supplies of less readily available species could take longer to procure. Because they typically run their plants close to maximum capacity, some manufacturers of engineered flooring noted that significant capital expenditures would be necessary to expand production much beyond 10–15 percent.

Although U.S. shipments of wood flooring grew during the 2002–06 period, the questionnaire data suggest that further expansion of solid wood flooring production may actually have been constrained by the relatively long lead time necessary to secure new supplies of logs and lumber, despite the relative abundance of the underlying resource. Also, major capital investment may have been necessary for further expansion of engineered wood flooring production.

## ***U.S. Market for Wood Flooring***

Unlike hardwood plywood, wood flooring is a finished or semi-finished product with a specific end use. Demand is driven by U.S. residential housing construction and remodeling, which reportedly account for over 80 percent of U.S. wood flooring sales.<sup>30</sup> For most of the period, the U.S. market for wood flooring benefitted from a rising U.S. housing market, which was driven by low mortgage rates, rising personal incomes, and favorable demographics.<sup>31</sup> Annual U.S. housing starts increased steadily, from 1.7 million starts in 2002 to a peak of 2.1 million starts in 2005.<sup>32</sup> Strong housing demand also resulted in

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<sup>30</sup> *Floor Covering Weekly*, "Statistical Report '05," July 17–31, 2006, 28.

<sup>31</sup> Catalina Research Inc., *Wood Flooring*, November 2005, 3.

<sup>32</sup> In 1991, the U.S. housing market began a period of steady expansion that continued until 2005. During that period, housing starts increased in all but two years (1995 and 2000), increasing at an overall average annual rate of 5.2 percent. USDOC, Census Bureau, "New Privately Owned Housing Units Started," undated

vigorous sales of existing homes, with buyers often undertaking remodeling projects.<sup>33</sup> The trend in the U.S. residential housing market toward use of more upscale building materials, such as wood flooring, was also significant. Late in the period, the housing market slowed, however, with annual housing starts decreasing to 1.8 million in 2006 and to 1.4 million in 2007.<sup>34</sup>

Substitutes for wood flooring (i.e., other types of flooring and flooring coverings) include carpet and rugs, resilient flooring (e.g., vinyl and rubber flooring), ceramic floor tiles, and laminate flooring.<sup>35</sup> With strong housing demand, U.S. sales of all flooring rose to \$24 billion in 2005 at the peak of the market (table 3.7). During the 2002–06 period, wood flooring continued a slow but steady upward trend relative to other types of flooring, despite the average price for wood flooring far exceeding most other flooring choices.<sup>36</sup> The share of U.S. flooring sales accounted for by wood flooring increased from 10 percent to 11 percent by value and from 3 percent to 4 percent by quantity during the 2002–06 period.<sup>37</sup>

## U.S. Market Trends

U.S. consumer tastes are trending away from domestic species and traditional appearance toward flooring of exotic (i.e., nonnative) species or nontraditional materials (e.g., bamboo), and toward a more rustic appearance (e.g., hand-scraped floors or reclaimed floors).<sup>38</sup> Brazilian manufacturers, who are major suppliers of exotic wood flooring, assert that Brazilian wood flooring is generally sold at the high-end of the U.S. market due to its high density and resistance to wear and that they rely primarily on species (e.g., jatoba, ipé, cumaru, tigerwood, and santos mahogany) that typically grow only in Brazil.<sup>39</sup> Also, wider width (i.e., plank) flooring has gained popularity at the expense of strip flooring, which is

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(accessed May 2, 2008).

<sup>33</sup> Catalina Research Inc., *Wood Flooring*, November 2005, 3, 59, 84.

<sup>34</sup> USDOC, Census Bureau, “New Privately Owned Housing Units Started,” undated (accessed May 2, 2008).

<sup>35</sup> Laminate flooring was introduced to the U.S. market in the mid 1990s and consists of (1) a top wear layer to resist abrasion, (2) a decorative paper layer, (3) a core layer of high-density fiberboard for structural integrity, and (4) a stabilizing bottom layer. The paper layer is printed with photo designs to mimic the surface of natural materials. U.S. sales of laminate flooring have grown rapidly and are expected to continue to grow due to strong sales in residential remodeling, where its advantages are durability and easy installation (i.e., locking tongue and groove technology) and maintenance. Despite the fact that it is often printed to simulate wood flooring, major U.S. flooring firms have laminate flooring in their product lines and do not regard it as a substitute for wood flooring. Laminate flooring is considered a floor covering rather than flooring and is priced between vinyl on the low end and wood flooring on the upper end. While the prices of both wood flooring and laminate have fallen, their relative positions are the same, although the gap has narrowed. USITC hearing transcript, October 3, 2007, 180–182; *Floor Covering Weekly*, “Statistical Report ‘06,” July 23–30, 2007, 1; and Miller, “Mannington Floors the Competition with Product Diversity,” April 2007, 48.

<sup>36</sup> *Floor Covering Weekly*, “Statistical Report ‘05,” July 17–31, 2006, 8; and Catalina Research Inc., *Wood Flooring*, November 2005, 1.

<sup>37</sup> Catalina Research Inc., *Wood Flooring*, November 2005, 22.

<sup>38</sup> Most of the U.S. producers and importers that expressed opinions in their questionnaire responses felt that U.S. and foreign wood flooring were interchangeable. However, U.S. importers pointed out that they typically import flooring of desirable exotic species that do not grow in U.S. forests. U.S. producers contended that the exotic flooring nevertheless takes a share of the U.S. market that otherwise would likely have been supplied by flooring of U.S. species. USITC, hearing transcript, October 3, 2007, 170 and 214; and Catalina Research Inc., *Wood Flooring*, November 2005, 1, 32–33.

<sup>39</sup> USITC hearing transcript, October 3, 2007, 217–219

**TABLE 3.7** U.S. Floor covering market sales: 2002–06

Segment	2002	2003	2004	2005	2006	<sup>a</sup> CAGR
						2002–06
						Millions of \$
						%
Carpet and rugs	13,030	13,820	14,440	15,350	15,060	3.7
Wood flooring	1,959	2,151	2,398	2,590	2,583	7.2
Ceramic flooring	2,360	2,540	2,860	3,070	3,170	7.7
Resilient flooring	1,960	1,786	1,820	1,820	1,700	-3.5
Laminate flooring	910	1,206	1,408	1,503	1,508	13.5
Total	20,219	21,503	22,926	24,333	24,021	4.4
						Billions of square feet
Carpet and rugs	17.98	19.48	19.16	19.38	17.98	0.0
Wood flooring	0.87	0.93	0.99	1.15	1.03	4.3
Ceramic flooring	2.64	2.81	3.14	3.26	3.30	5.7
Resilient flooring	3.64	3.60	3.84	3.84	3.26	-2.7
Laminate flooring	0.68	0.94	1.12	1.26	1.30	17.6
Total	25.81	27.76	28.25	28.89	26.87	1.0
						\$ per square foot
Carpet and rugs	0.72	0.71	0.75	0.79	0.84	3.7
Wood flooring	2.25	2.31	2.42	2.25	2.51	2.7
Ceramic flooring	0.89	0.90	0.91	0.94	0.96	1.8
Resilient flooring	0.54	0.50	0.47	0.47	0.52	-0.8
Laminate flooring	1.34	1.28	1.26	1.19	1.16	-3.5
Total	0.78	0.77	0.81	0.84	0.89	3.4

Source: *Floor Covering Weekly*, "Statistical Report '06," July 23–30, 2007, 10.

<sup>a</sup>Compound annual growth rate

now regarded as a commodity item.<sup>40</sup> Questionnaire responses of U.S. producers and importers confirm the growth of plank flooring and show that in 2006, plank flooring (including wide plank flooring) accounted for 35 percent of U.S. solid flooring production and 62 percent of U.S. engineered wood flooring production.<sup>41</sup> There was also a trend toward thicker flooring. With respect to solid wood flooring, for instance, 3/4s of an inch remained the dominant thickness and this type of flooring increased as a percentage of both U.S. shipments and imports during the period. Trends in consumer preference have expanded the range of wood flooring that U.S. flooring firms must offer, and many of the market niches identified by responding wood flooring producers depend on U.S. demand for high-end flooring.<sup>42</sup> The desire for high quality flooring is reflected in the responses of both U.S. producers and importers, who generally agree that factors other than price are frequently significant in U.S. sales of wood flooring. Responding U.S. wood flooring manufacturers rated product quality as the most influential factor with respect to their sales of wood flooring, and many noted factors such as high quality, craftsmanship, and consistency as

<sup>40</sup> *Hardwood Market Report*, 2006: The Year at a Glance, 2007, 18.

<sup>41</sup> Questionnaire data indicated that in 2006, 64 percent of U.S. solid flooring production was strip, 30 percent was plank, 5 percent was wide plank, and parquet accounted for less than 1 percent. With respect to engineered wood flooring, strip accounted for 38 percent, plank accounted for 46 percent, wide plank accounted for 16 percent, and parquet accounted for less than 1 percent.

<sup>42</sup> The market niches identified by responding U.S. producers include products such as high-end, custom, and designer flooring, parquet flooring, sports flooring, and reclaimed floors, as well as market segments such as the market for second homes (i.e., houses not intended as primary residences), particular regional markets, and sales to floor covering retailers.

sources of competitive advantage.<sup>43</sup> Service was rated the next most influential factor by responding firms, followed by business relationships.<sup>44</sup> Product availability and price were regarded as the least influential factors with respect to wood flooring sales.

U.S. consumption of engineered wood flooring grew more quickly than that of solid wood flooring during the 2002–06 period, because engineered wood flooring can be used in places (e.g., directly over slabs and in basements) not suited for solid flooring, has more consistent raw material availability, and has improved features (e.g., locking tongues and grooves) that facilitate do-it-yourself remodeling projects.<sup>45</sup> Questionnaire respondents noted that customers are starting to ask specifically for engineered wood flooring as opposed to solid wood flooring.

There is also a trend in the U.S. market toward prefinished flooring, which is generally easier to install than unfinished flooring,<sup>46</sup> and U.S. producers are continuing to develop harder finishes (e.g., acrylic impregnated floors) to increase resistance to wear. U.S. producer questionnaire data reveal that during the 2002–06 period, 99 percent of U.S. engineered production and about two-thirds of U.S. solid production were prefinished. U.S. wood flooring imports are also largely prefinished, although the percentages of prefinished flooring in reported imports was somewhat less than for U.S. production. Importer questionnaires indicate that during the 2002–06 period, about 90 percent of engineered flooring imports and approximately 54 percent of solid flooring imports were prefinished.<sup>47</sup>

Most of the U.S. market trends during the 2002–06 period were positive for U.S. producers of wood flooring in that either the market itself and/or opportunities for increased value added (i.e., prefinishing) were growing. However, these trends very likely did not benefit all U.S. producers equally, as the more numerous and relatively small U.S. producers of traditional unfinished solid wood flooring were less able than manufacturers of engineered wood flooring to take advantage of the favorable market trends.

## **Channels of Distribution**

Sales of wood flooring in the U.S. market typically follow either a one-step path directly from the manufacturer to the end user or a two-step path from the manufacturer through a distributor to the end user (figure 3.2). Most domestic and imported wood flooring is sold through the two-step distribution process. In 2006, U.S. manufacturers reported that about 75 percent of U.S. wood flooring production was sold to wholesale distributors, whereas on

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<sup>43</sup> Other factors identified by producers as sources of competitive advantage included characteristics of the firms themselves (e.g., tradition of product innovation, family ownership, brand, and longevity in the market), product attributes (e.g., dimensions, wear layers, color, and finishes) and manufacturing (e.g., custom work, grading, precise tolerances, and moisture control).

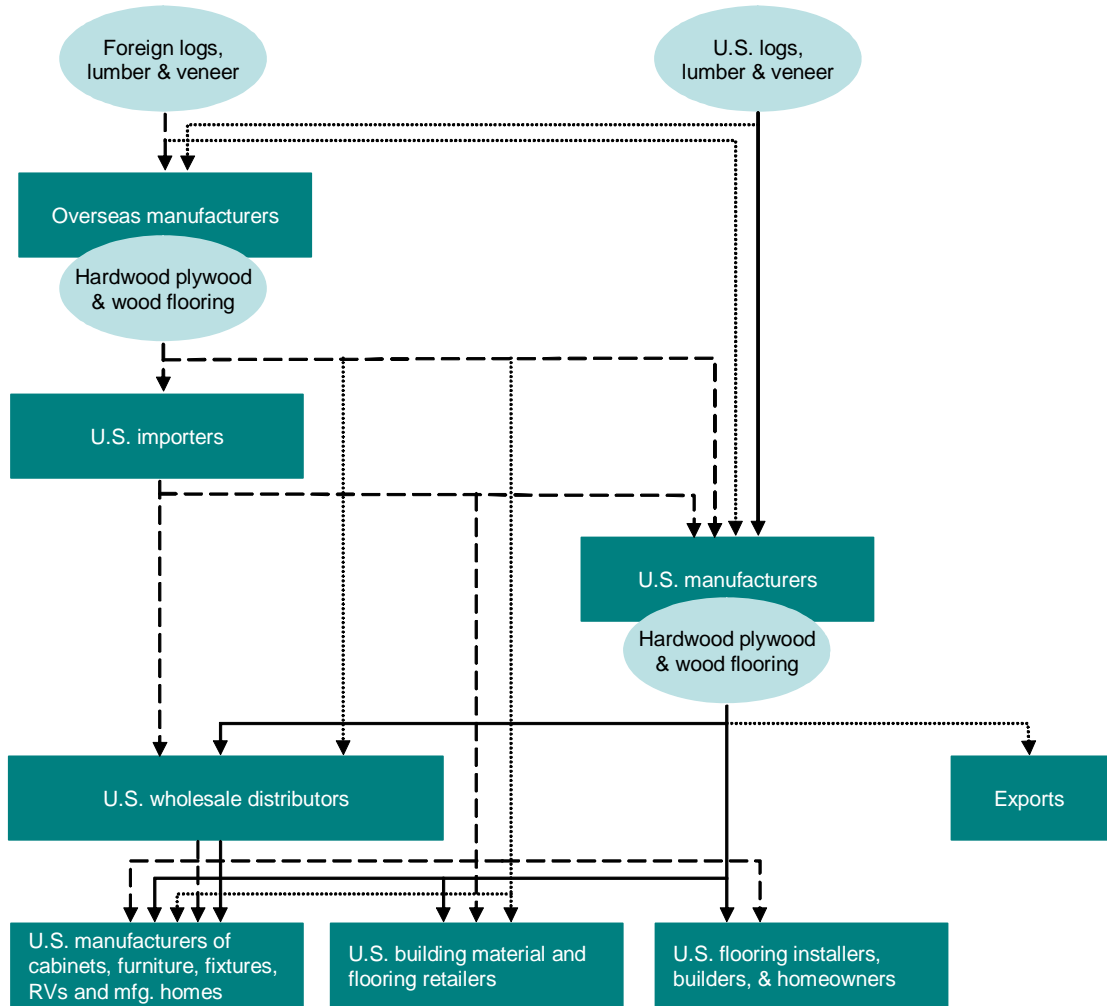
<sup>44</sup> U.S. producers identified lead times, on-time delivery, proximity to customers, and raw materials as sources of competitive advantage. U.S. customers may require special services such as just-in-time inventories and warehousing, promotional literature and displays, and/or cooperative advertising, small orders and/or less-than-truckload shipments, job-site deliveries, technical assistance, sales support, and special packaging.

<sup>45</sup> *Floor Covering Weekly*, “Statistical Report ‘05,” July 17–31, 2006, 8; and Catalina Research Inc., *Wood Flooring*, November 2005, 5.

<sup>46</sup> Catalina Research Inc., *Wood Flooring*, November 2005, 5.

<sup>47</sup> Reportedly, logistical considerations make imports of unfinished flooring from Asia impractical, so most of what is imported from Asia is prefinished, engineered flooring. Wahlgren, “Worldly Vision,” April/May 2007, 73.

**FIGURE 3.2** Major distribution channels for wood flooring and hardwood plywood



Source: IWPA, USITC analysis

Note: Solid lines represent flows of U.S. products, and dashed lines represent flows of imported products. Dotted lines represent minor flows.

average, 55 percent of U.S. imports were sold through wholesale distributors. Most U.S. producers' direct sales (one-step path) went to retail building materials dealers, with the small remainder split between home builders, flooring retailers, flooring installers, and homeowners. In contrast, direct sales of U.S. imports were most often sold to flooring retailers, home builders, and flooring installers.

Retail wood flooring sales reportedly outpaced overall U.S. wood flooring sales due to the growing importance of the residential remodeling market,<sup>48</sup> but sales through distributors increased as well, driven by increased wood flooring imports.<sup>49</sup> The Internet has become a key retail medium for wood flooring, especially for the "new breed" of discount flooring retailer (e.g., Lumber Liquidators) that is now competing with retail building materials dealers.<sup>50</sup>

## *Prices*

About one-half of U.S. producers reported that prices of solid and engineered wood flooring were determined through negotiations on a transaction-by-transaction basis, while price lists were the most important factor for the other half. In general, the use of contracts, either long or short term, is limited. Of the responding U.S. producers, nearly all noted that spot sales accounted for 100 percent of their sales.<sup>51</sup>

Fifty-eight percent of the responding U.S. producers reported that prices were generally quoted f.o.b. mill or warehouse. Thirty-five percent reported that they quoted prices on a delivered basis, and the balance reported quoting prices either f.o.b. or delivered based on customer preference. As in other industries, U.S. manufacturers typically offer some sort of discount based on either volume or prompt payment, with sales terms generally ranging from 10 to 40 days.

For solid wood flooring, reported average lead times ranged from one day to four weeks for orders shipped from inventory, with most producers averaging one week or less. Reported average lead times ranged from 1 to 12 weeks for sales produced to order, with most producers averaging 4 weeks or less. For engineered wood flooring, reported average lead times ranged from 3 to 14 days for orders shipped from inventory and from 1 to 8 weeks for sales produced to order.

Prices for all types of wood flooring in the U.S. market are reported to be generally cyclical.<sup>52</sup> According industry sources, in 2002, average weekly U.S. prices for traditional unfinished, oak strip flooring were at low ebb following the last slowdown in the U.S. economy (figure 3.3). Strip flooring prices, driven by the strong demand for residential housing construction, gradually increased to a high point in mid-2004. By early 2005, the subsequent decline took prices to levels comparable to 2002. The decline was, in part, attributed to increased production from North American producers, increasing imports, and

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<sup>48</sup> Catalina Research Inc., *Wood Flooring*, November 2005, 62.

<sup>49</sup> Wood flooring importers typically work through distributors to develop sales in the U.S. market. *Ibid.*, 65.

<sup>50</sup> *Floor Covering Weekly*, "Statistical Report '05," July 17–31, 2006, 12.

<sup>51</sup> The duration of sales contracts reportedly ranges from as little as 10 days to 2 years. When used, however, they do not always fix price and quantity. Of those producers reporting the use of contracts, about one-half indicated that price was subject to renegotiation during the term of the contract.

<sup>52</sup> Wahlgren, "Worldly Vision," April/May 2007, 72.

weakening U.S. demand for unfinished, oak strip flooring relative to exotic, plank, and prefinished flooring.<sup>53</sup>

Average annual prices collected from U.S. producer questionnaires for three solid oak strip flooring products generally track weekly industry data during the period (figure 3.4).<sup>54</sup> Responding U.S. importers reported very few prices for the traditional oak strip flooring products. Most reported import prices were for solid wood flooring of exotic species, either from Brazil or China.<sup>55</sup> In general, reported prices of engineered wood flooring declined during the period.<sup>56</sup>

## Hardwood Plywood

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### *U.S. Industry*

There are approximately 24 manufacturers of hardwood plywood in the United States.<sup>57</sup> As with wood flooring, a small number of firms account for the bulk of production; in 2006, the five largest companies accounted for over three-quarters (by quantity) of U.S. production of hardwood plywood. The U.S. industry was established on the West Coast in the mid-1960s.<sup>58</sup> Later, plants were built in the East to take advantage the vast regional hardwood resource, and, with a few exceptions, most U.S. hardwood plywood plants are located either in the Southeast or the Pacific Northwest. Industry statistics indicate that during the 2002–06 period, U.S. production of hardwood plywood was relatively evenly split between eastern and western plants.<sup>59</sup> In 2006, the average annual production capacity of responding hardwood plywood firms was 87 million square feet, although some producers reported annual production capacity of less than 100,000 square feet. Hardwood plywood producers also

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<sup>53</sup> Industry official, e-mail message to Commission staff, April 21, 2008.

<sup>54</sup> Commission questionnaires solicited price information for four solid wood flooring products and five engineered flooring products. Solid products included three oak strip flooring products, and a broad product category for solid flooring of exotic (i.e., nondomestic) species. Engineered products included a hand-scraped product and a sawn face product in addition to products with oak and exotic faces.

<sup>55</sup> The number of reporting firms for these products was not sufficient to allow prices to be reported directly.

<sup>56</sup> The limited number of responding producers and importers also prevents the direct release of these pricing data. Most reported prices for engineered wood flooring were for prefinished three inch oak with a face ply greater than 1 mm thick, flooring with a hand-scraped face (various species), and flooring of exotic species with few reports for prefinished three inch oak with a face ply less than 1 mm thick and flooring with a sawn face.

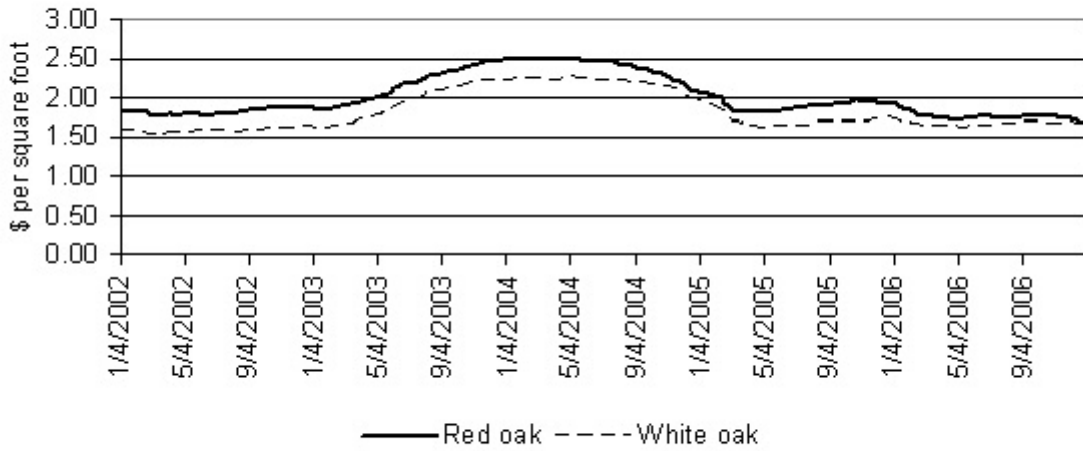
<sup>57</sup> Additionally, there are an estimated 90 U.S. establishments engaged in the manufacture of hardwood veneer. USDOC, Census Bureau, *Hardwood Veneer and Plywood Manufacturing: 2002*, September 2004, 5.

<sup>58</sup> Industry official, interview by Commission staff, Eugene, OR, August 17, 2007.

<sup>59</sup> The share of U.S. production accounted for by eastern plants ranged between 50 and 53 percent during the 2002–06 period. HPVA, *Hardwood Stock Panels, Annual Statistical Report for Calendar Year 2004*, 2005, 41 and 71; and HPVA, *Hardwood Stock Panels, Annual Statistical Report for Calendar Year 2006*, 2007, 45 and 75.

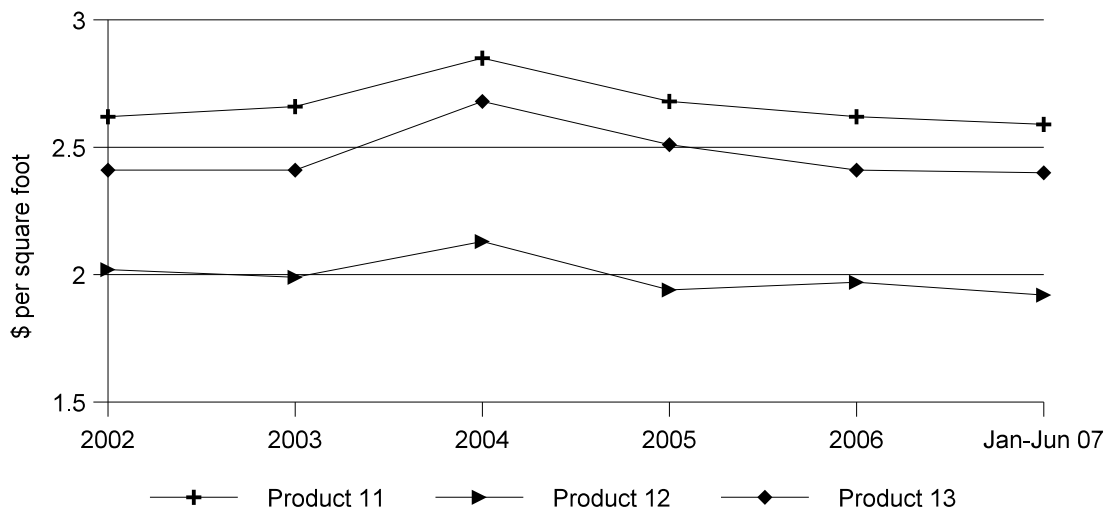


**FIGURE 3.3** U.S. composite oak, strip flooring prices, 2002–06



Source: Hardwood Publishing Co.

**FIGURE 3.4** U.S. solid wood flooring prices, 2002–06, and January–June 2007



Source: Compiled from U.S. producer questionnaires.

Note: Product 11–2 1/4 inch red oak, prefinished, Product 12–2 1/4 inch white oak, unfinished, and Product 13–3 1/4 inch oak, prefinished.

manufacture other types of wood products including veneer, doors, particleboard, and other products made with hardwood plywood.

In general, the U.S. manufacturing process from log to finished product is somewhat fragmented, and the level of vertical integration among U.S. firms varies. For example, some firms assemble the plywood panels with purchased veneer, while others have integrated veneer production, particularly for veneers to be used for cores, and may even have integrated log supply from company-owned woodlands. With respect to the production of sliced veneer, which is typically used for faces and backs, some firms specialize in slicing the veneer, while others specialize in the splicing (i.e., edge gluing) of sliced veneer into panel-sized pieces.<sup>60</sup>

U.S. producers identified all aspects of the manufacturing process as potential sources of competitive advantage over other manufacturers. With respect to raw materials, their certified timberlands were regarded by one responding firm to be a competitive advantage. Various product attributes were noted as being advantageous, including product quality, specialty panels, custom sizes and finishes, prefinishing, thin panels, and a broad product line. Various aspects of the manufacturing process were noted, such as vertical integration, sanding, adhesives, and proprietary grading. Small minimum orders, short lead times, and the ability to mix shipments of plywood with other products were noted as important factors in choosing a supplier. Special services sometimes required by plywood customers in the U.S. market include blueprint matching, assembling components, special packaging, product or plant engineering support, and logistics support.

### **Capacity, Shipments, Trade, and Consumption**

The total annual capacity of responding U.S. hardwood plywood firms increased at an average annual rate of 3 percent during the 2002–07 period, but the average annual capacity of responding firms decreased from about 100 million square feet to 87 million square feet. Estimated capacity utilization for responding producers was 78 percent in 2002 and 77 percent during 2003–04. In 2005, capacity utilization decreased to about 70 percent, where it remained for the rest of the period. The reported capital expenditures for new production capacity was \$2–50 million and averaged \$13 million or \$0.26 per square foot of capacity in 2006.

The trend in employment of production workers was generally down during the period. Reported employment of production workers increased by 1 percent in 2003 but subsequently declined during 2003–07 at an average annual rate of about 2 percent.

The total value of U.S. hardwood plywood shipments increased very slowly during the 2002–07 period, advancing at an average annual rate of about 1 percent (table 3.8).<sup>61</sup> On a

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<sup>60</sup> Industry official, interview by Commission staff, Old Fort, NC, July 18, 2007.

<sup>61</sup> U.S. producers do not think that shipments are particularly seasonal, although, on average, reported shipments in 2006 were somewhat larger in the first quarter and smaller in the fourth quarter. Summer is reported to be a period of slow sales because many small cabinet shops, which are often not air-conditioned, tend to close for vacation during the hot summer months. Industry official, interview by Commission staff, Old Fort, NC, July 18, 2007.

quantity basis, however, U.S. shipments actually declined, dropping each year between 2002 and 2007, with the largest year-over-year declines coming after 2005.<sup>62</sup>

Estimated U.S. trade in hardwood plywood is shown in table 3.8. The value of U.S. imports of hardwood plywood increased steadily from 2002 to 2006, and although imports declined slightly in 2007, the value of U.S. imports increased at an average annual rate of 11 percent during the period. Some U.S. producers actively sought opportunities to control costs by importing hardwood plywood, either as finished product or as raw material (i.e., platforms) for their own production process. Direct imports of hardwood plywood by U.S. producers as a percent of total imports by value remained in the 7–9 percent range between 2002 and 2006, but subsequently declined in 2007.

**TABLE 3.8** U.S. hardwood plywood: shipments, consumption, and trade, 2002–07

Item	2002	2003	2004	2005	2006	Estimated	<sup>a</sup> CAGR
						2007	2002–07
	<i>Millions of \$</i>						%
U.S. shipments	913	885	961	990	987	939	0.5
Imports	904	908	1,354	1,332	1,550	1,506	10.7
Exports	28	48	44	47	52	33	3.7
Consumption	1,790	1,745	2,270	2,275	2,484	2,412	6.1
Imports/consumption ( <i>percent</i> )	50.5	52.0	59.6	58.6	62.4	62.5	NA
Exports/production ( <i>percent</i> )	3.0	5.4	4.6	4.8	5.3	3.5	NA
	<i>Millions of square feet</i>						
U.S. shipments	1,079	1,064	1,061	1,026	951	890	-3.8
Imports	2,531	2,449	3,496	3,423	3,697	3,091	4.1
Exports	64	85	42	53	42	27	-15.8
Consumption	3,546	3,428	4,515	4,397	4,607	3,954	2.2
Imports/consumption ( <i>percent</i> )	71.4	71.4	77.4	77.9	80.3	78.2	NA
Exports/production ( <i>percent</i> )	5.9	8.0	4.0	5.2	4.4	3.1	NA

Source: Compiled from producer questionnaires and official statistics of the U.S. Department of Commerce.

<sup>a</sup>Compound annual growth rate.

Estimated import penetration (by value) increased from 51 percent in 2002 to 62 percent in 2007. Import penetration by quantity increased from 71 percent in 2002 to 80 percent in 2006. Import penetration by quantity is somewhat larger because imports are, on average, somewhat thinner than domestic production, leading to lower prices on a unit basis. In part, this is because of demand for imports of thin plywood for RVs and manufactured homes.<sup>63</sup> During

<sup>62</sup> Industry data show that the decline was not confined to a particular region. Production in both the East and Pacific Northwest decreased. HPVA, *Hardwood Stock Panels, Annual Statistical Report for Calendar Year 2004*, 2005, 41 and 71; and HPVA, *Hardwood Stock Panels, Annual Statistical Report for Calendar Year 2006*, 2007, 45 and 75.

<sup>63</sup> HTS statistical codes break out U.S. imports of door skins, 3.6 mm or less plywood of dimensions suitable for flush (i.e., flat surface) doors for interior use. During the 2002–06 period, U.S. imports of door skins accounted for 8–11 percent of the square foot quantities of annual U.S. imports of hardwood plywood. Based on producer and importer questionnaire responses, the average thickness of U.S. imports of hardwood plywood ranged from one-tenth inch (2.5 mm) to one-eighth inch (3 mm), less than the thickness of most U.S. hardwood plywood production during the 2002–06 period.

the 2002–06 period, the strong U.S. housing market favorably influenced demand for hardwood plywood in certain end uses (e.g., cabinets), but declining demand in other segments (e.g., furniture) moderated growth of U.S. consumption of hardwood plywood. The value and quantity of U.S. consumption increased at average annual rates of 7 percent and 5 percent, respectively, during the 2002–06 period. In 2006, U.S. consumption of hardwood plywood totaled \$2.5 billion, or 4.0 billion square feet (table 3.9). U.S. consumption of hardwood plywood decreased 3 percent by value and 14 percent by quantity in 2007.

**TABLE 3.9 U.S. Hardwood plywood producers: Average cost of goods sold, 2002–07**

Item	2002	2003	2004	2005	2006	2007
	<i>\$ per square foot</i>					
Hardwood plywood						
Raw material	0.57	0.58	0.61	0.64	0.70	0.73
Direct labor	0.10	0.09	0.10	0.10	0.11	0.11
Other factory costs	0.09	0.09	0.09	0.11	0.12	0.12
Total	0.75	0.77	0.80	0.85	0.93	0.96
	<i>%</i>					
Raw material	75.0	76.3	76.3	75.3	75.3	76.0
Direct labor	13.2	11.8	12.5	11.8	11.8	11.5
Other factory costs	11.8	11.8	11.3	12.9	12.9	12.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Compiled from U.S. producer questionnaires.

Note: Values and percentages may not add due to rounding.

### Cost of Goods Sold

Against the backdrop of flat or declining U.S. production during the 2002–06 period, the average cost of goods sold for responding U.S. hardwood plywood producers increased steadily, from \$0.75 per square foot in 2002 to \$0.93 per square foot in 2006, and was estimated to have increased further in 2007 (table 3.9). The percentages of the cost of goods sold accounted for by raw materials, direct labor, and other costs remained relatively stable during the period for U.S. hardwood plywood firms. Raw material is an even larger cost component for hardwood plywood than it is for wood flooring, accounting for 76–77 percent of the total; the remainder of the cost of goods sold is fairly evenly split between direct labor and other costs.

### *U.S. Market for Hardwood Plywood*

In their questionnaire responses, U.S. hardwood plywood manufacturers described the conditions in the U.S. hardwood plywood market during the 2002–07 period as being very competitive. Unlike wood flooring, hardwood plywood is generally an intermediate product that is used to manufacture a variety of other items. It is typically used for nonstructural purposes, and appearance is often a defining feature. Major end uses for U.S. hardwood plywood are cabinets, furniture, and store fixtures.<sup>64</sup>

<sup>64</sup> HPVA, *Hardwood Stock Panels, Annual Statistical Report for Calendar Year 2004*, 2005, 41 and 71, and HPVA, *Hardwood Stock Panels, Annual Statistical Report for Calendar Year 2006*, 2007, 45 and 75.

U.S. industry statistics indicate that shipments to both cabinet and fixture manufacturers increased during the period. Cabinet manufacturers, which make stock or custom kitchen cabinets and bathroom vanities, reportedly account for over one-half of U.S. hardwood plywood consumption. Benefitting from strong residential housing construction, the U.S. cabinet industry grew steadily during the 2002–06 period at an average annual rate of 5 percent. This spurred an increase in the quantity of direct shipments to the U.S. cabinet industry from U.S. hardwood plywood manufacturers; shipments grew at an average annual rate of 6 percent and accounted for almost one-half of direct sales by the U.S. industry in 2006.<sup>65</sup> As with wood flooring, consumer preference with respect to species is changing; hard maple and cherry have reportedly surpassed red oak as the preferred species for cabinets in the U.S. market.<sup>66</sup>

Because cabinet installation often involves custom or semi-custom manufacturing, the U.S. cabinet market has reportedly been somewhat more resistant to import competition than other segments of the U.S. plywood market. However, U.S. producers have recently perceived a loss of sales of cabinet components and parts, as some U.S. cabinet manufacturers have switched some of their purchases to imports. Direct domestic shipments to U.S. manufacturers of store fixtures, which accounted for about 7 percent of direct sales in 2006, also increased during the 2002–06 period.<sup>67</sup>

In contrast to the cabinets and fixtures segments of the market, demand for hardwood plywood from the declining U.S. furniture industry decreased during the 2002–06 period, particularly in the U.S. residential furniture and contract furniture (i.e., furniture for the hospitality industry) segments.<sup>68</sup> Industry statistics indicate that direct shipments of U.S. hardwood plywood to U.S. furniture manufacturers declined at an average annual rate of 13 percent during the period of investigation.<sup>69</sup> Direct shipments to retail building materials dealers also declined during the 2002–06 period. U.S. manufacturers report that some major retail building materials dealers have begun to purchase imported plywood, as have some large distributors of building products.

The U.S. manufactured home<sup>70</sup> and recreational vehicle (RV) industries also use hardwood plywood, particularly thin plywood (i.e., less than 1/4 inch thick).<sup>71</sup> The U.S. industry generally does not compete in this segment of U.S. demand.<sup>72</sup> Commission estimates of

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<sup>65</sup> Ibid.

<sup>66</sup> *Hardwood Review Weekly*, “North American Kitchen Cabinet Manufacturing,” May 25, 2007, 21; and *Hardwood Market Report, 2006: The Year at a Glance*, 2007, 18.

<sup>67</sup> HPVA, *Hardwood Stock Panels, Annual Statistical Report for Calendar Year 2004*, 2005, 41 and 71; and HPVA, *Hardwood Stock Panels, Annual Statistical Report for Calendar Year 2006*, 2007, 45 and 75.

<sup>68</sup> Demand from the office furniture and dormitory furniture segments has remained steady. Industry officials, interviews by Commission staff, Portland, OR, August 16, 2007, and Eugene, OR, August 17, 2007.

<sup>69</sup> HPVA, *Hardwood Stock Panels, Annual Statistical Report for Calendar Year 2004*, 2005, 41, 71; and HPVA, *Hardwood Stock Panels, Annual Statistical Report for Calendar Year 2006*, 2007, 45 and 75.

<sup>70</sup> Manufactured homes consist of one or more units on a permanent chassis that are transported to the site on wheels and usually remain on temporary foundations. USITC, *Conditions of Competition in the U.S. Market for Wood Structural Building Components*, 2003.

<sup>71</sup> The top thin plywood products are 2.7 mm (1/8 inch) and 3.4 mm (3/16 inch) 3-ply panels. Industry officials, interviews by Commission staff, Portland, OR, August, 13, 2007, and Alexandria, VA, May 11, 2007.

<sup>72</sup> Because veneer as thin as 0.01 inch (0.25 mm) is used, thin plywood is made using a wet process, in which the face and back veneers are laid up and pressed without prior drying. Because more labor is required to handle thin veneers, it is not cost effective for U.S. producers to make thin plywood. Smooth, knot-free lauan (*Shorea spp.*) logs from Indonesia or Malaysia are well suited for thin plywood and give those countries a competitive advantage. U.S. RV manufacturers use thin lauan plywood for its strength, light

demand in this segment indicate that demand declined at an average annual rate of about 3 percent from 812 million square feet in 2002 to 730 million square feet in 2006.<sup>73</sup> Increasing consumption attributable to relatively strong U.S. RV sales during the 2002–07 period did not offset decreasing consumption attributable to declining sales of manufactured homes.<sup>74</sup>

## Channels of Distribution

Similar to wood flooring, hardwood plywood can go through various, often circuitous, channels of distribution to reach end users, with some sales involving multiple distributors and products changing hands several times (figure 3.2). Most hardwood plywood, whether U.S. production or imports, is sold through a two-step distribution channel through a wholesale distributor to the end user, rather than a one-step distribution channel directly from the manufacturer to the end user. In 2006, responding U.S. producers and importers reported that 70 percent of U.S. production and 55 percent of U.S. imports were sold through wholesale distributors. Industry sources report that much of what is distributed through wholesale distributors is in turn sold to and used by small U.S. cabinet shops.<sup>75</sup>

According to U.S. producer questionnaires, in 2006, cabinet manufacturers were the largest market for one-step (i.e., direct) sales, accounting for 16 percent of total reported U.S. sales. Retail building materials dealers accounted for 6 percent, furniture manufacturers accounted for 4 percent, and fixture manufacturers accounted for 2 percent of total sales in 2006. Trace amounts were sold to manufactured home firms, flooring manufacturers, and for architectural millwork.<sup>76</sup> Generally, direct sales of U.S. imports were more likely to go to retail building material dealers than to cabinet manufacturers.

U.S.-made hardwood plywood was less interchangeable with imports than U.S.-made wood flooring because of the wider diversity of end uses for hardwood plywood. Nevertheless, hardwood plywood from U.S. and foreign sources was generally regarded by both producers and importers to be somewhat interchangeable. Producer questionnaire responses indicate that, as with wood flooring, product quality is a significant factor in purchasing decisions for U.S. hardwood plywood. Responding U.S. manufacturers rated product quality and service equally as being highly influential for their sales of hardwood plywood, and one producer suggested that the high end of the U.S. market was increasing in “architectural sophistication.” Price and business relationships were regarded as the next most influential, and product availability was regarded as less influential than the other factors.

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weight, and flexibility, which allows it to conform to interior contours. It is usually laminated with printed paper for interior applications or with fiber glass and aluminum for exterior walls. IWPA, “Innovation Continues to Drive the RV Industry,” 2005, 52–53; and industry officials, interviews by Commission staff, Dillard, OR, August 15, 2007, and Portland, OR, August, 13–14, 2007.

<sup>73</sup> RVIA, “Historical Glance: RV Wholesale Shipments,” undated (accessed May 20, 2008); USDOC, Census Bureau, “Cost & Size Comparisons For New Manufactured Homes,” undated (accessed May 20, 2008); Dickerhoof, *Panel Product Usage in Mobile Home Production*, 1978, 5; and RV industry official, telephone interview by Commission staff, May 20, 2008.

<sup>74</sup> U.S. RV shipments increased from 311,000 in 2002 to 390,500 in 2006 but declined to 353,400 in 2007. Annual U.S. shipments of manufactured homes decreased steadily from 168,500 units in 2002 to 117,300 units in 2006. A small increase in 2005 notwithstanding, shipments have decreased steadily from a maximum of 373,100 in 1998. RVIA, “Historical Glance: RV Wholesale Shipments,” and “RV Shipments and Sales Data,” undated (accessed August 9, 2008); and USDOC, Census Bureau, “Shipments of New Manufactured Homes: 1959–2006,” undated (accessed May 8, 2008).

<sup>75</sup> Industry official, interview by Commission staff, Old Fort, NC, July 18, 2007.

<sup>76</sup> Market niches identified by responding producers included architectural woodwork, RVs and boats, and “green” building materials.

sophistication.” Price and business relationships were regarded as the next most influential, and product availability was regarded as less influential than the other factors.

### **Product Trends in Hardwood Plywood**

U.S. production of hardwood plywood is trending toward thinner panels, as manufacturers and other consumers of hardwood plywood reduce costs. The traditional 3/4 inch panel still accounted for most U.S. shipments, but as a percent of total U.S. shipments, it declined from 65 percent to 54 percent during the 2002–06 period, while the percentages of thinner panels generally increased (table 3.10). In contrast, 3/4 inch plywood accounted for only about one-fourth of reported U.S. imports.

In 2006, architectural grades (i.e., grades AA, A, and B) accounted for 66 percent of reported U.S. shipments, and both U.S. producers and importers suggest that U.S. production trended toward higher grades during the 2002–06 period, as U.S. imports increased.<sup>77</sup> Imports of high-grade plywood are limited; in their questionnaire responses, very few U.S. importers reported any imports of architectural grade plywood. Rather, U.S. imports are mostly lower-grade panels (i.e., grades C and D), and importers claim that U.S. production is now confined to a narrow range of grades that no longer includes “utility plywood.”<sup>78</sup>

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<sup>77</sup> One U.S. producer noted that the market for A-grade plywood remained steady during the 2002–06 period but that the market for B-grade panels was being eroded by competition from imported C-grade panels.

