United States International Trade Commission

Conditions of Competition in the U.S. Market for Wood Structural Building Components

Investigation No. 332-445
USITC Publication 3596
April 2003

U.S. International Trade Commission

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PREFACE

On August 19, 2002, the Commission instituted investigation No. 332-445, *Conditions of Competition in the U.S. Market for Wood Structural Building Components,* under section 332(g) of the Tariff Act of 1930. The investigation was in response to a request from the Senate Committee on Finance (Committee) received on July 31, 2002 (see appendix A).

The purpose of this investigation was to gather information on competitive conditions in the U.S. structural building components industry over the period 1997-2002. As requested by the Committee, this report specifically provides:

1. An overview of the North American market for prefabricated wood structural building components (including a description of the principal wood structural building components in production and trade, and their nonwood substitutes);

2. A description of the U.S. industry, and the industry in the principal countries supplying the U.S. market, including recent trends in production, capacity, employment, and consumption;

3. Trade patterns (both imports and exports), factors affecting trade patterns (including tariffs and other border measures), and competitive conditions affecting U.S. production and trade;

4. Views of industry, homebuilders, and other interested parties on future developments in the supply of and demand for U.S. wood structural building components, including the effect of imports (including factors affecting imports such as tariffs and other border measures) and nonwood substitutes on U.S. production and housing construction; and

5. A comparison of the strengths and weaknesses of the U.S. industry and major U.S. suppliers in such areas as raw material supply, technological capabilities, plant and equipment modernization, and present capacity and potential capacity expansion.

A public hearing in connection with this investigation was held on December 5, 2002, in Washington DC. Notice of the investigation and hearing was given and written submissions were solicited by publishing a notice in the *Federal Register* of August 28, 2002 (67 F.R. 55273). A list of hearing participants is shown in appendix C.

The Commission obtained information from a variety of sources, including literature searches of industry, government, and academic publications. Information from industry and interested parties was obtained through the Commission's public hearing, responses to questionnaires, written submissions, telephone interviews, and field work. The Commission sent producer questionnaires to 347 companies that manufacture wood structural building components and purchaser questionnaires to 310 companies that are end users of wood structural building components. A total of 102 manufacturers completed and returned questionnaires. Based on the number of plants accounted for by questionnaire respondents, sampling intensities are estimated to range from 11 percent to 82 percent for the various products included in the scope of this investigation. A total of 55 purchasers completed and returned the questionnaires. The estimated sampling intensity of purchasers of wood structural building components was less than 1 percent.

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for Wood Structural Building Components

Abbreviations and Acronyms

AISI	American Iron and Steel Institute
APA	APA - The Engineered Wood Association
AF&PA	American Forest & Paper Association
BCMC	Board for the Coordination of the Model Codes
BOCA	Building Officials and Code Administrators, International
CABO	Council of American Building Officials
CCBFC	Canadian Commission on Building and Fire Codes
CFLI	Coalition for Fair Lumber Imports
CNBC	(Canadian) National Building Code
Commission or USITC	U.S. International Trade Commission
EN	Explanatory Notes
EWP	Engineered Wood Products
FAS	United States Department of Agriculture, Foreign Agricultural Service
FJ	Finger jointed
FPL	USDA Forest Service, Forest Products Lab
FS	United States Department of Agriculture, Forest Service
Glulam	Glue laminated timbers
HTS	Harmonized Tariff Schedule of the United States
IBC	International Building Code
ICBO	International Conference of Building Officials
ICC	International Code Council
IRC	International Residential Code
LSL	Laminated strand lumber
LVL	Laminated veneer lumber
LTFV	Less than fair value
M	Cubic meters
MSR	Machine stress rated
MT	Metric tons
NAHB	National Association of Home Builders
NBC	National Building Code
NLBMDA	National Lumber and Building Materials Dealers' Association
NTM	Nontariff measures
OSB	Oriented strand board
PSL	Parallel strand lumber
SBC	Standard Building Code
SBCCI	Southern Building Code Congress, International
SCL	Structural composite lumber
SFA/MF	Single family attached/multifamily
SFD	Single family detached
SLA	Softwood Lumber Agreement
SPF	Spruce-Pine-Fir
SYP	Southern yellow pine
UBC	Uniform Building Code
U.S. Customs	U.S. Customs Service
USDA	United States Department of Agriculture
USDOC	United States Department of Commerce
USDOC, ITA	United States Department of Commerce, International Trade Administration
USTR	United States Trade Representative
WTCA	Wood Truss Council of America

EXECUTIVE SUMMARY[1]

Introduction

- On July 31, 2002, the U.S. International Trade Commission (Commission) received a letter from the Senate Committee on Finance (Committee), requesting that the Commission "... conduct a study to gather information on competitive conditions in the U.S. structural building components industry." The Committee's request indicated that little public information is available on this industry, and cited its need for impartial and detailed information on the competitiveness of this industry. On August 19, 2002, the Commission instituted investigation No. 332-445, *Conditions of Competition in the U.S. Market for Wood Structural Building Components,* under section 332(g) of the Tariff Act of 1930. As requested by the Committee, the study covers structural building components including, but not limited to, beams and arches, roof and floor trusses, I-joists, prefabricated partitions and panels (including headers) for buildings and other structural wood members over the period 1997-2002 to the extent possible.

North American Market Overview

- The North American market, comprising the United States and Canada, is the leading world producer and consumer of forest products. Most North American consumption of wood structural building components is supplied from within. The major market, the United States, is largely supplied by domestic production and imports from Canada.[2] The Canadian market is approximately 10 percent of the size of the U.S. market and is largely supplied by Canadian product.

- Demand for wood structural building components is driven by the markets for new residential construction, residential repair and remodeling, and nonresidential commercial construction, all of which remained strong during 1997-2002 in Canada and the United States.

- U.S. housing starts increased from 1.5 million to 1.7 million during 1997-2002. In 2001, the Southern United States accounted for almost half (46 percent) of all privately owned housing starts. House size, which also affects the demand for wood structural building components, increased by 11 percent during 1997-2001. In addition, U.S. expenditures for residential repair and remodeling and nonresidential commercial construction grew at an average compound annual rate of 4.2 percent over the period. Canadian housing

[1] The information and analysis provided in this report are for the purposes of this report only. Nothing in this report should be construed to indicate how the Commission would find in an investigation conducted under statutory authority covering the same or similar subject matter.

[2] Mexico is not a large producer or supplier of wood structural building components to the United States. In 2002, Mexico supplied less than 1 percent of all U.S. imports under HTS 4418.90.45, the subheading that includes wood structural building components.

starts increased from 147,040 to 162,733 over 1997-2001; in general, Canadian trends in house size and remodeling expenditures were similar to those in the United States over the same period.

- Wood structural building components such as metal plate connected roof trusses and metal plate connected wood parallel chord (floor) trusses offer builders certain advantages, including on site labor savings, reduced erection time, specific engineered design values, and design flexibility. Prefabricated floor and wall panels are often used in the production of factory-built houses. Factory-built construction offers advantages such as the ability to build houses year-round, price stability, speed of construction, and energy savings.

- Prior to the advent of computer design, roof design was limited by the typical truss shapes and sizes contained in a manufacturer's catalogue. As the complexity of roof design no longer is constrained by reliance on preexisting designs, architects are limited only by their imaginations and esthetics and roof shapes have become progressively more complex.

- Glulam, I-joists, and structural composite lumber (SCL) are engineered wood products (EWP) that have been developed for specific performance characteristics. The development of EWP has been a response to the need to optimize wood product output from a changing timber resource and is primarily a North American phenomenon. EWP, manufactured with wood veneer or strands of wood fiber, utilize the fiber from smaller trees very efficiently, and in some cases can be manufactured from species of wood that are underutilized and relatively inexpensive. The development of EWP is also a result of industry efforts to create products that have better performance characteristics than traditional wood products.

- During 1997-2001, wood maintained its dominant presence (86 percent) in the U.S. residential market for structural building materials compared with its principal substitutes, concrete and steel.

The North American Wood Structural Building Component Industry

United States

- Driven by strong construction markets during 1997-2001, U.S. production of wood structural building components increased at an average compound annual rate of 8.0 percent to $10.3 billion in 2001 and is likely to be $10.7 billion in 2002. During 1997-2001, production of trusses and prefabricated panels increased continually at an average compound annual rate of 9.0 percent to $8.5 billion in 2001 and is likely to be $9.0 billion in 2002. EWP production grew at an average compound annual rate of 3.8 percent during the period; production increased from $1.5 billion in 1997 to $1.8 billion in 2001 and is likely to remain at $1.8 billion in 2002.

- In 2002, 1,690 U.S. firms manufactured trusses and/or prefabricated panels at more than 1,800 plants. Most are small firms (in 2001, average production per plant was $4.7 million) that are close to the markets they serve. During 1997-2002, the Midwest region accounted for the largest share of truss and panel production. Of the 38 U.S. firms that manufacture EWP, large forest products firms typically manufacture a full line of EWP and other smaller firms manufacture glulam.

- Coincident with strong growth in truss shipments during 1997-2001, the total number of truss industry employees increased from 32,069 to 39,307 over the period. Employment in the EWP industry is estimated to have increased from 5,372 to 5,724 during 1997-2001.

- Most trusses and EWP are used in residential construction, but EWP manufacturers reported that sales to commercial construction in 2001 were 25 percent of reported sales, somewhat more than the commercial sales reported by truss manufacturers.

- Truss and EWP production varies seasonally with the construction cycle and is heaviest in the second and third quarters. Production was seasonal in all regions of the country but slightly more so in the Northeast and Midwest. Seasonal employment peaks were more pronounced in the Northeast than in other regions of the country.

- During 1997-2002, roof trusses accounted for most production reported by truss manufacturers. Floor trusses accounted for 9 percent, and wall and floor panels increased from 5 percent to 11 percent. I-joists accounted for approximately 50 percent of U.S. EWP production. Laminated veneer lumber (LVL) accounted for 20-29 percent, and glulam accounted for 26-34 percent of the total value of EWP production.

- In spite of the strong U.S. housing market, the price of softwood lumber, the principal raw material of wood structural building components, generally declined due to strong North American softwood lumber production; other factors affecting price included weak export demand and increased U.S. imports of lumber from Europe.

- In 2001, 29 percent of reported truss sales was to building material dealers and 71 percent was to home builders, framers, and other customers. Some large home builders have integrated backwards into component manufacturing while some truss manufacturers have integrated forward into framing. Unlike sales of trusses, the majority (64 percent) of U.S. EWP sales in 2001 went to building material dealers, and the balance went to home builders, framers, and other customers.

Canada

- Wood structural building components account for a growing part of the Canadian wood products industry. During 1997-2002, economic growth and brisk construction activity in Canada and the United States fueled demand for Canadian-produced wood structural building components.

- Canadian Government shipment and employment data for wood structural building components provide a rough gauge of the size of the wood structural building components industry in Canada. Shipments of wood structural building components in Canada increased from C$480 million in 1997 to C$553 million in 1999, the latest year for which data are available. The total number of employees in the industry grew from 4,176 in 1997 to 4,517 in 1999. The United States accounts for over 90 percent of Canadian exports of wood structural building components; the only other export market of significance is Japan.

- In Canada, trusses and prefabricated panels are produced primarily by small family-owned businesses, many of which operate just one production facility. There are approximately 300 wood truss production facilities throughout Canada; two-thirds are in British Columbia, Ontario, and Quebec. Shipments of roof trusses in Canada totaled C$296.1 million in 1999, the latest year for which data are available. Shipments of roof trusses likely increased during 2000-2002 as a strong housing market in both Canada and the United States stimulated demand for trusses. Almost all Canadian exports of roof trusses go to the United States. Canadian imports of trusses are minimal.

- Cross-border investment by Canadian truss producers or U.S. truss producers has been limited. The relatively small size of the Canadian truss market relative to the U.S. market has kept U.S. investment in Canada to a minimum. For Canadian producers, investment in the U.S. market has been hindered by a lack of capital and a depreciating currency relative to the U.S. dollar.

- EWP in Canada generally are produced by much larger, and considerably fewer, firms than those that produce trusses and prefabricated panels. Some of these firms are publicly owned, and some are family owned. Some are the Canadian operations of large U.S. forest products companies. In response to strong construction markets in the United States and Canada during the period, Canadian production of glulam increased by 67 percent, I-joist production more than doubled, and LVL output expanded rapidly. Much of this output was exported, principally to the United States. Canada's imports of EWP are minimal.

- In Canada, there are nine producers of glulam and three producers of LVL. I-joists are produced by approximately 14 companies. Canadian production of glulam, LVL, and I-joists is quite small compared with U.S. output of these products. U.S. production of glulam is more than 10 times that of Canada; U.S. production of LVL is 10 times that of Canada; and U.S. production of I-joists is 4 times that of Canada.

- The EWP industry in Canada during the past several years has witnessed consolidation, new investment, capacity growth, and new entrants into the market. Some producers have bought other producers to expand and diversify their EWP offerings and increase their market share. Some have built new capacity to meet growing demand for EWP, while others, heretofore traditional lumber producers, have begun to move into engineered wood production to grow their business and to hedge the risks associated with the ongoing lumber trade dispute between the United States and Canada. The net result of all of this activity has been intensified competition and a rapid growth in capacity that has outstripped growth in production.

U.S. Trade in Wood Structural Building Components

- Industry officials identified U.S. trade actions (both the Softwood Lumber Agreement and subsequent antidumping and countervailing duty orders on softwood lumber), among other factors, that may have influenced the level of U.S. imports of wood structural building components from Canada during 1997-2002. These actions may have provided an incentive for Canadian firms to increase shipments to the United States of these items that contain softwood lumber and thereby avoid duties or quotas that would otherwise have applied to softwood lumber contained therein. Commission questionnaire responses and industry officials indicate the impact of these exports is primarily on U.S. border States.

- In contrast, industry sources indicate that U.S. trade actions have had less impact on EWP markets, and that SCL and glulam markets have not been impacted substantially. However, industry officials alleged that the trade actions have affected the market for I-joists by inhibiting the flow of Canadian flange stock to the United States.

- Wood structural building components are classified under Harmonized Tariff Schedule of the United States (HTS) 4418.90.45, builders' joinery and carpentry of wood, other. However, several factors complicate the interpretation of the levels of imports and exports reported in this subheading in relation to this investigation, including the fact that many products not within the scope of this investigation were, and continue to be, classified under this HTS subheading. Furthermore, changes in the classification of products between 1997 and 2002 resulted in highly variable imports within some statistical categories. Finally, trade in this HTS subheading is reported only in terms of value, obscuring trends in imports on a volume basis.

- Estimated U.S. imports of wood structural building components increased irregularly from $169.2 million in 1997 to $394.3 million in 2002. Canada was the principal supplier of these components during the period. The ratio of total U.S. imports to U.S. consumption increased from 3.4 percent in 1997 to 5.5 percent in 2002.

- U.S. exports of wood structural building components declined from $247 million in 1997 to $116 million in 2002. Loss of the Japanese glulam market to European competition was a significant factor in this decrease.

Competitive Conditions for U.S. and Canadian Producers in the U.S. Market

- The United States and Canada have ample wood supplies for the production of wood structural building components. However, Canada enjoys an advantage relating to supplies of flange stock materials (e.g., black spruce). U.S. and Canadian industry representatives allege that two-tiered pricing exists in the North American market for softwood lumber, that the Canadian price advantage was larger during the U.S./Canada Softwood Lumber Agreement (SLA) than in 2002, that two-tiered pricing remains in place since the imposition of U.S. antidumping and countervailing duties, and that border State truss manufacturers experience the largest competitive disadvantage because of any two-tiered price system.

- The wood structural building component industries in the United States and Canada are very similar in terms of technological capabilities and plant and equipment modernization. The industries in both countries are well established and the knowledge and skill level of the work force are comparable. Truss design software, a critical component of the truss manufacturing process, is sold by a handful of vendors to both U.S. and Canadian truss producers.

- In general, the United States has an advantage over Canadian producers regarding transportation cost and market location. Although residential construction in Canada has been strong since 1997, it is one-tenth the size of the residential construction market in the United States. Much of the large U.S. demand for wood structural building components is concentrated in areas that are greater distances from Canadian production facilities. Increased freight costs in many instances consequently reduce Canadian producers' ability to be competitive in these geographic areas with local producers. Therefore, Canadian exports of roof trusses to the United States have been concentrated in U.S. border States, whose relative proximity to Canadian truss plants lessens the impact of freight costs.