<sup>78</sup> The current industry standard grades were consolidated in the mid-1980s by the HPVA. This traditional marketing approach emphasized selling the “entire log.” Typically, an effort would be made to create special panels for large customers, while residual production went to other customers. Some U.S. firms noted a decreasing reliance on the traditional marketing approach based on standard HPVA grades in favor of proprietary grades (i.e., company-specific brands or grades). In their view, the standard grades have been “commoditized” or are deficient because they allow wide quality variation within grades and do not consider all defects or features of veneer that influence appearance and customer appeal. Reportedly, this trend started before the increase in imports but accelerated as imports increased. The use of proprietary brands does not imply the use of higher-value or higher-quality veneers. Industry officials, telephone interviews by Commission staff, January 31, 2008; and industry officials, interview by Commission staff, Alexandria, VA, September 24, 2007.

**TABLE 3.10** Hardwood Plywood: Shares of U.S. shipments and imports, by thickness, 2002–06, January–June 2006, and January–June 2007

Thickness	2002	2003	2004	2005	2006	Jan.-June 2006	Jan.-June 2007
% of U.S. shipments							
1/4" (5.2 mm) and less	18	18	20	21	22	22	22
3/8" (9.0 mm)	2	3	4	5	4	4	3
1/2" (12.0 mm)	11	12	12	13	13	13	13
5/8" (15.0 mm)	2	2	2	3	4	3	3
3/4" (18.0 mm)	65	62	58	55	54	54	56
1" (24.2 mm) and thicker	1	1	1	1	1	2	2
Other	1	1	1	2	2	2	2
Total	100	100	100	100	100	100	100
% of U.S. imports							
1/4" (5.2 mm) and less	32	35	36	37	35	35	35
3/8" (9.0 mm)	3	2	2	2	2	2	2
1/2" (12.0 mm)	15	15	15	13	14	14	14
5/8" (15.0 mm)	6	6	6	6	6	6	6
3/4" (18.0 mm)	22	24	25	26	26	26	26
1" (24.2 mm) and thicker	6	2	2	2	2	2	3
Other	16	16	14	14	15	15	15
Total	100	100	100	100	100	100	100

Source: Compiled from U.S. producer and importer questionnaires.

The use of alternative cores (e.g., particleboard or MDF) by the U.S. industry is increasing, although veneer cores still predominate.<sup>79</sup> According to questionnaire data, in 2006, approximately 69 percent of reported U.S. shipments had veneer cores. MDF and particleboard cores accounted for 20 percent and 10 percent, respectively, of U.S. shipments, and lumber (i.e., solid) cores accounted for the remainder. Several U.S. producers reported that the use of alternative cores grew in the U.S. market, as end users sought lower-cost alternatives and as U.S. production of low-grade plywood decreased.

U.S. production of prefinished plywood has increased relative to unfinished plywood. According to U.S. producer questionnaire responses, the level of prefinished plywood increased steadily, from 7 percent to 14 percent of reported U.S. plywood shipments during the 2002–06 period. In comparison, the reported percentage of prefinished imports of hardwood plywood exhibited no clear pattern, ranging from 1 to 8 percent of reported imports during the 2002–06 period, and may be further evidence of the limited participation of imports in high-end segments of the U.S. market.

Most U.S. plywood producers noted a growing awareness during the 2002–06 period of environmental issues among their customers, who are also concerned with manufacturing environmentally responsible products. Growing environmental awareness was evident in formaldehyde emissions reductions and increasing air quality standards, increased fiber sourcing standards (e.g., FSC standards), and increased demand for green building products (i.e., products certified by the Leadership in Energy and Environmental Design (LEED) Green Building Rating System<sup>TM</sup>).

<sup>79</sup> Industry official, interview by Commission staff, Washington, DC, May 3, 2007.



A significant environmental issue with respect to hardwood plywood is the off-gassing of urea formaldehyde, a component of the adhesives used to make hardwood plywood that has been shown to impact air quality.<sup>80</sup> Regulation of formaldehyde was not a competitive factor during the 2002–07 period because regulatory standards for formaldehyde emissions heretofore existed only for plywood used in the construction of manufactured homes. However, recent regulations promulgated by the California Air Resources Board (CARB) are expected to increase the impact of formaldehyde content on the U.S. market. In April 2007, CARB adopted stringent control measures to reduce formaldehyde emissions from composite wood products (e.g., plywood, particleboard, and MDF) and the products made from them (e.g., furniture, cabinets).<sup>81</sup> Large U.S. producers have already, or are in the process of, developing formaldehyde-free and low-emitting adhesives.<sup>82</sup> Although the new adhesives are typically more expensive, industry analysts nevertheless expect that the CARB regulations will ultimately lead to low-emission products becoming the standard for the entire U.S. market because California is a relatively large portion of the U.S. market.<sup>83</sup> This issue is a major concern for U.S. manufacturers, which contend that U.S. imports are not being held even to the current federal emissions standard for manufactured homes and that some imported plywood has been shown to have emissions many times the allowable level. It is expected that the testing and certification required by the new standard will, at least temporarily, disadvantage some foreign producers in the California market.<sup>84</sup>

## Prices

Sufficient questionnaire responses were received from U.S. producers to allow prices to be reported for three hardwood plywood products: birch, grade B-4, 1/4 inch; birch, grade B-2, 1/2 inch; and birch, grade D-3, 3/4 inch.<sup>85</sup> Average annual prices for these products are shown in figure 3.5. The average reported prices for 1/4 inch B-4 birch declined at an average annual rate of 3 percent during the 2002–06 period. Reported prices of the other products increased at average annual rates of 3–4 percent.

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<sup>80</sup> USITC hearing transcript, October 3, 2007, 33–36; and Hamler, “Plywood Gets a Makeover,” July 2007, 48.

<sup>81</sup> The CARB standards take effect in 2009 and are more stringent than existing HUD standards for formaldehyde emissions in manufactured homes. The current HUD standard is 0.3 parts per million (ppm), whereas CARB phase 1 levels are 0.08 ppm for hardwood plywood, 0.18 ppm for particleboard, and 0.21 ppm for MDF. Phase 2 levels are 0.05, 0.09, and 0.11 ppm, respectively. Hamler, “Plywood Gets a Makeover,” July 2007, 49.

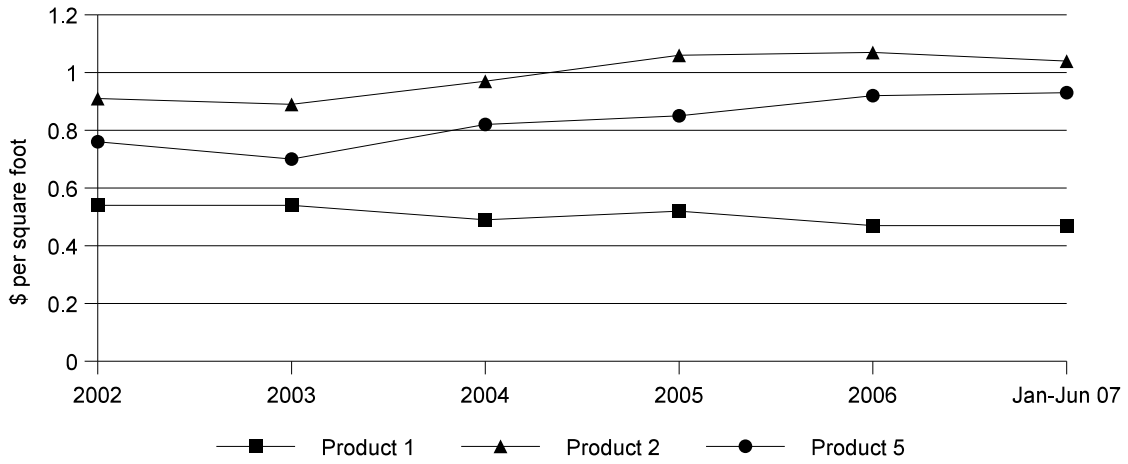
<sup>82</sup> Industry official, interview by Commission staff, Medford, OR, August 15, 2008.

<sup>83</sup> Hamler, “Plywood Gets a Makeover,” July 2007, 48–49.

<sup>84</sup> Some large foreign producers already make low-emitting panels for other markets (e.g., Japan), but reportedly, it will be more difficult for smaller Chinese producers to comply because they often use air dried veneer, which requires more adhesive to maintain adequate bonds. USITC, hearing transcript, October 3, 2007, 33–34 and 43; and Hamler, “Plywood Gets a Makeover,” July 2007, 48.

<sup>85</sup> Commission questionnaires solicited prices for 10 hardwood plywood products: five birch face, two oak face, and two maple face panels of various grades in addition to one thin panel of various face species. All other price data received from U.S. producers and importers were insufficient to permit public disclosure.

**FIGURE 3.5** U.S. hardwood plywood prices, 2002–06, and January–June 2007



Source: Compiled from U.S. producer questionnaires.

Note—Product 1—Birch face and back, grade B-4, Product 2—Birch face and back, grade B-2 and Product 5—Birch face and back grade D-3.

# CHAPTER 4

## China

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China is the largest hardwood plywood producer and the largest wood flooring market in the world. China's highly fragmented hardwood plywood and wood flooring industries have grown significantly in recent years, largely in response to booming domestic demand. However, production has outpaced consumption, resulting in significant export growth.

Many small Chinese hardwood plywood and wood flooring producers are not competitive in either domestic markets or export markets because of low levels of technology, inadequate technical expertise, poor or inconsistent product quality, and/or a lack of innovative designs. However, increased domestic and foreign investment—particularly from Taiwan and other southeast Asian countries—and imported advanced technology from the United States, Japan, and Europe have contributed to improved product quality and capacity expansion in recent years.

Despite paying relatively high prices for their raw materials, many Chinese producers enjoy low overall production costs because of low wage rates and the relatively high labor content within these industries. However, rising raw material costs, as well as increasing energy, labor, and transportation costs, have negatively impacted the competitive position of some Chinese manufacturers and resulted in curtailed production or closure of some facilities, particularly those making solid wood flooring.

In addition, government policies such as the processing trade preference program and the value-added tax (VAT) export rebate that had encouraged the development of China's wood processing industries and favored exports have been revised in recent years. Reductions in VAT export rebates have reduced the incentive to export, thereby favoring companies that focus on the domestic market.

## Industry Structure

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### *Hardwood Plywood*

China's hardwood plywood industry is highly fragmented, with thousands of privately owned enterprises ranging from workshops and small-scale companies to relatively large manufacturers. Overall, there are 5,000–6,000 hardwood plywood producers, most of which are small “cottage” mills with an annual production capacity of less than 2,000 cubic meters (m<sup>3</sup>).<sup>1</sup> Many of these cottage mills reportedly specialize in log peeling and veneer production to supply veneer to plywood producers and, as a result, the actual number of plywood producers may be somewhat smaller. Around 200 plywood producers reportedly have an annual production capacity of more than 20,000 m<sup>3</sup>, while around a dozen have an annual

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<sup>1</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 76; and Rutton and Hock, “Reviving Tropical Plywood,” May 2004, 25.

production capacity greater than 100,000 m<sup>3</sup>.<sup>2</sup> In comparison, the average reported plant size in the United States is approximately 87,000 m<sup>3</sup>.<sup>3</sup> Overall, the average annual production capacity of Chinese plywood producers is reportedly less than 4,500 m<sup>3</sup> each, or about 5 percent of reporting U.S. producers' average annual production capacity. China's total annual plywood production capacity is estimated to be 25–30 million m<sup>3</sup>, of which 85 percent is hardwood.<sup>4</sup>

Medium-sized mills, whose annual production capacity ranges from approximately 2,000–10,000 m<sup>3</sup>, reportedly account for 30 percent of China's total plywood capacity. These mills may purchase veneers from domestic cottage mills or from larger mills, or may import them. Larger plywood mills, with an annual production capacity greater than 10,000 m<sup>3</sup>, may be vertically integrated, peeling domestic or imported logs and then gluing and pressing the veneer layers to manufacture plywood. However, these mills may also purchase domestic poplar veneer used as core material from cottage mills, which reportedly can supply quality materials at a competitive price.<sup>5</sup> Some larger mills may also possess their own plantation resources.

According to one industry estimate, the top 20 plywood producers have annual production capacities ranging from 80,000 m<sup>3</sup> to 300,000 m<sup>3</sup> and are export oriented, having exported over 60 percent of their production in 2004, the latest year for which data are available.<sup>6</sup> In comparison, China's overall plywood industry exported 20 percent of production that year.<sup>7</sup> Although China's export-oriented plywood producers are significantly larger than the average Chinese plywood mill, they account for only about 10 percent of China's total plywood production, yet 30 percent of China's total plywood exports.<sup>8</sup>

Much of China's hardwood plywood industry is located near tree plantations in the southern and southeastern provinces of Jiangsu, Zhejiang, Fujian, and Guangdong.<sup>9</sup> Important plywood production centers in northern China include Shandong and Hebei provinces.<sup>10</sup> Access to log imports through major ports and to domestic plantation logs such as poplar (*Populus spp.*) and eucalyptus (*Eucalyptus spp.*), as well as access to log and veneer wholesale centers, equipment and material suppliers, low-cost skilled labor, and favorable transportation infrastructure have contributed to the development of industry clusters in these regions.<sup>11</sup>

Pizhou in Jiangsu province is one of the most important plywood production and export centers in China. With a total plywood production capacity of 8 million m<sup>3</sup>, approximately

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<sup>2</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 77.

<sup>3</sup> Average annual production capacity estimates for U.S. hardwood plywood producers are based on responses to the Commission's producer questionnaires, and were converted to cubic meters assuming an average thickness of 14 millimeters.

<sup>4</sup> Qian, "China's Wood Based Panel," April 22–25, 2007; and International Wood Markets Group, *The China Book*, part 2, 2006, 76.

<sup>5</sup> Rutton and Hock, "Reviving Tropical Plywood," May 2004, 25.

<sup>6</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 80.

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

<sup>9</sup> Xiufang, Cheng, and Canby, *China's Forest Product Exports*, 2005, 5; TFT, *China Wood Products Supply Chain Analysis*, March 2007, 9; and International Wood Markets Group, *The China Book*, part 2, 2006, 81.

<sup>10</sup> Xiufang, Cheng, and Canby, *China's Forest Product Exports*, 2005, 5.

<sup>11</sup> USDA, FAS, *Chinese Wood Usage Continues Rapid Growth*, July 11, 2007, 16; and International Wood Markets Group, *The China Book*, 2006, part 2, 74.

3,000 mills are engaged in plywood production or raw material supply in Pizhou and consume over 10 million m<sup>3</sup> of domestic poplar plantation logs and almost 3 million m<sup>3</sup> of imported logs and veneer annually.<sup>12</sup> Reportedly, 335 mills produce finished plywood, while the remainder are engaged in veneer production for both plywood and engineered wood flooring.<sup>13</sup> Of the 335 mills, 48 have production capacity reportedly exceeding 50,000 m<sup>3</sup> per year, while two producers have an annual production capacity greater than 100,000 m<sup>3</sup>.<sup>14</sup> In 2006, total plywood exports from Pizhou reached 3.2 million m<sup>3</sup>, or approximately 40 percent of total Chinese plywood exports that year.<sup>15</sup> Major export markets include the United States, the EU, and Japan.

## ***Wood Flooring***

Similar in structure to the plywood industry, the solid wood flooring industry is highly fragmented, with 5,000–6,000 producers, most of which are small in scale.<sup>16</sup> The average annual production of solid wood flooring producers is estimated to be 1,000 m<sup>3</sup>, although larger mills reportedly produce 2,000–10,000 m<sup>3</sup> annually.<sup>17</sup> In comparison, the average annual production of U.S. solid wood flooring producers is approximately 8,700 m<sup>3</sup>, almost nine times larger than that of the average Chinese mill.<sup>18</sup> There are reportedly around 100 larger-scale solid wood flooring mills that account for about 40 percent of China's solid wood flooring production.<sup>19</sup> Overall, there are about one million employees engaged in wood flooring production, distribution, and service activities.<sup>20</sup>

In contrast to the abundance of small-scale solid wood flooring producers, the engineered wood flooring industry in China is relatively more concentrated. In 2005, there were estimated to be around 100 Chinese engineered wood flooring producers.<sup>21</sup>

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<sup>12</sup> International Wood Markets Group, "China's 'City of Plywood,'" November 2007.

<sup>13</sup> Ibid.

<sup>14</sup> Ibid.

<sup>15</sup> Ibid.

<sup>16</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 158–59. Laminated flooring is the largest flooring industry segment in terms of production volume. However, laminated flooring is not the focus of this study.

<sup>17</sup> Ibid., 175.

<sup>18</sup> Average annual production estimates for U.S. solid wood flooring producers are based on responses to the Commission's producer questionnaires, and were converted to cubic meters assuming an average thickness of approximately 18 millimeters.

<sup>19</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 149.

<sup>20</sup> Includes employees engaged in laminated flooring production. ITTO, *Tropical Timber Market Report*, September 16–30, 2006.

<sup>21</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 168.

Annual production reportedly ranges from 5,000 m<sup>3</sup> for smaller engineered flooring mills, which is comparable in size to the average Chinese plywood mill, to 15,000 m<sup>3</sup> for large ones.<sup>22</sup> In comparison, the reported average plant size in the United States is almost 50,000 m<sup>3</sup>, substantially larger than the average Chinese engineered wood flooring producer.<sup>23</sup> The 10 largest engineered flooring producers are estimated to account for 50 percent of engineered wood flooring production in China.<sup>24</sup>

Overall, the wood flooring industry—comprising both solid and engineered wood flooring—is concentrated in the southern coastal provinces of Guangdong, Zhejiang, and Jiangsu, as well as Shanghai municipality, although important production centers are also located in Yunnan in the south and Liaoning and Heilongjiang in the north.<sup>25</sup> Engineered wood flooring tends to be produced in the same regions as plywood. The manufacturing processes of the two products are similar and certain plywood producers have expanded their product offerings to include engineered wood flooring.<sup>26</sup>

The bamboo flooring industry is a comparatively small segment of China’s overall wood flooring industry. There are an estimated 100–200 bamboo flooring producers, although many of them may only be semi-finished producers processing bamboo stalks into bamboo strips, which are in turn assembled into flooring by flooring mills.<sup>27</sup>

Following improvements in product quality in the late-1990s, bamboo flooring has reportedly increased in popularity in China because of its hardness and durability, particularly in commercial flooring applications.<sup>28</sup> In export markets such as the United States, bamboo flooring is increasingly viewed as “green,” which contributes to its cachet as an environmentally sustainable flooring product.<sup>29</sup>

## Raw Material Supply

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In recent years, China’s rapid economic growth has led to growing domestic consumption of wood products that has outpaced the supply of domestic wood resources.<sup>30</sup> As a result, China’s wood-processing industries rely heavily on imported raw materials. China is the largest importer of hardwood logs and lumber in the world, accounting for 36 percent of the

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<sup>22</sup> Ibid., 177.

<sup>23</sup> Average annual production estimates for U.S. engineered wood flooring producers are based on responses to the Commission’s producer questionnaires, and were converted to cubic meters assuming an average thickness of 13 millimeters.

<sup>24</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 168.

<sup>25</sup> Ibid., 159.

<sup>26</sup> Ibid., 169; and USITC hearing transcript, October 3, 2007, 233.

<sup>27</sup> Industry official, interview by Commission staff, China, February 21, 2008. Bamboo flooring is an engineered flooring product that is manufactured from strips split longitudinally from bamboo stalks. Bamboo flooring producers may purchase bamboo raw materials from cooperatives that process bamboo stalks into strips, which are further processed and glued together to form the basis of an engineered bamboo flooring product. Some bamboo flooring producers also produce engineered wood flooring.

<sup>28</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 171; and industry official, interview by Commission staff, China, February 21, 2008.

<sup>29</sup> ITTO, *Tropical Timber Market Report*, March 1–15, 2007, 8; and USITC hearing transcript, October 3, 2007, 178.

<sup>30</sup> White, et al., *China and the Global Market for Forest Products*, March 2006, 6.

value of global hardwood log imports and 14 percent of the value of global hardwood lumber imports in 2006.<sup>31</sup> Logging restrictions implemented in 1998 through China's National Forest Protection Program (NFPP) to protect domestic natural forests, and a subsequent elimination of import duties on logs and lumber, contributed to increasing raw material imports, particularly imported logs and lumber for higher-end or export-oriented products.<sup>32</sup> By 2004, imports of logs and lumber accounted for almost 36 percent of China's total raw material supply.<sup>33</sup> In recent years, domestic poplar plantations have also become an important source of core material for plywood and engineered wood flooring.

Generally, China's plywood industry uses poplar from fast-growing high-yield (FGHY) domestic plantations for core veneers, but is dependent upon imports of temperate and tropical wood species to produce face and back veneers.<sup>34</sup> The engineered wood flooring industry typically uses imported temperate or tropical species to produce face veneers, and domestic softwood and hardwood species, including plantation wood, as core material. The solid wood flooring industry reportedly relies on imports of temperate and tropical hardwood logs and lumber for 90 percent of its raw material.<sup>35</sup> China's abundance of domestic bamboo resources provide raw material for its bamboo flooring and other bamboo products.

### ***China's Raw Material Imports***

China is the world's largest importer of hardwood logs and lumber, obtaining significant hardwood imports from all major global supply sources noted in chapter 2. Hardwood logs, particularly high-value tropical logs, as well as temperate hardwood species, are processed into veneer to produce plywood and engineered wood flooring. Hardwood lumber is used to produce solid wood flooring. Chinese policies such as the NFPP that curb domestic timber production, coupled with an expansion of production capacity in China's wood processing industries in response to surging economic growth, growing domestic housing demand, and increased demand for wood-based products, have resulted in significant import growth in recent years. Growing demand for raw materials, particularly for tropical logs, increasing transportation costs and freight charges, and global supply shortages have contributed to increased prices for hardwood logs, lumber, and veneer.

China's hardwood log imports increased by 65 percent to 13.3 million m<sup>3</sup> from 2002 to 2007. Russia is the largest hardwood log supplier to China, accounting for almost one third of China's hardwood log imports in 2007, up from 12 percent in 2002 (table 4.1). Common species from Russia used in the production of hardwood plywood and wood flooring include birch (*Betula spp.*) and larch (*Larix spp.*), which is a softwood often used as core material.<sup>36</sup>

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<sup>31</sup> GTIS, Global Trade Atlas Database (accessed June 11, 2008). Hardwood logs are included in the following HS subheadings: 4403.49, 4403.91, and 4403.99. Hardwood lumber is included in the following HS subheadings: 4407.21, 4407.22, 4407.25, 4407.26, 4407.27, 4407.28, 4407.29, 4407.91, 4407.92, 4407.93, 4407.94, 4407.95, and 4407.99.

<sup>32</sup> TFT, *China Wood Products Supply Chain Analysis*, March 2007, 2.

<sup>33</sup> Weiming, et al., *Russian Logs in China*, 2007, 1. Figure includes both softwood and hardwood species.

<sup>34</sup> Xiufang, Cheng, and Canby, *China's Forest Product Exports*, 2005, 5.

<sup>35</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 162.

<sup>36</sup> TFT, *China Wood Products Supply Chain Analysis*, March 2007, 7.

**TABLE 4.1** China's total hardwood log imports, 2002–07

Country	2002	2003	2004	2005	2006	2007	Change	CAGR
							2002–07	2002–07
Quantity (thousand cubic meters)							%	
United States	61	75	118	155	179	225	269.6	29.9
Top 5 suppliers:								
Russia	961	1,784	2,201	2,898	3,681	4,326	350.1	35.1
Papua New Guinea	1,128	1,378	1,314	1,835	2,064	2,341	107.5	15.7
Malaysia	2,121	2,924	2,721	1,856	1,412	1,331	-37.2	-8.9
Gabon	1,087	940	633	802	958	1,150	5.8	1.1
Solomon Islands	163	283	450	650	775	1,049	544.8	45.2
All others	2,522	2,708	2,627	2,657	3,041	2,867	13.7	2.6
Total	8,043	10,091	10,063	10,852	12,110	13,289	65.2	10.6
Value in thousand \$								
United States	27,751	40,753	65,802	91,011	108,547	128,504	363.1	35.9
Top 5 suppliers:								
Russia	106,020	190,748	255,465	345,627	413,938	559,853	428.1	39.5
Papua New Guinea	123,214	154,873	169,353	270,514	345,246	414,744	236.6	27.5
Malaysia	243,035	395,422	416,997	268,405	226,852	249,027	2.5	0.5
Gabon	184,808	205,745	165,901	228,566	291,346	395,576	114.0	16.4
Solomon Islands	18,173	32,546	57,891	96,071	124,716	181,900	900.9	58.5
All others	347,675	422,632	461,518	510,770	650,440	918,724	164.2	21.5
Total	1,050,676	1,442,719	1,592,927	1,810,964	2,161,086	2,848,328	171.1	22.1
\$ per cubic meter								
United States	455	541	557	588	606	570	25.3	4.6
Top 5 suppliers:								
Russia	110	107	116	119	112	129	17.3	3.2
Papua New Guinea	109	112	129	147	167	177	62.2	10.2
Malaysia	115	135	153	145	161	187	63.3	10.3
Gabon	170	219	262	285	304	344	102.4	15.1
Solomon Islands	112	115	129	148	161	173	55.2	9.2
All others	138	156	176	192	214	320	132.4	18.4
Total	131	143	158	167	178	214	64.1	10.4

Source: GTIS, Global Trade Atlas Database (accessed March 12, 2008).

Note: Includes HS subheadings 4403.91, 4403.49, 4403.91, and 4403.99.

Factors that have contributed to increased Russia-China trade include the following: (1) increased harvesting of Siberian timber; (2) Russia's relatively easy overland access to China through border gateway towns such as Manzhouli (Inner Mongolia) and Suifenhe (Heilongjiang); (3) Chinese government investment in transportation infrastructure; (4) Chinese encouragement of border trade by reducing import-related taxes and duties; and (5)



favorable Chinese re-export policies for processed logs.<sup>37</sup> Although Chinese hardwood log imports from the United States increased by 270 percent to 225,000 m<sup>3</sup> during the 2002–07 period, U.S. hardwood logs, including species such as oak and cherry, never accounted for more than 1.7 percent of China’s total hardwood log imports.

Most of China's tropical log imports come from Southeast Asia and West Africa, and include species such as meranti (*Shorea spp.*), bintangor (*Calophyllum spp.*), and red canarium (*Canarium schweinfurthii*) from Southeast Asia, as well as okoumé (*Aucoumea klaineana*) from West Africa.<sup>38</sup> Nine countries—Malaysia, Burma, Papua New Guinea, Indonesia, Gabon, Equatorial Guinea, Congo, Cameroon, and the Central African Republic—accounted for almost 98 percent of China’s tropical log imports during the 2002–07 period. Although harvest restrictions, declining log availability, log export bans (particularly from Indonesia) to support domestic wood processing, and environmental pressures associated with deforestation and illegal logging have impacted tropical log supplies from many of China’s principal suppliers, Chinese imports from Southeast Asia and West Africa nevertheless increased overall. In Africa, declining tropical log supplies from Gabon were offset by increased supplies from Equatorial Guinea and Congo. Likewise in Southeast Asia, declining tropical log shipments from Indonesia were offset by increased shipments from Burma and Papua New Guinea.

Although hardwood log imports increased from 2002 to 2007, Chinese hardwood lumber and veneer imports decreased, reflecting in part a shift from imports of intermediate products to primary raw materials.<sup>39</sup> Despite declining lumber and veneer import volumes, import values increased during the period because of rising prices in dollar terms. Overall imports of lumber declined by 12 percent to 3.7 million m<sup>3</sup> during the period, led by substantially falling lumber shipments from Indonesia and, to a lesser extent, Malaysia (table 4.2). Increasing import volumes from the United States and Brazil helped to partially offset the declining import volumes from Malaysia and Indonesia. Reportedly, over one-half of Brazil’s lumber exports to China are destined for wood flooring producer A&W (Shanghai) Wood Co. Ltd., a Chinese solid and engineered wood flooring producer that acquired natural forest resources in Brazil amid a global supply shortfall in 2004.<sup>40</sup>

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<sup>37</sup> Weiming, et al., *Russian Logs in China*, 2007, 1; and USITC, Staff Paper: *The Effects of Increasing Chinese Demand on Global Commodity Markets*, 2006, 4-22.

<sup>38</sup> TFT, *China Wood Products Supply Chain Analysis*, March 2007, 7.

<sup>39</sup> For further discussion on China’s import shift from intermediate products to primary raw materials in forest products trade, see USITC, Staff Report: *The Effects of Increasing Chinese Demand on Global Commodity Markets*, 2006, 4-1; and Canby, et al., *Forest Products Trade Between China and Africa*, February 2008, 10.

<sup>40</sup> AFX News, “Carlyle to Invest 27.5 mln,” May 11, 2006. A&W (Shanghai) Wood Co. Ltd., a solid and engineered flooring producer, acquired a natural forest tract in Brazil to secure long-term timber resources, becoming the first Chinese company to do so in a foreign country.

**TABLE 4.2** China imports of lumber, 2002–07

Country	2002	2003	2004	2005	2006	2007	Change 2002–07	CAGR 2002–07
	Thousand metric tons						%	
Top 5 suppliers:								
United States	592	620	716	801	952	997	68.4	11.0
Thailand	591	671	835	762	706	694	17.5	3.3
Malaysia	474	436	429	474	376	310	-34.6	-8.2
Burma	183	191	200	276	175	259	41.7	7.2
Brazil	132	200	291	267	323	258	95.7	14.4
All other	2,232	1,977	1,820	1,502	1,419	1,176	-47.3	-12.0
Total	4,203	4,133	4,291	4,082	3,952	3,695	-12.1	-2.5
	Value in thousand \$							
Top 5 suppliers:								
United States	165,559	180,640	210,113	257,242	330,338	350,875	111.9	16.2
Thailand	111,743	135,233	175,991	172,505	179,104	196,816	76.1	12.0
Malaysia	98,998	87,864	7,332	106,845	100,215	82,193	-17.0	-3.7
Burma	37,917	34,967	36,082	60,869	36,498	46,638	23.0	4.2
Brazil	63,231	105,839	144,584	160,812	199,264	167,591	165.0	21.5
All other	510,232	435,142	439,585	428,670	459,760	406,168	-20.4	-4.5
Total	987,680	979,685	1,093,687	1,186,942	1,305,178	1,250,281	26.6	4.8
	\$ per cubic meter							
Top 5 suppliers:								
United States	280	291	293	321	347	352	25.9	4.7
Thailand	189	201	211	226	254	284	49.8	8.4
Malaysia	209	201	204	225	267	265	27.0	4.9
Burma	207	183	180	221	209	180	-13.2	-2.8
Brazil	480	443	497	602	616	650	35.4	6.3
All others	229	220	241	285	324	345	51.0	8.6
Total	235	237	255	291	330	338	44.0	7.6

Source: GTIS, Global Trade Atlas Database (accessed March 12, 2008).

Note: Includes subheadings 4407.21, 4407.22, 4407.25, 4407.26, 4407.27, 4407.28, 4407.29, 4407.91, 4407.92, 4407.93, 4407.94, 4407.95, and 4407.99.

Chinese veneer imports declined by 38 percent to 94,300 metric tons from 2002 to 2007, although the value of veneer imports increased, resulting in a 148 percent increase in average unit values during the period (table 4.3). Imports from China's largest import suppliers—Malaysia, the United States, and Indonesia—all declined, and were only slightly offset by increased veneer imports from Burma.<sup>41</sup>

### ***Development of Domestic Plantation Resources***

In recent years, the Chinese government has emphasized the development of plantation resources as an alternative to domestic natural forest resources and as a way to reduce the reliance of China's wood processing industries on imports of raw materials. Plantation timber, particularly FGHY species such as poplar, have increasingly replaced natural forests as the major domestic wood resource in China.<sup>42</sup> Under China's 11th five-year plan (2006–2010), plantation timber is intended to account for 63 percent of China's 248 million m<sup>3</sup> logging quota.<sup>43</sup> In contrast, under China's 10th five-year plan (2001–05), plantation timber accounted for 38 percent of China's previous 223 million m<sup>3</sup> logging quota.<sup>44</sup>

Following the implementation of the NFPP in 1998, Chinese domestic industrial roundwood production declined while log and lumber imports increased rapidly. Industrial roundwood production declined through 2002 but began to increase beginning in 2003, reaching 66.1 million m<sup>3</sup> in 2006.<sup>45</sup> The development and growth of plantations in China has been a leading factor behind the growth in domestic industrial timber harvests in recent years.<sup>46</sup>

China reportedly had approximately 53 million hectares (131 million acres) of plantation resources in 2003, although only about 43 percent (23 million hectares or 57 million acres) were allocated for commercial timber production.<sup>47</sup> A key segment of China's commercial plantation resources are FGHY plantations. Estimates of the area of China's FGHY

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<sup>41</sup> On July 29, 2008, the President signed legislation that requires the Secretary of State, in consultation with the Secretary of Commerce and other appropriate Federal officials, to submit to Congress, within a year of enactment, a report on Burma's timber trade. The reporting requirement is set out in section 12 of the Burma Democracy Promotion Act of 2007 (Public Law 110-286). The report is to include information relating to U.S. imports made from wood from Burma, statistics about Burma's timber trade, and information about the chains of custody of wood products from Burma; illegalities, abuses, or corruption in the Burmese timber sector; and a description of the consumer and commercial applications unique to Burmese hardwoods. The report must also include recommendations regarding the following: (1) alternatives to Burmese hardwoods for commercial applications; (2) strategies for encouraging sustainable management of timber in locations that compete with Burmese hardwoods; (3) the U.S. and international customs documents and declarations that would need to be kept and compiled to establish the chain of custody for products made from Burmese woods; and (4) strategies for strengthening the capacity of Burmese civil society to monitor and report on trade in timber and other extractive industries.

<sup>42</sup> USDA, FAS, *Chinese Wood Usage Continues Rapid Growth*, July 11, 2007, 4.

<sup>43</sup> Does not include the logging quota for bamboo. Any unused portion of the logging quota for plantation timber may be carried over to the following year. *Ibid.*

<sup>44</sup> *Ibid.*

<sup>45</sup> International Wood Markets Group, "Chinese Domestic Timber Harvest is Growing," November 2007.

<sup>46</sup> International Wood Markets Group, "China's 'City of Plywood'," November 2007.

<sup>47</sup> The remainder of China's plantations include protective forests (i.e., to mitigate soil erosion), economic or agricultural plantations such as orchards, fuelwood, and other forest cover. International Wood Markets Group, "Chinese Domestic Timber Harvest is Growing," November 2007; and International Wood Markets Group, *The China Book*, part 1, 2006, 20–21. The State Forest Administration (SFA) of China releases a National Forest Resource Report every five years. The Sixth National Forest Resource Report, covering 1999–2003, was released in 2005. One hectare equals approximately 2.5 acres.

**TABLE 4.3** China veneer imports, 2002–07.

Country	2002	2003	2004	2005	2006	2007	Change 2002–07	CAGR 2002–07
	Quantity (thousand cubic meters)						%	
Top 5 suppliers:								
Malaysia	54	57	32	35	22	23	-58.0	-15.9
United States	17	17	20	18	16	16	-7.3	-1.5
Burma	0	1	1	1	2	11	4,219.5	112.4
Indonesia	9	24	24	17	21	7	-25.8	-5.8
Vietnam	2	4	3	3	6	6	175.3	22.5
All others	71	38	32	36	31	32	-55.1	-14.8
Total	153	141	112	111	98	94	-38.3	-9.2
	Value in thousand \$							
Top 5 suppliers:								
Malaysia	15,419	15,971	10,523	13,750	8,976	10,024	-35.0	-8.3
United States	17,859	23,916	34,625	36,428	37,108	37,326	109.0	15.9
Burma	189	1,514	817	345	1,036	3,560	1,786.2	79.9
Indonesia	2,346	7,302	6,629	4,227	5,881	2,485	5.9	1.2
Vietnam	1,287	1,844	1,848	1,892	3,403	2,569	99.6	14.8
All others	36,862	34,799	47,651	56,717	54,558	57,204	55.2	9.2
Total	73,962	85,345	102,094	113,360	110,962	113,168	53.0	8.9
	\$ per metric ton							
Top 5 suppliers:								
Malaysia	286	279	331	388	401	442	54.6	9.1
United States	1061	1404	1693	2033	2374	2392	125.4	17.7
Burma	710	1396	756	361	587	310	-56.3	-15.3
Indonesia	266	309	272	246	283	380	42.7	7.4
Vietnam	570	442	649	663	555	413	-27.5	-6.2
All others	520	926	1492	1559	1746	1798	245.5	28.1
Total	483	607	908	1024	1133	1199	148.1	19.9

Source: GTIS, Global Trade Atlas Database (accessed March 12, 2008).

Note: Includes HS subheadings 4408.31, 4408.39, and 4408.90.

plantations range from 3.3–4.7 million hectares (8.2–11.6 million acres), or 14–20 percent of all plantations intended for commercial timber production.<sup>48</sup> Up to 60 percent of FGHY plantation forests consist of poplar, Masson pine (*Pinus massoniana*), and Chinese fir (*Cunninghamia lanceolata*).<sup>49</sup> An estimated 43 percent (1.6 million hectares or 4 million acres) of FGHY plantations is intended for the production of wood-based panels, including poplar logs for plywood and engineered flooring, while 35 percent (1.3 million hectares or 3.2 million acres) is intended for pulp and paper production.<sup>50</sup> Eucalyptus is another FGHY plantation species used as core material for hardwood plywood and engineered wood flooring, and is also used in China's paper and medium-density fiberboard (MDF) industries.<sup>51</sup> Of the 56,800 hectares (140,350 acres) of FGHY plantations planted in 2004, it is anticipated that 32 percent will be used for wood-based panels.<sup>52</sup>

As part of its plantation development strategy, China anticipates the establishment of 9.3 million hectares (23 million acres) of FGHY plantations by 2010, yielding a harvest of 97 million m<sup>3</sup>, 13 percent of which would be used as raw material for wood-based panel producers.<sup>53</sup> Further, China's target of 13 million hectares (32 million acres) of FGHY plantation forests by 2015 would provide 133 million m<sup>3</sup> of timber.<sup>54</sup> The estimated investment required to establish these FGHY plantations is \$9 billion, and reportedly these funds are expected to come from nongovernmental sources, including domestic and foreign direct investment.<sup>55</sup>

However, some industry observers question China's ability to meet this goal. China will need to plant approximately 1 million hectares (2.5 million acres) per year of FGHY plantations from 2002 to 2015 to meet its target of 13 million hectares; however, from 2002 to 2004, China planted less than 100,000 hectares (250,000 acres) annually.<sup>56</sup> Moreover, China's average plantation yield is 35 m<sup>3</sup> per hectare compared with a world average of 100 m<sup>3</sup> per hectare, calling into question China's ability to bridge the gap between domestic production and total timber demand, which is forecast to reach 150 million m<sup>3</sup> by 2010.<sup>57</sup>

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<sup>48</sup> International Wood Markets Group, *The China Book*, part 1, 2006, 27.

<sup>49</sup> Other hardwood species planted in China's FGHY plantations include eucalyptus (*Eucalyptus spp.*) and aspen (*Populus spp.*). Softwood species planted in China's FGHY plantations include paulownia (*Paulownia tomentosa*), spruce (*Picea spp.*), cryptomeria (*Cryptomeria japonica*), larch (*Larix spp.*), Korean pine (*Pinus koraiensis*), and masson pine (*Pinus massoniana*). International Wood Markets Group, *The China Book*, part 1, 2006, 27. Different data sources report different numbers. For example, ITTO reports that China's total poplar plantation area is 7 million hectares (17.3 million acres), 44 percent (3.1 million hectares or 7.7 million acres) of which is intended for timber production. ITTO, *Tropical Timber Market Report*, March 16–31, 2007, 10.

<sup>50</sup> International Wood Markets Group, *The China Book*, part 1, 2006, 29.

<sup>51</sup> Chinese industry official, interview by Commission staff, China, February 20, 2008; and International Wood Markets Group, *The China Book*, part 1, 2006, 26–27.

<sup>52</sup> International Wood Markets Group, *The China Book*, part 1, 2006, 29.

<sup>53</sup> *Ibid.*

<sup>54</sup> USDA, FAS, *China Solid Wood Products Annual 2005*, July 15, 2005, 5.

<sup>55</sup> International Wood Markets Group, *The China Book*, part 1, 2006, 32. In 2006, \$8.2 million (RMB 65.3 million) was invested in China's FGHY forests. Foreign investment and private domestic investment each accounted for about 40 percent of funds establishing FGHY plantations that year. Government funds accounted for 8 percent. State Forestry Administration of China, *China Forestry Statistical Yearbook 2006*, September 2007, 118. Incentives to encourage foreign and private investment in plantations may include extended land-use rights, low-interest loans, subsidized interest payments, exempted income taxes, and reduced administrative fees. See Stewart, "China's Support Programs for Selected Industries," June 2007, various pages; and American Forest and Paper Association, *China's Subsidization of its Forest Products Industry*, July 2004, various pages.

<sup>56</sup> USDA, FAS, *China Solid Wood Products Annual 2005*, July 15, 2005, 5.

<sup>57</sup> Weiming, et al., *Russian Logs in China*, 2007, 1.

Additional challenges include availability of suitable land and competing land uses, ecological concerns related to monoculture plantations, expected future increases in domestic consumption of paper products, and funding constraints.<sup>58</sup>

## **Production, Trade, and Consumption**

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China's hardwood plywood and wood flooring industries have grown significantly in recent years, principally in response to increasing domestic demand fueled by China's rapid economic growth, including robust residential construction-related activity and real estate development. However, production increasingly exceeded domestic consumption from 2002 to 2006 and, as a result, exports accounted for an increasing share of domestic production. Exports of hardwood plywood and wood flooring increased dramatically during the period as foreign market demand for these products increased, particularly in the United States. As a result of the expansion of China's hardwood plywood and wood flooring industries, imports of these products have declined.

### ***Hardwood Plywood***

Hardwood plywood is estimated to account for approximately 85 percent of China's total plywood production, which also includes certain softwood plywood. From 2002 to 2006, Chinese production of hardwood plywood more than doubled to an estimated 23.3 million m<sup>3</sup>, largely driven by growth in domestic real estate development and home remodeling (table 4.4). Production growth was particularly pronounced from 2002 to 2003, when increasing demand, coupled with low barriers to entry in the plywood industry, led to the establishment of thousands of new mills.<sup>59</sup>

From 2002 to 2006, Chinese domestic hardwood plywood consumption doubled to an estimated 17.7 million m<sup>3</sup>. Production outpaced consumption during the period. As a result, exports increased from 13 percent of production in 2002 to 25 percent in 2006. In contrast, imports declined by 14 percent during the period, as domestic production increasingly displaced imports. Import penetration declined over the period, and never accounted for more than 3.6 percent of domestic consumption.

An estimated 80 percent of hardwood plywood is consumed in the construction sector, interior decoration, and furniture applications.<sup>60</sup> Hardwood plywood sold into the Chinese

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<sup>58</sup> USDA, FAS, *China Solid Wood Products Annual 2005*, July 15, 2005, 5; and International Wood Markets Group, *The China Book*, part 1, 2006, 32.

<sup>59</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 74. However, a portion of the reported production increase may also be attributable, in part, to a change in survey methodology to capture a greater share of production from small mills.

<sup>60</sup> International Wood Markets Group, *The China Book*, part 3, 2006, 31.