- U.S. capacity to produce wood trusses and prefabricated panels and EWP far surpasses that of Canada. Although consisting primarily of small firms, the U.S. truss and prefabricated panel industry in recent years has seen the emergence, through internal expansion or consolidation, of some large producers with numerous production facilities. With respect to EWP, the plants of major U.S. producers tend to be bigger and more numerous than those of their Canadian competitors. The larger capacity of these manufacturers may provide them with greater economies of scale and lower unit production costs than their Canadian counterparts, and may also increase their opportunities for raising capital to expand capacity.

- U.S. Department of Labor statistics indicate that hourly compensation costs for production workers in all manufacturing in Canada in 2001 were 77 percent of U.S. compensation costs. However, labor costs for production workers in lumber and wood products manufacturing in Canada and the United States are roughly the same.

- Overall, the real value of the Canadian dollar depreciated by 7.8 percentage points relative to the U.S. dollar from January 1997 through September 2002, thus contributing to the competitiveness of Canadian products in the U.S. market during this period.

CHAPTER 1
INTRODUCTION

Background

On July 31, 2002, the U.S. International Trade Commission (Commission) received a request from the Senate Committee on Finance (Committee) under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)) that the Commission "... conduct a study to gather information on competitive conditions in the U.S. structural building components industry." (See request letter in appendix A.) The Committee request indicated that little public information is available on this industry, and cited its need for impartial and detailed information on the competitiveness of this industry as part of the Committee policy making process. The Committee request also indicated that growth in the U.S. market has been significant and imports of these products have increased significantly.

Purpose

As requested by the Committee, this report provides (1) an overview of the North American market for prefabricated wood structural building components (including a description of the principal wood structural building components in production and trade, and their nonwood substitutes); (2) a description of the U.S. industry, and the industry in the principal countries supplying the U.S. market, including recent trends in production, capacity, employment, and consumption; (3) trade patterns (both imports and exports), factors affecting trade patterns (including tariffs and other border measures), and competitive conditions affecting U.S. production and trade; (4) views of industry, homebuilders, and other interested parties on future developments in the supply of and demand for U.S. wood structural building components, including the effect of imports (including factors affecting imports such as tariffs and other border measures) and nonwood substitutes on U.S. production and housing construction; and (5) a comparison of the strengths and weaknesses of the U.S. industry and major U.S. suppliers in such areas as raw material supply, technological capabilities, plant and equipment modernization, and present capacity and potential capacity expansion.

The Commission instituted investigation No. 332-445, *Conditions of Competition in the U.S. Market for Wood Structural Building Components*, under section 332(g) of the Tariff Act of 1930 on August 19, 2002. A public hearing in connection with this investigation was held on December 5, 2002, in Washington DC. Notice of the investigation and hearing was given by posting copies of the notice at the Office of the Secretary, U.S. International Trade Commission, and by publishing the notice in the *Federal Register* of August 28, 2002, (67 F.R. 55273).[1]

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[1] A copy of the *Federal Register* notice of the Commission investigation is included in appendix B.

Scope

As specified in the request letter from the Committee, the report covers wood structural building components including, but not limited to, beams and arches, roof and floor trusses, I-joists,[2] prefabricated partitions and panels for buildings and other structural wood members, and covers the period 1997-2002, to the extent possible. These products are classified under Heading 4418 of the Harmonized Tariff Schedule of the United States (HTS) (builders' joinery and carpentry of wood) and are used in residential and commercial construction. Although these products are closely related by end-use and are in some cases substitutes, producers and industry analysts may consider them to be part of several separate industries. Manufacturers of trusses, wall panels, and floor panels are represented by the Wood Truss Council of America (WTCA). Manufacturers of beams, I-joists, and other composite structural wood members are represented by APA - The Engineered Wood Association (APA).[3]

The principal prefabricated wood structural building components covered under Heading 4418 as examined in this report are described below.

Roof and Floor Trusses

A truss is an engineered structural component designed to carry its own load and a superimposed design load. The individual pieces of the truss (members) form a semirigid structure and are assembled in such a way that they form triangles.[4] Connections between individual pieces are typically made with steel connectors called truss plates.[5] Designs are based on building code and engineering standard requirements,[6] but the shape and size of a truss is limited only by manufacturing capabilities and shipping and handling constraints.[7] Roof trusses are designed and manufactured to be used principally in roof construction and are made in a wide variety of shapes and sizes to accommodate different roof shapes and areas.[8] Floor or parallel chord trusses are designed and manufactured in much the same way as roof trusses but are characterized by a flat profile. Floor trusses are manufactured in a wide range of dimensions (length and depth) depending on the distance to be spanned and load to be supported. Floor and roof trusses are typically manufactured from various species

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[2] All references to the term I-joist in this report mean I-joists of wood construction as described further in chapter 2 of this report.

[3] Formerly known simply as the American Plywood Association, APA - The Engineered Wood Association broadened its scope to include manufacturers of new products such as oriented strand board, I-joists, laminated veneer lumber, parallel strand lumber, and laminated strand lumber.

[4] "Industry Terminology," WTCA, found at *http://www.woodtruss.com/terminology.htm*, retrieved July 15, 2002.

[5] Stamped from galvanized steel, truss plates are toothed connector plates which transfer tensile and shear forces within the truss. "Truss Types," found at *http://www.cwc.ca/products/trusses/types.html*, retrieved Sept. 5, 2002.

[6] "Quality Control," found at *http://www.cwc.ca/products/trusses/quality.html*, retrieved Sept. 5, 2002.

[7] "Wood Truss Introduction," found at *http://www.cwc.ca/products/trusses/intro.html*, retrieved Sept. 5, 2002.

[8] Ibid.

of softwood dimension lumber or light gauge steel and may contain members made from engineered wood products (EWP).

Laminated Beams and Arches

A variety of engineered wood products that are used for beams and arches fall within the scope of the investigation including glue laminated timbers (glulam),[9] I-joists,[10] and structural composite lumber (SCL) such as laminated veneer lumber (LVL), parallel strand lumber (PSL), and laminated strand lumber (LSL).[11]

Prefabricated Partitions and Panels

Prefabricated partitions and panels include wall panels and floor panels. A wall panel is a prefabricated structural component designed and manufactured to be used in wall applications. It consists of a frame of dimension lumber which is sometimes sheathed with oriented strand board (OSB),[12] insulation, and/or drywall.[13] A floor panel is a prefabricated structural component designed and manufactured to be used in floor applications and typically consists of a frame of floor joists or trusses overlaid with decking or flooring.

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[9] Glue laminated timber is a stress-rated EWP comprised of laminations of lumber (2 inches or less in thickness) that are bonded together with strong, waterproof adhesive along their length to form larger beams and timbers. "Glulam: Lower Cost, Higher Design Value," found at *http://www.apawood.org/glu_level_b.cfm?content=prd_glu_main*, retrieved Sept. 3, 2002.

[10] I-joists are structural members manufactured using lumber or laminated veneer lumber flanges and structural panel webs (typically oriented strand board) glued together with adhesives. The cross-section of the member forms the shape of the capital letter "I." "Industry Terminology," WTCA, found at *http://www.woodtruss.com/terminology.htm*, retrieved July 15, 2002.

[11] There are several types of SCL. LVL consists of layers of wood veneer and adhesive that are formed into billets of varying thicknesses and widths and cured in a heated press. PSL is manufactured by gluing strands of wood together under pressure with the wood fibers oriented along the length of the member. Found at *http://www.cwc.ca/products/ewp/psl/intro.html* and retrieved Sept. 9, 2002. Laminated strand lumber (LSL) is a composite wood product manufactured with strands of aspen or yellow poplar glued together. Typically, the wood fibers are oriented along the length of the member. Found at *http://tjm.com/products/restim.cfm*, retrieved Nov. 7, 2002.

[12] Like plywood, OSB is a panel product that is manufactured in various sizes and thicknesses. It is manufactured from rectangular-shaped wood strands that are oriented length-wise, arranged in layers at right angles to one another, laid up into mats, and bonded together with waterproof, heat-cured adhesive. "A Guide to Engineered Wood Products," APA - The Engineered Wood Association, Nov. 2002, p. 4.

[13] Evan Perez, "In More Homes, Foundations, Walls, Staircases Are Built Elsewhere and Trucked to Site," *Wall Street Journal*, Oct. 4, 2002.

Approach

This report describes the competitive conditions in the U.S. wood structural building components industry, including a discussion of the U.S. industry, the industry in the principal countries supplying the U.S. market, and recent trends in production, capacity, employment, and consumption. It also describes recent trade patterns, factors affecting trade patterns (including tariffs and other border measures), and competitive conditions affecting U.S. production and trade. It also provides an assessment of the relative competitiveness of the U.S. and Canadian industries based on information collected for the investigation. Data shown in the report cover 1997-2001 and 2002 to the extent that data are available.

The Commission obtained information from a variety of sources, including literature searches of industry, government, and academic publications. Information from industry and interested parties was obtained through the Commission's public hearing, responses to questionnaires, and written submissions.[14] Field trips to the States of Illinois, Maryland, North Carolina, Ohio, Wisconsin, and Washington were taken to interview manufacturers of both truss and panel products and EWP, the principal trade associations, and employees of the USDA Forest Service, Forest Products Lab (FPL). Canadian truss manufacturers were interviewed at the 2002 Building Component Manufacturers Conference in Columbus, Ohio. Also, telephone interviews were conducted with U.S. and Canadian manufacturers, Canadian trade associations, purchasers of wood structural building components, and industry analysts. Statistical data specific to the wood structural building component industry were provided by the WTCA, the APA, the National Association of Home Builders (NAHB), the FPL, and the U.S. Department of Commerce (USDOC).

Questionnaire Process

Existing information was supplemented by sending producer questionnaires to 347 companies that manufacture wood structural building components[15] and purchaser questionnaires to 310 companies that are end users of wood structural building components.[16] The producer sample was a stratified random sample from the 1,690 known U.S. manufacturers of wood structural building components. A selection of manufacturers belonging to the WTCA (for which data on the size of firms were available) was made such that the larger firms (based on total sales) were sampled at a heavier intensity than the smaller firms. This selection was combined with a random selection of the nonmember firms (for which size of firm data were not available). A total of 102 manufacturers completed and returned questionnaires. Questionnaires responses were received from producers in all regions of the United States. Based on the number of plants accounted for by questionnaire respondents, sampling intensities are estimated to be 11 percent for trusses and prefabricated panels, 76 percent for LVL, 82 percent for I-joists, and 42 percent for glulam. The 310 purchasers were chosen as a stratified random sample of the estimated 65,000 U.S.

[14] A list of hearing participants is shown in appendix C.

[15] Included in the group of producers were 34 producers of EWP and 14 producers which also purchase structural building components.

[16] Included in the group of purchasers were 15 dealer/brokers of the products and 14 purchasers which are also producers.

companies that purchase wood structural building components. The purchaser sample was selected from the membership roster of the NAHB. A total of 55 purchasers completed and returned the questionnaires. The estimated sampling intensity of purchasers of wood structural building components was less than 1 percent.

Organization of Study

Chapter 2 provides an overview of the North American market for prefabricated wood structural building components, including a description of the principal structural wood components in production and trade, and their nonwood substitutes. Chapter 3 describes the wood structural building component industry in the United States, Canada, and other principal supplying countries, including an estimate of the number of firms, extent of integration, and average size. Chapter 4 describes U.S. trade in wood structural building components. Chapter 5 provides a discussion of the competitive conditions for U.S. and Canadian producers in the U.S. market. Statistical tables are presented in appendix D.

CHAPTER 2
NORTH AMERICAN MARKET OVERVIEW

North America (comprised of the United States and Canada) is the leading world consumer of wood products.[1] The U.S. market is 10 times the size of the Canadian market. The market for wood structural building components represents approximately 8 percent of the market for wood products. This chapter describes the wood structural building component markets in both countries. Likewise, the North American industry is the world's leading producer of wood products and supplies most of the wood products consumed in North America. The industry has been instrumental in the development of wood structural building components. This chapter also provides descriptions of the technology and production processes for the various wood structural building components, the principal substitutes, and the market shares of those components in the U.S. market.

North American Housing Markets and the Construction Industry

United States

Demand for wood structural building components is driven by the markets for new residential construction, residential repair and remodeling, and nonresidential commercial construction, all of which remained strong during 1997-2001. Falling interest rates,[2] strong immigration,[3] and rising housing values, which boosted consumer confidence, all contributed to a strong housing market.[4] In 2002, 30-year fixed rate mortgages in the United States averaged 6.5 percent but finished the year close to 6 percent.[5] NAHB reported that the U.S.

[1] Most homes in Mexico are constructed using cement block or masonry rather than wood-frame construction. Thus, Mexico is not a large producer or consumer of wood structural building components. In 2002, Mexico supplied less than 1 percent (by value) of all U.S. imports under HTS 4418.90.45, the subheading that includes wood structural building components. "Housing Shortage in Mexico," found at *http://www.fas.usda.gov/ffpd/wood-circulars/dec99/news.html*, retrieved Apr. 25, 2003.

[2] The average rate for 30-year fixed mortgages was 7.6 percent in 1997, peaked at 8.1 percent in 2000, but decreased to 6.5 percent in 2002. Freddie Mac, "30-year Fixed-rate Mortgages since 1971," found at *http://www.freddiemac.com/pmms/pmms30.htm*, retrieved Jan. 9, 2003.

[3] Bobby Rayburn, "A Customer's View of the Structural Building Component Industry's Direction and Trends," NAHB presentation to the Building Component Manufacturers Conference, Columbus, Ohio, Oct. 17, 2002.

[4] "Housing Holds its Strength," *Crow's*, C. C. Crow Publications, Portland, OR, Oct. 11, 2002, p. 1.

[5] NAHB reported that long-term mortgage rates slipped below 6 percent allowing builders to find qualified buyers in most price ranges. "Lumber & Building Materials Daily," found at *http://www.lbmdaily.com/newsletter/newsletter.html*, retrieved Nov. 20, 2002.

average sales price for single family detached houses increased at an average compound annual rate of 8.3 percent.[6]

In 1997, privately owned housing starts totaled 1.5 million (table 2-1 and figure 2-1). During 1998-2001, housing starts were approximately 1.6 million per year, and in 2002, housing starts were approximately 1.7 million.[7] One domestic industry representative suggested that U.S. demand for housing was such that 2002 housing starts could have reached 2 million if the supply of labor was adequate.[8] The share of total U.S. housing starts by region was very stable between 1997 and 2002. In 2002, the South accounted for 46 percent of all privately owned housing starts (figure 2-2). The Northeast (9 percent), the Midwest (21 percent), and the West (24 percent) accounted for the remainder. U.S. housing starts are expected to decline slightly in 2003 but remain at a relatively high level (1.63 million).[9] (Regional statistics throughout this report are based on U.S. Census Bureau regions as shown in figure 2-3).

The size of houses also affects the demand for wood structural building components. Houses have doubled in size since 1950.[10] Driving the size increase are trends toward larger rooms, higher ceilings, and larger garages.[11] During 1997-2001, the average size of single family, detached houses, which accounted for approximately 70 percent of all U.S. privately owned housing starts, increased by approximately 11 percent to 2,272 square feet of furnished floor space.[12] The trend towards larger houses is expected to continue.[13]

U.S. expenditures for residential repair and remodeling grew at an average compound annual rate of 4.2 percent, from $134 billion in 1997 to $158 billion in 2001.[14] Likewise, U.S. expenditures for nonresidential commercial construction increased at an average compound annual rate of 3.7 percent from $174 billion in 1997 to $201 billion in 2001 (figure 2-4). The total consumption of structural building materials (e.g., lumber, EWP, concrete, and steel) used in the production of floors, walls, and roofing rose by 19 percent between 1997 and 2000.[15]

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[6] NAHB Research Center, *Builder Practices Report*, various volumes, 1998-2002.

[7] "New Privately Owned Housing Units Started - Seasonally Adjusted Annual Rate" found at *http://www.census.gov/const/startssa.pdf*, retrieved Jan. 10, 2003.

[8] USITC staff interview with industry official, Aug. 20, 2002.

[9] "Lumber & Building Materials Daily," found at *http://www.lbmdaily.com/newsletter/newsletter.html*, retrieved Jan. 14, 2003.