**TABLE 4.4** China's hardwood plywood: Production, trade, and consumption, 2002–06

Item	2002	2003	2004	2005	2006	Change 2002–06	CAGR 2002–06
	1,000 cubic meters					%	
Production <sup>a</sup>	9,720	17,990	17,960	21,530	23,360	140.3	24.5
Imports	317	438	486	379	272	-14.2	-3.8
Exports	1,214	1,424	2,843	3,926	5,883	384.6	48.4
Domestic apparent consumption	8,823	17,004	15,603	17,983	17,749	101.2	19.1
	% of units						
Import penetration	3.6	2.6	3.1	2.1	1.5	NA	NA
Exports to production	12.5	7.9	15.8	18.2	25.2	NA	NA

*Source:* Production figures from ITTO, *Annual Review and Assessment of the World Timber Situation 2006*, app. 1, July 2006, table T1-1; State Forestry Administration of China revised production data; and International Wood Markets Group, *The China Book*, part 2, 2006, 250. Trade data from GTIS, Global Trade Atlas Database (accessed March 17, 2008).

*Note:* Hardwood plywood trade data include the following 2006 6-digit HS subheadings and their subclassifications: 4412.13, 4412.14, 4412.22, 4412.23, and 4412.29. To the extent possible, export volumes were adjusted to reflect reporting countries' import volumes of hardwood plywood from China. However, because engineered wood flooring is classified in the same HS subheadings as hardwood plywood, exports are likely overstated and therefore domestic apparent consumption is likely understated.

<sup>a</sup>Based on staff estimates. Chinese hardwood plywood production figures as reported by ITTO were revised to take into account revised poplar plywood production figures as reported by the State Forestry Administration of China. Hardwood plywood is estimated to account for approximately 85 percent of China's total annual plywood production based on softwood plywood production figures for 2005 as reported in International Wood Markets Group, *The China Book*, part 2, 2006, 250.

domestic market reportedly tends to be used to make furniture, which is often exported to developed country markets, including the United States.<sup>61</sup> Common thicknesses of plywood produced in China range from 2.6 to 3.0 mm (approximately one-tenth of an inch) for thin panels to 18 mm for thicker panels.<sup>62</sup> According to one Chinese producer, common thicknesses of face veneers for plywood produced for export markets are 0.5–0.6 mm,<sup>63</sup> although other plywood producers reportedly use much thinner face and back veneers than this. A common thickness for a face veneer produced in China is 0.15 mm, whereas in Indonesia it is typically twice as thick.<sup>64</sup>

Chinese hardwood plywood exports to major markets increased significantly from 2002 to 2006. Hardwood plywood export volumes from China increased by about 385 percent to an estimated 5.9 million m<sup>3</sup>, while export values reached \$1.9 billion, a 480 percent increase from 2002 (table 4.5). However, since engineered wood flooring is classified in the same HS

<sup>61</sup> Industry official, interview by Commission staff, China, February 20, 2008.

<sup>62</sup> Rutton and Hock, "Reviving Tropical Plywood," May 2004, 23; and industry official, interview by Commission staff, China, February 20, 2008.

<sup>63</sup> Industry official, interview by Commission staff, China, February 20, 2008.

<sup>64</sup> Industry official, interview by Commission staff, Portland, OR, August 13, 2007.

**TABLE 4.5** China hardwood plywood exports, 2002–06

Country	2002	2003	2004	2005	2006	Change 2002–06	CAGR 2002–06
	Quantity (thousand cubic meters)					%	
Top 5 export markets:							
United States <sup>a</sup>	285	443	1,281	1,689	2,326	716.2	69.0
EU-27	159	164	340	821	910	473.4	54.7
Japan	275	287	344	407	630	128.8	23.0
Canada	16	16	60	85	413	2,546.4	126.8
Singapore	42	61	109	114	283	574.5	61.2
All other	438	454	710	810	1,321	202.0	31.8
Total	1,214	1,424	2,843	3,926	5,883	384.6	48.4
	Value in thousand \$						
Top 5 export markets:							
United States	99,802	156,439	415,872	600,003	967,936	869.9	76.5
EU-27	30,155	58,596	131,755	226,189	343,120	1,037.9	83.7
Japan	85,975	95,484	122,045	138,938	211,122	145.6	25.2
Canada	5,078	5,465	18,215	22,771	32,941	548.7	59.6
Singapore	11,401	15,924	25,874	26,098	39,427	245.8	36.4
All other	95,186	99,369	169,596	217,741	304,329	219.7	33.7
Total	327,597	431,277	883,358	1,231,741	1,898,876	479.6	55.2
	\$ per cubic meter						
Top 5 export markets:							
United States	350	353	325	355	416	18.8	4.4
EU-27	190	357	388	276	377	98.4	18.7
Japan	312	333	355	341	335	7.3	1.8
Canada	326	352	305	266	80	-75.5	-29.6
Singapore	271	262	238	228	139	-48.7	-15.4
All other	218	219	239	269	230	5.9	1.4
Total	270	303	311	314	323	19.6	4.6

Source: GTIS, Global Trade Atlas Database (accessed March 17, 2008).

Note: Includes the following HS 6-digit subheadings and their subclassifications: 4412.13, 4412.14, 4412.22, 4412.23, and 4412.29. These subheadings also include engineered wood flooring; therefore plywood export figures are likely overstated. To the extent possible, exports were adjusted to reflect only importing countries' hardwood plywood imports from China.

<sup>a</sup>Includes Puerto Rico.

subheadings as hardwood plywood and because China exports significant volumes of engineered wood flooring, hardwood plywood export figures are likely overstated. Hardwood plywood exports to the United States, China's largest export market, increased eight-fold during the period, driven largely by growth in the U.S. housing market.



## ***Wood Flooring***

From 2002 to 2007, China's total wood flooring production increased by 64 percent to 139 million m<sup>2</sup>, or at an annual rate of 10 percent (table 4.6). Engineered wood flooring production more than quadrupled to 75 million m<sup>2</sup>. In contrast, solid wood flooring production decreased by 32 percent to 44 million m<sup>2</sup>. Increasing raw material supply shortages and high prices for tropical species used in the solid wood flooring industry have resulted in a gradual decline in production, both absolute and relative to engineered wood flooring.<sup>65</sup> The growth in consumption of engineered wood flooring is attributable, in part, to its price advantage over solid wood flooring and, in part, to its stability once installed.<sup>66</sup> As a result, engineered wood flooring output overtook solid wood flooring output in China in 2006. China's bamboo flooring output grew at an average annual rate of 38 percent during the 2002–07 period to 20 million m<sup>2</sup>, although these production figures include engineered wood flooring consisting of a bamboo face and solid wood core and are likely overstated.<sup>67</sup>

Total wood flooring production capacity in China greatly exceeds production, resulting in significant excess capacity. From 2000 to 2004—the most recent year for which data are available—total wood flooring production capacity (excluding laminated flooring capacity) increased by 285 percent to 270 million m<sup>2</sup> as compared with production of 108 million m<sup>2</sup>, corresponding to an estimated total wood flooring capacity utilization rate of 40 percent. Solid wood flooring accounted for 200 million m<sup>2</sup> of capacity (35 percent capacity utilization rate in 2004), engineered wood flooring for 60 million m<sup>2</sup> (55 percent), and bamboo flooring for 10 million m<sup>2</sup> (50 percent).<sup>68</sup>

China is the world's largest wood flooring market. Wood flooring is widely used in housing developments, and is reportedly regarded by many Chinese consumers to be more aesthetically pleasing than ceramic tile or carpet.<sup>69</sup> China's domestic consumption of wood flooring (solid, engineered, and bamboo) was estimated to be approximately 120 million m<sup>2</sup> in 2006,<sup>70</sup> up by almost 40 percent since 2002, with the majority of domestic market demand growth occurring in engineered wood flooring, which grew at an estimated annual rate of 44 percent from 2002 to 2006.<sup>71</sup> Although estimates vary, solid wood flooring is generally believed to have accounted for 42–48 percent (50–58 million m<sup>2</sup>) of domestic consumption

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<sup>65</sup> TFT, *China Wood Products Supply Chain Analysis*, March 2007, 9.

<sup>66</sup> Industry official, e-mail message to Commission staff, November 7, 2007.

<sup>67</sup> Industry official, e-mail message to Commission staff, April 4, 2008. Other sources estimate bamboo flooring production to be much lower; for example, the China Timber Distribution Association reports 2006 bamboo flooring production closer to 8 million m<sup>2</sup>. Industry official, e-mail message to Commission staff, January 24, 2008.

<sup>68</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 157.

<sup>69</sup> Wood flooring was second to ceramic tile as the most popular type of floor covering in China in 2005. Ceramic tiles are reportedly still preferred in commercial establishments because they are easier to clean. Industry official, interview by Commission staff, China, February 17, 2008; and Catalina Research Inc., *Wood Flooring*, November 2005, 173.

<sup>70</sup> Reliable domestic consumption figures are difficult to obtain because various sources report different production and trade figures, resulting in inconsistent data.

<sup>71</sup> Industry official, e-mail message to Commission staff, September 6, 2007; and industry official, interview by Commission staff, China, February 17, 2008.

**TABLE 4.6** China wood flooring production, 2002–07

	2002	2003	2004	2005	2006	2007	Change 2002–07	CAGR 2002–07
	Million square meters						%	
Solid	65	70	70	50	45	44	-32.3	-7.5
Engineered	16	22	33	46	60	75	368.8	36.2
Bamboo	4	4	5	6	25	20	400.0	38.0
Total	85	96	108	102	130	139	63.5	10.3
	Million square feet							
Solid	700	753	753	538	484	474	-32.3	-7.5
Engineered	172	237	355	495	646	807	368.8	36.2
Bamboo	43	43	54	65	269	215	400.0	38.0
Total	915	1,033	1,163	1,098	1,399	1,496	63.5	10.3

Source: China National Forest Products Industry Association.

Note: 1 square meter equals approximately 10.76 square feet.

in 2006, while engineered flooring and bamboo flooring combined accounted for 53–58 percent (63–70 million m<sup>2</sup>).<sup>72</sup> While megacities such as Beijing and Shanghai account for the largest share of the solid wood flooring market, real estate development is reportedly accelerating in mid-sized Chinese cities while slowing in larger ones.<sup>73</sup>

The estimated value of China's solid wood flooring exports increased by 319 percent to \$1.1 billion from 2002 to 2006.<sup>74 75</sup> Over 80 percent of China's solid wood flooring exports were concentrated in three markets in 2006—the EU, the United States, and Canada—in 2006, up from 55 percent in 2002. From 2002 to 2006, an increasing percentage of China's exports of solid wood flooring to Japan were diverted to the EU and Canadian markets. As a result, the EU accounted for 42 percent (\$480 million) of Chinese exports in 2006, while Canada accounted for 13 percent (\$148 million). China's solid wood flooring exports to the United States increased by almost 340 percent to \$299 million, or at an annual rate of close to 45 percent (table 4.7). The United States consistently accounted for approximately one-quarter to one-third of China's solid wood flooring exports during the period.

<sup>72</sup> Industry official, e-mail message to Commission staff, September 6, 2007; and industry official, interview by Commission staff, China, February 17, 2008.

<sup>73</sup> Industry official, interview by Commission staff, China, February 17, 2008.

<sup>74</sup> As noted earlier, export volumes are difficult to assess because engineered wood flooring is classified with plywood, and solid hardwood flooring is classified with other products. Moreover, although China created 8-digit breakouts in HS 4409.20 in 2005 to delineate between solid hardwood flooring, bamboo flooring, and other continuously shaped wood products, Chinese export figures vary widely from, and are often lower than, market countries' reported imports. In addition, market countries' import volumes are reported in various units of measure, making meaningful comparison difficult.

<sup>75</sup> GTIS, Global Trade Atlas Database (accessed March 19, 2008).

**TABLE 4.7** China solid wood flooring exports, 2002–06

	2002	2003	2004	2005	2006	Change 2002–06	CAGR 2002–06
	Thousand \$					%	
Top export markets:							
EU-27	76,114	110,878	212,136	313,582	480,417	531.2	58.5
United States	68,202	112,258	217,952	289,047	299,346	338.9	44.7
Canada	6,650	25,845	75,410	132,436	147,647	2,120.2	117.1
Japan	74,427	90,521	96,704	98,998	107,430	44.3	9.6
Hong Kong	22,877	23,341	23,818	21,763	17,094	-25.3	-7.0
Australia	2,001	4,457	10,431	12,663	15,641	681.8	67.2
Korea	9,934	9,555	10,299	12,742	11,670	17.5	4.1
Ukraine	70	139	822	3,465	7,251	10,326.9	219.6
Mexico	1,850	3,775	6,968	6,806	5,865	217.0	33.4
Malaysia	249	733	1,698	2,811	5,185	1,979.7	113.6
All others	9,985	11,391	18,724	29,578	43,271	333.4	44.3
Total	272,359	392,893	675,963	923,891	1,140,817	318.9	43.1

Source: GTIS, Global Trade Atlas Database (accessed March 19, 2008).

Note: Data reported at the HS 2006 6-digit level for HS subheading 4409.20 (nonconiferous wood continuously shaped along any of its edges) and 4418.30 (parquet panels). Exports represent reporting countries' import statistics, and also include other hardwood products classified under HS subheading 4409.20, such as moldings.

## Capital Costs and Investment

While specific figures are unavailable, capital costs in the hardwood plywood and wood flooring industries in China can vary widely from small-scale cottage mills to larger export-oriented mills. Capital costs are reportedly low for small-scale plywood and flooring producers, and as a result, barriers to entry into the industry are low.<sup>76</sup> Larger export-oriented mills, including the top 20 domestic plywood mills, tend to be either joint ventures with foreign firms or domestically owned private companies.<sup>77</sup> Investment by these firms, including investment in advanced foreign manufacturing technology, is more substantial. Some larger Chinese plywood and wood flooring producers are increasingly considering investment opportunities in both domestic and overseas plantations to secure raw materials. One Chinese flooring producer has plans to invest in poplar and eucalyptus plantations in China and elsewhere in Asia.<sup>78</sup> In addition, the plywood and wood flooring industries in China are consolidating, with larger firms acquiring smaller ones.<sup>79</sup>

<sup>76</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 72–74.

<sup>77</sup> *Ibid.*, 79.

<sup>78</sup> Industry official, interview by Commission staff, China, February 18, 2008.

<sup>79</sup> Industry official, interview by Commission staff, China, February 18, 2008.

## Production Costs

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Hardwood plywood and wood flooring production processes in China generally include a relatively high labor content, particularly for the small mills that constitute the vast majority of Chinese producers. Although Chinese producers have relatively high raw materials costs (particularly for imported logs), low wage rates help to reduce overall wood processing costs by allowing producers to hire workers to perform certain tasks manually that would not be as cost effective at higher wage rates.<sup>80</sup> Such manual tasks may include hand scraping, repairing core defects in flooring to eliminate voids in tongues and grooves, and stitching together broken veneer pieces to produce veneer sheets to be pressed for both plywood and flooring cores. By performing certain tasks manually, raw material waste is reduced, and higher raw material recovery rates can be achieved, reportedly ranging from 50–70 percent, or higher.<sup>81</sup> As a result, raw material conversion costs and ultimately, operating costs, are reduced. The ability to utilize relatively inexpensive labor has been cited by Chinese producers as a significant competitive advantage.<sup>82</sup>

Additionally, by using veneer produced from domestic plantation logs as core material and importing the species used for the thinner face and back veneers, plywood and engineered flooring mills are able to reduce raw material costs on a per unit basis. In contrast, escalating raw material costs have reportedly negatively affected the solid wood flooring industry, which relies heavily on imported tropical logs and lumber. Although manufacturing costs vary greatly across a broad range of hardwood plywood and wood flooring products because of differences in dimension, species, grade, and technology utilized, general estimates of manufacturing costs for hardwood plywood and engineered and solid wood flooring producers in China are provided in table 4.8.

### *Raw Material Costs*

Various tropical and temperate hardwood species are used to produce hardwood plywood and wood flooring. With respect to plywood and engineered wood flooring, various tropical and temperate species are used to produce face and back veneers, whereas less expensive domestic plantation poplar is used as core veneer. Domestic plantation poplar logs may cost only a quarter of the cost of tropical logs,<sup>83</sup> depending on the species.

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<sup>80</sup> USITC hearing transcript, October 3, 2007, 228–29 and 231–32.

<sup>81</sup> A higher recovery rate implies a lower yield loss, which reduces raw material conversion costs. In comparison to China, raw material recovery rates in other plywood-producing countries are reportedly lower, ranging from 45–55 percent. However, one U.S. plywood producer is able to attain log utilization rates of 55–60 percent by utilizing computer systems that analyze the shape of a log and its position in the lathe in order to optimize yields. International Wood Markets Group, *The China Book*, part 2, 2006, 71 and 92; and industry officials, interviews by Commission staff, China, February 17–25, 2008, and the United States, July 17, 2007.

<sup>82</sup> Industry officials, interviews by Commission staff, China, February 18–19, 2008.

<sup>83</sup> Rutton and Hock, “Reviving Tropical Plywood,” May 2004, 27.

**TABLE 4.8** Examples of manufacturing costs for hardwood plywood and wood flooring producers in China

	Hardwood plywood	Engineered flooring		Solid wood flooring	
	% of total manufacturing costs				
Raw material	60–67	73–75		77–80	
Labor	10–13	6–9		5–8	
Other <sup>a</sup>	20–30	18–19		14–16	
	\$				
	<i>per cu. meter</i>	<i>per sq. meter</i>	<i>per sq. foot</i>	<i>per sq. meter</i>	<i>per sq. foot</i>
Raw material	215–360	12	1.12	15.50	1.44
Labor	40–60	1.00–1.50	.09–.14	1.00–1.50	.09–.14
Other	65–180	3.00	.28	3.00	.28
Total	320–600	16.00–16.50	1.49–1.54	19.50–20.00	1.81–1.86

Source: Hardwood plywood and wood flooring industry officials, interviews by Commission staff, China, February 18–25, 2008.

Note: One square meter equals approximately 10.76 square feet.

<sup>a</sup>Other costs may include energy costs, tenant fees, water, and other factory overhead.

For Chinese hardwood plywood, raw material can typically account for 60–70 percent of operating costs.<sup>84</sup> For hardwood plywood made with domestic poplar core veneer and imported tropical face and back veneers, the cost of imported material can range from 10 to 15 percent,<sup>85</sup> or less. As noted earlier, plywood produced in China reportedly has thinner face veneers. As a result, some Chinese mills may have a cost advantage with respect to the amount of more expensive tropical face veneer used per unit of output.

With respect to wood flooring, raw material costs typically range from 70 to 80 percent of operating costs, although raw materials costs may be substantially less for engineered wood flooring because it may include less expensive domestic poplar or other plantation species for core material.<sup>86</sup> With respect to solid wood flooring, the cost of raw materials has reportedly increased by 20–40 percent in recent years, depending on the species and grade.<sup>87</sup> The declining supply of high-quality logs and lumber from both domestic and foreign sources has contributed to the rising raw material costs and a decline in cost competitiveness for Chinese solid wood flooring producers.<sup>88</sup>

As of 2005, tropical face and back veneers at veneer wholesale markets generally ranged from \$280 to \$350 per m<sup>3</sup> depending on the species and quality, whereas tropical cores ranged from \$120 to \$220 per m<sup>3</sup>.<sup>89</sup> Likewise, the prices of veneer-quality domestic poplar logs reportedly doubled to \$100 per m<sup>3</sup> from 1998 to 2005, increasing further to

<sup>84</sup> Endesa-Botrosa, “Structural Changes in the Tropical Plywood Industry,” September 26, 2005, citing RWS Engineering Oy; and industry officials, interviews with Commission staff, Lancaster, PA, December 18, 2007, and China, February 16–25, 2008.

<sup>85</sup> Industry official, e-mail message to Commission staff, November 16, 2007.

<sup>86</sup> Industry officials, interview by Commission staff, China, February 16–25, 2008; and International Wood Markets Group, *The China Book*, part 2, 2006, 175–76.

<sup>87</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 157.

<sup>88</sup> *Ibid.*, 157.

<sup>89</sup> Wu, “Why China Plywood Competitive { sic },” September 26, 2005.

approximately \$135 per m<sup>3</sup> in 2007,<sup>90</sup> while smaller diameter plantation logs fetch \$40–\$80 per m<sup>3</sup>.<sup>91</sup> Poplar veneer used as plywood core material ranges from \$85 to \$115 per m<sup>3</sup>, whereas higher quality poplar veneers can range from \$170 to \$220 per m<sup>3</sup>.<sup>92</sup> Reportedly, Chinese farmers are increasingly switching land use away from other types of agriculture to plant poplar plantations in response to rising poplar prices.<sup>93</sup>

### ***Labor Costs***

Labor costs for both hardwood plywood and wood flooring are estimated to typically account for 5–15 percent of operating costs.<sup>94</sup> Average monthly salaries can range from \$100 to \$150 based on 6 days per week, 10–12 hours per day, although wages may be slightly higher depending on geographic region, inclusion of additional benefits such as insurance and pensions, and skill level.<sup>95</sup> Wages for Chinese workers are reportedly set to increase by 8–10 percent per year by government mandate, although some Chinese flooring producers claim that workers' wages actually increased by 12–15 percent in 2007 alone.<sup>96</sup> In contrast, average labor costs in the United States are over 20 times higher, ranging from \$16 to \$18 per hour,<sup>97</sup> or \$2,560–\$2,880 per month based on a 40-hour work week.<sup>98</sup>

### ***Transportation and Other Costs***

Several Chinese hardwood plywood and wood flooring producers stated that transportation costs have increased substantially since 2002. Transportation costs reportedly increased during the 2002–06 period, due in part to rising fuel and energy costs. However, while costs for outbound (eastbound) freight from China have reportedly increased by 20–25 percent to approximately \$2,800 per 40-foot container since 2002, costs for inbound (westbound) freight to China have reportedly decreased.<sup>99</sup> In 2007, transportation costs reportedly increased by 10–15 percent, due in part to rising fuel costs.<sup>100</sup> Inland mills and mills in northeastern China reportedly have greater transportation costs than those located within the vicinity of Shanghai or other ports, such as Zhangjiagang and Lianyungang in Jiangsu province.<sup>101</sup> Many solid wood flooring producers in the inland areas have reportedly switched to engineered wood flooring or laminated flooring because less expensive raw materials for

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<sup>90</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 82; and International Wood Markets Group, "Chinese Poplar and Poplar Plywood Update," November, 2007.

<sup>91</sup> Wu, "Why China Plywood Competitive {sic}," September 26, 2005.

<sup>92</sup> *Ibid.*

<sup>93</sup> Industry official, interview by Commission staff, China, February 17, 2008.

<sup>94</sup> Industry officials, interviews by Commission staff, China, February 16–25, 2008. For one engineered flooring producer, labor accounts for up to 25 percent of operating costs.

<sup>95</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 91; Wu, "Why China Plywood Competitive {sic}," September 26, 2005; industry official, interview by Commission staff, China, February 21, 2008; and industry official, e-mail message to Commission staff, February 14, 2008.

<sup>96</sup> Industry officials, interview by Commission staff, China, February 17, 2008.

<sup>97</sup> Industry official, interview by Commission staff, Portland, OR, August 15, 2007; and USITC hearing transcript, October 3, 2007, 66.

<sup>98</sup> Including benefits such as health insurance and retirement benefits, average labor costs could be 50 percent higher. Industry official, interview by Commission staff, Portland, OR, August 15, 2007.

<sup>99</sup> Industry official, interview by Commission staff, China, February 18, 2008.

<sup>100</sup> *Ibid.*

<sup>101</sup> *Ibid.*

these products can offset increased transportation costs.<sup>102</sup> In early 2008, transportation costs to the U.S. west coast for one Chinese flooring producer averaged \$99 per m<sup>3</sup>, or 6–8 percent of the landed cost of flooring product.<sup>103</sup> Other industry analysts estimate freight costs to the U.S. market to average \$60 per m<sup>3</sup>.<sup>104</sup>

## Marketing

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The vast majority of China's plywood and wood flooring production is sold through domestic wholesale markets. As of 2001, there were reportedly 344 wholesale markets and 651 retail markets, the vast majority of which were informal markets. Most wholesale markets are privately owned, and consist of a large number of vendors that sell various building materials, including timber, plywood, and flooring. Major customers include retailers, construction companies, and other panel producers.<sup>105</sup>

Nanxun Building Materials Market (Zhejiang province) is the largest plywood distribution center in China, and prices set in Nanxun are reportedly close to acting as a reference price for the rest of the country. Nanxun is also the largest production and distribution base for wood flooring.<sup>106</sup> Dongguang Houjie Xingye Timber and Plywood Market is located in a major furniture production center in Guangdong province and is reportedly the largest distribution center in southern China. Approximately 60 percent of lumber and plywood sold in this market is imported. Shanghai Furen Forest Products Wholesale Market sells plywood and flooring products, with over 50 percent of sales being tropical hardwood products primarily from Indonesia and Burma.<sup>107</sup>

Branding in the Chinese domestic market is becoming an increasingly important way to differentiate products. With respect to wood flooring, there are reportedly five large brands in the Chinese domestic market.<sup>108</sup> Chinese consumers are reportedly particularly responsive to brands for solid wood flooring, as it generally commands a price premium compared to laminated and engineered flooring.<sup>109</sup> In the Chinese market, larger plywood and flooring producers may distribute product through their own franchised retail outlets under their own brand name, or distribute their products through branded retail stores such as B&Q or Home Depot, either under their own brand name or under the retailer's brand.<sup>110</sup> Larger plywood and flooring producers may also produce other products to diversify their product mix to build brand recognition.<sup>111</sup>

Certain Chinese plywood and wood flooring producers also supply private label products to foreign producers, including U.S. hardwood plywood producer Columbia Forest Products,

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<sup>102</sup> Ibid.

<sup>103</sup> Ibid.

<sup>104</sup> International Wood Markets Group, *The China Book*, part 2, 2006, 249.

<sup>105</sup> Rutton and Hock, "Reviving Tropical Plywood," May 2004, 26.

<sup>106</sup> Ibid., 24. Annual flooring production in Nanxun is approximately 36 million square meters. Demand for logs and lumber at Nanxun is approximately 3 million cubic meters per year, 90 percent of which is imported.

<sup>107</sup> Ibid.

<sup>108</sup> Industry officials, interviews by Commission staff, China, February 18–29, 2008.

<sup>109</sup> Industry official, interview by Commission staff, China, February 18, 2008.

<sup>110</sup> Industry officials, interviews by Commission staff, China, February 18–26, 2008.

<sup>111</sup> Industry official, interview by Commission staff, China, February 20, 2008.

as well as U.S. engineered flooring producers Somerset Hardwood Floors and Mohawk Flooring.<sup>112</sup> Chinese producers may sell their plywood and flooring products on a contractual basis under the brand name of a foreign producer per the foreign producer’s specifications, as well as under the brand name of foreign retailers.<sup>113</sup> According to several Chinese plywood and wood flooring producers, Home Depot is one of the largest U.S. buyers of Chinese hardwood plywood and wood flooring.<sup>114</sup>

## Pricing

Prices vary widely for hardwood plywood and wood flooring in the Chinese market (tables 4.9 and 4.10). Domestically produced hardwood plywood using domestic poplar logs as core material is generally priced lower than imported plywood.<sup>115</sup> Prices for tropical hardwood plywood are generally higher than domestic poplar plywood.<sup>116</sup> Additionally, compared to smaller private mills, plywood produced from larger joint ventures is generally priced higher as a result of differences in quality and end-use applications.<sup>117</sup> In general, Chinese plywood and wood flooring producers reportedly face intense price competition and low profit margins, as their products are commodities and, until recently, benefitted from little product differentiation or branding.<sup>118</sup>

**TABLE 4.9** Listed export prices for various plywood products, February 2008

Species	Dimension (mm)	Thickness (mm)	Price range (\$ per cu. meter)
Poplar ( <i>Populus spp.</i> )	<sup>a</sup> 1220 x 2440	3–5	419–558
	1220 x 2440	9–15	349–447
	1220 x 2440	18	279–391
Chinese fir ( <i>Cunninghamia lanceolata</i> )	500 x 1000	21–27	335–391
Black walnut ( <i>Juglans nigra</i> ), oak ( <i>Quercus spp.</i> ), and teak ( <i>Tectona grandis</i> )	1120 x 2440	3	837–1117

Source: Fordaq Timber Network, citing Shanghai Jiashan Kalhua International Wood Market, China, February 13, 2008, found at <http://www.fordaq.com>, accessed April 8, 2008.

Note: Original prices quoted in RMB, which were converted to dollars by using the February 2008 exchange rate as reported by the U.S. Federal Reserve (1 dollar = 7.1644 RMB).

<sup>a</sup>Equivalent to a 4 x 8 foot sheet.

<sup>112</sup> Industry officials, interviews by Commission staff, China, February 18–26, 2008; and USITC hearing transcript, October 3, 2007, 49–50 and 235.

<sup>113</sup> Ibid.

<sup>114</sup> Ibid.

<sup>115</sup> International Wood Markets Group, *The China Book*, part 3, 2006, 32.

<sup>116</sup> Rutton and Hock, “Reviving Tropical Plywood,” May 2004, 23.

<sup>117</sup> International Wood Markets Group, *The China Book*, part 3, 2006, 32.

<sup>118</sup> USDA, FAS, *Chinese Wood Usage Continues Rapid Growth*, July 11, 2007, 11; TFT, *China Wood Products Supply Chain Analysis*, March 2007, 3; and USDA, FAS, *China Solid Wood Products Annual 2006*, July 13, 2006, 7.



**TABLE 4.10** Listed wholesale domestic prices for Chinese domestic and imported solid wood flooring products, February 2008

Origin	Species	Price range (\$ per sq. meter)	
		Standard <sup>a</sup>	Wide <sup>b</sup>
China	European oak ( <i>Quereus spp.</i> )	25.12	27.64
	Alder ( <i>Alnus spp.</i> )/birch ( <i>Betula spp.</i> )	16.05	18.42
	Pinnata ( <i>Pometia pinnata</i> )	13.26	14.66
South America	Balsamo ( <i>Myroxylon balsamum</i> )	45.08	53.04
	Cumaru ( <i>Dipteryx odorata</i> )	26.52	29.31
	Tauari ( <i>Couratari spp.</i> )	20.94	22.33
Southeast Asia	Merbau ( <i>Intsia spp.</i> )	23.45	24.85
	Keranji ( <i>Dialium spp.</i> )	22.33	23.03
	Kulim ( <i>Scorodocarpus boreensis</i> )	20.24	21.77
Africa	Awora ( <i>Garcinia spp.</i> )	24.85	25.82
	Sapelli ( <i>Entandrophragma cylindricum</i> )	23.73	25.12
	Iroko ( <i>Chlorophora spp.</i> )	( <sup>c</sup> )	22.05

Source: Fordaq Timber Network citing Shanghai Furen Wood Floor Distribution Center, February 5, 2008.

Note: Original prices were quoted in RMB, which were converted to dollars by using the February 2008 exchange rate as reported by the U.S. Federal Reserve (1 dollar = 7.1644 RMB).

<sup>a</sup>Standard refers to solid wood flooring in 18 mm x 90 mm x 900 mm fixed lengths.

<sup>b</sup>Wide size refers to 18 mm x 120 mm x 900 mm fixed lengths.

<sup>c</sup>Not available.

## Government Programs

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Past Chinese government policies have focused on protecting domestic natural forest resources and emphasizing the development and utilization of plantation resources as raw material for China's wood processing industries. Trade policies such as the processing trade (duty-free re-export) program and the VAT export rebate program were created to promote the development of certain value-added manufacturing industries, including domestic wood processing industries. Recent reductions in VAT export rebates for exported hardwood plywood and wood flooring, as well as a consumption and export tax on solid wood flooring alone, have reportedly recently discouraged export growth for both products.<sup>119</sup>

Chinese plywood and wood flooring producers, particularly those located in economic development zones, may also benefit from preferential tax rates, exempted income tax, and other investment incentives. Such benefits would apply to all manufacturing investments located in such zones and would not be limited solely to the plywood and wood flooring industries.

### *Trade Policies*

China has utilized the processing trade preference program and the VAT export rebate program to encourage the development of the domestic wood processing industry and conserve domestic forest resources. The processing trade preference program allows duty-free and VAT-free treatment for imported materials that are processed and re-exported as a value-added item.<sup>120</sup> Under the VAT export rebate program, certain exported products qualify for a VAT export rebate if the products contain domestic raw materials. Because these two programs provided benefits to an exporter using either imported or domestic raw materials, there was little discrimination based on the origin of the raw materials.<sup>121</sup>

Although hardwood plywood and wood flooring have benefitted from duty-free and VAT-free imported raw materials under the processing trade preference program, recent reductions in VAT export rebates for hardwood plywood and engineered flooring, as well as the elimination of VAT export rebates for certain solid wood flooring, aim to discourage exports of these products by increasing the amount of VAT owed on exported products. The majority of changes were made for products deemed by the government to be energy intensive, heavily polluting, resource consuming products, or products prone to international trade frictions.<sup>122</sup> Table 4.11 outlines recent changes to trade preference programs affecting both the hardwood plywood and wood flooring industries.

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<sup>119</sup> USDA, FAS, *China Eliminates Re-Export Preferences*, October 17, 2006, 4; and USDA, FAS, *China Wood Trade Policy Updates*, November 14, 2006, 3.

<sup>120</sup> USDA, FAS, *China Wood Trade Policy Updates*, November 14, 2006, 2.

<sup>121</sup> *Ibid.*

<sup>122</sup> USDA, FAS, *China Reduces Wide Range of VAT Rebates*, July 26, 2007, 3.

**TABLE 4.11** Changes to trade preference programs

Program	Hardwood plywood and engineered wood flooring (HS 4412)	Solid wood flooring (HS 4409 and 4418)
Processing trade preference program	Authorized	HS 4418.30 Authorized HS 4409.20 Eliminated (9/06) HS 4409.20 Re-authorized (11/06)
Value-added tax (VAT)	17 percent <sup>(a)</sup>	17 percent (HS 4409.20) <sup>(a)</sup>
VAT export rebate before 9/15/2006	13 percent	13 percent (HS 4418.30) Zero (HS 4409.20 - eliminated from program 1/04)
VAT export rebate effective 9/15/2006	11 percent	Zero (HS 4409.20) 11 percent (HS 4418.30)
VAT export rebate effective 7/1/2007	5 percent for certain plywood; eliminated for other plywood <sup>(b)</sup>	Zero (HS 4409.20) 11 percent (HS 4418.30)
VAT paid effective 7/1/2007	12 percent for certain plywood; 17 percent for other plywood	17 percent (HS 4409.20) 6 percent (HS 4418.30)
Additional policy changes:		
Consumption tax	None	5 percent (4/06)
Export tax	None	10 percent for solid wood flooring (9/06)

Source: USDA, FAS, *China Eliminates Re-Export Preferences*, tables 1–2, October 17, 2006, app. 2; USDA, FAS, *China Wood Trade Policy Updates*, November 14, 2006, 2; USDA, FAS, *China Solid Wood Products Annual 2006*, July 13, 2006, 7; and USDA, FAS, *China Reduces Wide Range of VAT Rebates*, tables 1–2, July 26, 2007, 5–32.

Note: Table refers to 2006 HS subheadings.

<sup>a</sup>The actual value of VAT paid for the exported finished product is the difference between the value of VAT paid for an imported input and the value of the VAT amount owed for the exported finished product.

<sup>b</sup>Plywood products eliminated from the VAT rebate include those made from endangered species (“imminent danger” according to Chinese tariff terminology) of tropical and other hardwoods. Also eliminated from the VAT rebate are certain blockboard, laminated woods, and parquet panels.

Reductions in VAT export rebates for other hardwood plywood products, coupled with increasing labor, energy, and raw materials costs, have reportedly had a negative financial impact on Chinese hardwood plywood producers.<sup>123</sup> For example, over 80 percent of plywood mills that produce for export have reportedly experienced cost increases that are cutting into company profits, which typically were already low at around 3 percent.<sup>124</sup> As a result of these cost increases, many small- and medium-sized Chinese mills have reportedly reduced production levels or have gone out of business.<sup>125</sup> In 2007 alone, 700 small plywood mills reportedly ceased production, due to a reduction in VAT export rebates, increasing production costs, lagging foreign demand, and low export prices.<sup>126</sup>

<sup>123</sup> International Wood Markets Group, “Chinese Poplar and Poplar Plywood Update,” November 2007.

<sup>124</sup> Ibid.

<sup>125</sup> Ibid.

<sup>126</sup> Industry officials, e-mail message to and telephone interview by Commission staff, April 4, 2008.

Recent policy changes have created additional financial challenges for China's solid wood flooring producers. In addition to a 5 percent consumption tax on solid wood flooring (to be paid by the manufacturer)<sup>127</sup> imposed in April 2006, the central government levied a 10 percent export tax on solid wood flooring in October 2006, despite re-authorizing solid wood flooring for processing trade preferences the previous month.<sup>128</sup> Because many larger solid wood flooring manufacturers are export oriented, some industry observers believe that the current policies may contribute to the rationalization of the Chinese solid wood flooring industry.<sup>129</sup>

Some industry analysts believe that the objective of recent policy changes and subsequent reversals is to protect domestic timber resources and slow investment in China's wood processing industries while maintaining the employment and competitiveness of the existing industry.<sup>130</sup> In addition, the reduction in VAT export rebates for hardwood plywood and wood flooring and the imposition of a consumption and export tax on solid wood flooring discourage exports, thereby implicitly favoring companies that produce for China's domestic market.<sup>131</sup> Despite these challenges, some producers are focusing on productivity improvements to offset the loss in VAT export rebates and to maintain competitiveness.<sup>132</sup>

### ***Other Policies***

Chinese plywood and wood flooring producers, particularly those located in economic development zones, may have benefitted from certain assistance programs and investment incentives, including exemption from corporate income tax for two years starting from the first year of making profits and preferential corporate income taxes thereafter; re-investment of tax rebates; reductions in property taxes; and negotiable land prices.<sup>133</sup> Investment incentives, often directed to foreign invested enterprises (FIEs), apply to all manufacturing investments located in such zones. In addition, various Chinese laws generally provide a range of preferential tax policies predominantly to FIEs, but also to domestic Chinese enterprises.<sup>134</sup> However, on January 1, 2008, a new Chinese tax law took effect which eliminated preferential tax breaks for FIEs and made the tax rates for domestic firms and foreign invested enterprises uniform.<sup>135</sup>

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<sup>127</sup> International Wood Markets Group, *The China Book*, part 3, 2006, 102.

<sup>128</sup> USDA, FAS, *China Wood Trade Policy Updates*, November 14, 2006, 2.

<sup>129</sup> *Ibid.*, 3.

<sup>130</sup> *Ibid.*

<sup>131</sup> USDA, FAS, *China Eliminates Re-Export Preferences*, October 17, 2006, 4.

<sup>132</sup> Industry official, interview by Commission staff, China, February 19, 2008.

<sup>133</sup> For example, see Nantong Economic Technological Development Area located in Jiangsu province, <http://www.netda.com>, and Moganshan (Deqing) Economic Development Zone located in Zhejiang province, <http://www.dqcom.gov.cn/en>, which is administered by the Deqing Foreign Trade and Economic Cooperation Bureau.

<sup>134</sup> For a list of Chinese laws and corresponding programs, see Stewart, "China's Support Programs for Selected Industries," June 2007.

<sup>135</sup> Jin, Minister of Finance, People's Republic of China, "Explanation on the Draft Enterprise Income Tax," March 8, 2007.

In February 2007, the United States requested WTO consultations with China concerning certain policies prohibited under WTO rules, including export subsidies and import substitution practices.<sup>136</sup> Enterprises in economic development zones, including hardwood plywood and wood flooring producers, may have benefitted from such policies. In November 2007, China entered into a memorandum of understanding with the United States in which it agreed to eliminate such practices by January 1, 2008.<sup>137</sup>

### ***Foreign Government Programs***

With respect to certain plywood, China's exports are subject to antidumping duties in the EU, Turkey, and Israel. In 2003, the EU found China to be dumping okoumé plywood during the 1999–2003 period, resulting in a countrywide dumping margin of 66.7 percent.<sup>138</sup> During the investigation, the European Commission recognized that the majority of Chinese exports of okoumé plywood had thinner face plies than the Community domestic like product, and found that in some cases a difference in face thickness could result in a price difference of 3.6–5.5 percent. In addition, the European Commission concluded that the combined impact of differences in face thickness, glue quality, and the quality of inner plies of Chinese producers corresponded to a price difference of 10–15 percent. As a result, the European Commission added a 10 percent adjustment to the c.i.f. price of cooperating Chinese exporting producers when calculating the dumping margins.<sup>139</sup>

Turkey initiated an antidumping investigation against Chinese plywood in February 2006, resulting in a final antidumping margin of \$240 per m<sup>3</sup>.<sup>140</sup> Likewise, Israel initiated antidumping proceedings with respect to certain MDF and plywood faced by veneer or lacquer paper from China in December 2004, resulting in an antidumping margin of 44.7 percent.<sup>141</sup>

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<sup>136</sup> WTO, Delegation of the United States, "China: Certain Measures Granting Refunds," February 7, 2007.

<sup>137</sup> Memorandum of Understanding Between the United States of America and the People's Republic of China Regarding Certain Measures Granting Refunds, Reductions or Exemptions from Taxes or Other Payments.

<sup>138</sup> The European Commission defined the product concerned as "plywood consisting solely of sheets of wood, each ply not exceeding 6 mm thickness, with at least one outer ply of okoumé, originating in the PRC, currently classifiable within CN code ex 4412 13 10." Both plywood made entirely of okoumé and plywood with one or two outer faces made of okoumé with core layers made from other species were included in the product description. See Council Regulation (EC) No. 1942/2004 (November 2, 2004) imposing a definitive anti-dumping duty and collecting definitively the provisional duty imposed on imports of okoumé plywood originating in the People's Republic of China, 336/8.

<sup>139</sup> *Ibid.*, 336/6 and 336/8.

<sup>140</sup> Plywood consisting solely of sheets of wood, each ply not exceeding 6 mm in thickness. WTO, Committee on Anti-Dumping Practices, "Semi-Annual Report Under Article 16.4 of the Agreement, Turkey," March 22, 2007, for the period July 31–December 31, 2006.

<sup>141</sup> WTO, Committee On Anti-Dumping Practices, "Semi-Annual Report Under Article 16.4 of the Agreement, Israel," April 17, 2007, for the period July 31–December 31, 2006.



# CHAPTER 5

## Other Foreign Suppliers

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The other primary suppliers of wood flooring and hardwood plywood to the U.S. market—Brazil, Canada, Indonesia, Malaysia, and Russia—share many characteristics. All five suppliers have large forested areas with significant supplies of raw material; together, they account for more than 40 percent of the world’s forested area. Three of the countries (Brazil, Indonesia, and Malaysia) are principally suppliers of tropical hardwood products, and the other two (Canada and Russia) are principally suppliers of temperate/boreal hardwood products. As shown in chapter 2, these countries, along with China, are not only the principal suppliers to the U.S. market, but account for significant shares of global exports of hardwood plywood and wood flooring. These countries are well adapted to compete in this market due to large natural forest resources and plantation areas (particularly in the tropical countries), generally low labor costs (with the exception of Canada), and large integrated forest industries with large scale facilities and an export orientation. For these countries, there is generally more information available for their plywood industries than for their flooring industries.<sup>1</sup> In addition, information is more readily available for industries producing solid wood flooring than for engineered wood flooring.

### Industry Structure and Capacity

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In contrast to the United States and China, the wood flooring and hardwood plywood industries in the five other supplier countries are typically more vertically integrated (particularly the hardwood plywood industry) and have access to larger tracts of timber as part of concessions on government-owned forest land. These concessions provide hardwood product firms with a steady supply of timber for their production processes. The wood flooring and hardwood plywood industries in these countries are privately owned and use essentially the same technologies to produce flooring and plywood as the United States. Brazil, Indonesia, Malaysia, and Russia have larger-scale plywood mills than does Canada, but the mills are on a similar scale to large U.S. firms. Little data and information are available on the size and structure of the wood flooring industries in these countries (table 5.1).

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<sup>1</sup> Data and information on flooring is often included under the category of builder’s joinery, also includes doors, windows, shutters, stairs, and door or window frames.

**TABLE 5.1** Foreign supplier countries: Sawmills, plywood mills, and other wood product producers, number of firms and installed capacity (1,000 cubic meters)

Country	Sawmills		Plywood mills	
	Firms	Installed Capacity <sup>a</sup>	Firms	Installed Capacity <sup>a</sup>
Brazil	10,000	NA	<sup>b</sup> <200	NA
Canada	<sup>c</sup> 50	<sup>d</sup> 5,389	12	<sup>d</sup> 5,389
Indonesia	327	7,460	113	12,000
Malaysia <sup>e</sup>	1,132	24,370	174	10,720
Russia	NA	NA	30–40	3,700

Source: USDA, FAS, *Indonesia Solid Wood Products: Annual 2006*, June 28 2006, 4; and Government of Malaysia, "Wood-Based Industry," 2006, 425.

<sup>a</sup>Installed capacity in thousands m<sup>3</sup> per year.

<sup>b</sup>This includes softwood and hardwood mills.

<sup>c</sup>Solid wood flooring firms.

<sup>d</sup>Capacity converted from 300 million square feet with an average thickness of 0.632 inches.

<sup>e</sup>Malaysian firms and installed capacity figures are for 1995.

## *Brazil*

While most of the plywood industry in Brazil is located in the southern portion of the country, the bulk of tropical (hardwood) plywood production remains in the north. According to the ITTO, an estimated 300 mills were in operation in 2000, 60 percent of which were medium- to large-scale companies; the remaining 40 percent were small-scale operations. At that time, 40 companies accounted for about 60 percent of plywood production capacity.<sup>2</sup> However, recent reports suggest that the number of plywood mills is now under 200 and that there may be only about 10 remaining that produce significant volumes of hardwood plywood.<sup>3</sup> According to Brazilian industry officials, the "Brazilian hardwood flooring industry is dwarfed by the U.S. industry. {Brazilian} production and capacity are rather small when compared to U.S. production and capacity {and} the Brazilian presence in the world market is smaller than the American presence."<sup>4</sup>

Most Brazilian wood flooring operations are also located in the south. Reportedly, there are some large-scale operations in this sector. BR-111, a major U.S.-based importer and distributor, has the largest flooring mill in South America (located outside of São Paulo), producing more than 1.4 million square feet of flooring per month for distribution to domestic and international markets.<sup>5</sup> Complete information is not available on the number or size of Brazilian wood flooring firms.

<sup>2</sup> Rutton and Hock, "Reviving Tropical Plywood," May 2004, 18.

<sup>3</sup> Industry official, interview by Commission staff, Washington, DC, September 14, 2007.

<sup>4</sup> USITC hearing transcript, October 3, 2007, 222.

<sup>5</sup> *FloorBiz.com*, "BR-111 Imports and Exports, Inc: About Us," undated (accessed January 16, 2008).



## *Canada*

The hardwood plywood industry in Canada is about one-quarter the size of the hardwood plywood industry in the United States and comprises approximately one dozen firms. Three of these firms are divisions of large integrated Canadian forest products companies. The remainder are not vertically integrated, and one is a division of a large U.S. hardwood plywood producer. The four largest producers account for 60–80 percent of total Canadian hardwood plywood production.<sup>6</sup> Three Canadian producers have integrated hardwood plywood operations—slicing and/or peeling hardwood logs and then gluing and pressing the veneer layers into the final product. The other producers purchase cores and face and back veneers. Although the scale of production operations for some U.S. hardwood plywood firms is larger than that of Canadian firms, production equipment and technology is similar because it is purchased from the same vendors. The age of the production equipment is also generally similar.<sup>7</sup> Employment in the industry in Canada totals approximately 1,000–2,000, but the number of workers has declined in recent years.

Approximately 60 percent of Canada's hardwood plywood production capacity is located in Ontario with the remainder in Quebec; Ontario and Quebec contain most of Canada's hardwood forests. Total capacity to produce hardwood plywood in Canada has been flat during the past five years with no consolidation of producers or expansion of capacity during this period.<sup>8</sup>

The wood flooring industry in Canada is approximately one-quarter the size of the U.S. wood flooring industry and consists of approximately 50 firms, mostly small, family-owned businesses producing primarily or exclusively wood flooring. Most are located in eastern Canada; a few small producers are located in British Columbia and the maritime provinces.<sup>9</sup> Most producers have only one plant, while a few of the bigger ones have multiple plants. Only two of these firms are vertically integrated, with their own logging and sawing operations. The industry is fragmented, with the top four producers accounting for 20–40 percent of total Canadian production of wood flooring. A handful of Canadian wood flooring firms produce both solid wood and engineered wood flooring. The vast majority of firms only make solid wood flooring, of which approximately 50 percent of these only make unfinished solid wood flooring and 50 percent make both finished and unfinished solid wood flooring. Employment in the Canadian industry numbers several thousand but has reportedly declined during the past few years.<sup>10</sup> Capacity in Canada has fluctuated over the past 5 years, with some new players entering the market during the 2003–05 period but then going out of business in 2006. Reportedly there is a moderate amount of unused wood flooring

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<sup>6</sup> Industry officials, interviews by Commission staff, Washington, DC, August 10 and September 14, 2007; and company annual reports and Web sites of various Canadian hardwood plywood producers.

<sup>7</sup> Industry officials, interviews by Commission staff, Washington, DC, August 10 and September 14, 2007.

<sup>8</sup> Industry officials, interviews by Commission staff, Washington, DC, August 10 and September 14, 2007.

<sup>9</sup> About one-third of Canadian wood flooring production capacity is in Ontario and two-thirds are in Quebec.

<sup>10</sup> Industry officials, interviews by Commission staff, Washington, DC, September 14, October 10, and November 14, 2007; and company annual reports and Web sites of various Canadian wood flooring producers.

production capacity in Canada; very little consolidation of wood flooring producers in Canada has occurred in the past 5 years.<sup>11</sup>

## *Indonesia*

The forest products industry in Indonesia is geographically concentrated in the Indonesian states on Borneo and Sumatra. Borneo alone accounts for 68 percent of plywood production, 49 percent of sawn timber production, and 99 percent of veneer production.<sup>12</sup> The government of Indonesia generally ties logging concession rights to firms with downstream production capabilities, such that logging firms must operate plywood mills, sawmills, or other wood processing facilities.<sup>13</sup> According to official production statistics, the plywood industry is nearly twice the size of the sawnwood industry,<sup>14</sup> and roughly the same size as the Indonesian veneer industry. The Indonesian wood flooring industry is small relative to the plywood industry.

There are a large number of plywood mills in Indonesia relative to the country's output, indicating that the plywood industry suffers from overcapacity and low productivity.<sup>15</sup> According to a 2003 ITTO report, Indonesia's capacity utilization was approximately 40 percent; the overall Asian plywood sector was reportedly operating at 50 percent of capacity.<sup>16</sup> In 2006, a significant share of Indonesia's plywood mills were idle due to production equipment limitations or lack of raw materials, with the remaining operating at less than 50 percent capacity.<sup>17</sup> Some plants that did not already have the ability to process small diameter logs or the ability to peel logs down to a small diameter were reportedly retooling their operations in preparation for restarting production in order to utilize available raw material.<sup>18</sup> In the late 1990s, plywood mills accounted for more than 50 percent of employment in the wood products sector; more recent data are not available.

The plywood industry in Indonesia is dominated by large-scale business groups such as the Barito Pacific Group (BPG), the Djajanti Group, and the Kalimantan Group, which have forest logging concessions and operate plants that produce a wide range of products including hardwood plywood and wood flooring.<sup>19</sup> BPG, comparable in production capacity and relative size to large U.S. firms, is the largest group in the Indonesian plywood industry. It operates at least 10 wood processing mills, of which 5 have dedicated plywood production lines with an annual plywood production capacity of approximately 1.5 million m<sup>3</sup>. In its 2005 annual report, BPG reported that over 85 percent of its production was exported, with

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<sup>11</sup> Industry officials, interviews by Commission staff, Washington, DC, September 14, October 10, and November 14, 2007.

<sup>12</sup> Government of Indonesia, Department of Statistics, "Industry Database," undated (accessed February 22, 2008).

<sup>13</sup> Less than 5 percent of the capacity of the Indonesian wood products industry is unaffiliated with concessions. *Indonesian Commercial Newsletter*, "Plywood Industry Requires Consolidation and Restructuring," April 9, 2002.

<sup>14</sup> Flooring statistics are believed to be incorporated into both the plywood and sawnwood industries data.

<sup>15</sup> Turner, Katz, and Buongiorno, *Implications for the New Zealand Wood Products Sector*, July 2007, 16.

<sup>16</sup> Adams, ITTO, "Is This the End of Thin-Panel Tropical Plywood?" 2003.

<sup>17</sup> World Bank, "Sustaining Economic Growth," December 2006, 71.

<sup>18</sup> *Ibid.*

<sup>19</sup> *Indonesian Commercial Newsletter*, "Plywood Industry Requires Consolidation and Restructuring," April 9, 2002.

the largest share of its exports shipped to the Middle East.<sup>20</sup> Plywood accounts for nearly 80 percent of BPG's total production. However, plywood production and sales volume declined by approximately 62 percent from 2002 to 2005 partly due to crackdowns on illegal logging that resulted in the closure of two of BPG's five dedicated plywood production lines.<sup>21</sup>

## *Malaysia*

As in Indonesia, Malaysian production is specialized by region. Production of primary forest products such as logs, plywood, and veneer is heavily concentrated in the Malaysian states of Sabah and Sarawak on Borneo. The plywood industry consists of 174 mills with the largest and most efficient plants located in Sarawak, which accounted for 63 percent of Malaysia's plywood production volume in 2001; Sabah accounted for 22 percent in the same year and Peninsular Malaysia for 15 percent.<sup>22</sup> Plywood accounted for more than 30 percent of Malaysian wood product exports in 2006. Although the number of mills is evenly distributed across Malaysia, Sarawak has larger mills compared to the rest of the country and accounted for nearly 70 percent of the total value of plywood exports in 2006.<sup>23</sup> While the plywood industries in Sarawak and Sabah are export oriented, most of Peninsular Malaysia's production is from smaller mills, which supply primarily local consumers such as wooden furniture producers. Peninsular Malaysia accounted for only 5 percent of the total value of Malaysian plywood exports in 2006.<sup>24</sup>

## *Russia*

Most producers of hardwood plywood in Russia are located in European Russia, north of Moscow, close to major sources of hardwood logs. There are presently 30–40 Russian mills producing hardwood plywood, primarily using birch.<sup>25</sup> Russian plywood production capacity in 2007 totaled 3.7 million m<sup>3</sup>, a 6 percent increase over the 2006 level.<sup>26</sup> Major producers and exporters include the Sveza Group mills, the largest producer in Russia, with major mills located in St. Petersburg, Kostroma, and Perm; Parfino Plywood Factory, with its plywood mill located in the Novgorod region; and Syktyvkar Plywood Mill, with its mill located in Komi Republic.<sup>27</sup> The three companies collectively account for nearly one-half of Russian annual production capacity of hardwood plywood and one-half of Russian exports to the United States. Sveza Group's 2006 capacity was approximately 590,000 m<sup>3</sup>; Syktyvkar's was 170,000, and Parfino's 100,000. In terms of exports, the Sveza Group accounted for 28 percent of Russian exports to the United States, Syktyvkar for 10 percent, and Parfino, 11 percent.<sup>28</sup> Since 2002, annual investment in the overall Russian forest products industry has

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<sup>20</sup> PT Barito Pacific Timber Tbk Integrated Wood Industries, *Annual Report 2005*, 5. BPG's primary markets include: the United States (17.1 percent), Japan (7.7 percent), Europe (8.2 percent), Middle East (31.3 percent), Korea (14.9 percent), and local market (14.9 percent). Taiwan, China, and Hong Kong account for less than 5.0 percent of its annual production.

<sup>21</sup> *Ibid.*, 7 and 19.

<sup>22</sup> Malaysia Timber Industry Board, "Malaysia Export Statistic: Year 2006," updated January 10, 2008.

<sup>23</sup> *Ibid.*

<sup>24</sup> Rutton and Hock, "Reviving Tropical Plywood," May 2004, 17–18.

<sup>25</sup> Industry representative, e-mail message to Commission staff, July 19, 2007.

<sup>26</sup> European Federation of the Plywood Industry, *Annual Report, 2006–2007*, June 28, 2007.

<sup>27</sup> Industry representative, e-mail message to Commission staff, July 19, 2007.

<sup>28</sup> Industry representative, e-mail message to Commission staff, July 19, 2007.

risen more than threefold, to an estimated \$2.4 billion in 2006, and the main sources of foreign investment in the Russian forest sector are principally northern European and Chinese firms.<sup>29</sup>

## Raw Material Supply

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### *Brazil*

Brazilian forested area consists of natural forests and plantations that occupy nearly two-thirds of the country's total land area (table 5.2).<sup>30</sup> Hardwoods make up two-thirds of the approximately 6 million hectares (14.8 million acres) of plantations; the remaining one-third are softwood plantations.<sup>31</sup> Native forests in Brazil are under both private and public ownership. Private production areas reached 240 million hectares (593 million acres) in 2006, about one-half of the total native forest area, and private forests are the major source of tropical wood production. The remaining inventory of native forests is destined for conservation units and indigenous lands. Legal production in public conservation forest areas is minimal.<sup>32</sup>

### *Canada*

In Canada, hardwoods account for 15 percent of the total forested area, softwoods account for another 67 percent, and the remaining 18 percent consists of forests of mixed composition. Like Malaysia, provincial governments in Canada, as opposed to the federal government, retain ownership of most forest land. Moreover, most of the hardwood in Canada is harvested from these provincially owned public lands through licensing agreements with Canadian forest firms.<sup>33</sup> Private forests (about one-half of which are located in Ontario and Quebec) are a second source of raw material for flooring and plywood producers.<sup>34</sup>

### *Indonesia*

Indonesia ranks second behind Brazil in the extent of its tropical forest area, most of which is located on the islands of Sumatra and Borneo. Indonesia's forest lands are classified into

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<sup>29</sup> Van Leeuwen, *Wood Markets: Monthly International Report*, November 2006, 5.

<sup>30</sup> ABIMCI, "2004 Sector Study," undated (accessed March 26, 2008), 8.

<sup>31</sup> FAO, *State of the World's Forests 2007*, 2007, Annex 102–140.

<sup>32</sup> USDA, FAS, *Brazil: Solid Wood Products Annual Report 2006*, December 8, 2006, 3.

<sup>33</sup> FAO, *State of the World's Forests 2007*, 2007, Annex 102–140; and Tembec, *Annual Report 2006*, September 2006.

<sup>34</sup> Hardwood Plywood and Veneer Association Web site, <http://www.hpva.org/products/facts.asp> (accessed April 23, 2007).

**TABLE 5.2** Foreign supplier countries: Forest resources, 2005

Country	Forested area	Production forests	Plantation forests	Notes
	Million hectares			
Brazil	478	240	6 <sup>a</sup>	483 million hectares in the Amazon region, of which about 240 million hectares are privately owned.
Canada	310	235	NA	Production forests are officially classified as commercial forests. Ownership: 71 percent provincial, 23 percent federal, and 6 percent private.
Indonesia	88	62	3	Production includes forest concessions for conversion as well as limited production forests. 1.3 million hectares are community forests.
Malaysia	21	12	2	2.3 million additional hectares are available for logging or conversion to other uses such as crop or housing development.
Russia	809	771	17	45 percent privately owned.

Source: FAO, *State of the World's Forests 2007*, 2007, annex 102–140; Government of Indonesia, Department of Statistics, Industry Database”, undated (accessed February 11, 2008); USDA, FAS; *Malaysia: Solid Wood Products Annual 2007 Report*, July 10, 2007, 6; and Russia–Geographic Website. [www.geographic.org](http://www.geographic.org) (accessed May 11, 2008).

<sup>a</sup>Includes pine and other softwoods.

three groups: production (54 percent); conversion to other uses (28 percent); and conservation/protection forest (18.6 percent).<sup>35</sup> Forests are primarily owned by the national government and managed through concessions to integrated wood products companies.<sup>36</sup> These concessions provide the government some control in balancing illegal logging and deforestation with domestic demand. Even with centralized control, deforestation remains a serious concern. In fact, Indonesia’s forest area has decreased by an estimated 24 percent since 1990.<sup>37</sup>

## ***Malaysia***

Malaysia has the smallest forest area of the five countries, with its forested area divided between Peninsular Malaysia and the states of Sabah and Sarawak on Borneo. While forests

<sup>35</sup> Production forests are natural stands that are used primarily for industrial roundwood production; conversion forests are those forests slated for conversion to other uses, such as for city expansion and infrastructure development; and conservation/protected forests are those areas that are designated for preservation in its natural state. FAO, “Global Forest Resources Assessment 2005,” 2006, 209.

<sup>36</sup> Inhutani I-IV are state-owned forestry companies with concession rights that compete in the wood products industry. *Down to Earth*. “Kalimantan, Indonesia: All Logged Out,” February 21, 1997; and Turner, Katz, and Buongiorno, *Implications for the New Zealand Wood Products Sector*, July 2007, 16.

<sup>37</sup> FAO, “Update 34,” December 2000, 70; FAO, “Global Forest Resources Assessment 2005,” 2006, 197 and 209.

cover about 60 percent of the country's total land area, Malaysia has emphasized the use of sustainable public and private forest plantation growth to supplement the supply of industrial roundwood for its wood products industry.<sup>38</sup> As in Canada, harvesting of Malaysian forest resources is controlled by concessions issued to private companies by the various state governments.

## ***Russia***

Russian forested lands cover approximately 810 million hectares (2 billion acres) and constitute more than 45 percent of the country's total area.<sup>39</sup> The dominant share (about 75 percent) of Russia's forest resources are of various coniferous species such as larch.<sup>40</sup> The commercial forests are distributed largely within three geographic zones: the European region, the western and the eastern Siberian region, and the Far East region.<sup>41</sup> Approximately 70 percent of Russia's forests are concentrated in the Far East region and Siberia, in relatively close proximity to China and other main markets in the Asia-Pacific region.<sup>42</sup> Hardwoods are primarily located in the European and Far East regions (accounting for 40 and 44 percent of the hardwood resources, respectively);<sup>43</sup> the Siberian region only accounts for 16 percent of the total hardwood resources.<sup>44</sup>

## ***Log Production, Trade and Consumption***

The largest hardwood log producer, Brazil, is the only country of the five examined that had an appreciable decrease in log production from 2002 to 2006. Canada and Malaysia registered increased log production whereas Indonesian and Russian production remained relatively stable during the period (table 5.3). Log production in Indonesia and Malaysia, like plywood production, is heavily concentrated on the island of Borneo.<sup>45</sup>

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<sup>38</sup> The policy aims to increase planted forest area from 320,000 hectares in 2006 to 500,000 hectares. The government of Malaysia announced that the Forest Plantation Development Sdn. Bhd. (FPD) will disburse loans to five companies to establish 75,000 hectares of new forest plantations. *Global Wood*, "Soft Loans Awarded for Forest Plantation Development," July 15, 2007.

<sup>39</sup> Shivdenko, "Russian Forests at the Beginning of the Third Millennium," 2003.

<sup>40</sup> Interfax-CNA, *Russia's Timber, Woodworking, Pulp and Paper Industry in 2004-2005*, August 2005, 6.

<sup>41</sup> Roshchupkin, "The Forest Resources of Russia by Region," undated (accessed May 7, 2007).

<sup>42</sup> Schloenhardt, "The Illegal Trade in Timber and Timber Products in the Asia-Pacific Region," 2008, 65.

<sup>43</sup> Roshchupkin, "The Forest Resources of Russia by Region," undated (accessed May 7, 2007).

<sup>44</sup> *Ibid.*

<sup>45</sup> Official Indonesian 2005 production statistics report that while Borneo accounted for 36 percent of total Indonesian log production (Central Kalimantan and East Kalimantan alone accounted for 17 and 15 percent of total Indonesian log production respectively, in 2005), Borneo accounted for 71 percent of the total harvest from concessions. While 55 percent of all logs are produced on Sumatra, this is primarily plantation logs grown specifically for the pulp and paper industry. Plywood and flooring production are also concentrated on Borneo and are primarily supplied by logs from natural forest concessions. Government of Indonesia, Department of Statistics, "Industry Database," undated (accessed February 11, 2008). It is difficult to accurately gauge the level of Indonesian log production because: (1) official statistics only include national forest concessions, (2) only about one-half of the companies required to report production actually return national forestry statistics forms, and (3) there are large discrepancies between volumes officially exported from Indonesia and volumes reported by destination countries. Turner, Katz, and Buongiorno, *Implications for the New Zealand Wood Products Sector*, July 2007, 17. See also Goetzl, "Discrepancies in Foreign Trade Data," September 30, 2005.

**TABLE 5.3** Foreign supplier countries: Hardwood log production, trade, and consumption, 2002–06

Source	2002	2003	2004	2005	2006	CAGR 2002–06
	Production (1,000 cubic meters)					%
Brazil	96,484	76,416	67,359	74,067	70,265	-7.6
Canada	33,936	33,617	35,581	37,400	37,400	2.5
Indonesia	26,500	26,000	23,000	18,000	26,000	-0.5
Malaysia	17,913	21,531	24,399	24,910	26,992	10.8
Russia	37,400	34,706	29,600	35,000	36,800	-0.4
	Imports (1,000 cubic meters)					
Brazil	13	12	9	8	6	-17.6
Canada	2,579	2,085	2,401	2,025	2,500	-0.8
Indonesia	149	51	70	84	70	-17.2
Malaysia	418	109	93	73	100	-30.1
Russia	20	21	17	0	0	-100.0
	Exports (1,000 cubic meters)					
Brazil	405	211	211	85	85	-32.3
Canada	363	316	331	208	250	-8.9
Indonesia	1,000	800	137	102	100	-43.8
Malaysia	5,092	5,468	5,118	5,759	4,700	-2.0
Russia	8,400	9,460	10,372	13,300	14,500	14.6
	Domestic consumption (1,000 cubic meters)					
Brazil	96,091	76,217	67,157	73,990	70,186	-7.6
Canada	36,152	35,386	37,651	39,217	39,650	2.3
Indonesia	25,649	25,251	22,933	17,982	25,970	0.3
Malaysia	13,239	16,172	19,374	19,224	22,392	14.0
Russia	29,020	25,267	19,245	21,700	22,300	-6.4

Source: ITTO, *Annual Review and Assessment of the World Lumber Situation 2006*, July 2006, appen. 1, table 1-1C; and FAOSTAT, Forestry Database (accessed October 10, 2007).

Canada, which imported nearly 10 percent of its domestic consumption, was the only one of the five with significant hardwood log imports; the other four countries imported less than 1 percent of their domestic consumption in any given year. Brazil, Canada, and Indonesia appear to be consuming nearly all of their hardwood log production in the manufacture of downstream products, such as flooring, veneer, and plywood. Russia and Malaysia were the only countries that reported substantial exports of industrial hardwood logs from 2002 to 2006, Russia exported nearly 40 percent of its production in 2006.

During the 2002–06 period, Russia was the world's leading exporter of hardwood logs, accounting for more than one-quarter of such exports in 2006 and nearly three-quarters of the total of these five suppliers.<sup>46</sup> Russian exports increased by 73 percent to 14.5 million m<sup>3</sup> (\$737 million) during this period, principally to China, Japan, and Europe.<sup>47</sup> China accounted for the biggest increase in total Russian exports of hardwood logs during this period; such exports increased more than fivefold during the 2002–2006 period, accounting for 28 percent of total Russian exports in 2006, by volume.<sup>48</sup>

<sup>46</sup> GTIS, Global Trade Atlas Database (accessed June 5, 2007).

<sup>47</sup> Ibid.

<sup>48</sup> GTIS, Global Trade Atlas Database (accessed June 5, 2007). Oak log exports constituted an estimated 18 percent of log exports to China by volume and an estimated 25 percent of log exports by value in 2006.

Limitations on harvests from natural stands notwithstanding, Malaysian production of logs, lumber, and veneer increased in recent years to supply the rapidly growing domestic demand, rather than export markets.<sup>49</sup> Malaysia consumed a greater share of its raw materials during the period, increasing from 74 percent in 2002 to over 83 percent in 2006.<sup>50</sup> Nevertheless, Malaysia still accounts for over 20 percent (by value) of global log exports.<sup>51</sup>

Malaysian plywood and wood flooring manufacturers rely principally on domestic raw material. Meranti (*Shorea spp.*), Nyatoh (*Palaquium spp.* and *Payena spp.*), and Keruing (*Dipterocarpus spp.*) are the species of timber most commonly used in plywood production, and the government of Malaysia has banned the export of logs of these species from Peninsular Malaysia<sup>52</sup> to ensure a sufficient supply of logs for domestic production activities on both Peninsular and the Borneo states of Malaysia.<sup>53</sup> Sarawak exports its logs primarily to China, Japan, and India. While Japan has historically been the largest market for Malaysian logs exports, India and China are becoming important markets. In 2006, China, Japan, and India accounted for about 25 percent of roundwood exports from Malaysia.

## **Production, Trade, and Consumption**

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Of these five supplier countries, the leading producers of hardwood plywood and wood flooring are Indonesia and Malaysia (table 5.4).<sup>54</sup> Moreover, Indonesia and Malaysia each produce approximately three times more plywood than the United States (see table 2.2 in chapter 2). The top exporters are also Indonesia and Malaysia (table 5.5). The top export markets for most of these five suppliers were the United States and the EU, with Japan being an important market for Indonesia and Malaysia (table 5.6).

Production of hardwood plywood increased in Brazil, Malaysia, and Russia during the 2002–06 period (table 5.4).<sup>55</sup> Plywood production in Indonesia dropped suddenly in 2004 but nearly regained 2002 levels by 2006. With the exception of Canada, the five countries imported negligible quantities during the period; however they each exported 23–94 percent of their production.

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<sup>49</sup> The production of lumber and plywood together account for almost 90 percent of total domestic log consumption. Seneca Creek Associates LLC and Wood Resources International LLC, “Illegal,” *Illegal Logging and Global Wood Markets*, November 2004, 83; and ITTO, *Annual Review and Assessment of the World Timber Situation 2006*, July 2006, 4–11.

<sup>50</sup> Malaysia exported 28 percent of its production in 2002 as compared to 17 percent in 2006.

<sup>51</sup> GTIS, Global Trade Atlas Database (accessed June 5, 2007).

<sup>52</sup> Seneca Creek Associates LLC and Wood Resources International LLC, “Illegal,” *Illegal Logging and Global Wood Markets*, November 2004, 83.

<sup>53</sup> U.S. Department of State official, e-mail message to Commission staff, September 28, 2007.

<sup>54</sup> Separate data for the products are not available. There is also little or no available data on solid or engineered wood flooring production for the selected countries.

<sup>55</sup> Similar production, trade, and consumption data are not available for wood flooring.



**TABLE 5.4** Foreign supplier countries: Hardwood plywood production, trade, and consumption, 2002–06

Source	2002	2003	2004	2005	2006	CAGR 2002–06
	Production (1,000 cubic meters)					%
Brazil	1,100	1,220	1,380	1,305	1,387	6.0
Canada	300	300	300	302	293	-0.6
Indonesia	6,550	6,111	4,514	4,534	6,111	-1.7
Malaysia	4,341	4,771	4,734	5,006	5,072	4.0
Russia <sup>a</sup>	1,821	1,978	2,246	2,556	2,598	9.3
	Imports (1,000 cubic meters)					
Brazil	0	0	0	0	0	NA
Canada	305	375	236	221	268	-3.2
Indonesia	4	1	7	14	7	15.0
Malaysia	52	64	13	29	30	-12.8
Russia <sup>a</sup>	31	41	43	54	46	10.4
	Exports (1,000 cubic meters)					
Brazil	750	850	462	550	321	-19.1
Canada	369	348	363	442	435	4.2
Indonesia	5,520	5,092	3,205	2,696	3,205	-12.7
Malaysia	3,614	3,875	4,349	4,537	4,800	7.4
Russia <sup>a</sup>	1,157	1,201	1,438	1,527	1,577	8.0
	Domestic consumption (1,000 cubic meters)					
Brazil	350	370	918	755	1,066	32.1
Canada	236	327	173	81	126	-14.5
Indonesia	1,034	1,020	1,315	1,852	2,913	29.6
Malaysia	779	960	398	498	302	-21.1
Russia <sup>a</sup>	695	818	851	1,083	1,067	11.3

Source: ITTO, *Annual Review and Assessment of the World Lumber Situation 2006*, July 2006, appen. 1, table 1-1C; and FAOSTAT, Forestry Database (accessed October 10, 2007).

<sup>a</sup>Includes both softwood and hardwood plywood; industry sources estimate that more than 90 percent of production and nearly 100 percent of exports consist of hardwood plywood.

**TABLE 5.5** Foreign supplier countries: Exports and imports of plywood and wood flooring, 2002–06

Source	2002	2003	2004	2005	2006	CAGR
	Thousands of \$					2002–06
						%
Plywood and engineered wood flooring:						
Brazil:						
Exports to:						
United States	64,290	81,574	117,085	74,064	60,731	-1.4
United Kingdom	51,053	42,475	71,583	46,875	49,040	-1
Puerto Rico (U.S.)	14,520	16,784	25,239	17,185	11,805	-5
All other	65,158	81,175	118,172	89,351	74,515	3.4
Total exports	195,021	222,008	332,079	227,475	196,091	0.1
Total imports	384	28	134	279	497	6.7
Canada:						
Exports to:						
United States	198,513	190,040	219,388	263,340	255,238	6.5
Bermuda	38	76	189	624	531	93.3
United Kingdom	0	129	32	623	336	
All other	637	693	1,747	1,941	1,275	18.9
Total exports	199,188	190,938	221,356	266,528	257,380	6.6
Total imports	85,198	93,893	136,108	127,123	153,104	16
Indonesia:						
Exports to:						
Japan	633,139	542,104	586,229	488,870	597,459	-1.4
United States	153,124	106,067	110,611	100,301	111,847	-7.6
Taiwan	62,043	77,761	76,967	61,611	54,388	-3.2
All other	514,550	569,249	478,209	418,454	331,414	-10.4
Total exports	1,362,856	1,295,181	1,252,016	1,069,236	1,095,108	-5.3
Total imports	2,761	1,277	5,181	5,947	16,733	56.9
Malaysia:						
Exports to:						
Japan	498,154	551,795	721,204	701,821	1,033,521	20.0
United States	119,323	102,249	162,274	160,347	183,857	11.4
Korea	111,223	123,388	101,315	131,678	160,654	9.6
All other	265,637	283,716	382,920	419,737	486,131	16.3
Total exports	994,337	1,061,148	1,367,713	1,413,583	1,864,163	17.0
Total imports	2,443	1,095	3,114	6,024	12,283	49.7
Russia:						
Exports to:						
United States	89,098	84,030	124,576	125,627	96,149	1.9
Egypt	22,467	26,087	25,267	41,415	47,979	20.9
Germany	11,410	15,050	27,329	33,249	42,006	38.5
All other	119,164	133,474	196,850	272,302	318,624	27.9
Total exports	242,139	258,641	374,022	472,593	504,758	20.2
Total imports	2,997	3,964	4,663	6,377	10,632	37.2

See note at end of table.

**TABLE 5.5** Foreign supplier countries: Exports and imports of plywood and wood flooring, 2002–06—*Continued*

Source	2002	2003	2004	2005	2006	CAGR
	Thousands of \$					2002–06
						%
<b>Solid wood flooring:</b>						
<b>Brazil:</b>						
Exports to:						
United States	71,900	106,680	195,754	222,548	292,814	42.1
France	7,411	10,876	29,887	39,851	51,248	62.2
Netherlands	5,500	11,480	20,289	23,577	37,108	61.2
All other	39,527	53,037	75,647	90,575	125,414	33.5
Total exports	124,336	182,073	321,577	376,551	506,584	42.1
Total imports	390	668	287	2,427	3,052	67.3
<b>Canada:</b>						
Exports to:						
United States	101,501	149,013	163,488	132,028	113,950	2.9
Ireland	6,848	8,924	8,491	6,246	5,353	-6.0
United Kingdom	8,943	8,512	5,249	4,390	3,743	-19.6
All other	9,649	15,360	11,558	11,729	9,689	0.1
Total exports	126,941	181,809	188,786	154,393	132,735	1.1
Total imports	142,383	170,422	253,502	305,934	331,124	23.5
<b>Indonesia:</b>						
Exports to:						
United States	36,992	49,549	63,818	64,375	93,989	26.3
China	95,770	109,570	118,633	117,003	85,177	-2.9
Netherlands	16,560	24,415	36,308	38,088	62,414	39.3
All other	204,537	245,373	327,070	379,316	465,015	22.8
Total exports	353,859	428,907	545,829	598,782	706,595	18.9
Total imports	1,856	782	2,843	2,076	5,607	31.8
<b>Malaysia:</b>						
Exports to:						
Japan	39,082	43,278	52,121	54,293	50,768	6.8
United States	47,810	39,728	51,656	48,026	48,975	0.6
Netherlands	18,250	21,847	26,200	26,969	38,871	20.8
All other	122,897	120,684	153,764	139,255	168,858	8.3
Total exports	228,039	225,537	283,741	268,543	307,472	7.8
Total imports	14,072	21,423	28,493	25,083	40,869	30.5
<b>Russia:</b>						
Exports to:						
Lithuania	0	0	72	160	3,592	
Kazakhstan	1,034	1,326	1,639	1,871	2,172	20.4
United States	194	258	434	772	1,184	57.2
All other	1,424	2,538	4,385	4,587	7,163	49.8
Total exports	2,652	4,122	6,530	7,390	14,111	51.9
Total imports	10,677	12,577	15,003	19,657	30,417	30

See note at end of table.

**TABLE 5.5** Foreign supplier countries: Exports and imports of plywood wood flooring, 2002–06—*Continued*

Source	2002	2003	2004	2005	2006	CAGR 2002–06
	Thousands of \$					%
Plywood and engineered and solid wood flooring:						
Brazil:						
Exports to:						
United States	136,190	188,254	312,839	296,613	353,545	26.9
France	8,666	13,118	33,911	42,382	55,341	59.0
United Kingdom	52,504	43,729	72,777	48,824	51,835	-0.3
All other	121,998	158,980	234,129	216,209	241,953	18.7
Total exports	319,358	404,081	653,656	604,028	702,674	21.8
Total imports	774	696	420	2,706	3,549	46.3
Canada:						
Exports to:						
United States	300,014	339,053	382,877	395,368	369,188	5.3
Ireland	6,901	8,968	8,527	6,301	5,373	-6.1
United Kingdom	8,943	8,641	5,282	5,013	4,079	-17.8
All other	10,272	16,085	13,458	14,239	11,475	2.8
Total exports	326,130	372,747	410,144	420,921	390,115	4.6
Total imports	227,581	264,315	389,611	433,057	484,228	20.8
Indonesia:						
Exports to:						
Japan	677,099	594,125	668,728	571,483	659,165	-0.7
United States	190,116	155,616	174,429	164,676	205,836	2.0
China	160,610	208,324	200,869	179,704	133,330	-4.5
All other	688,890	766,023	753,818	752,154	803,371	3.9
Total exports	1,716,715	1,724,088	1,797,844	1,668,017	1,801,702	1.2
Total imports	2,761	1,277	5,181	5,947	16,733	56.9
Malaysia:						
Exports to:						
Japan	537,236	595,073	773,326	756,114	1,084,289	19.2
United States	167,132	141,977	213,930	208,372	232,832	8.6
Korea South	117,611	129,066	107,694	138,141	167,737	9.3
All other	400,397	420,570	556,506	579,499	686,777	14.4
Total exports	1,222,376	1,286,686	1,651,456	1,682,126	2,171,635	15.5
Total imports	16,515	22,518	31,606	31,107	53,152	33.9
Russia:						
Exports to:						
United States	89,293	84,289	125,010	126,398	97,333	2.2
Egypt	22,467	26,087	25,267	41,415	47,979	20.9
Germany	11,478	15,265	27,849	33,925	42,908	39.0
All other	121,554	137,122	202,427	278,245	330,650	28.4
Total exports	244,792	262,763	380,553	479,983	518,870	20.7
Total imports	13,674	16,541	19,666	26,034	41,049	31.6

Source: GTIS, Global Trade Atlas Database (accessed May 15, 2008).

Note: Export values as reported at the 6-digit level for HTS subheadings 4409.20, 4412.13, 4412.14, 4412.22, 4412.29, 4412.23, and 4418.30.

**TABLE 5.6** Foreign supplier countries: Share of exports of hardwood plywood and wood flooring by market, 2002–06 (%)

Source	2002	2003	2004	2005	2006
<b>Brazil:</b>					
United States	42.6	46.6	47.9	49.1	50.3
EU	37.6	35.2	35.2	33.2	35.2
Canada	1.5	2.2	2.5	3.0	2.4
All other	18.2	16.0	14.4	14.8	12.1
<b>Canada:</b>					
United States	92.0	91.0	93.4	93.9	94.6
EU	5.4	6.2	4.0	3.5	3.1
Japan	0.5	0.7	0.6	0.5	0.3
All other	2.1	21.0	2.1	2.0	1.9
<b>Indonesia:</b>					
Japan	39.4	34.5	37.2	34.3	36.6
EU	11.3	11.1	13.5	15.5	16.9
United States	11.1	9.0	9.7	9.9	11.4
All other	38.2	45.4	39.6	40.4	35.1
<b>Malaysia:</b>					
Japan	44.0	46.2	46.8	44.9	44.9
United States	13.7	11.0	13.0	12.4	10.7
EU	9.3	8.3	9.6	8.2	9.8
All other	33.0	34.4	30.6	34.5	29.6
<b>Russia:</b>					
EU	41.3	42.6	47.4	50.4	54.7
United States	36.5	32.1	32.8	26.3	18.8
Egypt	9.2	9.9	6.6	8.6	9.2
All other	13.0	15.4	13.1	14.6	17.2

Source: GTIS, Global Trade Atlas (accessed May 15, 2008).

Note: Export values as reported at the 6-digit level for HTS subheadings 4409.20, 4412.13, 4412.14, 4412.22, 4412.29, 4412.23, and 4418.30.

Canada, Malaysia, and Russia were the only countries to increase exports of hardwood plywood during the period, whereas Indonesian hardwood plywood exports decreased by 42 percent. During the period, Indonesian domestic consumption of hardwood plywood increased by 182 percent. In fact, domestic consumption increased in 3 of the 5 countries (except for Canada and Malaysia); domestic consumption nearly tripled in Brazil.

An estimated 60 percent of Brazilian plywood in 2000 was produced from tropical hardwood;<sup>56</sup> the remainder came from softwood (particularly pine) from the plantations in the south of the country. Softwood plywood and combi-plywood<sup>57</sup> are now the major types

<sup>56</sup> According to industry officials, the Brazilian industry relies primarily on exotic species such as Jatoba, Ipe, Cumaru, and Muracatiara (also known as Brazilian Cherry, Walnut, Teak, and Tigerwood, respectively). These species exist only in Brazil and do not grow anywhere in {North America}. USITC hearing transcript, October 3, 2007, 217.

<sup>57</sup> Combi-plywood is hardwood plywood with face and back of tropical hardwood veneer and core of pine veneer and is considered hardwood plywood for the purposes of this study.

of plywood produced in Brazil, and their use is continuing to increase due to the increased availability of materials from fast-growing pine plantations.<sup>58</sup>

As Brazilian manufacturers have developed downstream products such as engineered wood flooring and cabinetry, hardwood plywood exports have decreased, falling by 57 percent from 2002 to 2006. The United States and the United Kingdom remain the top destination for Brazilian exports of hardwood plywood, about one-third of exports are to the United States, about one-quarter to Europe, and the remainder to other markets.<sup>59</sup> Moreover, Brazil is the leading producer of “exotic” species of solid wood flooring. Brazil accounts for about 5 percent of such U.S. hardwood-flooring sales.<sup>60</sup>

Canadian production of hardwood plywood fluctuated only slightly during the 2002–06 period (table 5.4). In 2006, hardwood plywood made with a veneer core accounted for 65 percent of total Canadian production of hardwood plywood; hardwood plywood made with particle board cores, MDF cores, and cores made from other material accounted for 27 percent, 6 percent, and 2 percent, respectively, of total Canadian production.<sup>61</sup> Canadian domestic consumption of hardwood plywood decreased during the past five years and is only 3 percent of U.S. domestic consumption.<sup>62</sup> The decline of the wood furniture industry in Canada has reduced their domestic demand for hardwood plywood.<sup>63</sup>

Production of wood flooring in Canada is believed to have grown from 2002 to 2005, but to have declined or been flat since then.<sup>64</sup> Production for a growing Canadian market has been dampened by increased wood flooring imports and a decline in exports to the United States because of the appreciating Canadian dollar, the weakening U.S. housing market, a decline in demand for some of the Canadian wood species used to make flooring, and rising U.S. imports of wood flooring from other countries. Canadian consumption of wood flooring is believed to have grown during the past five years in response to strong construction and remodeling activity and some displacement of other types of flooring by wood flooring.<sup>65</sup> Industry estimates indicate that in 2007, 25 percent of domestic wood flooring production was consumed domestically. The rapid growth in imports of wood flooring and hardwood plywood suggests that imports likely increased their share of the Canadian market for these products over the period.

Overall, Canadian exports of wood flooring and hardwood plywood rose steadily from 2002 to 2005. In 2006, however, exports declined by 7.3 percent to \$390 million. The United States remained the top destination (accounting for 90 percent of all Canadian hardwood

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<sup>58</sup> Although there are no official production data on wood flooring, Commission staff estimated tropical hardwood lumber production based on data from industry leaders and unofficial data furnished by the sector.

<sup>59</sup> ANPM, written submission to the USITC, October 3, 2007, question 1, Q-2.

<sup>60</sup> *Ibid.*, 2.

<sup>61</sup> HPVA, *Hardwood Stock Panels: Annual Statistical Report for Calendar Year 2004, 2005*. Data for 2002 are not available. These data are from Canadian hardwood plywood producers and likely account for the majority of total Canadian production of hardwood plywood. Industry officials, interviews by Commission staff, Washington, DC, August 14, 2007 and September 13, 2007.

<sup>62</sup> One Canadian hardwood plywood producer stated that Canadian demand has been flat or has increased slightly during the past five years.

<sup>63</sup> Industry officials, interviews by Commission staff, Washington, DC, August 14, 2007, and September 13, 2007.

<sup>64</sup> Wood flooring trade associations in Canada do not collect production or shipment data from their members. No production or shipment data for wood flooring are available from the Canadian government.