[10] Bobby Rayburn, "A Customer's View of the Structural Building Component Industry's Direction and Trends, NAHB presentation to the Building Component Manufacturers Conference, Columbus, Ohio, Oct. 17, 2002.

[11] "Wood's Market Share in Decline," *Wood Markets*, Vol. 7, No. 6, Aug. 2002, p. 4.

[12] The average square footage of U.S. single family, detached houses was 2,045 in 1997, 2,130 in 1998, 2,088 in 1999, 2,277 in 2000, and 2,272 in 2001. NAHB Research Center, *Builder Practices Report*, various volumes, 1998-2002.

[13] Bobby Rayburn, "A Customer's View of the Structural Building Component Industry's Direction and Trends, NAHB presentation to the Building Component Manufacturers Conference, Columbus, Ohio, Oct. 17, 2002.

[14] "Expenditures for Residential Improvements and Repairs by Property Type, Quarterly," found at *http://www.census.gov/const/c50/histtab2.pdf*, retrieved Jan. 10, 2003.

[15] "Wood's Market Share in Decline," *Wood Markets*, Vol. 7, No. 6, Aug. 2002, p. 4.

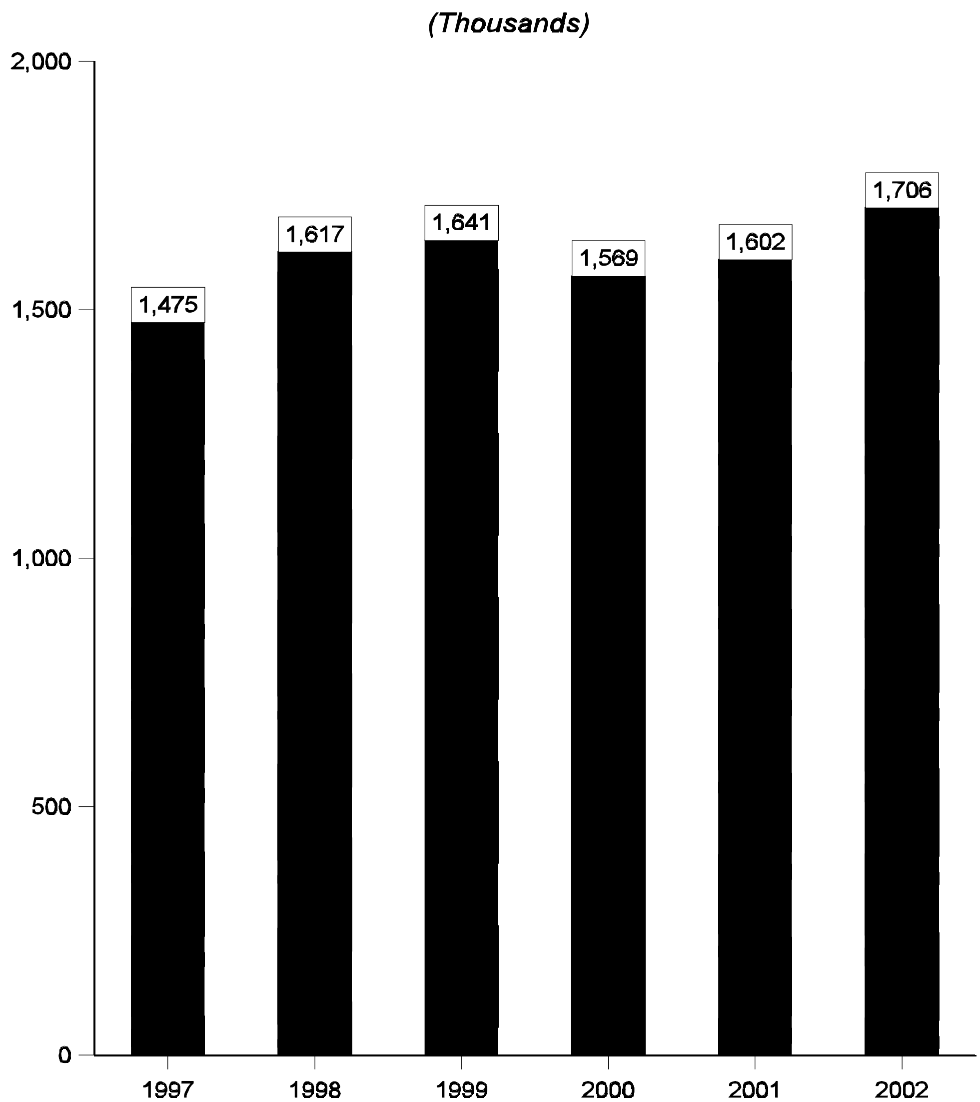
Table 2-1
U.S. housing starts: Privately owned and total,[1] by type of structure and region,[2] 1997-2001

Period and region	Single units: Town-house	Single units: Detached	Single units: Total	Multi-unit: 2 to 4 units	Multi-unit: 5 or more units	Multi-unit: Total	Total privately owned	Percent
	Thousands of units							
1997:								
Northeast	22	89	111	5	21	26	137	10
Midwest	28	210	238	17	48	65	304	20
South	39	468	507	13	151	164	671	45
West	15	263	278	10	76	86	363	25
Total	104	1,030	1,134	44	296	340	1,475	100
1998:								
Northeast	24	98	122	5	21	26	148	9
Midwest	31	242	273	13	45	58	330	20
South	45	529	574	15	155	170	743	46
West	17	286	303	9	83	92	395	24
Total	117	1,155	1,271	43	303	346	1,617	100
1999:								
Northeast	26	101	126	9	20	29	155	9
Midwest	37	251	289	9	50	59	348	21
South	45	534	580	8	159	167	747	46
West	19	289	308	6	78	84	392	24
Total	127	1,175	1,302	32	307	339	1,641	100
2000:								
Northeast	24	94	118	9	27	36	154	10
Midwest	38	223	260	11	46	57	317	20
South	49	506	556	11	147	158	714	46
West	15	282	297	8	79	87	384	24
Total	126	1,105	1,231	39	299	338	1,569	100
2001:								
Northeast	20	91	111	11	28	39	150	9
Midwest	43	226	269	9	52	61	330	21
South	59	531	590	9	132	141	731	46
West	18	285	303	7	81	88	391	24
Total	140	1,134	1,273	36	293	329	1,602	100
2002:								
Northeast	22	96	118	10	31	41	159	9
Midwest	55	222	277	10	63	73	350	21
South	62	566	628	11	143	154	782	46
West	21	315	336	7	72	79	415	24
Total	160	1,199	1,359	38	309	347	1,706	100

[1] Totals may not add due to rounding.
[2] Regions correspond to U.S. Census regions as shown in figure 2-3.

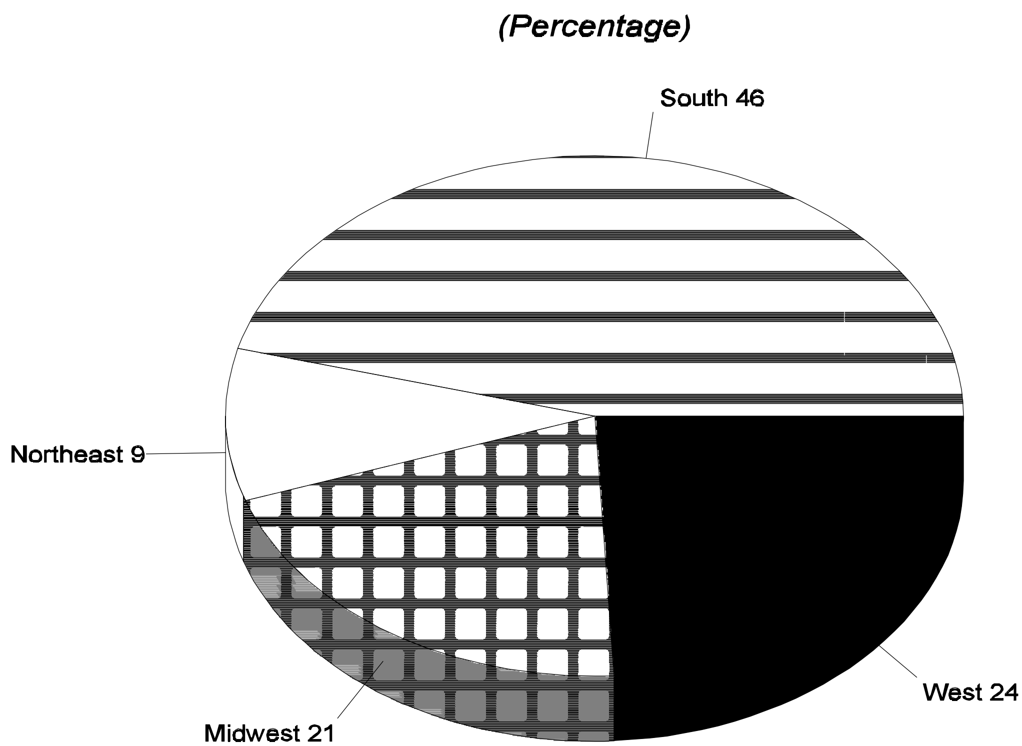
Source: U.S. Census Bureau, Series C20 reports 96-2, 97-2, 98-2, 99-2, and 20 00-2, *http://www.census.gov/const*.