<sup>65</sup> Industry officials, interviews by Commission staff, Washington, DC, September 13, 2007, October 24, 2007, and November 7, 2007.

plywood exports throughout the period). Imports of hardwood plywood, and wood flooring, much of which came from the United States, more than doubled (table 5.5).

According to the ITTO, Indonesia's hardwood plywood production increased by approximately 35 percent to over 6.1 million m<sup>3</sup> from 2004 to 2006 (table 5.4). Due to logging quotas and crackdowns on illegal logging, however, Indonesian plywood production had been depressed in 2004 and 2005 to approximately 4.5 million m<sup>3</sup>.<sup>66</sup> Due in part to raw material constraints, Indonesian plywood production was forecast to remain stable in 2007.<sup>67</sup> Indonesia specializes in the production and exportation of thin plywood (2.7 and 3.4 millimeters thick), which is not typically produced in the United States. The veneers of Indonesian species are smooth, lightweight, light in color, and open grained, which allow them to be used in many different applications.<sup>68</sup>

The Indonesian plywood industry suffers from overcapacity and low productivity.<sup>69</sup> In 2003, Indonesia's capacity utilization was approximately 40 percent. The overall Asian plywood sector reportedly operates at 50 percent of capacity.<sup>70</sup> Data on Indonesian production of wood flooring is not available. However, Indonesia, the world's second largest producer of tropical hardwood lumber, produced approximately 7 million m<sup>3</sup> of such lumber in 2006. It is likely that the production of solid wood flooring has grown significantly since 2002, as exports from Indonesia have registered strong growth.<sup>71</sup>

Indonesia's top export markets for hardwood plywood and wood flooring are Japan (55 percent) and the United States (10 percent) (table 5.6).<sup>72</sup> Middle Eastern and European markets are increasingly important markets for Indonesian plywood producers. Indonesian imports of hardwood plywood have been negligible since 2002, in part because imports of veneer, plywood, and parquet flooring are subject to a 5–10 percent rate of duty.

The value of Indonesian exports of solid wood flooring nearly doubled since 2002, growing by approximately 20 percent per year to nearly \$707 million in 2006 (table 5.5). The EU was the top destination for Indonesian solid wood flooring exports during the 2004–06 period and accounted for 35 percent of the total in 2006. The second leading export market was China, accounting for 12 percent of Indonesian exports.<sup>73</sup> Indonesian imports of solid wood flooring are negligible.

During the 2002–06 period, Malaysian hardwood plywood production increased by 17 percent by volume (table 5.4), and production was forecast to increase by 2 percent to 5.2 million m<sup>3</sup> in 2007.<sup>74</sup> Reportedly, raw materials previously exported as sawnwood and veneer from Sabah and Sarawak are now being converted to plywood at domestic mills.<sup>75</sup> According to Malaysian Timber Forum, the tightening of available raw materials and the emergence of substitute materials (e.g., MDF) contributed to the slight contraction of the Malaysian

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<sup>66</sup> UNCTAD Info Comm, "Tropical Timber Production," undated (accessed May 19, 2008).

<sup>67</sup> ITTO, *Annual Review and Assessment of the World Timber Situation 2006*, July 2006, 10–11.

<sup>68</sup> USITC hearing transcript, October 3, 2007, 284.

<sup>69</sup> Turner, Katz, and Buongiorno, *Implications for the New Zealand Wood Products Sector*, July 2007, 16.

<sup>70</sup> Adams, "Is This the End of Thin-panel Tropical Plywood?" 2003.

<sup>71</sup> There is no evidence that domestic consumption has expanded faster than exports.

<sup>72</sup> ITTO, *Annual Review and Assessment of the World Timber Situation 2006*, July 2006, 10–11; and FAO, "Forest Industry Structures," May 1997, 33.

<sup>73</sup> GTIS, Global Trade Atlas Database (accessed June 5, 2007).

<sup>74</sup> ITTO, "Annual Review and Assessment of the World Timber Situation 2006," July 2006, 10–11.

<sup>75</sup> ITTO, "Forest Industry Structures," May 1997, 28.

plywood industry in 2004.<sup>76</sup> More than 70 percent of Malaysia's plywood production is exported to markets in Asia (table 5.6), principally Japan and Korea.<sup>77</sup> The growth of Malaysian plywood production was driven by foreign market demand; Malaysian exports rose by 1.2 million m<sup>3</sup> while the domestic market declined by nearly 500,000 m<sup>3</sup> (table 5.4). Due to the increased use of substitute materials such as particleboard and MDF, domestic consumption of plywood has decreased, pushing the Malaysian plywood industry to find additional export markets.<sup>78</sup>

Malaysian exports of solid wood flooring increased 35 percent by value from 2002 to 2006, with the largest increase in 2004 (table 5.5). The EU has been the leading market for Malaysian solid wood flooring since 2002, and accounted for 43 percent of all Malaysian exports of solid wood flooring in 2006. The next leading export market was Japan at \$50.7 million, accounting for 17 percent of Malaysian exports.<sup>79</sup> Malaysian imports of solid wood flooring are negligible.<sup>80</sup>

Russian production of plywood rose by 9.3 percent from 2002 to 2006 reflecting strong housing-related demand in Russia and strong demand for Russian exports of plywood (table 5.4).<sup>81</sup> In 2006, exports of plywood accounted for over 60 percent of the total volume of plywood produced in the Russian Federation.<sup>82</sup> Russian exports of hardwood plywood increased by 75 percent in quantity terms and more than doubled in value terms during the 2002–06 period to 1.4 million m<sup>3</sup> (\$504 million).<sup>83</sup> The United States was Russia's leading market for hardwood plywood and wood flooring in 2006, accounting for 19 percent of total Russian exports (table 5.6).

## Production Costs

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Given the wide variation in the quality, type, and species of raw materials and the large number of wood flooring and hardwood plywood products, the cost of production for wood flooring and hardwood plywood is not readily available. For all the foreign suppliers covered by this study, the cost of raw material, whether it be logs, lumber, or veneer, accounts for the largest portion of the cost of production for both wood flooring and hardwood plywood. Raw material costs, as a percentage of the cost of the product, range from 40 to 80 percent, followed by labor, which is generally 15–25 percent of the cost of production.<sup>84</sup>

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<sup>76</sup> Malaysian Timber Forum, "People Who Live in Glass Houses," undated (accessed August 20, 2007).

<sup>77</sup> Seneca Creek Associates LLC, and Wood Resources International LLC, *Illegal Logging and Global Wood Markets*, November 2004, 82–83.

<sup>78</sup> Malaysian Timber Forum, "People Who Live in Glass Houses," undated (accessed August 20, 2007).

<sup>79</sup> GTIS, Global Trade Atlas Database (accessed June 5, 2007).

<sup>80</sup> Ibid.

<sup>81</sup> According to one industry source, 92 percent of all Russian plywood production consists of hardwood (mainly birch) and nearly 100 percent of plywood exports are birch, as softwood plywood produced in Russia is too low in quality for export markets. According to another source, there is only one large softwood plywood mill operating in Russia today. Industry official, e-mail messages to Commission staff, June 5 and 19, 2007. FAO, FAOSTAT Forestry Database (accessed June 5, 2007).

<sup>82</sup> Industry official, e-mail message to Commission staff, June 5, 2007.

<sup>83</sup> European Federation of the Plywood Industry, *Annual Report, 2006-2007*, June 8, 2007; and GTIS, Global Trade Atlas Database (accessed June 5, 2007).

<sup>84</sup> Rutton and Hock, "Reviving Tropical Plywood," May, 2004, 35–37.



## ***Raw Material Costs***

Log and lumber markets reportedly are competitive in these supplier countries, and because hardwood logs, particularly higher-valued logs, are traded internationally, log prices in these countries track global markets to some degree.

In Canada, hardwood log costs reportedly have been rising, due to rising harvesting costs and the cost of transporting logs from greater distances. However, one Canadian producer noted that the costs for particle board cores, MDF cores, and hardwood veneer have generally been flat over the 2002–06 period.<sup>85</sup> Hardwood lumber costs for wood flooring producers in Canada rose from 2002 to 2005, but flattened or declined thereafter.<sup>86</sup>

In Indonesia, the cost for legally harvested hardwood logs varied from \$50 to \$140 per m<sup>3</sup>, and illegally sourced logs reportedly were 35–50 percent of the legal timber price.<sup>87</sup> In Malaysia, logs account for around 50 percent of production costs in Sabah and Sarawak and up to 60 percent in Peninsular Malaysia for plywood and sawn timber producers.<sup>88</sup> Downstream producers in Peninsular Malaysia do not have concessions and purchase their raw materials on one- or two-month contracts. Therefore, volatility in log prices is a major concern, because plywood is generally sold one or two months ahead, using short term (i.e., three month) contracts, it is difficult for mills to adequately plan for and purchase logs at an acceptable price, and to organize the logistics of production and transport in such a way that plywood is delivered on time.<sup>89</sup> Malaysian hardwood log prices more than doubled during the 2002–07 period (figure 5.1).

## ***Labor Costs***

The cost of labor, the second largest cost component, is considerably lower in the foreign supplier industries than in the United States with the exception of Canada. Despite the fact that forest industries are major employers in the economies of these supplier countries, data on labor costs for these specific industries are not readily available. However, labor appears to account for fairly similar percentages of the cost of production in all supplier countries.

In Brazil labor typically accounts for 15–20 percent of the total cost of production for wood flooring.<sup>90</sup> In Canada, labor accounts for 10–15 percent of the total cost of production for

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<sup>85</sup> Industry officials, interviews by Commission staff, Washington, DC, August 14 and September 13, 2007.

<sup>86</sup> *Ibid.*

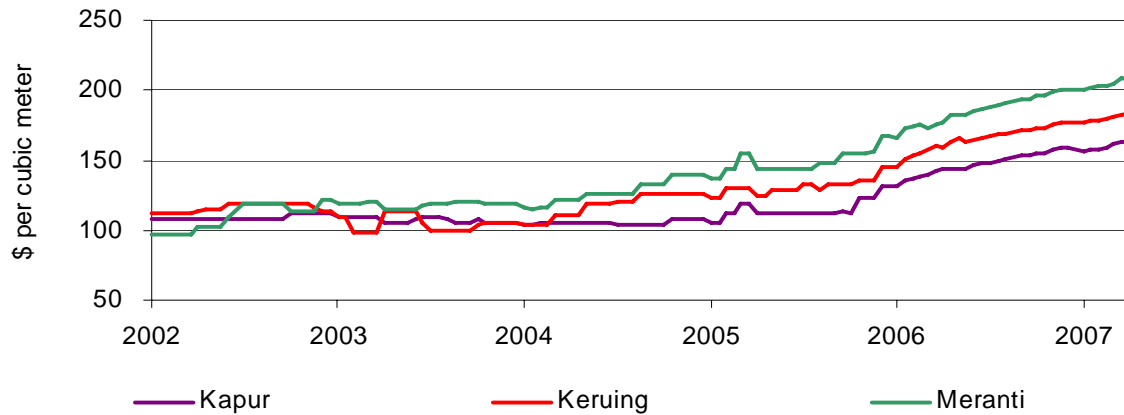
<sup>87</sup> Seneca Creek Associates LLC and Wood Resources International LLC, “Illegal Logging and Global Wood Markets,” November 2004, 72–73.

<sup>88</sup> Rutton and Hock, “Reviving Tropical Plywood” 2004, 37.

<sup>89</sup> *Ibid.*, 15 and 27.

<sup>90</sup> Industry officials, interviews by Commission staff, Washington, DC, September 14 and October 10, 2007.

**FIGURE 5.1** Malaysia: Nominal hardwood log prices, 2002–07



Source: ITTO Pricing Database (accessed February 20, 2008).

wood flooring and from 15–30 percent of the total cost of production of hardwood plywood. Wages in Canada, at least for hardwood plywood workers, have increased by roughly 3–5 percent annually in the past few years. For one large Canadian wood flooring firm, wages for factory workers are C\$10–C\$15 (\$9–\$14) per hour plus benefits, and wages for supervisors are C\$15–C\$20 (\$14–\$19) per hour plus benefits.<sup>91</sup> Given the recent appreciation of the Canadian dollar, wages and benefits for workers in the wood flooring industry and the hardwood plywood industry in Canada are believed to be comparable to, or even higher than, wages and benefits for workers in the U.S. industries.<sup>92</sup>

According to official Indonesian wage statistics, monthly wage rates in East Kalimantan, where a majority of the wood flooring and hardwood plywood production occurs, were Rp 400,000 (\$43). Wage rates in South Kalimantan, with a smaller forest products industry, were as low as Rp 377,500 (\$41). The average monthly wage rate for employees in the plywood and wood processing sector on Sumatra was Rp 510,400 (\$55). However, the average monthly wages for Borneo increased by over 37 percent from 2003 to 2006. On average, production related workers that earn Rp 400,000–700,000 (\$43–\$76) per month, work 45–60 hours a week.<sup>93</sup>

In contrast to Indonesia, basic wage rates in Malaysia vary according to location and industrial sector, while supplementary benefits (e.g., bonuses, uniforms, free or subsidized transport, performance incentives) can vary from company to company. The average basic monthly salary ranges from Rm 515 (\$145) for unskilled workers to Rm 565 (\$159) for

<sup>91</sup> Industry officials, interviews by Commission staff, Washington, DC, September 14, October 10, and November 7, 2007.

<sup>92</sup> Ibid.

<sup>93</sup> Based on a 45-hour work week and 52 weeks a year, Indonesian workers are paid \$0.22–0.39 per hour on Borneo; wages on Sumatra average \$0.28 per hour. Workers in the plywood and other wood processing sectors on Borneo and Sumatra are paid less, between \$0.22 and \$0.28 per hour. Government of Indonesia, Ministry of Manpower and Transmigration, “Wage Matters,” undated (accessed November 11, 2007).

semi-skilled workers, and wages may reach Rm 734 (\$207) for skilled workers/craftsmen.<sup>94</sup> Data specific to the plywood and flooring industries are not available.

## Marketing Practices

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For hardwood plywood, the channels of distribution within the U.S. market are similar for the producers for all five foreign suppliers, and not unlike those for domestic producers. Production in foreign supplier countries for the U.S. market is generally produced to order, not for inventory, and typically consists of many batch-type orders rather than long production runs of a few standard types of hardwood plywood.<sup>95</sup> Since most hardwood products are produced to order, the product, and not the country of origin, appears to be the dominant characteristic in determining the channels of distribution. Competitive products move through the same channels of distribution. Thin hardwood plywood, which predominately goes to producers of manufactured homes and RVs, has different distribution channels and does not appear to compete head-to-head with domestic U.S. products. Imported wood flooring goes through distributors or wholesalers, as well as the major branded U.S. manufacturers, to flooring installers for use as underlayment.<sup>96</sup>

Distribution channels for Canadian plywood are very similar or the same as those for U.S. plywood. Wholesale Canadian producers sell the vast majority of their hardwood plywood through numerous building materials distributors, which in turn sell to end users. Small volumes of hardwood plywood are also sold directly to furniture and cabinet makers and to large retail outlets. The channels of distribution for Canadian hardwood plywood have not changed significantly in the past five years.<sup>97</sup>

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<sup>94</sup> There is no national minimum wage law applicable to the manufacturing sector in Malaysia. Based on a 45-hour work week and 52 weeks a year, Malaysian workers are paid approximately between \$0.74 and \$1.06 an hour. Malaysian Industrial Development Authority, "Minimum Wage by Region," undated (accessed May 19, 2008).

<sup>95</sup> Production for order helps users reduce their inventory carrying costs. Industry officials, interviews by Commission staff, Washington, DC, August 10 and September 13, 2007.

<sup>96</sup> The plywood layer directly under installed wood flooring or other floor coverings. Underlayment provides a smooth surface on which to install flooring.

<sup>97</sup> Ibid.

The channels of distribution for wood flooring are similar to those for hardwood plywood, although somewhat simpler, and do not vary among suppliers. Direct purchasers of imported solid and engineered wood flooring include distributors, homebuilders, flooring retailers and installers, independent hardwood specialty stores, building materials distributors, and homebuilding stores. The majority of imported solid wood flooring is likely handled by distributors that have direct ties with, or represent, producers in the five supplier countries. Finally, it appears that branding is more important for wood flooring than for hardwood plywood.<sup>98</sup>

## Prices

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The price trends in this section are based on industry observations or individual company price sheets, since there are no independently published price series or indexes for wood flooring or hardwood plywood in the United States or foreign supplier markets.

In Canada, prices for hardwood plywood reportedly were flat or have declined in the past five years due to increased competitive pressures and rising imports.<sup>99</sup> According to industry sources, prices for wood flooring declined in the past few years because of competition from low-priced imports and the construction slowdown in the United States. Some producers experienced greater price deterioration for engineered wood flooring than for solid wood flooring, and attributed that difference to increased Canadian imports of engineered wood flooring from China.<sup>100</sup>

Prices for Indonesian thin (2.7 mm) plywood increased considerably since 2002 (figure 5.2). Malaysian prices, although following the same pattern, remained slightly above Indonesian prices for the same product. Prices for 3 mm plywood from Indonesia and Malaysia, although similar to 2.7 mm plywood, did not increase as much (figure 5.3). Furthermore, Indonesian and Malaysian prices diverged in early 2006 with Malaysian prices remaining above those of Indonesia throughout 2006 and 2007. Thick plywood (6 mm–19 mm), although following the same increasing price trend as thin plywood, was considerably less expensive than the other sizes (figure 5.4). Brazilian thick plywood remained above similar plywood from Indonesia and Malaysia throughout the period. This price gap was most notable from 2002 to 2004. However once Indonesia and Malaysia began cracking down on illegal logging in 2004, the price gap began to close and by 2007, prices nearly converged with those for Brazilian plywood.

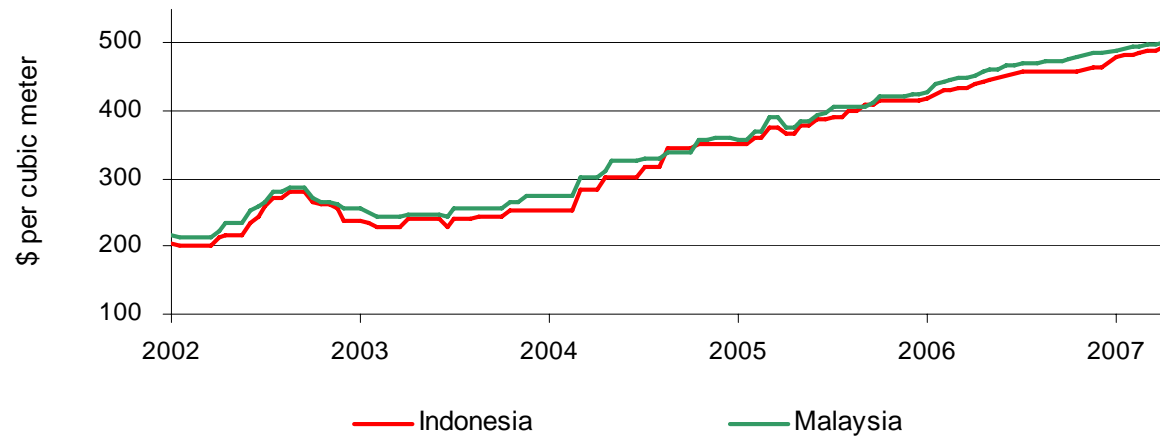
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<sup>98</sup> Ibid.

<sup>99</sup> Ibid.

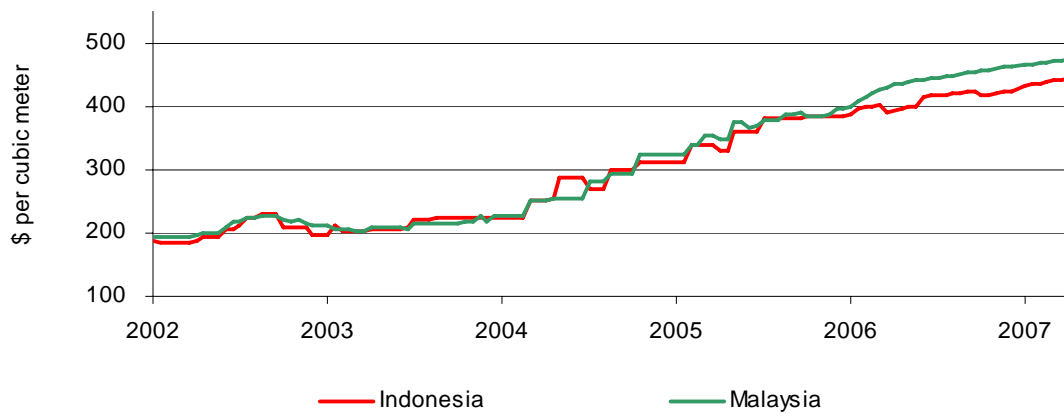
<sup>100</sup> Industry officials, interviews by Commission staff, Washington, DC, September 10, October 24, and November 14, 2007.

**FIGURE 5.2** Thin Plywood: Indonesia and Malaysia nominal 2.7 mm plywood prices, 2002–07



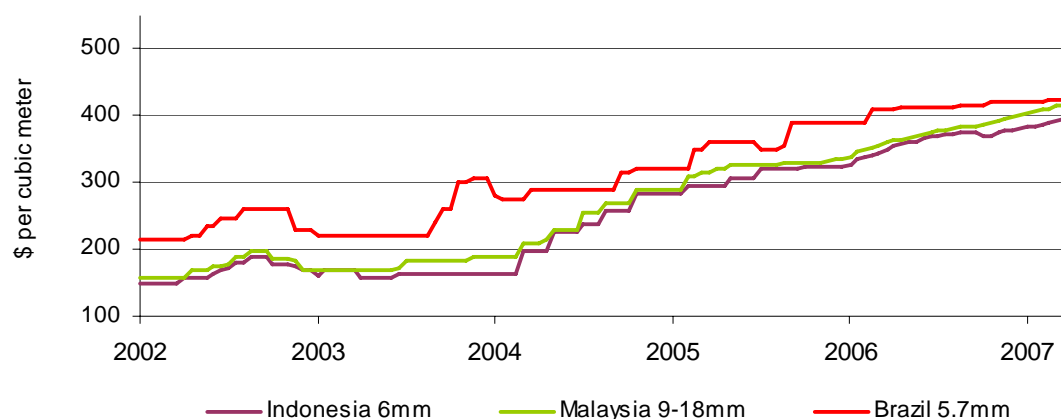
Source: ITTO Pricing Database (accessed February 20, 2008).

**FIGURE 5.3** Plywood: Indonesia and Malaysia nominal 3 mm plywood prices, 2002–07



Source: ITTO Pricing Database (accessed February 20, 2008).

**FIGURE 5.4** Thick plywood: Brazil, Indonesia and Malaysia nominal plywood prices, 2002–07



Source: ITTO Pricing Database (accessed February 20, 2008).

## Government Programs

A wide range of policies, strategies, laws, and regulations have been developed in these five supplier countries to facilitate forest management, as well as to promote the development of the wood products industries. This extensive government involvement is attributable to the high degree of state ownership of forest resources and the relative importance of the forest products sector to the national economies of these countries. Moreover, all of these major supplier countries are signatories to a number of key international treaties, including the Convention on the International Trade in Endangered Species (CITES), the Convention on Biological Diversity, and the International Tropical Timber Agreement.<sup>101</sup> Illegal logging is a primary concern in four of the five countries—Russia and the three tropical countries, Brazil, Indonesia, and Malaysia. All of these countries have taken steps to combat domestic illegal logging, with varying degrees of success.

Brazilian forest products incentives, such as tax breaks, beneficial credit programs, and subsidies, are designed to promote exports. For example, the government offers tax and tariff exemptions for equipment imported for the production of forestry goods for export, an excise and sales tax exemption on these exported goods, and eligibility for a rebate on the social contribution tax (pensions).<sup>102</sup>

The Brazilian national forest policy, the National Forest Program 2000–2010 (*Programa Nacional de Florestas, PNF*), was launched in 2001 to ensure that forests are sustained.<sup>103</sup> One of the goals of the program is to establish 50 million hectares (124 million acres) of managed national forests and 20 million hectares (49 million acres) of forest plantations on

<sup>101</sup> Schloenhardt, “The Illegal Trade in Timber,” 2008, 68; CITES Web site. <http://www.cites.org> (accessed June 30, 2008); Convention on Biological Diversity Web site. <http://www.cbd.int> (accessed June 30, 2008); and International Tropical Timber Agreement Web site. <http://www.itto.or.jp> (accessed June 30, 2008).

<sup>102</sup> USDA, FAS, “Brazilian Softwood Plywood Production and Export Continue to Accelerate,” March 4, 2005, 2.

<sup>103</sup> ITTO, “Brazil,” 2006, 208.

private land by 2010. The legislation also establishes penalties for forest crimes (Decree no. 3179). Recent measures taken by the Brazilian government to protect the Amazon are reportedly producing positive results.<sup>104</sup> In August 2007, the government reported that the rate of deforestation in the Amazon rainforest dropped by 25 percent in 2006 to the lowest recorded rate since the mid-1970's. Reportedly, preliminary data for 2007 show that deforestation had further declined by 9,600 square kilometers, representing a 31 percent decline from 2006.<sup>105</sup> In 2007, nine Brazilian nongovernmental organizations entered a pact aimed at ending deforestation in seven years.<sup>106</sup>

Though not specifically targeting wood flooring and hardwood plywood, the Canadian federal and provincial governments have taken steps to maintain the competitiveness of the Canadian forest products sector. In February 2007, the Canadian federal government announced the Forest Industry Long-Term Competitiveness Initiative, a program of financial assistance to the forest products sector in such areas as the development of new wood products and manufacturing processes, the development of new export markets, and worker retraining.<sup>107</sup> In 2005 and 2006, the province of Ontario announced financial assistance to its forest products sector in such areas as worker training, electricity conservation, and more efficient use of wood fiber. In 2006, the province of Quebec budgeted substantial financial aid to its forest products sector.<sup>108</sup> However, according to Canadian industry officials, there are no government programs that specifically target the hardwood plywood industry or the wood flooring industry in Canada.<sup>109</sup>

Like Brazil, Indonesia has several policies aimed at reducing illegal logging. These policies limit and control the transportation of logs within Indonesia as well as ban international trade of raw logs.<sup>110</sup> Important Indonesian policies include the log export ban and the sawnwood export tax. To further combat illegal logging, the government of Indonesia also signed MOUs with Japan, the United Kingdom, and the United States. Furthermore, like Malaysia, Indonesia is currently negotiating a voluntary partnership agreement as a means to implement the EU's FLEGT licensing system (see chapter 2).<sup>111</sup>

In contrast with Brazil and Indonesia, representatives of the Malaysian industry claim that illegal logging is a minor issue in its forest sector.<sup>112</sup> Malaysia has established certification and transportation policies to ensure that logs imported, transported, and/or exported are all of legal origin. Moreover, since 2005 Malaysia has banned the importation of Indonesian

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<sup>104</sup> These measures include: (1) a moratorium on the harvesting and sale of over-harvested species; (2) the introduction and implementation of measures to control illegal logging through high-tech devices for timber-tracing and satellite data transfer; (3) limiting the area allowed for farming in forest properties in the Amazon; (4) yield regulation in natural selection forests; and (5) restoration forestry programs. ITTO, "Brazil," 2006, 210–13.

<sup>105</sup> ANPM, written submission to the USITC, October 3, 2007, III, A, 6, and Q-5. However, deforestation rates reportedly increased substantially from August to December of 2007. BBC News, "Brazil Amazon deforestation soars," January 24, 2008, <http://news.bbc.co.uk/2/hi/americas/7206165.stm> (accessed August 5, 2008).

<sup>106</sup> ANPM, written submission to the USITC, October 3, 2007, III, C, 7.

<sup>107</sup> Natural Resources Canada, *The State of Canada's Forests*, 2007.

<sup>108</sup> Natural Resources Canada, *The State of Canada's Forests 2005–2006*, 2006.

<sup>109</sup> Industry officials, interviews by Commission staff, Washington, DC, August 14, September 13, October 10, and November 7, 2007.

<sup>110</sup> Indonesia has more than 17,000 islands within its borders which make enforcing the log export ban difficult.

<sup>111</sup> EU Voluntary Partnership Agreement Web site. [http://www.illegal-logging.info/sub\\_approach.php?subApproach\\_id=121](http://www.illegal-logging.info/sub_approach.php?subApproach_id=121) (accessed May 19, 2008).

<sup>112</sup> Industry official, telephone interview by Commission staff, November 11, 2007.

logs and squared timber to assist Indonesia in its efforts to combat illegal logging, particularly by stemming the flow of illegal logs crossing its sparsely populated land border with Indonesia on Borneo. The Malaysian Timber Industries Board reported that the prohibition of imports of large square and scantling (LSS) logs with a diameter of less than 60 inches was also meant to help curb illegal logging in Indonesia. Limitations on the size of timber that can be traded ensures that younger trees are not felled so that forests have time to regenerate.

The Malaysian government promotes the exportation of downstream value-added products, including plywood and flooring by applying export taxes on raw materials. Malaysia also discourages imports of plywood by applying a 45 percent import tariff. Veneer faces a 25 percent import tariff, although face veneers may be imported free of duty.<sup>113</sup> The government also administers programs to expand timber processing capacity such as tax rebates or processing incentives to the millers and log producers, provision of land infrastructure, establishment of shipping facilities, and the development of special areas for timber-based activities known as timber processing zones.<sup>114</sup> Further, the Ministry of Plantation Industries and Commodities provides support for the development of forest plantations by providing 15 years of tax relief to firms establishing forest plantations. Companies can either take tax deductions equivalent to the amount of investment made, or obtain group relief, which allows a company to offset the losses incurred from the profits of another company within the same group.<sup>115</sup>

The Malaysian government has established several agencies to develop and promote its forest industries: the Malaysian Timber Industry Board, which regulates the timber industry; the Forest Department, which oversees timber resources; and the National Timber Certification Council, which develops and monitors the national timber certification scheme.

Russia primarily uses export tax policies to promote the development of its wood processing sector, including hardwood plywood and wood flooring. In February 2007, the government of Russia announced a new log export tax schedule that will result in rates of 40 percent by January 2009.<sup>116</sup> The government of Russia hopes that this policy will attract both foreign and domestic investment in the next two to three years,<sup>117</sup> particularly from neighboring log importing nations.<sup>118</sup> The government of Russia expects its log export policies to increase its exports of downstream wood products in five to seven years.<sup>119</sup> Analysts estimate that the direct effects will include lower log prices in Russia, which would benefit local flooring and plywood manufacturers,<sup>120</sup> and higher log prices outside Russia given both the magnitude of the export tax increase and Russia's large share of the global log market. Thus, Russian plywood should be more competitive in global markets. Indirect effects will likely be felt by timber operations in North America that may benefit as they supply part of the gap caused by the reduction in Russian log exports, while Chinese and European sawmills that rely on

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<sup>113</sup> ITTO, *Annual Review and Assessment of the World Timber Situation 2006*, July 2006, 10–11; and FAO, "Forest Industry Structures," May 1997, 33.

<sup>114</sup> ITTO, *Annual Review and Assessment of the World Timber Situation, 2006*, July 2006, 33.

<sup>115</sup> U.S. Department of State official, e-mail message to Commission staff, September 28, 2007.

<sup>116</sup> Van Leeuwen, *Wood Markets: Monthly International Report*, April 2007, 1.

<sup>117</sup> Roberts, Carreau, and Lethbridge, "Russia Plans to Dramatically Increase Its Export Tax On Logs," February 22, 2007, 4.

<sup>118</sup> Van Leeuwen, *Wood Markets: Monthly International Report*, April 2007, 4.

<sup>119</sup> *Ibid.*, 5.

<sup>120</sup> Logs typically constitute as much as 65 percent of the variable cost of producing plywood. Roberts, Carreau, and Lethbridge, "Russia Plans to Dramatically Increase Its Export Tax On Logs," February 22, 2007, 6.



Russia as a principal of hardwood logs may face log shortages and higher Russian log prices.<sup>121</sup>

Under the Forest Code 2006, the Russian Federal Forest Agency established a number of initiatives to reduce illegal logging, one of which was an effort to cover 100 percent of the area of commercially exploited forests with a remote sensing system, with a goal of reducing illegal logging by 20–30 percent within the first two years.<sup>122</sup> Other initiatives included improvements to the system for obtaining and monitoring logging licenses, establishment of long-term forest leasing of remote sensing/monitoring, and facilitation of the national forest certifications systems.<sup>123</sup> In 2007, the Russian government adopted the 2007 Forest Code with the goal of accelerating investment in the forest sector.

The principal features of this code were the creation of a legislative and legal system to guarantee the rights of investors and provide the stability needed to attract foreign investment, and a shift in the ownership of forest resources from federal to regional authorities.<sup>124</sup>

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<sup>121</sup> Van Leeuwen, *Wood Markets: Monthly International Report*, April 2007, 5; and Roberts, Carreau, and Lethbridge, “Russia Plans to Dramatically Increase Its Export Tax On Logs,” February 22, 2007, 6–7.

<sup>122</sup> Schloenhardt, “The Illegal Trade in Timber,” 2008, 68; and Federal Forestry Agency of RF, *Concept of National Action Plan for Preventing Illegal Logging and Associated Trade*, March 2006, 16.

<sup>123</sup> Federal Forestry Agency of RF, *Concept of National Action Plan*, March 2006, 12.

<sup>124</sup> Roberts, Carreau, and Lethbridge, “Russia Plans to Dramatically Increase Its Export Tax On Logs,” February 22, 2007, 10.



# CHAPTER 6

## Competitive Conditions in the U.S. Market

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The structure of the global wood flooring and hardwood plywood market is changing. Production of wood flooring and hardwood plywood has increased in developing countries even as developed countries remain the largest markets for these products. Consequently, trade in these products is increasing. In addition to the increased capability and new entrants in foreign industries, relatively high production costs in the United States, recent trends in exchange rates, and structural changes in the U.S. industries and U.S. markets shaped the competitive environment during the 2002–07 period.

U.S. production, consumption, and trade of wood flooring and hardwood plywood all increased during the 2002–07 period. However, the share of the domestic markets supplied by domestic industries is declining, and the share held by imports is rising. In 2002, U.S. producers supplied about two-thirds of the U.S. wood flooring and hardwood plywood market. By 2007, U.S. producers supplied just over one-half of the U.S. market. Domestic market share is particularly important as the U.S. industries have traditionally focused on the large U.S. market, and exports have historically accounted for a small share of U.S. production. This decline in domestic market share is due to a number of factors.

The key factors affecting the competitive position of the U.S. wood flooring and hardwood plywood industries in the U.S. market include the following:

- U.S. demand for wood flooring and hardwood plywood showed very strong growth for most of the period, driven in large part by the continued strength of the U.S. residential housing market. Spurred by this growing demand, domestic flooring producers were able to significantly increase production and capacity. In contrast, hardwood plywood producers did not increase production or capacity during the period.
- A significant shift in U.S. market preferences toward products such as prefinished wood flooring, exotic species for solid wood flooring, and engineered wood flooring, largely benefitted foreign suppliers who were able to respond to increased U.S. demand.
- U.S. producers of wood flooring and hardwood plywood increased imports of finished products either to broaden product lines or to supplement domestic production and increased imports of platforms for engineered wood flooring and hardwood plywood to lower production costs.
- Reportedly increasing market power of large domestic retailers, coupled with their logistical ability to source products overseas, contributed to the further erosion of the domestic market share of the U.S. wood flooring and hardwood plywood industries and may also have weakened U.S. producers' ability to negotiate prices.

- China emerged as a major global competitor and supplier to the U.S. market. Despite an expanding domestic market, the rapid growth of Chinese production and exports of engineered wood flooring and hardwood plywood moved China from being a net importer to a large net exporter. China accounted for most of the growth in U.S. imports during the 2002–07 period.
- The declining value of the U.S. dollar relative to other major currencies, which boosted U.S. exports to some markets, did not affect the major U.S. suppliers' currencies equally. For example, China was able to increase exports to the United States and increase its market share, partly at the expense of other foreign suppliers such as Brazil and Canada (whose currencies appreciated even more).

## **Factors Affecting Competitive Position**

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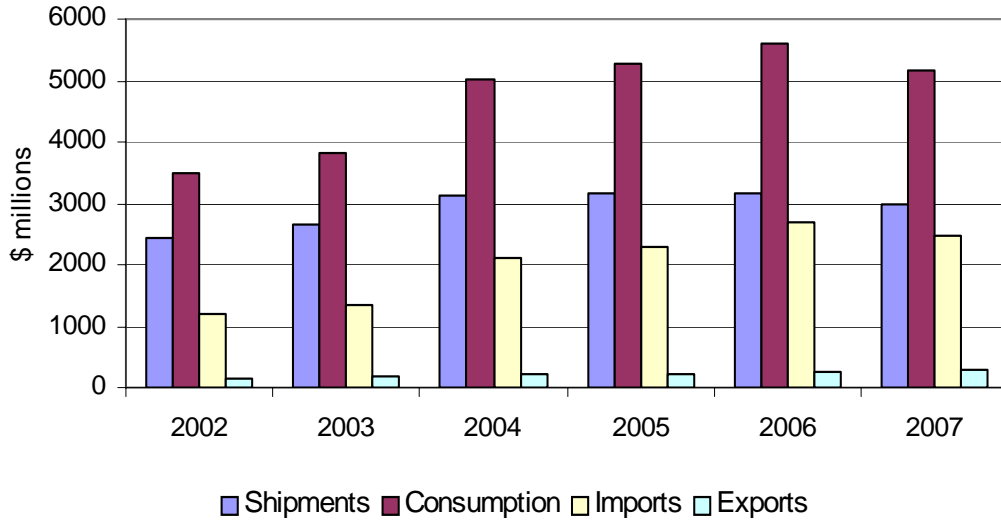
Competitive position is affected by demand factors and supply factors. On the demand side, a primary market driver has been the demand for residential construction and renovation. This demand in turn drives the demand for solid and engineered wood flooring and for products such as furniture, cabinetry, and wall paneling that utilize hardwood plywood. Other demand factors include changes in consumer tastes and preferences, the presence in the market of traditional and new products, new standards or quality requirements, a growing focus on environmental concerns, marketing practices, and the channels of distribution for the products. Supply-side factors include variable production costs (led by raw material and labor costs), capital costs, investment, capacity utilization, infrastructure, proximity to markets, and product innovations, as well as the structure of the industry (i.e., concentration, and vertical and horizontal integration). In addition to the demand and supply factors in the U.S. market, currency exchange rates and the demand for wood flooring and hardwood plywood in other economies have important effects on the competitiveness of wood flooring and hardwood plywood industries.

### ***Demand Factors***

#### **Markets for Products**

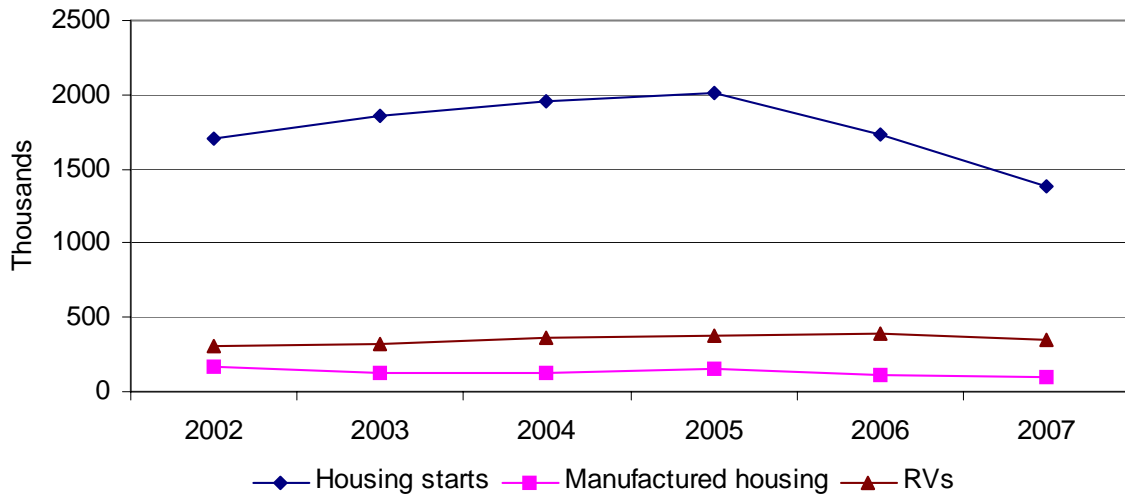
The U.S. market for traditional wood flooring and hardwood plywood products is subject to the cyclical nature of the markets for U.S. residential housing, manufactured homes, and RVs. During the 2002–06 period, U.S. consumption of wood flooring and hardwood plywood rose rapidly before declining in 2007 (figure 6.1). The dramatic growth and subsequent drop in consumption generally parallels the performance of the U.S. housing market, particularly traditional construction (figure 6.2). Other market segments showed a mixed pattern. Shipments of RVs increased by 25 percent over the period from 2002 to 2006 before declining by 10 percent in 2007, while shipments of manufactured homes declined by more than 40 percent during the 2002–07 period.

**FIGURE 6.1** U.S. shipments, consumption, imports, and exports of wood flooring and hardwood plywood, 2002–07



Source: Compiled from U.S. producer and importer questionnaires.

**FIGURE 6.2** Housing starts, manufactured housing shipments, and RV shipments, 2002–06



Source: USDOC, Census Bureau; and Recreational Vehicle Industry Association.

Major U.S. producers and large intermediate consumers increasingly looked abroad for sources of supply as they tried to reduce costs to better compete in end markets. As such, imports accounted for an increasing share of the growing U.S. wood flooring and hardwood plywood market even as U.S. production rose over the period. A growing share of imports of wood flooring were by U.S.-based producers sourcing products and inputs from foreign markets. Additionally, newer products, such as engineered wood flooring, are enjoying faster demand growth than traditional products such as solid wood flooring. It is in this segment that imports rose most rapidly, with the major U.S. flooring manufacturers and the large U.S. building materials retailers reportedly accounting for much of that import growth.

### *Wood flooring*

Collectively, U.S. shipments of solid and engineered wood flooring rose rapidly during the period under review, increasing from \$1.5 billion in 2002 to nearly \$2.2 billion in 2004, before declining to \$2.0 billion in 2007. However, some U.S. wood flooring producers were not able to take full advantage of favorable market trends. For example, U.S. producers of unfinished oak strip flooring, a product that has remained virtually unchanged for decades, were unable to take advantage of increasing U.S. demand for prefinished flooring, wide-width flooring, and flooring of exotic species. Imports of these prefinished products are at least partially responsible for the increased import market share of the U.S. solid wood flooring market, which rose from 16 percent in 2002 to 27 percent in 2007 as imports more than tripled by 2005 before declining over the next two years (figure 6.3).