Figure 2-1
Privately owned U.S. housing starts, 1997-2002



Source: U.S. Census Bureau, "New Privately Owned Housing Units Started," found at *http://www.census.gov/const/startan.pdf*, retrieved Mar. 3, 2003.

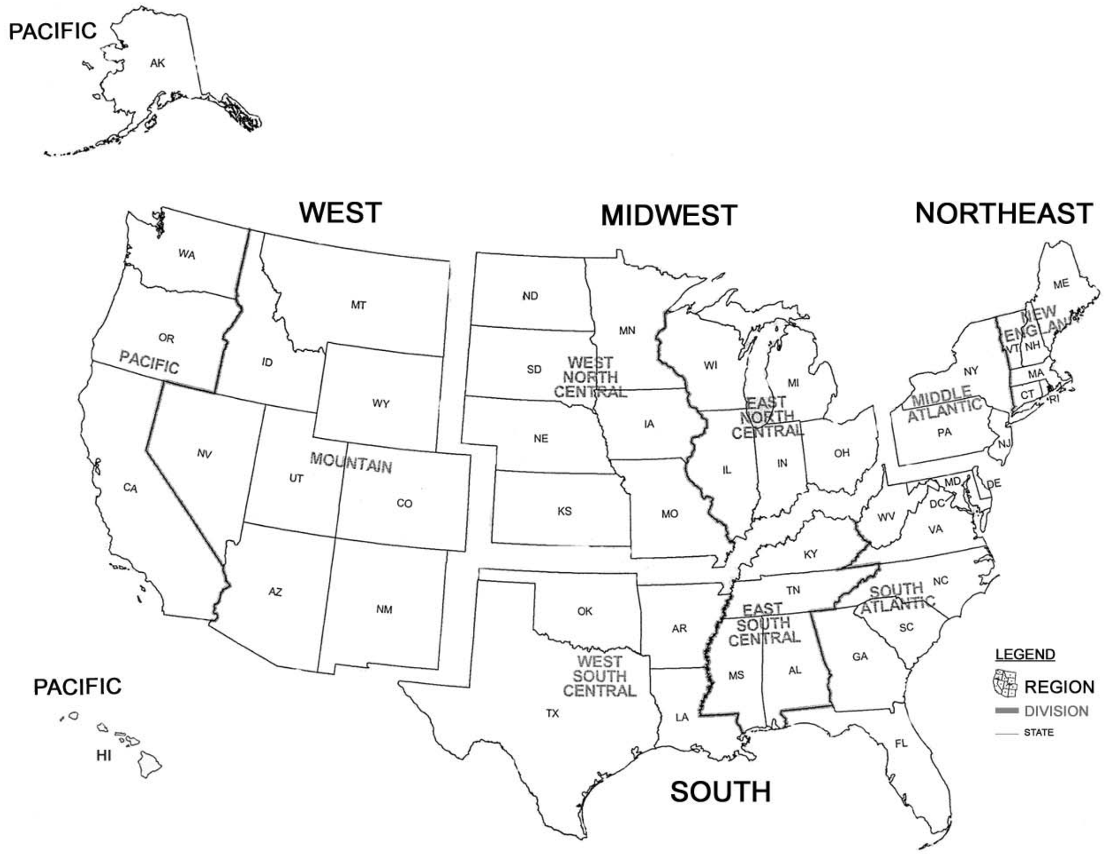
Figure 2-2
U.S. housing starts: Share by region,[1] 2002



[1] Regions correspond to U.S. Census regions as shown in figure 2-3.

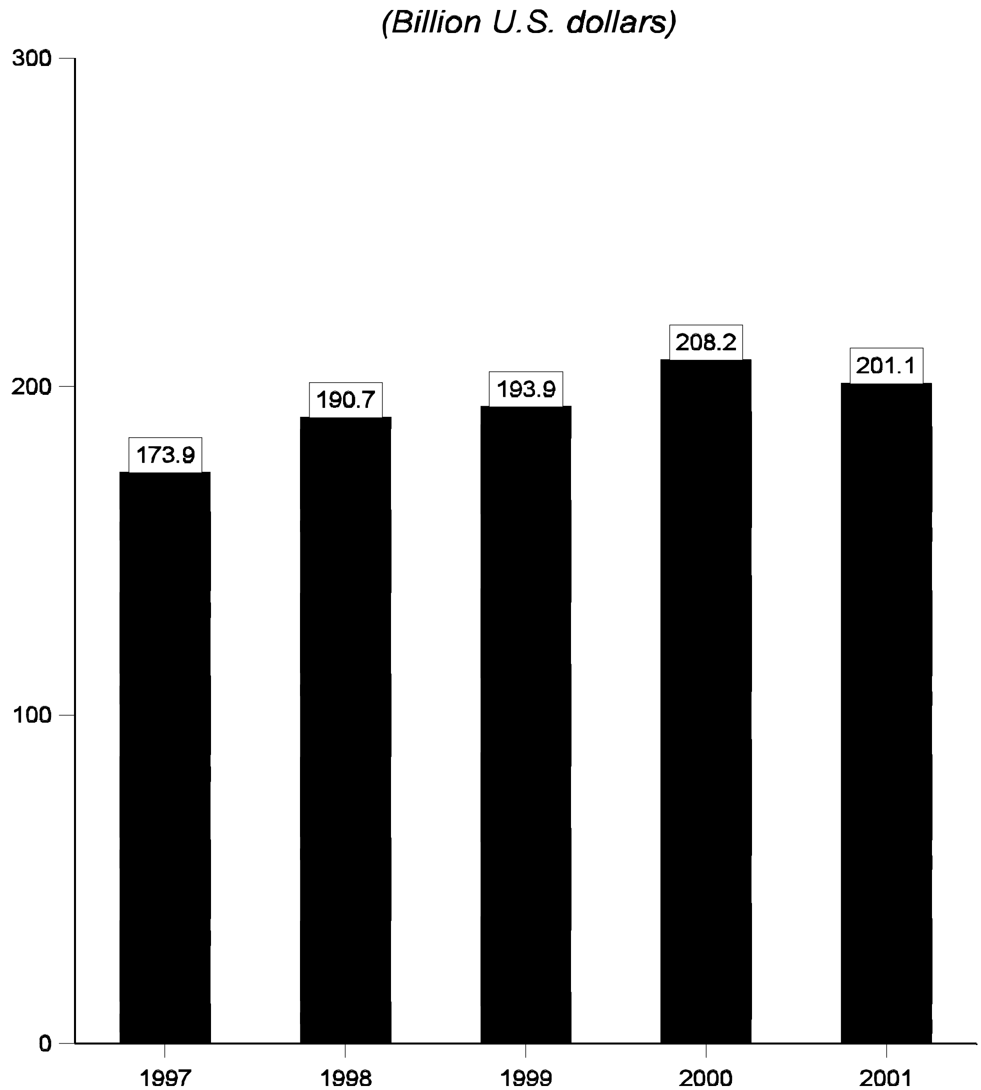
Source: U.S. Census Bureau.

Figure 2-3
Census regions and divisions of the United States



Source: U.S. Census Bureau.

Figure 2-4
U.S. nonresidential construction expenditures, 1997-2001



Source: U.S. Census Bureau.

Canada

Since 1997, macroeconomic conditions in Canada have been conducive to an expanding construction market and a consequent increase in demand for wood structural building components. Canada has enjoyed steady economic growth accompanied by major gains in employment and personal income. Mortgage rates have been low and there has been some growth in the population.[16] Housing starts in Canada rose from 147,040 units in 1997 to 162,733 units in 2001 (figure 2-5). The year 2002 was an even stronger year for housing in Canada, with housing starts totaling an estimated 204,857 units.[17] Single-detached houses accounted for approximately 60 percent of total housing starts in Canada; semidetached houses, row houses, and apartments accounted for the remainder (table 2-2).

Housing starts are concentrated in the more populated Provinces of Canada. Ontario, the largest Province in Canada by population, accounted for 45 percent of total Canadian housing starts in 2001 (table 2-3). The prairie Provinces of Manitoba, Saskatchewan, and Alberta accounted for 21 percent of total housing starts in 2001, Quebec accounted for 17 percent of housing starts, and British Columbia accounted for 11 percent. Although total housing starts in Canada have increased in recent years, housing activity has varied throughout the country because some Provinces have enjoyed stronger economic growth and larger population gains than other Provinces. A buoyant economy and an increase in population in Ontario and Alberta boosted demand for housing in these two Provinces. Between 1997 and 2001, housing starts in Ontario and Alberta rose by 36 percent and 23 percent, respectively. On the other hand, housing starts in British Columbia declined by 41 percent between 1997 and 2001 as sluggish economic conditions and low population growth in the province depressed housing activity. Housing starts in Quebec rose irregularly from 25,896 units in 1997 to 27,682 units in 2001.[18]

Growth in employment and personal income has stimulated increased spending on residential repair and remodeling in Canada.[19] Expenditures for residential repair and remodeling in Canada grew from C$20.4 billion in 1997 to C$23.4 billion in 2001.[20] Nonresidential construction expenditures in Canada also increased during the period, from C$56.6 billion in 1997 to C$68.7 billion in 2001 (figure 2-6). Alberta accounted for 31 percent of total nonresidential construction expenditures in 2001, Ontario accounted for 26 percent, and Quebec, 15 percent.[21]

The construction of larger homes in Canada has contributed to the growth in demand for Canadian wood structural building components. According to industry sources, the average size of a residential home in Canada has increased in the past few years, construction designs have become more complex, and homes have become more customized.[22] A survey of new home builders and renovators in Canada conducted in the summer of 1999 found that

[16] Canada Mortgage and Housing Corp., *Canadian Housing Statistics 2001*, June 2002.

[17] Ibid., news release, Jan. 9, 2003, "2002 Starts Best Since 1989," found at *http://www.cmhc-schl.gc.ca/en/news/nere/2003/2003-01-09-0815.cfm*, retrieved Mar. 13, 2003.

[18] Ibid., *Canadian Housing Statistics 2001*, June 2002.

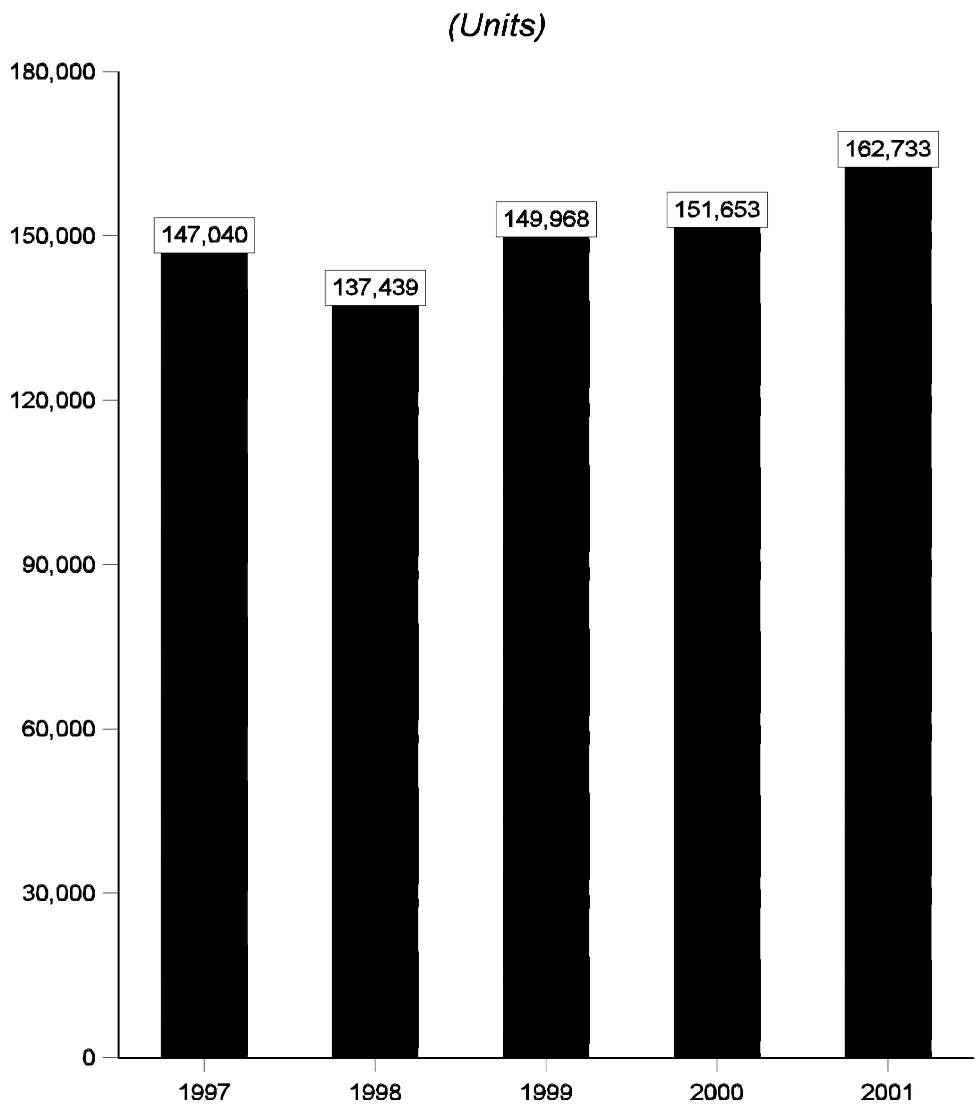
[19] "Robust growth for reno," *The CHBA Renovator Report*, July, 2002.

[20] Statistics Canada, CANSIM II, tables on maintenance and repair expenditures and major renovations in housing.

[21] Canada Mortgage and Housing Corp., *Canadian Housing Statistics 2001*, June 2002.

[22] USITC staff telephone interviews with industry officials, Oct. 9, 2002 and Nov. 1, 2002.

Figure 2-5
Housing starts in Canada, 1997-2001



Source: Canada Mortgage and Housing Corporation.

Table 2-2
Housing starts in Canada, by type, 1997-2001

Year	Single-detached	Semi-detached	Row	Apartment and other	Total
	Units				
1997	93,186	11,385	17,256	25,213	147,040
1998	86,431	10,043	15,287	25,678	137,439
1999	92,190	11,096	14,895	31,787	149,968
2000	92,184	11,530	15,247	32,692	151,653
2001	96,026	11,883	15,166	39,658	162,733

Source: Canada Mortgage and Housing Corporation.