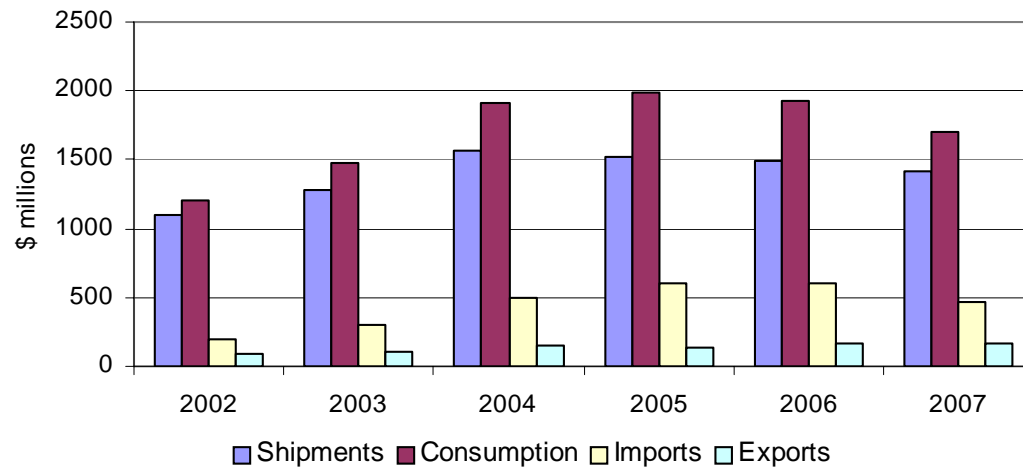
At the same time, imported engineered wood flooring captured nearly one-half of the rapidly rising domestic market in that product, increasing from 22 percent to 49 percent over the same period that imports rose by 350 percent (figure 6.4). The introduction of engineered wood flooring has expanded the overall U.S. wood flooring market, as it can be used in applications not suitable for solid wood flooring. Further, the strong growth in U.S. consumption of engineered wood flooring relative to solid wood flooring during the period indicates that it captured some of the market for traditional solid wood flooring. Engineered wood flooring now accounts for nearly 40 percent of the U.S. wood flooring market.

Although industry executives do not consider laminate flooring to be a substitute for wood flooring, they nevertheless testified at the Commission hearing that the prices of both wood and laminate flooring had fallen and that the price gap had narrowed.<sup>1</sup> Therefore, in spite of the strong growth of engineered wood flooring during the period, the increasing share of the overall floor covering market captured by laminate flooring has likely put price pressure on wood flooring, particularly in the residential remodeling end use.

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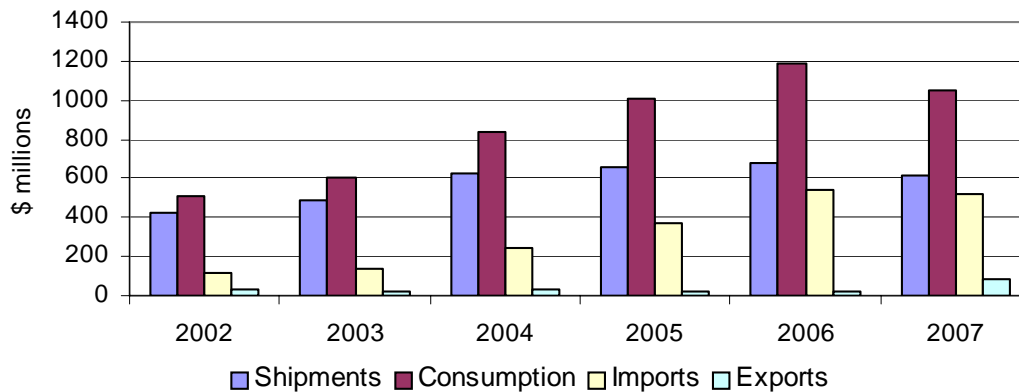
<sup>1</sup> USITC hearing transcript, October 3, 2007, 180.

**FIGURE 6.3** U.S. shipments, consumption, imports, and exports of solid wood flooring, 2002–07



Source: Compiled from U.S. producer and importer questionnaires and official statistics of the U.S. Department of Commerce.

**FIGURE 6.4** U.S. shipments, consumption, imports, and exports of engineered wood flooring, 2002–07



Source: Compiled from U.S. producer and importer questionnaires and official statistics of the U.S. Department of Commerce.

Consumer tastes and preferences have also changed during the period. Expansion of the housing and renovation markets resulted in an increased demand for exotic woods in flooring products relative to traditional species such as oak. This change in demand led to increased imports of products such as solid wood flooring made from tropical woods, particularly those from Latin America.

Finally, growing consumer and government sensitivity to global environmental issues such as forest degradation and destruction has increased demand for wood products made from legally sourced raw material grown in sustainably managed forests. It is not clear how this aspect affects the market, either through price premiums or market share, as data are not readily available. Also, some firms produce and market sustainable products without making claims about certification. The “Green” building codes, such as LEED, have also increased demand for such products from the commercial building sector. Flooring made from bamboo—perceived by some consumers to be more sustainable than hardwoods harvested from natural forests—has benefitted from this trend.

### *Hardwood plywood*

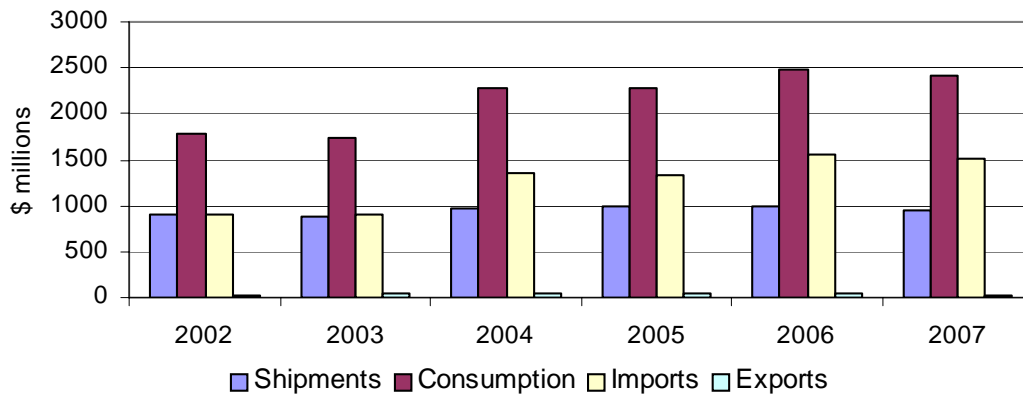
In contrast to the growth in U.S. shipments of both solid and engineered wood flooring, shipments of hardwood plywood were essentially flat over the period, while consumption increased by about half and imports rose by more than two-thirds from 2002–07 (figure 6.5). The share of U.S. imports of hardwood plywood in the U.S. market rose from 51 percent in 2002 to 62 percent in 2007. However, a significant share, perhaps one-third, of U.S. imports of hardwood plywood consists of thin plywood, a segment in which U.S. producers typically do not compete. Demand from U.S. makers of cabinets and fixtures rose, while demand from furniture makers declined, an important but declining market for U.S. plywood producers.

As with flooring, the quality of hardwood plywood is a significant demand factor, and the U.S. industry has turned toward higher grade products, rather than the utility grades, choosing to go up the quality scale rather than trying to lower costs to compete in the market with imports for lower grades of hardwood plywood. This trend has been influenced by the earlier loss of large segments of the furniture market as that industry increasingly moved production offshore. Another quality factor influencing the demand for hardwood plywood is the level of formaldehyde emissions. Finally, environmental awareness and “Green” building codes have increased the demand for certified hardwood plywood products.

As in the flooring segments, substitute products are also applying competitive pressure on U.S. hardwood plywood manufacturers, particularly in the lower grades. For example, plywood with cores other than veneer, such as particle board or MDF, is gaining market share relative to low-grade plywood. In addition, MDF and particle board are increasingly competing directly with low-grade plywood in some applications, such as furniture and cabinetry, in both domestic and foreign markets.



**FIGURE 6.5** U.S. shipments, consumption, imports, and exports of hardwood plywood, 2002–07



Source: Compiled from U.S. producer and importer questionnaires and official statistics of the U.S. Department of Commerce.

## Exports

Foreign demand for U.S. wood flooring and hardwood plywood was strong during the 2002–07 period. In 2002, exports of solid wood flooring accounted for 8 percent of U.S. production; by 2007, the export share had risen to 12 percent. At the same time, the export share for engineered wood flooring doubled from 7 percent to 14 percent. The decline in the value of the dollar, particularly against the Canadian dollar, is the principal factor for the increase, as most U.S. export growth was to Canada.

## Supply Factors

### Raw Material

As noted in chapter 2, the United States is the world’s largest producer of hardwood logs, the basic raw material for wood flooring and hardwood plywood. U.S. hardwood forest resources remain abundant and include certain species particularly well suited to the manufacture of wood flooring and hardwood plywood. However, during a period of strong market growth and increasing production, at least for wood flooring, U.S. lumber production was basically flat, and the particular grades of lumber preferred by the U.S. solid wood flooring industry were in tight supply. This reportedly inelastic supply may ultimately have somewhat constrained U.S. production of wood flooring.<sup>2</sup>

<sup>2</sup> The pattern of forest land tenure in the United States, particularly in the East, where hardwoods are typically privately owned on relatively small parcels, may also contribute to the inelastic nature of raw material supply. Not only must timber production compete with other land uses, but when timber is sold, it is often sold at auction. This is in contrast to most other supplying countries where tenure is secured through negotiated concessions involving relatively large parcels.

With one exception, the other major foreign suppliers of wood flooring and hardwood plywood are also well-endowed with natural stands of hardwood resources, and each has desirable species, e.g., Russian birch and Indonesian or Malaysian lauan for hardwood plywood, and certain Brazilian species are currently very popular for flooring in the U.S. market. As in the United States, however, raw material supplies in these countries tightened over the period, partly a function of efforts to address illegal logging, and prices for raw materials increased.

China is unique among the large producers of wood flooring and hardwood plywood in not being well-endowed with forest resources and having a limited domestic supply of natural raw material with which to feed its rapidly growing wood products industry. However, by providing a large portion of the material necessary for veneer cores, its poplar plantations have greatly aided, if not made possible, the growth of China's engineered wood flooring and hardwood plywood industries, because for engineered wood flooring and hardwood plywood, imported raw material is necessary only for face and back veneers. As the production data in chapter 4 demonstrate, China's competitive position is not nearly as strong for solid wood flooring, where it is necessary to import essentially all of the lumber necessary for its production.

### **Cost of Production**

As noted in the global overview in chapter 2, the United States and the six foreign suppliers to the U.S. market all have large wood products industries that produce flooring and plywood, and each has at least some firms with large production capacities, technical ability, and large outputs. Thus, global competition is based on relative production costs, product quality, and product differentiation.

The U.S. industries are generally at a disadvantage vis-à-vis most foreign suppliers with respect to production costs, which are among the most important determinants of industry profitability and competitiveness in wood flooring and hardwood plywood. In addition to the cost of procuring raw material, production costs include labor, energy, capital costs of buildings and equipment, inventory and marketing costs, and transport of wood flooring and hardwood plywood to customers. Given the wide variety of products and various levels of quality produced in all three segments (solid wood flooring, engineered wood flooring, and hardwood plywood) per unit production costs across countries for aggregated products may be neither very illustrative nor particularly useful. However, broadly speaking these industries are high variable cost industries, with raw material generally accounting for 50 to 80 percent and labor 15 to 25 percent of total production costs.

#### *Variable costs*

##### ***Raw material***

The U.S. industries were not at a competitive disadvantage with respect to the cost of raw material vis-à-vis most foreign competitors. The average U.S. cost of raw material for solid wood flooring ranged from \$1.30 to \$1.50 per square foot during the 2002–06 period and averaged 62–66 percent of the total production cost. The cost of raw material rose over the period for U.S. producers, but may not be rising faster than that of the major competitors.

In Brazil, Indonesia, Malaysia, raw material is reportedly increasingly scarce, due in part to crackdowns on illegal logging, and prices are reported to have increased substantially during the period. For example, the Malaysian prices for two species of tropical hardwood commonly used in the manufacture of hardwood plywood have increased at a faster rate than U.S. hardwood log prices (figure 6.6). This suggests that U.S. producers' competitive position may be improved at least with respect to raw material.

The cost of core material in China is likely lower than that in the United States, reflecting the abundant supply of poplar. Chinese producers likely pay competitive market prices within China for raw material, both domestic and imported. Because China is the world's largest importer of hardwood logs, it is doubtful that China has a competitive advantage in the cost of raw material other than that conferred by the availability of the poplar plantations.

### ***Labor***

Except for Canada, the United States is at a competitive disadvantage with respect to labor costs, which typically are the second leading cost item in wood flooring and hardwood plywood production. U.S. and Canadian labor rates ranked highest among major producers, at \$10 to \$20 per hour in 2006. Brazil has lower labor costs than the United States, with hourly rates in the manufacturing sector just over \$4 per hour.<sup>3</sup> Labor rates in Malaysia and Indonesia are about \$40 per month (less than \$0.25 per hour). Despite the use of hand labor by Chinese producers in much of the production process, China's overall labor cost is relatively low,<sup>4</sup> due to relatively low wage rates, typically around \$1.00 per hour. Labor rates in the hardwood plywood industry in Russia are not available.

### ***Other inputs and costs***

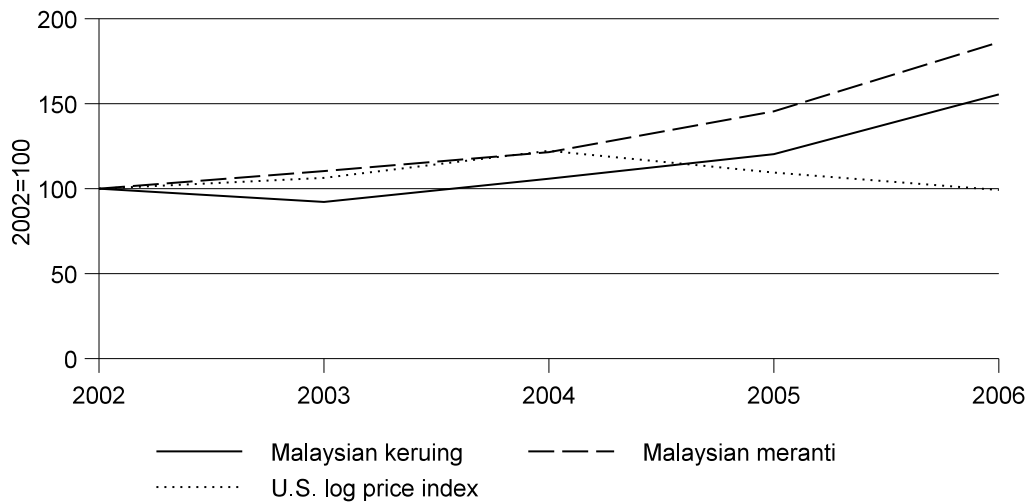
The United States is reportedly competitive with respect to other production costs, such as energy, adhesives, finishes, and transportation. All global producers have been affected by rising costs for many of these items in recent years.

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<sup>3</sup> Goetzl and Ekström, "Report on the Review of the U.S. Market," 2007, p 13.

<sup>4</sup> USITC hearing transcript, October 3, 2007, 235.

**FIGURE 6.6** U.S. and Malaysian logs: Trend in indexed prices, 2002–06



Source: ITTO database for Malaysian logs and BLS for U.S. log price index.

### *Fixed costs*

As noted in Chapter 3, domestic production capacity for wood flooring increased substantially over the period, while production capacity for hardwood plywood remained essentially unchanged. Estimated capacity utilization rates in the United States were 80 to 90 percent for solid wood flooring, slightly above 80 percent for engineered wood flooring, and from 70 to 80 percent for hardwood plywood over the period.

Given that the technology for producing these products is similar throughout the global industry, and that raw material, labor, and other variable inputs constitute the vast majority of the cost of production, variations in capital costs may not be a particularly significant competitive factor.<sup>5</sup> However, capacity utilization rates and levels of new investment may be indicators of competitiveness, although not as significant as would be the case in high fixed-cost (or capital-intensive) industries. As noted earlier, some industries, such as those in Indonesia, are reportedly operating at very low rates of capacity utilization, which hinders their competitiveness. Canadian producers also noted that some of their plants are idle during part of the year. Capacity utilization rates for flooring plants in China are approximately 40 percent.

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<sup>5</sup> However, in China, capital costs are relatively low for wood flooring and plywood producers, the vast majority of which are small, and these lower capital costs also contributed to the growth of the industry.

## Industry Structure

As noted in chapter 3, the hardwood plywood and the wood flooring industries are highly concentrated in the United States, and this concentration has increased slightly over the period. According to industry statistics, in 2006, the five largest hardwood plywood companies accounted for over 75 percent (by quantity) of U.S. production, with a total of approximately 24 manufacturers in the United States. Similarly, in 2006, the five largest companies producing wood flooring accounted for almost 60 percent of total U.S. production, with approximately 155 manufacturers in the United States.

Although data are not available, the wood flooring and hardwood plywood industries in most major foreign competitors are likely not as concentrated as in the United States and Canada. The concentration in the U.S. industries suggests a structure in which a few large firms are able to have influence over demand and price, while many of the smaller U.S. firms may be price takers. In such an industry structure, the larger firms are able to exert some control over prices through branded or niche products, vertical or horizontal integration, or expanded international operations. Smaller firms, in contrast, may be more impacted by import competition and have fewer resources to integrate their production or to procure products and inputs overseas.

With respect to certain other suppliers, the U.S. wood flooring and hardwood plywood industries have a competitive disadvantage in weak linkages to logging operations but a competitive advantage in strong linkages to distributors and retailers, especially through nationally branded products. However, this advantage may be diminishing as distributors and retailers establish relationships with foreign supplier industries and domestic producers source more of their nationally branded product offshore. Vertical coordination (ownership, concessions, or contracts linking producers to logging operations, distributors, and retailers) in the wood flooring and hardwood plywood industry typically enhances competitiveness by giving producers more certainty about raw material supply, distributor demand, and prices.

## Channels of Distribution

Rising concentration in the distribution chain, particularly at the retail level, is reportedly hindering the ability of U.S. wood flooring and hardwood plywood firms to maintain market share by influencing prices for wood flooring and hardwood plywood. Greater competition in the U.S. market between U.S. and imported wood flooring and hardwood plywood is reportedly partly a result of greater market power held by retailers, particularly the large building and home supply companies, as these enterprises have more logistical capability than smaller retailers to source products from overseas.<sup>6</sup> The share of the U.S. retail market held by the large retailers<sup>7</sup> has risen sharply in recent years.<sup>8</sup> For example, the large building and home supply companies accounted for a reported 38 percent of the market for all wood flooring in 2007, up from 29 percent in 2002. This increase in market share has come largely at the expense of the floor covering stores, whose share of the retail wood flooring market

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<sup>6</sup> Industry official, interview with Commission staff, June 25, 2008.

<sup>7</sup> Large retail/wholesale firms include regional and national chains of lumber supply stores, as well as mass merchandisers such as the large home supply stores and club stores.

<sup>8</sup> Goetzl, and Ekström, "Report on the Review of the U.S. Market," 2007, 58.

has dropped from 67 percent to less than 60 percent during the same period.<sup>9</sup> The large building and home supply companies reportedly are taking an even larger share of the market for engineered wood flooring, the fastest-growing market segment.<sup>10</sup>

Imported solid and engineered wood flooring is also sold through the networks of the major floor covering producers and importers. Increasingly, both domestic producers and foreign producers or their importers seeking nationwide distribution of their products must negotiate contract terms directly with these retail chains.

## **Exchange Rates**

The recent decline in the value of the U.S. dollar has aided the U.S. industries' competitiveness vis-à-vis most foreign suppliers in the U.S. market. The declining value of the dollar puts upward pressure on prices of imported wood flooring and hardwood plywood products from all leading foreign supplier industries and thus tends to raise the prices of U.S. wood flooring and hardwood plywood that compete with such imports. At the same time, the lower-valued U.S. dollar has provided a price advantage to U.S. exports not only vis-à-vis other foreign products, but also vis-à-vis domestic products in foreign markets such as Canada and the EU.

Table 6.1 shows recent trends in nominal and real (inflation adjusted) exchange rates for the U.S. dollar vis-à-vis the foreign suppliers' currencies. All foreign currencies have appreciated in value relative to the dollar, although in the case of the Malaysian ringgit and the Chinese yuan, the appreciation has been significantly less and has occurred only since mid-2006. The real values of the Brazilian real, Canadian dollar, the Indonesian rupiah, and the Russian ruble have risen faster than the Malaysian ringgit and Chinese yuan, giving Malaysia and China an advantage vis-à-vis the other suppliers to the U.S. market. However, according to Chinese industry sources, many inputs used by China's wood flooring and hardwood plywood industry are imported and priced in U.S. dollars. These raw materials have been subject to the same upward price pressures as other commodities priced in dollars. For a country such as China, which had traditionally pegged its foreign exchange rate to the dollar, this raised the cost of those inputs and mitigated some of that advantage that China has when selling its final products into the U.S. market.

## **Pricing and Marketing**

Trends in the prices received by U.S. producers of wood flooring and hardwood plywood indicate the weakening competitive position of the U.S. wood flooring and hardwood plywood industries relative to imports. Figure 6.7 shows the indexed trend in average producer prices (unit values) for hardwood plywood and solid wood and engineered wood flooring from 2002 to 2006 from the Commission's questionnaire data.<sup>11</sup> Producer prices remained relatively flat over this period. The average of each of the producer prices declined

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<sup>9</sup> Catalina Research, Inc., 2005. Industry official, interview with Commission staff, August 6, 2008.

<sup>10</sup> Industry official, interview with Commission staff, June 25, 2008.

<sup>11</sup> The domestic producer prices are indexed to protect the confidentiality of the data. Indexed prices were derived by dividing each yearly price by the 2002 price and multiplying by 100.

**TABLE 6.1** Exchange rates: Units of foreign currency per U.S. dollar, 2002–06

Foreign currency		2002	2003	2004	2005	2006	2007	% change 2002-07 <sup>a</sup>
Brazilian real	nominal	2.92	3.08	2.93	2.43	2.17	1.947	-33.3
	real <sup>b</sup>	2.63	2.47	2.27	1.82	1.61	1.43	-45.5
Canadian dollar	nominal	1.57	1.40	1.30	1.21	1.13	1.074	-31.6
	real	1.56	1.39	1.30	1.22	1.16	1.11	-29.0
Chinese yuan	nominal	8.28	8.28	8.28	8.19	7.97	7.608	-8.1
	real	8.65	8.75	8.64	8.66	8.64	8.64	-6.9
Indonesian rupiah	nominal	9,311.21	8,577.14	8,938.93	9,704.70	9,159.33	9,141.00	-1.8
	real	7,802.28	6,885.52	6,946.21	7,040.42	6,081.61	5,865.47	-24.8
Malaysian ringgit	nominal	3.80	3.80	3.80	3.79	3.67	3.43	-9.7
	real	3.84	3.89	3.94	3.94	3.80	3.58	-6.8
Russian ruble	nominal	31.35	30.69	28.81	28.28	27.19	25.58	-18.4
	real	23.29	20.52	17.83	16.01	14.53	12.90	-45.3

Source: International Monetary Fund, *International Financial Statistics* (monthly), various issues.

<sup>a</sup>Calculated from unrounded data using the Consumer Price index in the United States and the foreign country.

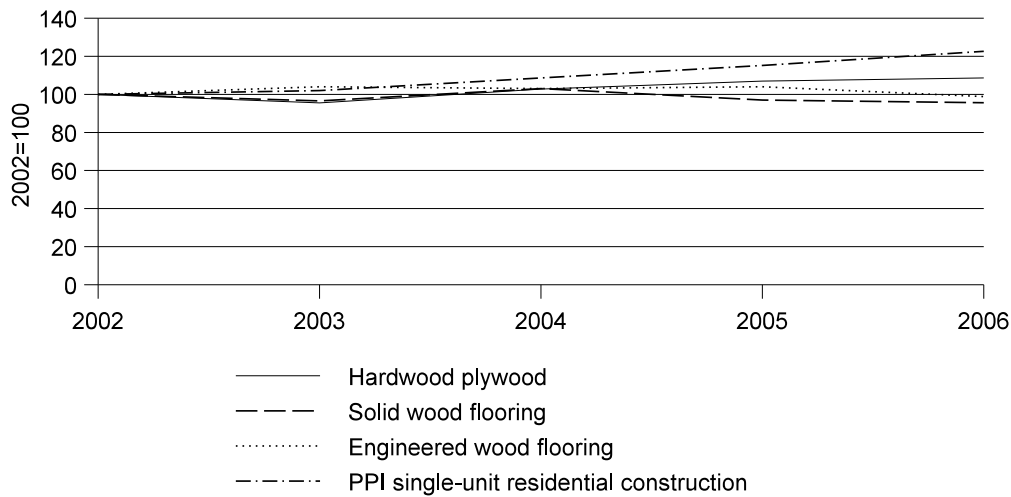
<sup>b</sup>Real exchange rate (Year 2000=100)

slightly in 2006 from the average price received in 2002 in nominal terms. Figure 6.7 also shows the trend in the producer price index (PPI) of materials and components used in residential housing construction calculated by the Bureau of Labor Statistics.<sup>12</sup> Wood flooring and hardwood plywood prices, on average, did not keep up with the increase in prices received by producers of other materials and components used in residential housing construction, despite the housing and construction boom during the 2002–06 period. Increased competition from imports moderated both price and production increases for hardwood plywood and wood flooring during this period, resulting in low rates of growth in producer prices for these products.<sup>13</sup>

<sup>12</sup> USDOL, BLS, PPI Database (accessed May 19, 2008).

<sup>13</sup> United Nations, *UNECE/FAO Forest Products Annual Market Review, 2004-2005, 2005*.

**FIGURE 6.7** Indexed hardwood plywood, solid, and engineered wood flooring producer prices, averaged selected grades, and PPI for single-unit residential construction inputs and materials, 2002–06



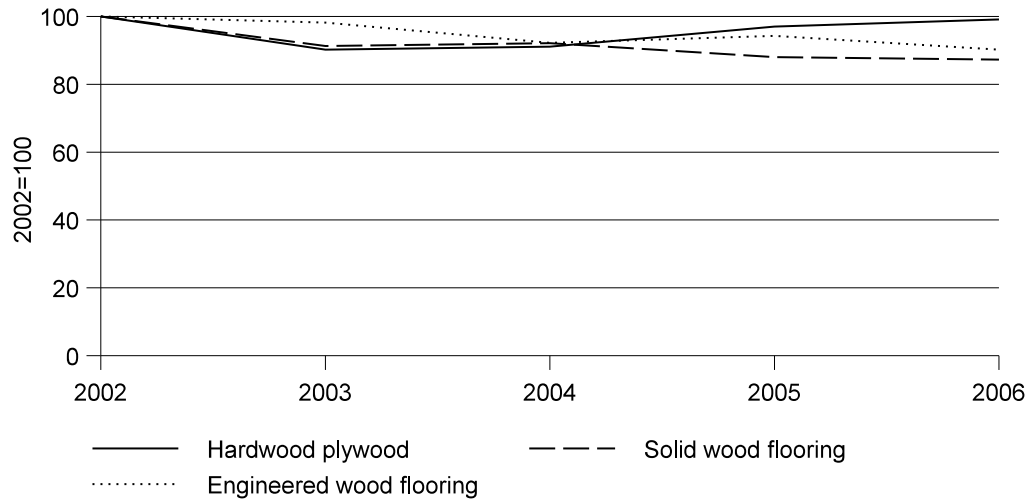
Source: Compiled from U.S. producer and importer questionnaires and BLS.

In addition to the small decline in the average producer prices in nominal terms, prices of these products did not keep up with the increase in hardwood lumber prices, which likely reduced the competitive position of the U.S. industry (figure 6.8). The average producer price of hardwood plywood and solid and engineered wood flooring declined relative to the price of hardwood lumber from 2002 to 2006. The decline in this price ratio indicates increasing cost pressures as producers may not have been able to sufficiently raise prices to pass through increased raw material prices to consumers.

Direct comparisons of U.S. producer and import prices for various wood flooring and hardwood plywood products are difficult owing to the confidentiality of the questionnaire data. However, there is some evidence of price pressure and competition from imports for utility grades of hardwood plywood (figure 6.9). For example, for birch hardwood plywood (C-3 and D-3 grades), U.S. producer prices increased for D-3 grade, while unit values of C-3 and D-3 grades of hardwood plywood imported from China declined during the 2004–06 period.



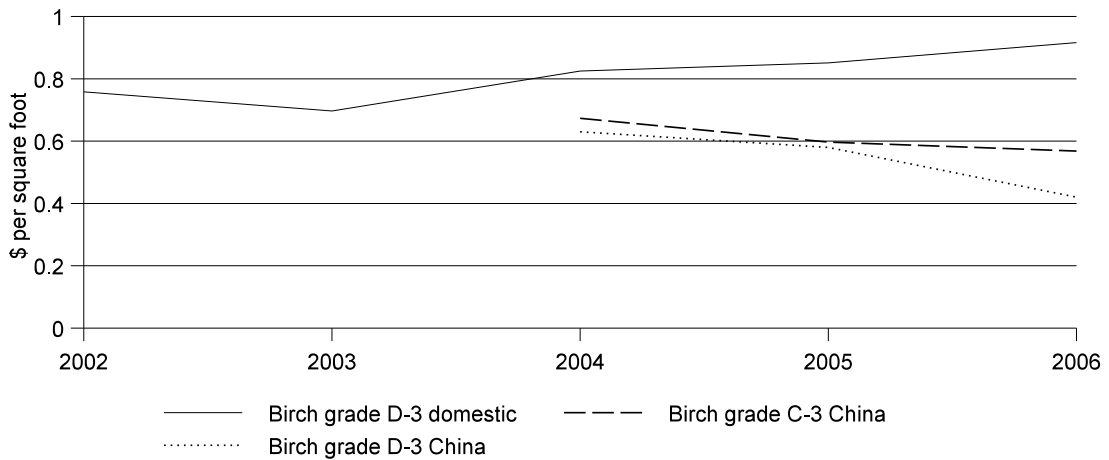
**FIGURE 6.8** Indexed hardwood plywood and solid and engineered wood flooring prices deflated by hardwood lumber PPI, 2002–06



*Source:* Compiled from U.S. producer and importer questionnaires and BLS.

*Note:* Producer prices are deflated by the Hardwood Lumber PPI.

**FIGURE 6.9** Hardwood plywood: Domestic producer price and Chinese import prices, selected grades, 2002–06

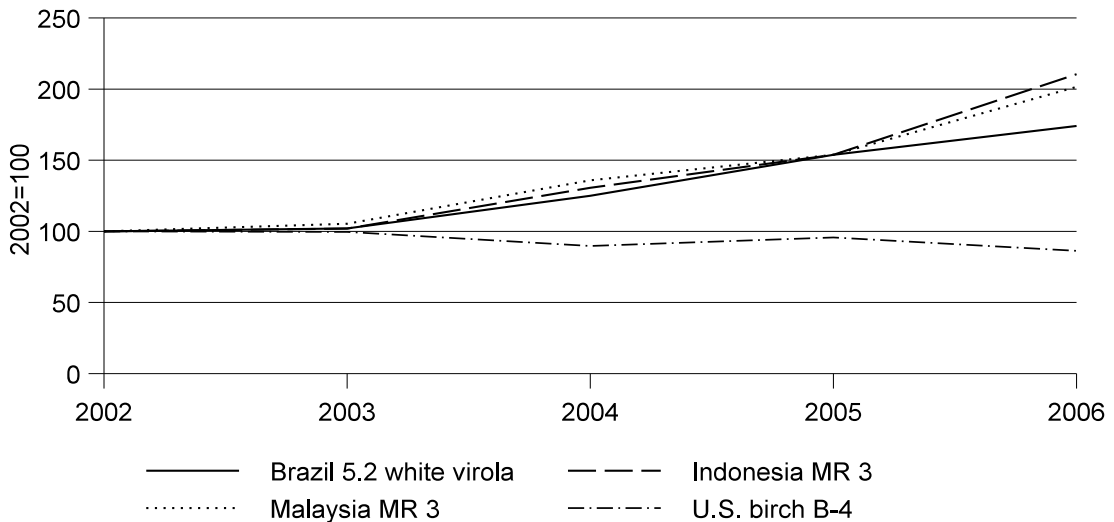


*Source:* Compiled from U.S. producer and importer questionnaires.

While these products compete, the divergence in the trends in product prices is reportedly due, at least in part, to the higher quality of the U.S. domestic product.<sup>14</sup>

The price trends for thin hardwood plywood products show a divergence between U.S. and foreign thin hardwood plywood prices from 2002–06 (figure 6.10). The virola plywood from Brazil and the meranti plywood from Indonesia and Malaysia are likely substitutes, and their rising prices over the period are consistent with the rising raw material prices in those countries. The price for 1/4-inch birch plywood produced in the United States declined over the period, even as raw material prices were rising in the United States.

**FIGURE 6.10** Hardwood plywood: Indexed U.S., Malaysian, and Brazilian prices, 2002–06



Source: ITTO, pricing database for Malaysian and Brazilian hardwood plywood. Compiled from U.S. producer and importer questionnaires.

<sup>14</sup> Industry official, interview by Commission staff, Portland, Oregon, August 16, 2007.

## **Government Programs**

In addition to trade policies, government involvement is concentrated in the forestry sector, which supplies raw material to the wood flooring and hardwood plywood industries. Program activities generally involve research and development, forestry practices, marketing, and export promotion.

### *Trade policies*

Import tariffs are the principal trade policy tool for wood flooring and hardwood plywood in major importing nations, and tariff rates in the United States are at the lower end of the range of tariffs applied in those markets. However, in general, tariffs for these products are relatively low in the major markets. Also, as described in chapter 2, new government procurement and developing trade policies regarding the origin and legality of logs and lumber used by these industries, and by extension the products made from those raw materials, may have larger effects on market access in the future than do traditional tariff barriers. These policies are aimed at reducing the incidence of illegal logging and trade, and may have the additional effects of raising raw material prices in certain supplier countries, increasing the competitiveness of legally sourced materials, and reducing forest degradation, particularly in tropical regions.

### *Other government policies*

Producers in the United States and Canada receive no direct aid support from those governments. In China, government involvement improved the competitive position of the Chinese industries during the 2002–06 period. The wood flooring and hardwood plywood industries benefitted from duty-free and VAT-free imports of raw materials and from VAT export rebates. The Chinese industries have also benefitted in the past from preferential income tax programs. However, recent reductions in VAT export rebates for certain solid wood flooring have reduced the export incentives.



# Bibliography

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- Adams, Mike. International Tropical Timber Organization (ITTO). "Is This The End of Thin-panel Tropical Plywood?" *Tropical Forest Update* 13, no. 2 (2003).
- AFX News. "Carlyle to Invest 27.5 mln Used in China's Shanghai Anxin Flooring." *Forbes*, May 11, 2006. <http://www.forbes.com/markets/feeds/afx/2006/05/11/afx2737878.html>.
- American Forest and Paper Association. *China's Subsidization of its Forest Products Industry*, July 2004.
- Armas, Genaro. "Sawmills Pressured as Furniture Plants Go Abroad." *USAToday*, September 15, 2007.
- Armstrong Industries. "Armstrong Announces Investments in Hardwood Flooring." News release, March 15, 2006. <http://phx.corporate-ir.net/phoenix.zhtml?c=98651&p=irol-newsArticle&ID=832321&highlight=capella>.
- \_\_\_\_\_. "Armstrong World Industries Partners with Tropical Forest Foundation," March 27, 2007. <http://www.armstrong.com>.
- Anderson. "Shaw Industries Agrees to Acquire the Anderson Family of Companies." News release, September 14, 2007. <http://www.andersonfloors.com/news/pr091407.aspx>.
- Hammond, Don. "Commentary on Forest Policy in the Asia-Pacific Region," Asia-Pacific Forestry Commission, 1997.
- Associacao Brasileira da Industria de Madeira Proccada Mecanicamente (ABIMCI). "2004 Sector Study: Mechanically-Processed Timber Industry," undated. <http://www.abimci.com.br> (accessed March 26, 2008).
- Associacao Nacional dos Produtores de Pisos de Madeirs' (ANPM). Written submission to the U.S. International Trade Commission in connection with inv. no. 332-487, *Wood Flooring and Hardwood Plywood: Competitive Conditions Affecting the U.S. Industries*, September 17, 2007.
- Buchanan, Chip. "What in the World Happened to Red Oak?" Presentation to the Ohio Forestry Association, June 2005.
- Canby, Kerstin, James Hewill, Luke Bailey, Eugenia Katsigris, and Sun Xiufang. *Forest Products Trade Between China and Africa: An Analysis of Imports and Exports*. Forest Trends, February 2008. <http://www.forest-trends.org>.
- Catalina Research, Inc. *Wood Flooring*. Catalina Report CR038, November 2005.
- Chan, Allen T. Y. "How Much Risk? Investment Strategies for China." Presented at China's Boom: Implications for Investment & Trade in Forest Products and Forestry, Vancouver, BC, January 18-20, 2006.

Congressional Research Service, “Summary of H.R. 1947, To Amend the Lacey Act Amendments of 1981 to Extend Its Protections to Plants Illegally Harvested Outside of the United States, and for Other Purposes.” 110<sup>th</sup> Congress, introduced March 13, 2007.  
<http://thomas.loc.gov/cgi-bin/bdquery/z?d110:HR01497:@@D&summ2=m&> (accessed March 18, 2008).

\_\_\_\_\_. “Summary of S. 1930, A Bill to Amend the Lacey Act Amendments of 1981 to Prevent Illegal Logging Practices, and for Other Purposes,” 110<sup>th</sup> Congress, introduced August 1, 2007. <http://thomas.loc.gov/cgi-bin/bdquery/z?d110:SN01930:@@D&summ2=m&> (accessed March 18, 2008).

Contreras-Hermosilla, Arnoldo, Richard Doornbosch, and Michael Lodge. *The Economics of Illegal Logging and Associated Trade*. SG/SD/RT(2007)1. Paris: OECD, January 2007.

Dickerhoof, H. Edward. *Panel Product Usage in Mobile Home Production in the Top Five Producing States and in the United States*. Resource Report FPL 3, U.S. Department of Agriculture. U.S. Forest Service, 1978.

*Down to Earth*. “Kalimantan, Indonesia: All Logged Out,” February 21, 1997.  
<http://forest.org/archive/indomalay/inrainsi.htm>.

Endesa-Botrosa. “Structural Changes in the Tropical Plywood Industry and Improving Tropical Plywood Mill Profitability.” PowerPoint presentation given at an ITTO conference, Beijing, China, September 26, 2005.

European Council (EC). “Council Conclusions: Forest Law Enforcement, Governance and Trade (FLEGT) (2003/C 268/01).” *Official Journal of the European Union*, November 7, 2003.

\_\_\_\_\_. “Council Regulation (EC) No. 2173/2005 of 20 December 2005 on the Establishment of a FLEGT Licensing Scheme for Imports of Timber Into the European Community,” *Official Journal of the European Union*, December 31, 2005.

European Economic Service. Wood Products and Panels. December 18, 2007.  
<http://www.euwid-wood-products.com/>.

European Federation of the Plywood Industry. *Annual Report, 2006–2007*, June 28, 2007.

European Commission. “Forest Law Enforcement, Governance and Trade (FLEGT), Proposal for an EU Action Plan.” COM (2003) 251 final, May 21, 2003.

European Economic Service. “Sveza Invests 15m Euro in Plywood Production.” *Wood Products and Panels*, December 18, 2007. <http://www.euwid-wood-products.com/>.

Federal Forestry Agency of RF. *Concept of National Action Plan for Preventing Illegal Logging and Associated Trade*, March 2006.

*FloorBiz.com*. “BR-111 Imports and Exports, Inc.: About Us,” undated. <http://www.floorbiz.com> (accessed January 16, 2008).

*Floor Covering Weekly*. “Statistical Report ‘05.” Vol. 55, no. 18, July 17–31, 2006.

\_\_\_\_\_. “Statistical Report ‘06.” Vol. 56, no. 18, July 23–30, 2007.

- Food and Agricultural Organization of the United Nations (FAO). FAOSTAT Forestry Database. <http://faostat.fao.org/Desktop Default.aspx?PageID=381&lang=en>.
- \_\_\_\_\_. "Forest Industry Structures and the Evolution of Trade Flows in the Asia-Pacific Region—Scenarios to 2010," May 1997. <ftp://ftp.fao.org/docrep/fao/W7713E/W7713E00.pdf>.
- \_\_\_\_\_. "Global Forest Resources Assessment 2005: Progress Towards Sustainable Forest Management." FAO Forestry Series Paper 147, 2006.
- \_\_\_\_\_. "Governments Making Progress in Curbing Illegal Logging." News release, December 5, 2005. <http://www.fao.org/newsroom/en/news/2005/1000162/index.html>.
- \_\_\_\_\_. *State of the World's Forests, 2007*. Rome: FAO, 2007.
- \_\_\_\_\_. "Update 34." Asia and the Pacific National Forest Programmes, December 2000.
- Forest Stewardship Council (FSC). "More Than 100 Million Hectares Certified to FSC Standards." News release, April 3, 2008. [http://www.fsc.org/news.html?&tx\\_ttnews\[tt\\_news\]=9&tx\\_ttnews\[backPid\]=107&cHash=d767127c01](http://www.fsc.org/news.html?&tx_ttnews[tt_news]=9&tx_ttnews[backPid]=107&cHash=d767127c01).
- Global Trade Information Service, Inc. (GTIS). Global Trade Atlas Database.
- Global Wood*. "Soft Loans Awarded for Forest Plantation Development," July 15, 2007.
- Goetzl, Alberto. "Discrepancies in Foreign Trade Data: An Assessment of U.S. and ITTO Trade Statistics on Tropical Wood Trade," 2005.
- Goetzl, Alberto and Håkan C. Ekström, *Report on the Review of the U.S. Market for Tropical Timber Products*, International Tropical Timber Council, CEM-CFI(XL)/5 Rev. 1, July 27, 2007.
- Government of Indonesia. Ministry of Manpower and Transmigration. "Wage Matters," undated. [http://www.nakertrans.go.id/ENGLISHVERSION/wage\\_matters.php](http://www.nakertrans.go.id/ENGLISHVERSION/wage_matters.php) (accessed November 11, 2007).
- Government of Indonesia. Department of Statistics, "Industry Database," undated. <http://www.bappenas.go.id> (accessed February 11, 2008).
- Government of Malaysia. "Wood Based Industry." Third Industrial Master Plan. Kuala Lumpur, 2006.
- Hamler, A. J. "Plywood Gets a Makeover." *Wood Shop News* XXI, no. 8 (July 2007).
- Hardwood Market Report*. "2006: The Year at a Glance." Memphis, 2007.
- Hardwood Plywood & Veneer Association (HPVA). *Hardwood Stock Panels: Annual Statistical Report for Calendar Year 2006, 2007*.
- \_\_\_\_\_. *Hardwood Stock Panels: Annual Statistical Report for Calendar Year 2004, 2005*.
- Hardwood Publishing. *Annual Forecast 2007*. Charlotte: Hardwood Publishing, 2007.
- Hardwood Review Global*. "World Wide Lumber Demand Is Up." Vol. 16, no. 12 (May 2006).

\_\_\_\_\_. “Overseas Markets Take on Increased Importance.” Vol. 17, no. 3 (August 2006).

*Hardwood Review Weekly*. “North American Kitchen Cabinet Manufacturing, Slump Will Carry into 2008.” Vol. 23, no. 37 (May 25, 2007).

IMF. *International Financial Statistics*.

*Indonesian Commercial Newsletter*. “Plywood Industry Requires Consolidation and Restructuring,” April 9, 2002.

Interfax-CNA. *Russia’s Timber, Woodworking, Pulp and Paper Industry in 2004–2005*, August 2005.

International Tropical Timber Organization (ITTO). *Annual Review and Assessment of the World Timber Situation 2006*. GI-7/06. Yokohama, Japan: ITTO, July 2006.

[http://www.itto.or.jp/live/Live\\_Server/377/E-AR06-Text.pdf](http://www.itto.or.jp/live/Live_Server/377/E-AR06-Text.pdf).

\_\_\_\_\_. “Brazil.” *SFM Tropics: Status of Tropical Forest Management 2005*, 2006.

[http://www.itto.or.jp/live/Live\\_Server/1222/ITTOSFMTropics2005\\_summary.e.pdf](http://www.itto.or.jp/live/Live_Server/1222/ITTOSFMTropics2005_summary.e.pdf).

\_\_\_\_\_. “Sustainable Forest Management,” undated

<http://www.itto.or.jp/live/PageDisplayHandler?pageId=13> (accessed November 7, 2006).

\_\_\_\_\_. *Tropical Timber Market Report* 11, no. 18 (September 16–30, 2006).

\_\_\_\_\_. *Tropical Timber Market Report* 12, no. 5 (March 1–15, 2007).

\_\_\_\_\_. *Tropical Timber Market Report* 12, no. 6 (March 16–31, 2007).

International Wood Markets Group. *The China Book: Wood Products Industry and Markets Review*. First edition. Vancouver, Canada: International Wood Markets Group, 2006.

\_\_\_\_\_. “China’s ‘City of Plywood’.” *Wood Markets China Bulletin*, November 2007.

\_\_\_\_\_. “Chinese Domestic Timber Harvest is Growing.” *Wood Markets China Bulletin*, November 2007.

\_\_\_\_\_. “Chinese Poplar and Poplar Plywood Update.” *Wood Markets China Bulletin*, November 2007.

International Wood Products Association (IWPA). “Innovation Continues to Drive the RV Industry.” *Imported Wood*, 2005.

Jin, Renqing. Minister of Finance. People’s Republic of China. “Explanation on the Draft Enterprise Income Tax of the People’s Republic of China.” Presented at the Fifth Session of the Tenth National People’s Congress, March 8, 2007.

<http://www.china-embassy.org/eng/gyzg/t302221.htm>.



- Malaysian Industrial Development Authority. "Minimum Wage by Region," undated. <http://www.mida.gov.my> (accessed May 19, 2008).
- Malaysian Timber Forum. "People Who Live in Glass Houses Should Not Throw Stones: Malaysia Plywood and World Trade," undated. <http://www.mtc.com.my/news/pr168.htm> (accessed August 20, 2007).
- Malaysia Timber Industry Board, "Malaysia Export Statistic: Year 2006," undated. <http://www.mtib.gov.my/statistic/stat2006/statmsia2006.php> (accessed January 10, 2008).
- Miller, Frank, Rodney Taylor, and George White. *Keeping It Legal: Best Practices for Keeping Illegally Harvested Timber Out of Your Supply Chain*. Gland, Switzerland: World Wildlife Fund, Global Forest & Trade Network, July 2006.
- Miller, Hannah. "Mannington Floors the Competition with Product Diversity." *Wood & Wood Products* 112, no. 5 (April 2007).
- Natural Resources Canada (NRC). *The State of Canada's Forests 2007*, 2007. <http://canadaforests.nrcan.gc.ca/files/450>.
- \_\_\_\_\_. *The State of Canada's Forests 2005-2006: Forest Industry Competitiveness*, 2006. <http://warehouse.pfc.forestry.ca/HQ/26336.pdf>.
- Organization for Economic Cooperation and Development (OECD). *Environmental Outlook*. Paris: OECD, 2001.
- Programme for the Endorsement of Forest Certification Schemes (PEFC). "About PEFC," undated. [http://www.pefc.org/internet/html/about\\_pefc.htm](http://www.pefc.org/internet/html/about_pefc.htm) (accessed February 14, 2008).
- PT Barito Pacific Timber Tbk Integrated Wood Industries. *Annual Report 2005*, undated.
- Qian, Sunny. "China's Wood Based Panel: Investment Strategy & Industrial Prospect." Presented at the 3rd Annual China Wood Based Panel Trade and Investment Conference, Hangzhou, China, April 22-25, 2007. <http://www.chinawood.net>.
- Recreational Vehicle Industry Association (RVIA). "Historical Glance: RV Wholesale Shipments," undated. [http://www.rvia.org/AM/Template.cfm?Section=Historical\\_Glance](http://www.rvia.org/AM/Template.cfm?Section=Historical_Glance) (accessed May 20, 2008).
- Recreational Vehicle Industry Association (RVIA). "RV Shipments and Sales Data," undated. [http://www.rvia.org/AM/customsource/INCL\\_BusinessIndicators.cfm?Section=Business\\_Indicators](http://www.rvia.org/AM/customsource/INCL_BusinessIndicators.cfm?Section=Business_Indicators) (accessed August 9, 2008).
- Roberts, Don, Herve Carreau, and Jonathan Lethbridge. "Russia Plans to Dramatically Increase Its Export Tax On Logs." CIBC World Markets. Equity Research Industry Update, February 22, 2007.
- Roshchupkin, Valery P., "The Forest Resources of Russia By Region," undated. [http://home.netcom.com/~runar/res\\_gen.htm](http://home.netcom.com/~runar/res_gen.htm) (accessed May 7, 2007).

- Rutton, Lamon, and Tan Seng Hock. "Reviewing Tropical Plywood: How Increasing Transparency and Cooperation in the Tropical Hardwood Plywood Trade Could Reduce Market Fluctuations and Price Volatility and Reinvigorate the Trade." ITTO Technical Series no. 20, May 2004.  
[http://www.itto.or.jp/live/Live\\_Server/712/ts20e.pdf](http://www.itto.or.jp/live/Live_Server/712/ts20e.pdf).
- Saunders, Jade. "EU FLEGT," undated. <http://www.illegal-logging.info/> (accessed June 22, 2007).
- \_\_\_\_\_. *Supply Chain Management and Illegal Timber*. London: Chatham House, September 2006.
- Schloenhardt, Andreas. "The Illegal Trade in Timber and Timber Products in the Asia-Pacific Region." Canberra, Australia: Australian Institute of Criminology, 2008.
- Seneca Creek Associates LLC and Wood Resources International LLC. "*Illegal*" Logging and Global Wood Markets: The Competitive Impacts on the U.S. Wood Products Industry. Prepared for the American Forest & Paper Association. Poolesville, MD, and University Place, WA: Seneca Creek Associates LLC and Wood Resources International LLC, November 2004.
- Shivdenko, Anatoly, "Russian Forests at the Beginning of the Third Millenium: Status and Trends." Presented at XII World Forestry Congress, 2003.  
<http://www.fao.org/DOCREP/ARTICLE/WFC/XII/MS11-E.HTM>.
- Stark, Tamara, and Sze Pang Cheung. *Sharing the Blame: Global Consumption and China's Role in Ancient Forest Destruction*. Greenpeace International and Greenpeace China, March 28, 2006.  
<http://www.greenpeace.org/international/press/reports/sharing-the-blame>.
- Stewart, Terence P. "China's Support Programs for Selected Industries: Wood and Wood Products." Trade Lawyers Advisory Group, June 2007.
- Tembec. *Annual Report 2006*, September 2006.
- Tropical Forest Trust (TFT). *China Wood Products Supply Chain Analysis: Helping Chinese Wood Producers Achieve Market Demand for Legal and Sustainable Timber*, March 2007.  
<http://www.tropicalforesttrust.com>.
- Tropical Timber Market Report*. "Brazil Raises Intake of U.S. Timber." Vol. 13, no. 6 (March 2008).
- Turner, James, Andres Katz, and Joseph Buongiorno. *Implications for the New Zealand Wood Products Sector of Trade Distortions due to Illegal Logging*. SCION: Next Generation Biomaterials, July 2007.
- UNCTAD. "Tropical Timber Production," undated. <http://www.unctad.org/infocomm/anglais/timbertrop/market.htm> (accessed May 19, 2008).
- United Nations Economic Commission for Europe and Food and Agriculture Organization of the United Nations, *Forest Products Annual Market Review 2004-2005*, 2005.  
[http://www.unece.org/trade/timber/docs/fpama/2005/2005\\_fpamr.pdf](http://www.unece.org/trade/timber/docs/fpama/2005/2005_fpamr.pdf).

- United States Trade Representative (USTR). "USTR Schwab and Indonesian Trade and Forest Ministers Sign Agreement on Illegal Logging as Part of Effort to Deepen Trade and Investment Relations." News release, November 16, 2006.
- U.S. Agency for International Development (USAID). "Initiative Against Illegal Logging," May 20, 2004. [http://www.usaid.gov/about\\_usaid/presidential\\_initiative/logging.html](http://www.usaid.gov/about_usaid/presidential_initiative/logging.html).
- U.S. Customs and Border Patrol (USCBP). Customs Rulings Online Search System. <http://rulings.customs.gov/>.
- U.S. Customs and Border Patrol. Vera Adams. Statement to the Senate Committee on Energy and Natural Resources, Subcommittee on Public Lands and Forests, May 30, 2007. [http://energy.senate.gov/public/index?cfm?fuseAction=Hearings.Testimony&Hearing\\_ID=1629&Witness\\_ID=4665](http://energy.senate.gov/public/index?cfm?fuseAction=Hearings.Testimony&Hearing_ID=1629&Witness_ID=4665).
- U.S. Department of Agriculture (USDA). Foreign Agricultural Service (FAS). (Authors: James Butterworth and Zhang Lei). *China Solid Wood Products Annual 2006*. GAIN Report no. CH6052, July 13, 2006. <http://www.fas.usda.gov/gainfiles/200607/146208294.pdf>.
- \_\_\_\_\_. (Author: Bernardo Silva). *Brazil: Solid Wood Products Annual Report 2006*. GAIN Report no. BR6629, December 8, 2006. [www.fas.usda.gov/gainfiles/200612/146269769.pdf](http://www.fas.usda.gov/gainfiles/200612/146269769.pdf).
- \_\_\_\_\_. (Author: Fred Kessel). *Indonesia Solid Wood Products: Annual 2006*. GAIN Report no. ID6012, June 28, 2006. [www.fas.usda.gov/gainfiles/200606/146198093.pdf](http://www.fas.usda.gov/gainfiles/200606/146198093.pdf).
- \_\_\_\_\_. (Authors: James Butterworth and Zhang Lei). *China Solid Wood Products Annual 2005*. GAIN Report no. CH5052, July 15, 2005. <http://www.fas.usda.gov/gainfiles/200507/146130349.pdf>.
- \_\_\_\_\_. (Authors: Mark Petry, Owen Wagner, and Bao Liting). *China Reduces Wide Range of VAT Rebates 2007*. GAIN Report no. CH7060, July 26, 2007. <http://www.fas.usda.gov/gainfiles/200708/146292052.pdf>.
- \_\_\_\_\_. (Authors: Mark Petry and Zou Qing). *Chinese Wood Usage Continues Rapid Growth*. GAIN Report no. CH7057, July 11, 2007. <http://www.fas.usda.gov/gainfiles/200707/146291716.pdf>.
- \_\_\_\_\_. (Authors: Mark Petry and Zhang Lei). *China Eliminates Re-Export Preferences 2006*. GAIN Report no. CH6089, October 17, 2006. <http://www.fas.usda.gov/gainfiles/200610/146249334.pdf>.
- \_\_\_\_\_. (Authors: Mark Petry and Zhang Lei). *China Wood Trade Policy Updates*. GAIN Report no. CH6102, November 14, 2006. <http://www.fas.usda.gov/gainfiles/200611/146249520.pdf>.
- \_\_\_\_\_. (Author: Raymond Hoh). *Malaysia: Solid Wood Products Annual 2007 Report*. GAIN Report no. MY7026. July 10, 2007.

- \_\_\_\_\_. (Author: Zhang Lei). *China Solid Wood Products Annual 2004*. GAIN Report no. CH4024, July 30, 2004. <http://www.fas.usda.gov/gainfiles/200408/146107212.pdf>.
- \_\_\_\_\_. “Brazilian Softwood Plywood Production and Export Continue to Accelerate.” Commodity and Marketing Programs. International Trade Report, March 4, 2005.
- U.S. Department of Agriculture. Forest Service. “Forest Inventory and Analysis National Program,” undated. <http://www.fia.fs.fed.us/program-features/rpa/default.asp>. (accessed May 9, 2008)
- U.S. Department of Commerce (USDOC). Census Bureau. “Cost & Size Comparisons For New Manufactured Homes and New Single Family Site Built Homes (2000–2006),” undated. <http://www.census.gov/const/mhs/sitebuiltvsmh.pdf> (accessed May 20, 2008).
- \_\_\_\_\_. *Hardwood Veneer and Plywood Manufacturing: 2002*. Report no. EC02-311-321211, September 2004.
- \_\_\_\_\_. *Lumber Production and Mill Stocks: 2006*. Report no. MA321T(06)-1, July 2007.
- \_\_\_\_\_. “New Privately Owned Housing Units Started: Annual Data,” undated. <http://www.census.gov/const/startsan.pdf> (accessed May 2, 2008).
- \_\_\_\_\_. “Shipments of New Manufactured Homes: 1959–2006,” undated. <http://www.census.gov/const/mhs/shiphist.pdf> (accessed May 8, 2008).
- U.S. Department of Labor (USDOL). Bureau of Labor Statistics (BLS). “Average Hourly Earnings of Production Workers,” undated. [http://data.bls.gov/PDO/servlet/SurveyOutlet?series\\_id=CEU3132100008&data\\_tool=XGtable](http://data.bls.gov/PDO/servlet/SurveyOutlet?series_id=CEU3132100008&data_tool=XGtable) (accessed June 12, 2008).
- \_\_\_\_\_. Bureau of Labor Statistics (BLS). PPI database. <http://www.bls.gov/data/home.htm>.
- U.S. International Trade Commission (USITC). *Conditions of Competition in the U.S. Market for Wood Structural Building Components*, USITC Publication 3596, Washington, DC: USITC, 2003.
- \_\_\_\_\_. *The Effects of Increasing Chinese Demand on Global Commodity Markets*. Staff Research Study 28. USITC Publication 3864. Washington, DC: USITC, 2006.
- \_\_\_\_\_. *Harmonized Tariff Schedule of the United States* (2008).
- \_\_\_\_\_. Hearing transcript in connection with inv. no. 332-487, *Wood Flooring and Hardwood Plywood: Competitive Conditions Affecting the U.S. Industries*, October 3, 2007.
- \_\_\_\_\_. Interactive Tariff and Trade Dataweb (Dataweb). <http://dataweb.usitc.gov>.
- United States Trade Representative (USTR). “International cooperation in preventing and combating illicit international trafficking in forest products.” Submission of the United States to the United Nations Commission on Crime Prevention and Criminal Justice, December 15, 2007.

- Van Leeuwen, Gerry. *Wood Markets: Monthly International Report*, November 2006.
- \_\_\_\_\_. *Wood Markets: Monthly International Report*, April 2007.
- Wahlgren, Kim. "Worldly Vision, State of the Industry 2007." *Hardwood Floors* 20, no. 2 (April/May 2007).
- Weiming, Song, Cheng Baodong, Zhang Shengdong, and Meng Xianggang. *Russian Logs in China: The Softwood Commodity Chain and Economic Development in China*. Forest Trends, 2007.  
<http://www.forest-trends.org>.
- White, Andy, Sun Xiufang, Kerstin Canby, Xu Jintao, Christopher Barr, Eugenia Katsigris, Gary Bull, Christian Cossalter, and Sten Nilsson. *China and the Global Market for Forest Products: Transforming Trade to Benefit Forests and Livelihoods*. Forest Trends, March 2006.  
<http://www.forest-trends.org>.
- White House. "President's Initiative Against Illegal Logging." Washington, DC.  
<http://www.whitehouse.gov/infocus/illegal-logging/piaail.html>, accessed May 20, 2007.
- Wood Digest*. "Mohawk Industries, Inc. Announces Purchase of Wood Flooring Assets," June 26, 2007.  
<http://www.wooddigest.com/publication/article.jsp?id=925&pubId=1>.
- European Economic Service. "Sveza Invests 15m Euro in Plywood Production." *Wood Products and Panels*, December 18, 2007. <http://www.euwid-wood-products.com/>.
- World Bank. *Strengthening Forest Law Enforcement and Governance*. Report no. 36638-GLB. Washington, DC: World Bank, August 2006.
- \_\_\_\_\_. "Sustaining Economic Growth, Rural Livelihoods, and Environmental Benefits: Strategic Options for Forest Assistance in Indonesia." Washington, DC: World Bank, December 2006.
- World Forestry Center. "The Forests of Russia," 2003. <http://wfi.worldforestry.org/WF-russia.htm>.
- WTO. Committee on Anti-Dumping Practices. "Semi-Annual Report Under Article 16.4 of the Agreement, Israel." G/ADP/N/153/ISR, April 17, 2007.
- \_\_\_\_\_. "Semi-Annual Report Under Article 16.4 of the Agreement, Turkey." G/ADP/N/153/TUR, March 22, 2007.
- WTO. Delegation of the United States. "China: Certain Measures Granting Refunds, Reductions, or Exemptions from Taxes and Other Payments." Communication to the Delegation of China and to the Chairman of the Dispute Settlement Body. WT/DS358/1. G/L/813. G/SCM/D74. G/TRIMS/D/25, February 7, 2007.
- Wu, Shengfu. "Why China Plywood Competitive {sic}." Presented at ITTO conference, Beijing, China, September 26, 2005.

Xiufang, Sun, Cheng Nian, and Kerstin Canby. *China's Forest Product Exports: An Overview of Trends by Segment and Destinations*. Forest Trends, 2005. <http://www.forest-trends.org>.

Zhang, Tony. "China's Plantation Program: Will It Be Able to Supply the Growing Needs of Both Wood Products and Pulp and Paper Producers?" Presented at China's Boom: Implications for Investment & Trade in Forest Products and Forestry, Vancouver, BC, January 18–20, 2006.

**APPENDIX A**  
**Request Letter and Letter Amending the**  
**Schedule**

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MAX BAUCUS, MONTANA, CHAIRMAN

JOHN D. ROCKEFELLER IV, WEST VIRGINIA  
KENT CONRAD, NORTH DAKOTA  
JEFF BINGAMAN, NEW MEXICO  
JOHN F. KERRY, MASSACHUSETTS  
BLANCHE L. LINCOLN, ARKANSAS  
RON WYDEN, OREGON  
CHARLES E. SCHUMER, NEW YORK  
DEBBIE STABENOW, MICHIGAN  
MARIA CANTWELL, WASHINGTON  
KEN SALAZAR, COLORADO

CHARLES E. GRASSLEY, IOWA  
ORRIN G. HATCH, UTAH  
TRENT LOTT, MISSISSIPPI  
OLYMPIA J. SNOWE, MAINE  
JON KYL, ARIZONA  
CRAIG THOMAS, WYOMING  
GORDON SMITH, OREGON  
JIM BUNNING, KENTUCKY  
MIKE CRAIG, IDAHO  
PAT ROBERTS, KANSAS

# United States Senate

COMMITTEE ON FINANCE

WASHINGTON, DC 20510-6200

RUSSELL SULLIVAN, STAFF DIRECTOR  
KOLAN DAVIS, REPUBLICAN STAFF DIRECTOR AND CHIEF COUNSEL

February 28, 2007

SECRET NUMBER

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2531

U.S. International Trade Commission

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009

The Honorable Daniel R. Pearson  
Chairman  
U.S. International Trade Commission  
500 E Street, SW  
Washington, DC 20436

Dear Chairman Pearson:

In order to gain a better understanding of the trends and new developments in the global wood flooring and hardwood plywood industries, the Committee requests, pursuant to section 332(g) of the Tariff Act of 1930, that the U.S. International Trade Commission institute an investigation and provide a report on the competitive conditions affecting the U.S. wood flooring and hardwood plywood industries during the period from 2002-2006. The Commission's report on this investigation should provide to the extent possible, the following:

- An overview of the U.S. markets for solid and engineered wood flooring (both unfinished and factory finished products), and hardwood plywood;
- A description of the U.S. industries for wood flooring and hardwood plywood and the industries in the principal countries (including Canada, China, Brazil, Indonesia, Malaysia, Russia) supplying the U.S. market, including trends in production, capacity, employment, and consumption;
- An examination of U.S. trade patterns and the factors affecting trade patterns, including tariffs and other border measures;
- An analysis of the factors affecting the competitive position of U.S. producers and the principal foreign suppliers to the U.S. market including raw materials, illegal logging, technological capabilities, labor practices, environmental policies, government programs, and substitutes for wood flooring and hardwood plywood;
- Views of industry, homebuilders, importers and other interested parties on developments in the supply of and the demand for wood flooring and hardwood plywood, including the effect of imports and substitutes for each product.

The Commission should submit its report to the Committee not later than fifteen months from the receipt of this request. The Committee intends to make the report available to the public in its entirety. Therefore, I request that the report not include any confidential business information. The Commission's assistance in this matter is greatly appreciated.

Sincerely,

Max Baucus

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OFFICE OF THE SECRETARY  
U.S. INTERNATIONAL TRADE COMMISSION  
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MAX BAUCUS, MONTANA, CHAIRMAN

JOHN D. ROCKEFELLER IV, WEST VIRGINIA  
KENT CONRAD, NORTH DAKOTA  
JEFF BINGAMAN, NEW MEXICO  
JOHN F. KERRY, MASSACHUSETTS  
BLANCHE L. LINCOLN, ARKANSAS  
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CHARLES E. SCHUMER, NEW YORK  
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PAT ROBERTS, KANSAS  
JOHN ENSIGN, NEVADA  
JOHN E. SUNUNU, NEW HAMPSHIRE

# United States Senate

COMMITTEE ON FINANCE

WASHINGTON, DC 20510-6200

RUSSELL SULLIVAN, STAFF DIRECTOR  
KOLAN DAVIS, REPUBLICAN STAFF DIRECTOR AND CHIEF COUNSEL

March 7, 2008

*ER - MAR 10 2008 - 018*

The Honorable Daniel Pearson  
Chairman  
U.S. International Trade Commission  
500 E Street, SW  
Washington, DC 20436

Dear Chairman Pearson:

*332-487*

In a letter dated February 28, 2007, the Committee requested, pursuant to section 332(g) of the Tariff Act of 1930, that the Commission institute an investigation and provide a report on the competitive conditions affecting the U.S. wood flooring and hardwood plywood industries. I asked that the Commission provide its report to the Committee no later than 15 months from receipt of the request, or by June 6, 2008.

I am amending the Committee's request, and now ask that the Commission provide its completed report no later than August 15, 2008.

Sincerely,

Max Baucus



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**APPENDIX B**  
***Federal Register* Notices**

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Terauds, Bureau of Reclamation, Albuquerque Area Office, 555 Broadway NE, Suite 100, Albuquerque, New Mexico 87102.

Copies of the FEIS are available for public inspection and review at the following locations:

- Bureau of Reclamation, Albuquerque Area Office, 555 Broadway NE., Suite 100, Albuquerque, New Mexico 87102
- Southern Peaks Public Library, 423 4th Street, Alamosa, Colorado 81101
- Taos Public Library, 402 Camino de la Placita, Taos, New Mexico 87571
- City of Española Library, 405 Paseo de Onate, Española, New Mexico 87532
- Albuquerque Main Library, 501 Copper NW., Albuquerque, New Mexico 87102
- Santa Fe Public Library, 145 Washington Street, Santa Fe, New Mexico 87501
- El Paso Public Library, Clardy Fox Branch, 5515 Robert Alva Avenue, El Paso, Texas 79905
- Thomas Branigan Memorial Library, 200 East Picacho Avenue, Las Cruces, New Mexico 88001
- Socorro Public Library, 401 Park Street, Socorro, New Mexico 87801

**FOR FURTHER INFORMATION CONTACT:** Ms. Valda Terauds, Bureau of Reclamation, Albuquerque Area Office, 555 Broadway NE., Suite 100, Albuquerque, New Mexico 87102; telephone 505-462-3584; facsimile 505-462-3593; e-mail: [vterauds@uc.usbr.gov](mailto:vterauds@uc.usbr.gov).

Ms. April Sanders, U.S. Army Corps of Engineers Albuquerque District, 4101 Jefferson Plaza NE, Albuquerque, New Mexico 87109; telephone 505-342-3443; facsimile 505-342-3195; e-mail: [april.f.sanders@usace.army.mil](mailto:april.f.sanders@usace.army.mil).

Mr. Nabil Shafike, PhD, New Mexico Interstate Stream Commission, 121 Tijeras NE, Suite 2000, Albuquerque, New Mexico 87102; telephone 505-764-3866; facsimile 505-764-3893; e-mail: [nabil.shafike@state.nm.us](mailto:nabil.shafike@state.nm.us).

**SUPPLEMENTARY INFORMATION:** Pursuant to various legal authorities, and subject to allocation of supplies and priority of water rights under state law, Reclamation and the Corps operate dams, reservoirs, and other facilities in the upper Rio Grande basin to:

- (1) Store and deliver water for agricultural, domestic, municipal, industrial, and environmental uses;
- (2) Assist the Commission in meeting downstream water delivery obligations mandated by the Rio Grande Compact;
- (3) Provide flood protection and sediment control; and
- (4) Comply with existing laws, contract obligations, and international treaties.

The Upper Rio Grande Basin Water Operations Review (Review) provides the basis of, and is integral to, preparation of the FEIS. The purpose of the Review and FEIS is to:

- (1) Identify flexibilities in operation of federal reservoirs and facilities in the upper Rio Grande basin that are within existing authorities of Reclamation, the Corps, and the Commission, and in compliance with Federal and State laws;
- (2) Develop a better understanding of how these facilities could be operated more efficiently and effectively as an integrated system;
- (3) Formulate a plan for future water operations at these facilities that is within the existing authorities of Reclamation, the Corps, and the Commission; complies with Federal, State, and other applicable laws and regulations; and assures continued safe dam operations;
- (4) Improve processes for making decisions about water operations through better interagency communication and coordination and facilitation of public review and input; and
- (5) Support compliance by the Corps, Reclamation, and the Commission with applicable laws and regulations, including, but not limited to, the National Environmental Policy Act and the Endangered Species Act.

The FEIS addresses water operations at the following facilities with the noted exceptions and limitations:

- Flood control operations at Platoro Reservoir (the Review and FEIS include only flood control operations at Platoro that are under the Corps' authority; water supply operations at Platoro are under local control)
- Closed Basin Division-San Luis Valley Project
  - Heron Dam and Reservoir
  - Abiquiu Dam and Reservoir
  - Cochiti Dam and Reservoir
  - Low Flow Conveyance Channel
  - Flood control operations at Elephant Butte Dam and Reservoir (because of current litigation, water supply operations at Elephant Butte are not included in the Review or FEIS)
  - Flood control operations at Caballo Dam and Reservoir (because of current litigation, water supply operations at Caballo are not included in the Review or FEIS).

#### Proposed Federal Action

Reclamation, the Corps, and the Commission identified Alternative E-3 as the preferred alternative for water operations in the upper Rio Grande basin. This alternative allows for increased native (Rio Grande) water conservation and storage in Abiquiu

Reservoir, maintains current channel capacity below Abiquiu Dam, increases channel capacity below Cochiti Dam, and allows a full range of operation for the Low Flow Conveyance Channel, with continued communication and coordination for flood control operations at Elephant Butte and Caballo Dams.

No decision will be made on the proposed Federal action until 60 days after the release of the FEIS. After the 60-day waiting period, Reclamation, the Corps, and the Commission will complete individual agency Records of Decision. The Records of Decision will identify the action(s) that will be implemented and discuss all factors leading to the decision(s).

Dated: March 2, 2007.

**Rick L. Gold,**

*Regional Director—Upper Colorado Region, Bureau of Reclamation.*

[FR Doc. E7-7034 Filed 4-19-07; 8:45 am]

**BILLING CODE 4310-MN-P**

## INTERNATIONAL TRADE COMMISSION

[Investigation No. 332-487]

### Wood Flooring and Hardwood Plywood: Competitive Conditions Affecting the U.S. Industries

**AGENCY:** United States International Trade Commission.

**ACTION:** Institution of investigation and scheduling of hearing.

**SUMMARY:** Following receipt on March 6, 2007, of a request from the Senate Committee on Finance, the Commission instituted investigation No. 332-487, *Wood Flooring and Hardwood Plywood: Competitive Conditions Affecting the U.S. Industries*, under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)).

#### DATES:

- April 11, 2007: Date of institution.
- August 22, 2007: Deadline for filing requests to appear at the public hearing.
- August 29, 2007: Deadline for filing pre-hearing briefs and statements.
- September 13, 2007, 9:30 a.m.: Public hearing.
- October 5, 2007: Deadline for filing post-hearing briefs and statements.
- December 28, 2007: Deadline for filing written statements.
- June 6, 2008: Transmittal of report to the Committee on Finance.

**ADDRESSES:** All Commission offices, including the Commission's hearing rooms, are located in the United States

North, Range 7 East, New Mexico Principal Meridian, Colorado were accepted on May 16, 2007.

The plat and field notes, in duplicate, of the dependent resurvey of certain mineral claims in Township 43 North, Range 4 West, New Mexico Principal Meridian, Colorado, were accepted on June 6, 2007.

The plat, and field notes, in duplicate, of the dependent resurvey in Township 8 South, Range 76 West, and the plat, in duplicate, of the entire record, of the dependent resurvey of a portion of the west boundary of Township 9 South, Range 76 West, both of the Sixth Principal Meridian, Colorado were accepted on June 19, 2007.

**Randall M. Zanon,**

*Chief Cadastral Surveyor for Colorado.*

[FR Doc. E7-13186 Filed 7-6-07; 8:45 am]

**BILLING CODE 4310-JB-P**

## INTERNATIONAL TRADE COMMISSION

[Investigation No. 332-487]

### Wood Flooring and Hardwood Plywood: Competitive Conditions Affecting the U.S. Industries

**AGENCY:** United States International Trade Commission.

**ACTION:** Rescheduling of public hearing.

**SUMMARY:** The Commission has rescheduled the public hearing in this investigation from September 13, 2007, to October 3, 2007. As announced in the notice of institution of the investigation published in the **Federal Register** on April 20, 2007 (72 FR 19960), the hearing will be held at the U.S. International Trade Commission Building, 500 E Street, SW., Washington, DC; it will begin at 9:30 a.m. Certain dates relating to the filing of written statements and other documents have been changed; the revised schedule of dates is set out immediately below. All other requirements and procedures set out in the notice published on April 20, 2007, continue to apply. In the event that, as of the close of business on September 12, 2007, no witnesses are scheduled to appear at the hearing, the hearing will be canceled. Any person interested in attending the hearing as an observer or nonparticipant may call the Secretary to the Commission (202-205-2000) after September 12, 2007, for information concerning whether the hearing will be held.

**DATES:** April 11, 2007: Date of institution.

September 12, 2007: Deadline for filing requests to appear at the public hearing.

September 19, 2007: Deadline for filing pre-hearing briefs and statements.

October 3, 2007, 9:30 a.m.: Public hearing.

October 24, 2007: Deadline for filing post-hearing briefs and statements.

January 11, 2008: Deadline for filing all other written statements.

June 6, 2008: Transmittal of report to the Committee on Finance.

**FOR FURTHER INFORMATION CONTACT:**

Industry-specific information may be obtained from Fred Forstall, Co-Project Leader, (202-205-3443 or [alfred.forstall@usitc.gov](mailto:alfred.forstall@usitc.gov)), or David Ingersoll, Co-Project Leader, (202-205-2218 or [dave.ingersoll@usitc.gov](mailto:dave.ingersoll@usitc.gov)). For information on legal aspects of the investigation, contact William Gearhart of the Commission's Office of the General Counsel at 202-205-3091 or [william.gearhart@usitc.gov](mailto:william.gearhart@usitc.gov). The media should contact Margaret O'Laughlin, Office of External Relations at 202-205-1819 or [margaret.olaughlin@usitc.gov](mailto:margaret.olaughlin@usitc.gov). Hearing impaired individuals are advised that information on this matter can be obtained by contacting the TDD terminal on 202-205-1810. General information concerning the Commission may also be obtained by accessing its Internet address (<http://www.usitc.gov>). Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Secretary at 202-205-2000.

Issued: July 3, 2007.

By order of the Commission.

**Marilyn R. Abbott,**

*Secretary to the Commission.*

[FR Doc. E7-13187 Filed 7-6-07; 8:45 am]

**BILLING CODE 7020-02-P**

## INTERNATIONAL TRADE COMMISSION

[USITC SE-07-013]

### Government in the Sunshine Act Meeting Notice

**AGENCY HOLDING THE MEETING:** United States International Trade Commission.

**TIME AND DATE:** July 20, 2007 at 2:30 p.m.

**PLACE:** Room 101, 500 E Street, SW., Washington, DC 20436, Telephone: (202) 205-2000.

**STATUS:** Open to the public

**MATTERS TO BE CONSIDERED:**

1. Agenda for future meetings: none.
2. Minutes.
3. Ratification List.
4. Inv. Nos. 731-TA-1114-1115 (Preliminary) (Certain Steel Nails from

China and the United Arab Emirates)—briefing and vote. (The Commission is currently scheduled to transmit its determination and Commissioners' opinions to the Secretary of Commerce on or before July 30, 2007.)

5. Inv. Nos. 701-TA-447 and 731-TA-1116 (Preliminary) (Circular Welded Carbon-Quality Steel Pipe from China)—briefing and vote. (The Commission is currently scheduled to transmit its determination to the Secretary of Commerce on July 23, 2007; Commissioners' opinions are currently scheduled to be transmitted to the Secretary of Commerce on or before July 30, 2007.)

6. Outstanding action jackets: none.

In accordance with Commission policy, subject matter listed above, not disposed of at the scheduled meeting, may be carried over to the agenda of the following meeting.

By order of the Commission.

Issued: July 3, 2007.

**William R. Bishop,**

*Hearings and Meetings Coordinator.*

[FR Doc. E7-13228 Filed 7-6-07; 8:45 am]

**BILLING CODE 7020-02-P**

## INTERNATIONAL TRADE COMMISSION

[USITC SE-07-013]

### Government in the Sunshine Act Meeting Notice

**AGENCY HOLDING THE MEETING:** United States International Trade Commission.

**TIME AND DATE:** July 20, 2007 at 2:30 p.m.

**PLACE:** Room 101, 500 E Street, SW., Washington, DC 20436, Telephone: (202) 205-2000.

**STATUS:** Open to the public.

**MATTERS TO BE CONSIDERED:**

1. Agenda for future meetings: None.
2. Minutes.
3. Ratification List.
4. Inv. Nos. 731-TA-1114-1115 (Preliminary) (Certain Steel Nails from China and the United Arab Emirates)—briefing and vote. (The Commission is currently scheduled to transmit its determination and Commissioners' opinions to the Secretary of Commerce on or before July 30, 2007.)
5. Inv. Nos. 701-TA-447 and 731-TA-1116 (Preliminary) (Circular Welded Carbon-Quality Steel Pipe from China)—briefing and vote. (The Commission is currently scheduled to transmit its determination to the Secretary of Commerce on July 23, 2007; Commissioners' opinions are currently scheduled to be transmitted to the Secretary of Commerce on or before July 30, 2007.)

**APPENDIX C**  
**HTS Descriptions and Tariff Information**





# **U.S. Tariff Treatment**

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Classification of wood flooring and hardwood plywood is complicated by the variety of wood flooring and hardwood plywood products, technical refinements in the manufacture of these products, the development of new products (e.g., bamboo flooring), and the complexity of the HTS (shown in tables C-1 to C-3). Classification issues are evident in the large number of customs rulings issued by the U.S. Customs and Border Protection (CBP) for these products.

The U.S. wood flooring and hardwood plywood industries contend that U.S. importers sometimes intentionally misclassify imports of these products to avoid paying the appropriate duties.<sup>1</sup> In August 2005, U.S. industry associations brought allegations of misclassification to the attention of CBP. Subsequently, CBP initiated national enforcement operations targeting imports of wood flooring and hardwood plywood, which uncovered widespread misclassification.<sup>2</sup>

Finally, changes to the HTS, resulting from the 2007 Harmonized Schedule (HS) amendments,<sup>3</sup> had an impact on the classification of wood flooring and hardwood plywood. These changes include (1) establishing distinct subheadings for bamboo products in various headings of chapter 44, (2) restructuring the subheadings in heading 4412, and (3) clarifying the classification of assembled flooring through additional U.S. chapter note 4(b). These changes further complicate analysis of import trends because 2007–08 import statistics do not correspond directly to data from earlier years. (A comparison of old and new subheadings in headings 4409, 4412, and 4418 and some relevant customs rulings are presented in table C-4.)

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<sup>1</sup> USITC hearing transcript, October 3, 2007, 19.

<sup>2</sup> CBP, statement to the Senate Committee on Energy and Natural Resources, Subcommittee on Public Lands and Forests, May 30, 2007.

<sup>3</sup> Amendments to the HS are made by the World Customs Organization on a five year cycle.

**TABLE C-1** Wood flooring: HTS heading 4409, tariff rates, 2008

		<sup>a</sup> General	<sup>b</sup> Special	<sup>c</sup> Column 2
HTS provision	Article description	Rates (percent ad valorem)		
4409	Wood (including strips and friezes for parquet flooring, not assembled) continuously shaped (tongued, grooved, rebated, chamfered, V-jointed, beaded, molded, rounded or the like) along any of its edges, ends or faces, whether or not planed, sanded or end-jointed:			
4409.10 4409.10.05	Coniferous: Wood continuously shaped along any of its ends, whether or not also continuously shaped along any of its edges or faces, all the foregoing whether or not planed, sanded or end-jointed:	3.2%	Free	33 1/3%
4409.10.20	Other: Wood flooring:	Free		33 1/3%
4409.21 4409.21.05	Nonconiferous: Of bamboo: Wood continuously shaped along any of its ends, whether or not also continuously shaped along any of its edges or faces, all the foregoing whether or not planed, sanded or end-jointed :	3.2%	Free	33 1/3%
4409.21.90	Other:	Free		\$1.70/m <sup>3</sup>
4409.29 4409.29.05	Other: Wood continuously shaped along any of its ends, whether or not also continuously shaped along any of its edges or faces, all the foregoing whether or no planed, sanded or end-jointed:	3.2%	Free	33 1/3%
4409.29.25 4409.29.25.30 4409.29.25.50	Other: Wood flooring: Maple (Acer spp.): Birch (Betula spp.) and beech (Fagus spp.): Other:	Free		8%
4409.29.25.60 Other				

Source: Harmonized Tariff Schedule of the United States (2008).

<sup>a</sup>Normal trade relations, formerly known as the most-favored-nation duty rate.

<sup>b</sup>The "Free" duty rate is available for the designated tariff lines for the following U.S. trade preference programs: GSP, U.S.-Australia FTA, U.S.-Bahrain FTA, NAFTA, U.S.-Chile FTA, CBERA, U.S.-Israel FTA, ATPA/ATPDEA, U.S.-Jordan FTA, U.S.-Morocco FTA, CAFTA, and the U.S.-Singapore FTA.

<sup>c</sup>Applies to imports from a small number of countries that do not enjoy normal trade relations duty status.

**TABLE C-2** Wood flooring and hardwood plywood: HTS heading 4412, tariff rates, 2008

		<sup>a</sup> General	<sup>b</sup> Special	<sup>c</sup> Column 2
HTS provision	Article description	Rates (percent ad valorem)		
4412	Plywood, veneered panels and similar laminated wood:			
	Of bamboo:			
4412.10	Plywood			
4412.10.05	Other	8%	<sup>d</sup> Free	40%
4412.10.90	Other plywood consisting solely of sheets of wood (other than bamboo), each ply not exceeding 6 mm in thickness:	Free		
	With at least one outer ply of tropical wood specified in subheading note 1 to this chapter::			
4412.31	Not surface covered, or surface covered with a clear or transparent material which does not obscure the grain, texture or markings of the face ply:			
	With a face ply of birch ( <i>Betula</i> spp.):			
4412.31.05	Panels not exceeding in any dimension 3.6 mm in thickness, 1.2 m in width and 2.2 m in length :	Free		50%
4412.31.05.20	Other:			
	Not surface covered :			
	Other:			
4412.31.05.40	With a face ply of Spanish cedar ( <i>Cedrela</i> spp.) or walnut ( <i>Juglans</i> spp.):	8%	<sup>e</sup> Free	40%
4412.31.05.60	With a face ply of Spanish cedar ( <i>Cedrela</i> spp.) :			
4412.31.25	With a face ply of walnut ( <i>Juglans</i> spp.):			
4412.31.25.10	Other:			
4412.31.25.20	With at least one outer ply of the following tropical woods: Dark Red Meranti, Light Red Meranti, White Lauan, Sipo, Limba, Okoumé, Obeche, Acajou d'Afrique, Sapelli, Virola, Mahogany, Palissandre de Para, Palissandre de Rio or Palissandre de Rose :	8%	Free	40%
4412.31.40	With a face ply of mahogany ( <i>Swietenia</i> spp. or <i>Khaya</i> spp.):			
	Other:			
4412.31.40.40	Panels not exceeding in any dimension 3.6 mm in thickness, 1.2 m in width and 2.2 m in length:			
4412.31.40.50				

See source at end of table

**TABLE C-2** Wood flooring and hardwood plywood: HTS heading 4412, tariff rates, 2008—*Continued*

		<sup>a</sup> General	Special	<sup>b</sup> Column 2
HTS provision	Article description	Rates (percent ad valorem)		
4412.31.40.60	Other: Not surface covered:			
4412.31.40.70	Other:			
4412.31.51	Other:	8%	<sup>f</sup> Free	40%
4412.31.51.30	With a face ply of sen (Kalopanax: spp.):			
	Other			
4412.31.51.50	Panels not exceeding in any dimension 3.6 mm in thickness, 1.2 m in width and 2.2 m in length:			
	Other:			
4412.31.51.60	Not surface covered:			
4412.31.51.70	Other:			
	Other			
4412.31.60	With at least one outer ply of the following tropical woods: Dark Red Meranti, Light Red Meranti, White Lauan, Sipo, Limba, Okoumé, Obeche, Acajou d'Afrique, Sapelli, Virola, Mahogany, Palissandre de Para, Palissandre de Rio or Palissandre de Rose	8%	<sup>g</sup> Free	40%
	Other:			
4412.31.91	Other, with at least one outer ply of nonconiferous wood:	8%	<sup>f</sup> Free	40%
4412.32	Not surface covered, or surface covered with a clear or transparent material which does not obscure the grain, texture or markings of the face ply:			
4412.32.05	With a face ply of birch (Betula spp.):	Free		50%
4412.32.05.20	Panels not exceeding in any dimension 3.6 mm in thickness, 1.2 m in width and 2.2 m in length			
	Other:			
4412.32.05.40	Not surface covered:			
4412.32.05.60	Other:			
4412.32.25	With a face ply of Spanish cedar (Cedrela spp.) or walnut (Juglans spp.):	5.1%	<sup>e</sup> Free	40%
4412.32.25.10	With a face ply of Spanish cedar (Cedrela spp.):			
4412.32.25.20	With a face ply of walnut (Juglans spp.):			

See source at end of table.

**TABLE C-2** Wood flooring and hardwood plywood: HTS heading 4412, tariff rates, 2008—*Continued*

		<sup>a</sup> General	Special	<sup>b</sup> Column 2
HTS provision	Article description	Rates (percent ad valorem)		
4412.32.31 4412.32.31.30 4412.32.31.40 4412.32.31.50 4412.32.31.60 4412.32.31.70	Other: With a face ply of sen (Kalopanax spp.): With a face ply of mahogany (Swietenia spp. or Khaya spp.): Panels not exceeding in any dimension 3.6 mm in thickness, 1.2 m in width and 2.2 m in length: Not surface covered: Other:	8%	<sup>e</sup> Free	40%
4412.32.56	Other	8%	<sup>e</sup> Free	40%
4412.39	Other, with both outer plies of coniferous wood: Not surface covered, or surface covered with a clear or transparent material which does not obscure the grain, texture or markings of the face ply:			
4412.39.10	With a face ply of Parana pine (Araucaria angustifolia):	Free		40%
4412.39.30	With a face ply of European red pine (Pinus silvestris):	3.4%	<sup>h</sup> Free	40%
4412.39.40	Other:	8%	<sup>e</sup> Free	40%
4412.39.50	Other	5.1%	<sup>i</sup> Free	40%
4412.94	Other Blockboard, laminboard and battenboard: With at least one outer ply of nonconiferous wood: Plywood: Not surface covered, or surface covered with a clear or transparent material which does not obscure the grain, texture or markings of the face ply:			
4412.94.10	With a face ply of birch (Betula spp.):	Free		50%
4412.94.10.30	Other: Not surface covered:			
4412.94.10.50	Other:			
See source at end of table				

**TABLE C-2** Wood flooring and hardwood plywood: HTS heading 4412, tariff rates, 2008—*Continued*

		<sup>a</sup> General	Special	<sup>b</sup> Column 2
HTS provision	Article description	Rates (percent ad valorem)		
4412.94.31	Other:	8%	<sup>f</sup> Free	40%
4412.94.31.05	Wood flooring			
	Other			
4412.94.31.11	With a face ply of Spanish cedar ( <i>Cedrela</i> spp.):			
4412.94.31.21	With a face ply of walnut ( <i>Juglans</i> spp.):			
4412.94.31.31	With a face ply of sen ( <i>Kalopanax</i> spp.):			
4412.94.31.41	With a face ply of mahogany ( <i>Swietenia</i> spp. or <i>Khaya</i> spp.):			
	Other:			
4412.94.31.60	Not surface covered:			
4412.94.31.71	Other:			
4412.94.41	Other:	8%	<sup>j</sup> Free	40%
4412.94.51	Other:	Free		40%
4412.99	Other:			
	With at least one outer ply of nonconiferous wood:			
4412.99.06	Containing at least one layer of particleboard:	Free		40%
	Other:			
	Plywood:			
	Not surface covered, or surface covered with a clear or transparent material which does not obscure the grain, texture or markings of the face ply:			
4412.99.10	With a face ply of birch ( <i>Betula</i> spp.):	Free		50%
4412.99.10.20	Panels not exceeding in any dimension 3.6 mm in thickness, 1.2 m in width and 2.2 m in length:			
See source at end of table				

**TABLE C-2** Wood flooring and hardwood plywood: HTS heading 4412, tariff rates, 2008—*Continued*

		<sup>a</sup> General	Special	<sup>b</sup> Column 2
HTS provision	Article description	Rates (percent ad valorem)		
4412.99.10.30	Other:			
4412.99.10.40	Not surface covered:			
4412.99.31	Other:	8%	<sup>f</sup> Free	40%
4412.99.31.10	Other:			
	With a face ply of Spanish cedar ( <i>Cedrela</i> spp.):			
4412.99.31.20	With a face ply of walnut			
4412.99.31.30	( <i>Juglans</i> spp.):			
	With a face ply of sen			
4412.99.31.40	( <i>Kalopanax</i> spp.):			
	With a face ply of mahogany			
4412.99.31.50	( <i>Swietenia</i> spp. or <i>Khaya</i> spp.):			
	Other:			
	Panels not exceeding in any dimension 3.6 mm in thickness, 1.2 m in width and 2.2 m in length:			
4412.99.31.60	Other, not surface covered:			
4412.99.31.70	Other			
4412.99.41	Other:	8%	<sup>i</sup> Free	40%
4412.99.51	Other:	Free		40%

Source: Harmonized Tariff Schedule of the United States (2008).

<sup>a</sup>Normal trade relations, formerly known as the most-favored-nation duty rate.

<sup>b</sup>The "Free" duty rate is available for all of the designated tariff lines noted in the "Special" column for the following U.S. trade preference programs: U.S.-Australia FTA, U.S.-Bahrain FTA, NAFTA, U.S.-Chile FTA, CBERA, U.S.-Israel FTA, ATPA/ATPDEA, U.S.-Jordan FTA, U.S.-Morocco FTA, CAFTA, and the U.S.-Singapore FTA. The designated tariff lines differ only in how the specific product is treated under GSP and, in one case, under AGOA.

<sup>c</sup>Applies to imports from a small number of countries that do not enjoy normal trade relations duty status.

<sup>d</sup>Brazil, Ecuador, and Indonesia are not eligible under GSP.

<sup>e</sup>Brazil is not eligible under GSP.

<sup>f</sup>Brazil and Indonesia are not eligible under GSP.

<sup>g</sup>Indonesia is not eligible under GSP.

<sup>h</sup>Russia is not eligible under GSP.

<sup>i</sup>Also free of duty under AGOA.

<sup>j</sup>Brazil, Colombia, Ecuador, and Indonesia are not eligible under GSP.

**TABLE C-3** Wood flooring: HTS heading 4418, tariff rates, 2008

		<sup>a</sup> General	<sup>b</sup> Special	<sup>c</sup> Column 2
HTS provision	Article description	Rates (percent ad valorem)		
4418	Builders' joinery and carpentry of wood, including cellular wood panels and assembled flooring panels; shingles and shakes:			
	Assembled flooring panels:			
	For mosaic floors:			
4418.71	Solid:	Free		33 1/3%
4418.71.10	Other:			
4418.71.20	Having a face ply more than 6 mm in thickness:	Free		33 1/3%
4418.71.90	Other:	8%	<sup>d</sup> Free	40%
4418.72	Other, multilayer:			
4418.72.20	Having a face ply more than 6 mm in thickness:	3.2%	<sup>e</sup> Free	33 1/3%
4418.72.90	Other:	8%	<sup>d</sup> Free	40%
4418.79.00	Other:	3.2%	<sup>e</sup> Free	33 1/3%
4418.90	Other:			
4418.90.46	Other:	3.2%	<sup>e</sup> Free	33 1/3%
4418.90.46.90	Other:			

Source: Harmonized Tariff Schedule of the United States (2008).

<sup>a</sup>Normal trade relations, formerly known as the most-favored-nation duty rate.

<sup>b</sup>The "Free" duty rate is available for all of the designated tariff lines noted in the "Special" column for the following U.S. trade preference programs: U.S.-Australia FTA, U.S.-Bahrain FTA, NAFTA, U.S.-Chile FTA, CBERA, U.S.-Israel FTA, ATPA/ATPDEA, U.S.-Jordan FTA, U.S.-Morocco FTA, CAFTA, and the U.S.-Singapore FTA. The designated tariff lines differ only in how the specific product is treated under GSP.

<sup>c</sup>Applies to imports from a small number of countries that do not enjoy normal trade relations duty status.

<sup>d</sup>Brazil and Indonesia are not eligible under GSP.

<sup>e</sup>Brazil is not eligible under GSP.



**TABLE C-4** Wood flooring and hardwood plywood: Comparison of 2006 and 2008 HTS

	HTS Subheading		NTR Rate of Duty	Customs Ruling(s)
	2006	2008		
Coniferous, unfinished, end-matched	4409.10.05	4409.10.05	3.2	NYL84912, HQ966511
Non-coniferous, unfinished, end-matched, Jatoba	4409.20.05	4409.29.0515	3.2	N018276
Non-coniferous, unfinished, end-matched, Ipe	4409.20.05	4409.29.0525	3.2	
Non-coniferous, unfinished, end-matched, Santos mahogany	4409.20.05	4409.29.0535	3.2	
Non-coniferous, unfinished, end-matched, Cumaru	4409.20.05	4409.29.0545	3.2	
Non-coniferous, unfinished, end-matched, Other	4409.20.05	4409.29.0555	3.2	
Coniferous, unfinished	4409.10.20	4409.10.20	free	
Non-coniferous, unfinished, Maple	4409.20.2530	4409.29.2530	free	NYI82516
Non-coniferous, unfinished, birch and beech	4409.20.2550	4409.29.2550	free	
Non-coniferous, unfinished, Other	4409.20.2560	4409.29.2560	free	
Coniferous, factory-finished	4418.90.4590	4418.90.4690	3.2	NYK88580, NYL88584
Non-coniferous, factory-finished	4418.90.4590	4418.90.4690	3.2	N005740, NYM83957

**Veneer core**

Tropical & birch face plies < 4 mm	4412.13.05	4412.31.05	free	
Tropical, Spanish cedar or walnut face plies < 4 mm	4412.13.25	4412.31.25	8.0	N016791
Tropical, tropical face ply as specified < 4 mm	4412.13.40	4412.31.40	8.0	NYE89394, N016791
Tropical face ply < 4 mm	4412.13.51	4412.31.51	8.0	NYI83048
Tropical & other tropical face ply < 4 mm, surface covered	4412.13.60	4412.31.60	8.0	N003349
Tropical face ply < 4 mm, surface covered	4412.13.91	4412.31.91	8.0	
Nonconiferous & birch face plies < 4 mm	4412.14.05	4412.32.05	free	N014319, NYL81697
Nonconiferous & Spanish cedar or walnut face plies < 4 mm	4412.14.25	4412.32.25	5.1	NYI86315
Nonconiferous < 4 mm	4412.14.31	4412.32.31	8.0	NYK88580, N018580, NYL80482, NYI83048, NYL85524, N014319, NYR04361
Nonconiferous < 4 mm, surface covered	4412.14.56	4412.32.56	8.0	
Coniferous outer plies, face ply < 4 mm	4412.19.40	4412.39.40	8.0	NYK80312, NYR04361
Coniferous outer plies, face ply < 4 mm, surface covered	4412.19.5050	4412.39.5050	5.1	
Any of the above with face ply 4 to 6 mm		4418.72.95	8.0	NYL80482, NYI83048

**TABLE C-4** Wood flooring and hardwood plywood: Comparison of 2006 and 2008 HTS—*Continued*

Product	HTS Subheading		NTR	Customs
	2006	2008	Rate of Duty	Ruling(s)
<b>Particleboard, MDF, or solid core</b>				
Tropical ply w/ layer of particleboard, face ply < 4 mm	4412.22.06	4412.99.06	free	N009861
Tropical, plywood, solid core, birch face ply < 4 mm	4412.22.10	4412.94.10	free	N018276
Tropical, plywood, other core, birch, face ply < 4 mm	4412.22.10	4412.99.10	free	
Tropical, plywood, solid core, face ply < 4 mm	4412.22.31	4412.94.31	8.0	N009195, N007691, N018276, NYL84773, N005740
Tropical, plywood, other core, face ply < 4 mm	4412.22.31	4412.99.31	8.0	
Tropical, plywood, solid core, face ply < 4 mm, surface covered	4412.22.41	4412.94.41	8.0	
Tropical, plywood, other core, face ply < 4 mm, surface covered	4412.22.41	4412.99.41	8.0	
Tropical, solid core, face ply < 4 mm	4412.22.51	4412.94.51	free	
Tropical, other core (e.g., HDF), face ply < 4 mm	4412.22.51	4412.99.51	free	N018581, N018579
Nonconiferous w/ layer of particleboard, face ply < 4 mm	4412.23.01	4412.99.06	free	NYJ86751
Nonconiferous, plywood, solid core, birch face ply < 4 mm	4412.29.15	4412.94.10	free	
Nonconiferous, plywood, other core, birch face ply < 4 mm	4412.29.15	4412.99.10	free	
Nonconiferous, plywood, solid core, face ply < 4 mm	4412.29.36	4412.94.3105	8.0	NYK89145, NYL84772, NYM87186
Nonconiferous, plywood, other core, face ply < 4 mm	4412.29.36	4412.99.31	8.0	
Nonconiferous, plywood, solid core, face ply < 4 mm, surface covered	4412.29.46	4412.94.41	8.0	
Nonconiferous, plywood, other core, face ply < 4 mm, surface covered	4412.29.46	4412.99.41	8.0	
Nonconiferous, solid core, face ply < 4 mm	4412.29.56	4412.94.51	free	N014319
Nonconiferous, other core, face ply < 4 mm	4412.29.56	4412.99.51	free	NYL84771, N004602
Any of the above w/ face ply > 6 mm		4418.72.2000	3.2	
Any of the above with face ply 4-6 mm		4418.72.9000	8.0	N005740
<b>Bamboo flooring</b>				
Grain of plies parallel, face ply < 4 mm	4412.29.56	4412.10.90	free	NYK80976, N009491
Grain of plies parallel, face ply 4 to 6 mm	4412.29.56	4418.72.91	free	N004630, N006431, N010868, N016268
Grain of plies parallel, face ply > 6 mm	4412.29.56	4418.72.20	3.2	N019775
Grain of plies perpendicular, face ply < 4 mm	4412.29.36	4412.10.05	8.0	
Grain of plies perpendicular, face ply 4 to 6 mm	4412.29.36	4418.72.90	8.0	NYK89493
Grain of plies perpendicular, face ply > 6 mm	4412.29.56	4418.72.20	3.2	
Solid core, bamboo face ply 4 to 6 mm	4412.29.36	4418.72.90	3.2	N010035, N011396

**TABLE C-4** Wood flooring and hardwood plywood: Comparison of 2006 and 2008 HTS—*Continued*

Product	HTS Subheading		NTR	Customs
	2006	2008	Rate of Duty	Ruling(s)
Veneer core, bamboo face ply, 4-6 mm	4412.14.31	4418.72.90	3.2	N011396
<sup>a</sup> Bamboo strips turned on edge (vertical)	4412.29.56	4418.79.00	3.2	N010868, N009461, N010035, N014321, N015849
Bamboo strand flooring	4418.90.45	4418.90.46	3.2	N017610, N0100035

**Cork flooring**

Laminated cork flooring	4504.10.30	4504.10.30	free	NYJ82489
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**Parquet (mosaic) flooring**

Solid	4418.30.0000	4418.71.1000	8.0	NYG89486
Engineered, face > 6 mm	4418.30.0000	4418.71.2000	8.0	
Engineered, other	4418.30.0000	4418.71.9000	8.0	

**Veneer core**

Tropical & birch face plies	4412.13.05	4412.31.05	free	
Tropical, Spanish cedar or walnut face plies	4412.13.25	4412.31.25	8.0	
Tropical, tropical face ply as specified	4412.13.40	4412.31.40	8.0	N004190
Tropical face ply	4412.13.51	4412.31.51	8.0	
Tropical & other tropical face ply, surface covered	4412.13.60	4412.31.60	8.0	N003349
Tropical face ply < 4 mm, surface covered	4412.13.91	4412.31.91	8.0	
Nonconiferous & birch face plies	4412.14.05	4412.32.05	free	NYM87266
Nonconiferous & Spanish cedar or walnut face plies	4412.14.25	4412.32.25	5.1	NYH84065
Nonconiferous	4412.14.31	4412.32.31	8.0	NYH84065, NYR02554, N018677
Nonconiferous, surface covered	4412.14.56	4412.32.56	8.0	

**Particleboard, MDF, or solid core**

Tropical ply w/ layer of particleboard	4412.22.06	4412.99.06	free	
Tropical, plywood, solid core, birch face ply	4412.22.10	4412.94.10	free	
Tropical, plywood, other core, birch face ply	4412.22.10	4412.99.10	free	
Tropical, plywood, solid core	4412.22.31	4412.94.31	8.0	N016760
Tropical, plywood, other core	4412.22.31	4412.99.31	8.0	

**TABLE C-4** Wood flooring and hardwood plywood: Comparison of 2006 and 2008 HTS—*Continued*

Product	HTS Subheading		NTR	Customs
	2006	2008	Rate of Duty	Ruling(s)
Tropical, plywood, solid core, surface covered	4412.22.41	4412.94.41	8.0	
Tropical, plywood, other core, surface covered	4412.22.41	4412.99.41	8.0	
Tropical, solid core	4412.22.51	4412.94.51	free	
Tropical, other core	4412.22.51	4412.99.51	free	
Nonconiferous w/ layer of particleboard	4412.23.01	4412.99.06	free	
Nonconiferous, plywood, solid core, birch face ply	4412.29.15	4412.94.10	free	N016760
Nonconiferous, plywood, other core, birch face ply	4412.29.15	4412.99.10	free	
Nonconiferous, plywood, solid core	4412.29.36	4412.94.31	8.0	
Nonconiferous, plywood, other core	4412.29.36	4412.99.31	8.0	
Nonconiferous, plywood, solid core, surface covered	4412.29.46	4412.94.41	8.0	
Nonconiferous, plywood, other core, surface covered	4412.29.46	4412.99.41	8.0	
Nonconiferous, solid core	4412.29.56	4412.94.51	free	
Nonconiferous, other core	4412.29.56	4412.99.51	free	N020370
<sup>a</sup> The classification of bamboo flooring made of vertically oriented strips of bamboo is currently being considered by CBP under ruling number N015849.				
<i>Sources:</i> Harmonized Tariff Schedule of the United States (2008), and USCBP Customs Rulings Online Search System.				

**APPENDIX D**  
**Hearing List of Participants**

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## CALENDAR OF PUBLIC HEARING

Those listed below appeared as witnesses at the United States International Trade Commission's hearing:

**Subject:** Wood Flooring and Hardwood Plywood: Competitive Conditions Affecting the U.S. Industries

**Inv. No.:** 332-487

**Date and Time:** October 3, 2007 - 9:30 a.m.

Sessions were held in connection with this investigation in the Main Hearing Room (room 101), 500 E Street, S.W., Washington, D.C.

### CONGRESSIONAL APPEARANCE:

**The Honorable Ron Wyden**, United States Senator,  
United States Senate, State of Oregon

### ORGANIZATION AND WITNESS:

#### Panel 1: U.S. Plywood Producers and Industry Associations

Hardwood Federation

**Deb Hawkinson**, Executive Director

The United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial and Service Workers International Union, AFL-CIO, CLC (USW)

**Keith Romig**, Strategic Issues Representative

Hardwood Plywood & Veneer Association (HPVA)

**E.T. Altman**, President, HPVA

Timber Products Company

**Gail Overgard**, Vice President, International Division

Columbia Forest Products

**Paul Davis**, Senior Marketing Analyst

**ORGANIZATION AND WITNESS (continued):**

**Panel 2: U.S. Flooring Producers and Industry Associations**

National Wood Flooring Association, Inc. (NWFA)

**Edward S. Korczak**, CEO and Executive Director, NWFA

The Wood Flooring Manufacturers Association (NOFMA)

**Timm Locke**, Executive Vice President, NOFMA

**Tommy Maxwell**, Owner, Maxwell Hardwood Flooring

**Bob Haggard**, Vice President, Sales, Hassell and Hughes Lumber Company

Saul Ewing, LLP  
Washington, D.C.  
on behalf of

Anderson Hardwood Floors, Armstrong World Industries, Inc. and Mannington Mills, Inc.

**Frank J. Ready**, President and Chief Executive Officer,

North American Flooring Products, Armstrong World Industries, Inc.

**Thomas S. Davis**, President and Chief Executive Officer,

Mannington Mills, Inc.

**Don Finkell**, President and CEO, Anderson Hardwood Floors

**Jeffrey D. Nickel**, Deputy General Counsel, Business & Commercial,  
Armstrong World Industries, Inc.

**Jeffrey S. Levin** ) - OF COUNSEL

The Master's Craft Corporation

**Clyde Elbrecht**, Owner



**ORGANIZATION AND WITNESS (continued):**

**Panel 3: Importers' Associations, Foreign Producers and Industry Associations**

International Wood Products Association (IWPA)

**Brent J. McClendon**, Executive Vice President, IWPA  
**Stuart H. Clarke**, President, Clarke Veneers and Plywood  
**Donald A. Thompson**, President, Thompson Mahogany Company

Bryan Cave, LLP  
Washington, D.C.  
on behalf of

Associação Nacional dos Produtores de Pisos de Madeira (ANPM) (National Hardwood Flooring Association - Brazil):

**Daniel Pagano**, President, BR 111 Exotic Hardwood Flooring  
**Allan Nery**, Representative, BR 111 Exotic Hardwood Flooring  
**Fabio Scandian**, Representative, The Scandian Group

**Lyle Vander Schaaf** )  
 ) - OF COUNSEL  
**Felipe Berer** )

Greenberg Traurig, LLP  
Washington, D.C.  
on behalf of

China National Forest Products Industry Association and Various Chinese Wood Products Companies

**Shengfu Wu**, Director, China National Forest Products Industry Association  
**Heping Xin**, Vice President and General Manager, Guangzhou Panyu Kangda Board Co., Ltd.  
**Frank Zhang**, Counsel for Chinese Producers, Beijing Dowway Law Firm  
**Bihong Li**, Assistant General Manager, Dehau TB New Decoration Company, Ltd.

**Jeffrey S. Neeley** )  
 ) - OF COUNSEL  
**Robert D. Stang** )



**APPENDIX E**  
**Summary of Views of Interested Parties**

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## **Anderson Hardwood Floors, Armstrong World Industries Inc., and Mannington Mills Inc.<sup>1</sup>**

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In his pre-hearing written submission, Mr. Levin, counsel to U.S.-based wood flooring producers Anderson Hardwood Floors, Armstrong World Industries Inc., and Mannington Mills Inc., urged several actions by the U.S. government to promote a “level playing field” and “fair trade” for wood flooring products, as some foreign competitors do not adhere to international trading rules:

- First, the U. S. government should press for 1) the elimination of illegal production and export subsidies of wood flooring, preferably through the WTO or bilateral consultations and negotiations where practical, or through legislation or other enforcement mechanisms if necessary; and 2) the Chinese government to both correct its foreign exchange rate system, and enforce and expand its recently announced repeal of tax rebates to wood flooring exports.
- Second, U.S. Customs and Border Protection (Customs) should continue its Priority Trade Initiative to enforce the proper tariff classification, duty collection, and country-of-origin marking of imported wood flooring products.
- Third, Congress should hold hearings, accept public input, and pass legislation that expands the Lacey Act to prohibit the importation of endangered timber species, and the U.S. government should negotiate multilateral and bilateral trade limits on endangered timber species and trade measures that encourage economically viable and sustainable forestry management to counter illegal logging.
- Fourth, Congress should extend the Trade Adjustment Assistance Program for U.S. workers who lose their jobs as a result of global trade.
- Finally, the Commission’s report in this investigation should be comprehensive, including all of the relevant facts, data, and trends both within the industry and market for hardwood flooring products, so that its report will “serve as the preeminent and objective factual repository upon which necessary and appropriate actions can be based by the executive and legislative branches of our government.”

## **Anderson Hardwood Floors<sup>2</sup>**

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In his hearing testimony, Mr. Finkell, of Anderson Hardwood Floors (Anderson), a vertically integrated producer from sawing logs to finishing hardwood flooring, stated that unless something is done quickly to address the unfair competitive environment, many more family-

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<sup>1</sup> Jeffrey S. Levin, Saul Ewing LLP, Washington DC, counsel to Anderson Hardwood Floors, Armstrong World Industries Inc., and Mannington Mills Inc., USITC written submission, September 19, 2007.

<sup>2</sup> Don Finkell, President and chief executive officer, Anderson Hardwood Floors, USITC hearing transcript, 144–147.

owned producers will not be as lucky as his firm (sold in October 2007) in aligning themselves with a larger producer within the U.S. hardwood flooring industry.

## **Armstrong World Industries Inc.<sup>3</sup>**

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In his hearing testimony, Mr. Ready, of Armstrong World Industries Inc. (Armstrong), which described itself as the largest U.S. producer of wood flooring, expressed the view, which he said was shared by many domestic producers, that the industry's playing field is not only no longer level, but is also becoming increasingly unbalanced. He said that although some domestic producers, including Armstrong, import small amounts of certain hardwood flooring and even operate production facilities abroad, these and other efforts to enhance their own competitiveness and to promote sustainable forestry practices are undermined by foreign competitors who depend upon illegal logging, government subsidies, and evasion of duties through tariff mis-classification.

## **BR 111 Exotic Hardwood Flooring<sup>4</sup>**

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In his hearing testimony, Mr. Nery, of BR 111 Exotic Hardwood Flooring, an associate member of the Brazilian National Hardwood Flooring Association (ANPM), which imports, develops, and supplies exotic hardwood flooring products from Brazil to the U.S. market, claimed that hardwood flooring products from Brazil are of such unique character (e.g., density, wear resistance, color, and grain patterns) that they do not compete with products of domestic origin and command a higher price in the more upscale niche market.

In his hearing testimony, Mr. Pagano, also of BR 111 Exotic Hardwood Flooring, said that Brazil's laws are more than adequate to prevent illegal logging, including licencing requirements to move sawn logs, and proof-of-origin requirements to ship lumber, plywood, or flooring.

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<sup>3</sup> Frank J. Ready, president and chief executive officer, North American Flooring Products, Armstrong World Industries Inc., USITC hearing transcript, 133–38.

<sup>4</sup> Allan Nery, representative, BR 111 Exotic Hardwood Flooring, USITC hearing transcript, 216–21; and Daniel Pagano, president, BR 111 Exotic Hardwood Flooring, USITC hearing transcript, 237–40.

## **China National Forest Products Industry Association (CNFPIA)<sup>10</sup>**

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In his post-hearing written submission, Mr. Neely, counsel to CNFPIA, disputed certain allegations by the U.S. wood flooring industry. He asserted that 1) subsidy allegations are vague rather than firm-specific for either the hardwood plywood or wood flooring industries in China, and are inconsistent with findings by Canadian authorities on a similar industry; 2) illegal logging cannot possibly account for more than a small fraction of the competitive cost advantages of Chinese products; 3) illegal logging is not within the control of Chinese hardwood plywood or wood flooring producers anyway; 4) the lack of U.S. formaldehyde emission regulations weakens allegations of Chinese failures to meet emissions standards; and 5) some of the same U.S. firms that aided the development efforts of Chinese firms now complain about Chinese success in the U.S. market.

In his hearing testimony, Mr. Wu of CNFPIA, addressed what he considered the misperception that Chinese plywood and wood flooring industries are unable to meet the quality or style standards in developed countries. According to Mr. Wu, (1) almost all wood for plywood and wood flooring cores comes from domestic plantation resources and only a small portion of face veneer is imported, (2) China has a cost advantage in production of labor-intensive plywood and wood flooring products, and (3) Chinese exporting firms regularly comply with industry standards worldwide. On the last point, Mr. Wu noted that China sells these products in both the Japanese and European markets that impose some of the highest standards in the world, so in certain respects, the internal Chinese market has higher product standards than the United States, which he said relies largely on voluntary industry standards.

## **Columbia Forest Products<sup>11</sup>**

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In his hearing testimony, Mr. Davis, of Columbia Forest Products (Columbia), which claims to be one of the largest manufacturers of hardwood plywood products in North America, favors market-driven approaches to suppress illegal log trading, including a certification chain of national, regional, and local distributors and fabricators in the Forest Stewardship Council (FSC) network across North America. Mr Davis encouraged the Commission to consider how forest certification programs can be utilized to manage the trade and sources of legal timber.

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<sup>10</sup> Jeffery S. Neeley, and Robert D. Stang, Greenberg Traurig, LLP, Washington, DC, counsels to China National Forest Products Industry, USITC written submission, October 24, 2007; and Shengfu Wu, director, China National Forest Products Industry Association, USITC hearing transcript, 226–30.

<sup>11</sup> Paul Davis, senior marketing analyst, Columbia Forest Products, USITC hearing transcript, 46–53.

## **Dehau TB New Decoration Co. Ltd.**<sup>12</sup>

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In his hearing testimony, Mr. Li of Dehau TB New Decoration Co. Ltd. (Dehau), stated that his firm exports 70 percent of its plywood to the United States, its products meet U.S. standards for formaldehyde emissions and certification of the legal status of its logs, and Dehau does not sell its hardwood products in the United States at unfairly low prices. With regard to unfairly low prices, he said that sales at such prices would be harmful to the firm's stock price and to its corporate survival.

## **Guangzhou Panyu Kangda Board**<sup>13</sup>

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In his hearing testimony, Mr. Xin of the Guangzhou Panyu Kangda Board (through Counsel, Mr. Zhang), stated that multi-layered engineered wood flooring sells for lower prices than solid wood flooring, due to consumer preference and willingness to pay more for solid wood flooring. According to Mr. Xin, the Chinese industry developed this product and manufactures it efficiently to high quality standards. By contrast, he said that there are few producers and little production of this product in the United States, because the U.S. industry is still learning how to manufacture it and has not yet approached the quality or efficiency standards of the Chinese product.

## **Hardwood Federation**<sup>14</sup>

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In her hearing testimony, Ms. Hawkinson, of the Hardwood Federation of industry associations that represent producers and distributors of hardwood products in the United States, said that the more systemic problems currently confronting the U.S. hardwood plywood and flooring industry include: 1) numerous foreign countries that support their wood products manufacturing with grants and loans, low-priced resources, tax benefits, and other subsidies; 2) U.S. wood products exporters also face much higher tariffs abroad than those countries who export to the United States; 3) foreign exporters also mis-classify their products to avoid paying U.S. import duties; 4) labor standards, workplace safety, and environmental protection are less stringent, or even non-existent, in foreign countries than in the United States; and 5) allegedly, a significant quantity of timber in foreign countries with state-controlled forest resources is extracted illegally from protected forests, in excess of concession limits, and without payment of royalties or duties.

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<sup>12</sup> Bihong Li, assistant general manager, Dehau TB New Decoration Co. Ltd., USITC hearing transcript, pp. 230–33.

<sup>13</sup> Heping Xin, vice president and general manager, Guangzhou Panyu Kangda Board Ltd., through Frank Zhang, Dowway Law Firm, counsel for Chinese Producers, USITC hearing transcript, 233–37.

<sup>14</sup> Deb Hawkinson, executive director, Hardwood Federation, USITC hearing transcript, 15–22.



## **Hardwood Import Coalition<sup>15</sup>**

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In his written submission, Mr. Grove, of the Hardwood Import Coalition (Coalition) of firms that import solid and engineered wood flooring as well as hardwood plywood, claimed that imports increased not necessarily because of illegal and unfair trade practices, but rather due to increased U.S. demand and shifts in consumer preferences toward a wide and oftentimes exotic array of products, some of which are only available from other countries. Coalition members import these products to take advantage of better prices, higher quality, better service, and more dependable supplies. Hence, instead of imposing punitive import duties or restrictions upon the entire industry, Mr. Grove suggested that the U.S. government should target those firms that willfully engage in unfair, deceptive, or illegal business practices, while allowing legitimate firms to import wood flooring into the U.S. market unimpeded.

## **Hardwood Plywood & Veneer Association (HPVA)<sup>16</sup>**

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In his hearing testimony, Mr. Altman, of the HPVA said his members produce more than 85 percent of the stock panel hardwood plywood and nearly 60 percent of the engineered hardwood flooring in the United States. He expressed concern that imported hardwood plywood from China does not meet the voluntary U.S. industry consensus standard ANSI/HPVA-1 that limits formaldehyde emissions, although the Chinese product is stamped as meeting this standard. He said that the U.S. industry has invested in control methods that dramatically reduced formaldehyde emission levels among domestic hardwood products over the past two decades, but that imported wall paneling had 2–5 times the emissions failure rate of domestic wall paneling during the 2001–05 period.

## **Hassell and Hughes Lumber Co.<sup>17</sup>**

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In his hearing testimony, Mr. Haggard, of domestic hardwood flooring producer Hassell and Hughes Lumber Co., claimed that U.S. producers are competitively disadvantaged and that potential adverse impacts upon raw materials suppliers and other supporting businesses result from foreign competitors not bearing the same regulatory requirements for environmental protection, employee health and safety, and sustainable forestry practices as do U.S. producers.

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<sup>15</sup> Robin Grove, chair, Hardwood Import Coalition, Washington DC, USITC written submission, January 11, 2008.

<sup>16</sup> E.T. Altman, president, HPVA, USITC hearing transcript, 31–37.

<sup>17</sup> Bob Haggard, vice president, sales, Hassell and Hughes Lumber Co., USITC hearing transcript, 123–27.

## **International Wood Products Association (IWPA)<sup>18</sup>**

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In his hearing testimony and post-hearing written submission, Mr. McClendon, of the IWPA, representing some 220 U.S. firms that produce or import wood products, stated that imported wood products provide broad economic benefits to the United States by meeting growing demand for quality products at affordable prices, providing access to wood species not grown in the United States, and supporting domestic U.S. jobs throughout the logistics chain. He said that the IWPA, in opposing illegal logging, works aggressively with and commends the U.S. Government for its initiatives, including the U.S.-Indonesia Memorandum of Understanding; the U.S.-China strategic economic dialogue to initiate a bilateral agreement; and the U.S.-Peru Free Trade Agreement annex that address this issue. However, he said that the IWPA finds it difficult to accept the U.S. industry's argument that illegal logging is causing a lack of competitiveness in the U.S. market, for it is difficult to prove how much illegal logging is occurring and where the logs are destined. According to Mr. McClendon, most illegal logs do not enter into international trade and most imports into the United States are accompanied by the necessary permits and other documents to certify that they are traded legally under international and national laws and regulations. He also expressed confidence that Customs has both the authority and capabilities necessary to deal with mis-classification and fraudulent labeling of imports. However, he said that IWPA opposes legislation to amend the Lacey Act because the legislation would not provide any assistance to foreign government efforts to eliminate illegal logging and holds U.S. firms and their customers liable for any illegal activity that occurs in forests, sawmills, transport, and ports in foreign locations.

## **J. Michael & Co. LLC and Fine Furniture Ltd.<sup>19</sup>**

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In their written submission, on behalf of J. Michael & Co. LLC (an importer of engineered wood flooring) and Fine Furniture Ltd. (an exporter and manufacturer of engineered wood flooring), Ms. Mowry, Ms. Cramer, and Ms. Herman singled out two issues for the Commission's consideration: the need to conduct separate analysis of wood flooring and hardwood plywood and the need to gather its own data instead of relying on Customs data for its analysis. In support of the first point, they asserted that the wood flooring and hardwood plywood industries are two distinct industries with vast differences in product appearances, usage, distribution channels, customer perceptions, manufacturing, and price. Accordingly, they suggested that the Commission conduct this investigation through the lens of the like-product standard in unfair trade investigations and conclude that the products manufactured by the wood flooring and hardwood plywood industries are not like products. They also stated that Customs data for wood flooring and hardwood plywood are imprecise,

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<sup>18</sup> Brent J. McClendon,, executive vice president, IWPA, USITC hearing transcript, 206-09; and USITC written submission, October 24, 2007.

<sup>19</sup> Kristin H. Mowry, Jill A. Cramer, and Jodi B. Herman, Mowry International Group LLC, Washington DC, counsels to J. Michael & Co. LLC and Fine Furniture Ltd., USITC written submission, January 11, 2008.

especially for engineered wood flooring, so the Commission should rely instead on Commission-collected information.

## **Mannington Mills Inc.**<sup>20</sup>

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In his hearing testimony, Mr. Davis, of engineered hardwood flooring producer Mannington Mills Inc. (Mannington), said that he was more concerned about the substantial import growth in recent years, particularly from China, than about the weak residential housing market and rising production costs. Mr. Davis claimed that China became the world's dominant producer and exporter by 2006, at the expense of both U.S. and other foreign producers. He attributed China's growth to low-cost but highly skilled labor, an undervalued currency, substantial government subsidies, and suspect logging practices. These factors and alleged use of U.S. designs enabled Chinese producers to leap-frog over the development and marketing stages in a short time frame and at minimal cost, to under-cut domestic producers with cheaper knock-offs of U.S. brands in the U.S. market.

## **Master's Craft Corp.**<sup>21</sup>

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In his hearing testimony, Mr. Elbrecht, of solid wood flooring producer Master's Craft Corp., claimed that undertaking the veneering and pressing stage in China, not only enables his U.S.-based firm to compete in a global market, but also supports both the U.S. hardwood timber industry and jobs for Americans, and ensures that U.S.-origin raw materials continue to retain a competitive edge. According to Mr. Elbrecht, any proposed regulations to level the playing field should address only those products of non-native origin or products manufactured or acquired illegally, as protective regulations affecting products with domestic content would render them uncompetitive and unable to support the U.S. timber industry. Further, any protective tariffs imposed upon goods imported from China could backfire by tempting other countries to respond, thus rendering U.S. exports less competitive abroad.

## **Maxwell Hardwood Flooring**<sup>22</sup>

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In his hearing testimony, Mr. Maxwell, of domestic hardwood flooring producer Maxwell Hardwood Flooring (Maxwell), noted that the domestic industry's already small profit margin is narrowing due to low hardwood flooring prices and rising fuel charges. He also said that the major competitive disadvantage for domestic producers is the alleged government subsidies provided to foreign competitors.

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<sup>20</sup> Thomas S. Davis, president and chief executive officer, Mannington Mills Inc., USITC hearing transcript, 138-44.

<sup>21</sup> Clyde Elbrecht, owner, Master's Craft Corp., USITC hearing transcript, 147-52.

<sup>22</sup> Tommy Maxwell, owner, Maxwell Hardwood Flooring, USITC hearing transcript, 127-33.

## **National Wood Flooring Association Inc. (NWFA)<sup>23</sup>**

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In his hearing testimony, Mr. Korczak, of the NWFA, which includes both U.S. and foreign distributors, dealers, contractors, and producers of wood flooring, affirmed that the distinct products of both U.S. and foreign wood flooring manufacturers are competitive in a global industry when it is characterized by free trade and fair marketing. By contrast, he said that China and certain other nations were cited for illegal logging, mislabeling products to evade import tariffs, and government subsidies benefitting their own wood flooring industries.

## **Retail Industry Leaders Association (RILA)<sup>24</sup>**

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In her written submission, Ms. Lester of the RILA, which represents the largest retailers in the United States, including a number of retailers that carry wood flooring products, said that artificially restricting imports would adversely affect retailers by limiting the variety of flooring products they can provide to consumers and by restricting supply, which can increase prices that would then be shouldered by consumers of flooring products who could potentially switch to other flooring products, thus further eroding the market share of U.S. producers. Even though hardwood and softwood flooring may sometimes be cheaper to produce overseas, the additional shipping and import tariff costs, as well as the additional shipping time, do not easily allow for product customization, which the retailer must consider. Hence, domestically produced flooring from domestically grown wood is still highly competitive when compared with imports of finished products. Further, she said that rising U.S. exports (benefitting from higher worldwide demand due to consumer preferences, shipping costs, and a weaker U.S. dollar) and declining U.S. imports shows that the U.S. market for hardwood and softwood flooring is still highly competitive, with neither imports nor domestic products dominating, conditions that RILA anticipates to continue into at least the near future.

## **Timber Products Co.<sup>25</sup>**

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In his hearing testimony, Mr. Overgard, of the Timber Products Co., stated that his firm insists that its timber imports from China must comply with U.S. domestic laws and standards. However, he expressed concern about timber documentation, emissions standards, duty evasion, and subsidies. Logs entering China are difficult to document because they pass through many different traders. He said that as a result, plywood entering the United States from China is highly undervalued. Further, Chinese hardwood plywood producers are not

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<sup>23</sup> Edward S. Korczak, chief executive officer and executive director, NWFA, USITC hearing transcript, 114–16.

<sup>24</sup> Stephanie Lester, vice president, International Trade, RILA, Arlington VA, USITC written submission, December 19, 2007.

<sup>25</sup> Gail Overgard, vice president, International Division, Timber Products Co., USITC hearing transcript, 38–45.

effectively being held to any type of standard for formaldehyde emissions, as plywood entering from China often measures 10–60 times the standard for plywood produced in the United States. He said that manufacturers in China often place a birch backing on another hardwood face to take advantage of the duty-free status of birch plywood and avoid the 8-percent rate of duty applied to any other faced plywood. Finally, according to Mr. Overgard, the Chinese government often subsidizes its wood products industry through VAT rebates, grants, favorable interest rates on loans, debt forgiveness, and tax concessions.

## **United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial and Service Workers International Union, AFL-CIO, CLC (USW)<sup>26</sup>**

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In her pre-hearing written submission, Ms. Hart, of the USW, stated that the rapid growth in U.S. imports of hardwood plywood and flooring and consequent deterioration in the U.S. trade balance occurred largely due to the influx of imports from newly emerging exporters, particularly China, but also Brazil and Chile. According to Ms. Hart, this rapid import growth of hardwood flooring and plywood is attributed principally to systematic non-enforcement of logging laws and government failures to prohibit illegal log imports that enabled downstream wood products industries to enjoy unfair advantages from lower input costs. Further, industries in many foreign countries rely on lax labor and environmental standards to enhance their competitiveness.

In his hearing testimony, Mr. Romig, of the USW, claimed that many segments of both the paper and woodworking industries are disadvantaged by the unfair trade practices of foreign competitors, particularly cutthroat pricing and competitors who take full advantage of lax labor and environmental standards abroad. Mr. Romig cited statistics of the American Forest and Paper Association indicating that as much as 23 percent of global hardwood exports and 30 percent of hardwood plywood exports are of suspicious origin and that these illegal exports depress world prices by 7–16 percent. Likewise, statements of the Organization of Economic Cooperation and Development were cited by Mr. Romig indicating that significant percentages of the wood from China, Russia, Indonesia, and Brazil are of suspicious origin and that these four countries now account for nearly 50 percent of wood flooring imports to the United States and 66 percent of U.S. hardwood plywood imports.

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<sup>26</sup> Holly R. Hart, Legislative director, USW, Washington DC, USITC written submission, August 29, 2007; and Keith Romig, strategic issues representative, USW, USITC hearing transcript, 22–30.

## **U.S. Plywood and Wood Flooring Industries<sup>27</sup>**

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In his post-hearing written submission, Mr. Levin, counsel to the U.S. Plywood and Wood Flooring Industries, stated that these industries have been severely harmed by unfair import competition that displaced U.S. market share held by the domestic producers, despite market conditions during 2002–06 that should have benefitted them, including record demand for hardwood plywood and flooring. Mr. Levin attributed the problems confronting the domestic industries to three factors. First, tariff classifications for these products are unwieldy, which causes widespread confusion in the trading community among foreign suppliers, U.S. importers, and even Customs officials. Second, exploding import growth in recent years, with products from China leading the increase, as China has grown from an insignificant player in 2002 to predominate by 2006. Finally, Chinese producers and exporters benefit from a nearly limitless supply of cheap yet highly skilled labor, an undervalued fixed exchange rate, and subsidies that allegedly include discounted loans for export-oriented enterprises, loan forgiveness for state-owned enterprises, preferential lending mechanisms, grants, and foreign currency retention schemes.

## **Wood Flooring Manufacturers Association (NOFMA)<sup>28</sup>**

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In his hearing testimony, Mr. Locke, of NOFMA, said that his organization represents U.S. hardwood flooring manufacturers who produce approximately 75 percent of the solid unfinished flooring produced in the United States. He expressed concern about the volume of finished hardwood flooring entering the U.S. market that is being mis-classified as solid unfinished hardwood products, allegedly to avoid paying duties. Further, although import volumes have declined since 2006, in part due to stepped-up Customs enforcement, imported finished hardwood flooring still enters the U.S. market at prices below the cost for domestic mills to produce unfinished flooring stock.

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<sup>27</sup> Jeffrey S. Levin, Saul Ewing LLP, Washington DC, counsel to the U.S. Plywood and Wood Flooring Industries, USITC written submission, October 24, 2007. This brief was submitted on behalf of the Hardwood Federation, HPVA, NWFA, NOFMA, Anderson, Armstrong, Columbia, Mannington, and Timber Products, who together formed this ad hoc coalition.

<sup>28</sup> Tim Locke, executive vice president, NOFMA, USITC hearing transcript, 116–23.