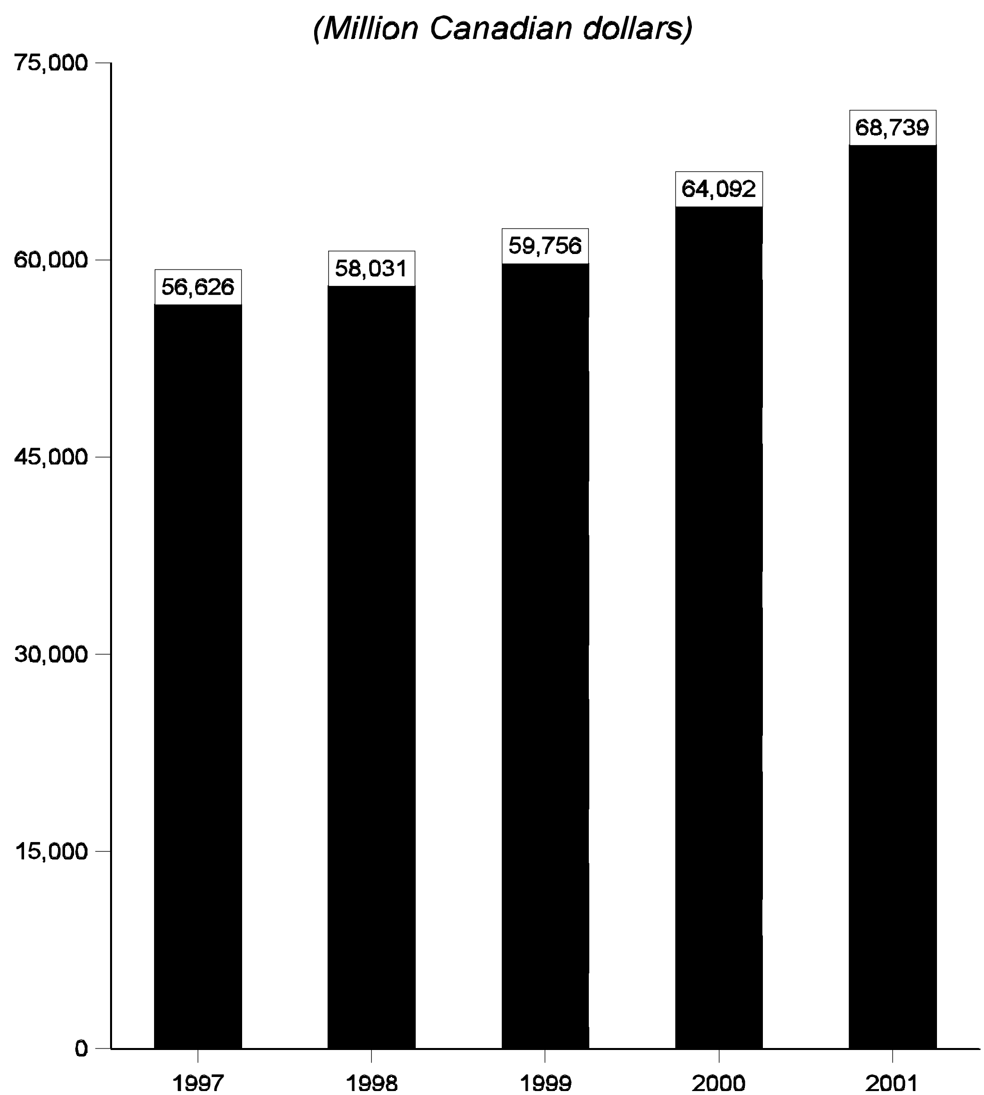
Table 2-3
Housing starts in Canada, by region, 1997-2001

Year	Atlantic[1]	Quebec	Ontario	Prairies[2]	British Columbia	Total
	Units					
1997	8,681	25,896	54,072	29,040	29,351	147,040
1998	7,558	23,138	53,830	32,982	19,931	137,439
1999	9,013	25,742	67,235	31,669	16,309	149,968
2000	9,680	24,695	71,521	31,339	14,418	151,653
2001	10,017	27,682	73,282	34,518	17,234	162,733

[1] The provinces of Newfoundland, Prince Edward Island, Nova Scotia, and New Brunswick.
[2] The provinces of Manitoba, Saskatchewan, and Alberta.

Source: Canada Mortgage and Housing Corporation.

Figure 2-6
Nonresidential construction expenditures in Canada, 1997-2001



Source: Canada Mortgage and Housing Corporation.

many builders planned to build larger and more luxurious homes to meet the needs of "move up" home purchasers more completely.[23]

Technology of Onsite Construction vs. Factory-built Components

This section provides information on the technical development of wood structural building components. It is focused on the U.S. housing market, but methods of residential construction and the trends in the development of wood structural building components are similar in the United States and Canada. Although site-built wood frame construction remains the principle method of residential construction, many homes are now constructed using some wood structural building components.

Trusses and Prefabricated Panels

Metal plate connected wood roof trusses were first introduced in the 1950s and were followed later by metal plate connected wood parallel chord (floor) trusses.[24] The advantages of trusses, which include onsite labor savings, reduced erection time, specific engineered design values, and design flexibility,[25] have helped the industry to expand. During 1997-2001, the value of wood truss production grew at an average compound annual rate of approximately 7.7 percent. Production in 2002 was estimated to be approximately $8.0 billion.[26] Site-built, wood frame construction[27] remains the predominant method of home construction in the United States,[28, 29] however many site-built homes are now constructed using some wood structural building components, most often roof trusses.[30]

Factory-built houses differ from site-built houses by having structural elements other than trusses (e.g., walls, floors) that have been prefabricated. Factory-built construction extends the potential advantage of constructing structural building components in a controlled plant

[23] Canadian Home Builders' Association, *CHBA Pulse Survey*, Spring/Summer 1999.

[24] "Component Industry Timeline," found at *http://www.woodtruss.com/timeline.htm*, retrieved Jan. 10, 2003.

[25] "Why Use Trusses Instead of Conventional Framing," found at *http://www.trussnet.com/articles/TrusNetfeatureArticles.cfm?ID=731*, retrieved Sept. 9, 2002.

[26] Responses to Commission producer questionnaire.

[27] Also known as stick-built.

[28] Ron Wakefield, Michael O'Brien, and Yvan Beliveau, U.S. Department of Housing and Urban Development, *Industrializing the Residential Construction Site*, July 2000, p. 19.

[29] In 2001, site-built homes accounted for 94 percent of all single family U.S. houses and 74 percent of all privately owned housing starts. "Type of Construction Method of New One-Family Houses Completed," found at *http://www.census.gov/pub/const/sftotalconstmethod.pdf*, retrieved Nov. 12, 2002.

[30] Ron Wakefield, Michael O'Brien, and Yvan Beliveau, U.S. Department of Housing and Urban Development, *Industrializing the Residential Construction Site*, July 2000, p. 19.

environment to the other elements of a house. Other advantages include the ability to construct houses year-around, price stability, energy savings,[31] and speed of construction.[32]

Disadvantages include potentially higher cost,[33] high risk of error,[34] and volatile demand.[35] During 1997-2001, a small, steady portion (6 percent to 7 percent) of U.S. single family homes was factory-built houses.[36] There are four subclassifications of factory-built house construction – panelized, modular, precut, and manufactured housing.[37] Panelized houses are assembled from factory-built, two-dimensional wall panels[38] and other parts or components (e.g., roof trusses, floor panels) necessary to complete the frame.[39] The components are shipped to the job site and assembled on a permanent foundation. One large U.S. home builder built 22,000 panelized homes in 2001 and expected to build 28,000 in 2002.[40] The same builder reported a 9 percent reduction in average construction time.[41] Likewise, modular houses are also constructed from factory-built components. However, the components are finished three-dimensional sections that are transported to the site and assembled on a permanent foundation. Modular home sales totaled 33,500 units in 2001, a historic high, and represented about 2 percent of all U.S. home starts.[42] Although the reported

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[31] Barb McHatton, Dan McLeister, and Eric Benderoff, "Alternative Choices," *Professional Builder*, Sept. 1994, p. 134.

[32] USITC staff interview with industry official, Aug. 21, 2002.

[33] Manufacturers reported that site-built walls were often less expensive than wall panels for two reasons. First, the quality of material in panels is generally higher than that for site-built walls and second, building materials dealers offer very attractive prices on studs, which are considered loss leaders, to secure the builder's business on all the other items necessary. USITC staff interviews with industry officials, Aug. 21, 2002 and Oct. 17-18, 2002, and Barb McHatton, Dan McLeister, and Eric Benderoff, "Alternative Choices," *Professional Builder*, Sept. 1994, p. 135.

[34] Reportedly, the dimensions of the foundation and the wall panels must match exactly. Discrepancies as small as 2 inches in the size of the slab will cause the wall panels not to work and are relatively common. Such mistakes are not easy to correct. USITC staff interviews with industry officials, Aug. 21, 2002 and Oct. 18, 2002.

[35] Manufacturers report that during downturns builders often keep their crews busy by building walls on site. Thus, as construction markets soften, demand for panels drops more than that for other components, but component manufacturers are encumbered by the overhead of the panel building equipment. USITC staff interviews with industry officials, Oct. 17-18, 2002.

[36] "Type of Construction Method of New One-Family Houses Completed," found at *http://www.census.gov/pub/const/sftotalconstmethod.pdf*, retrieved Nov. 12, 2002.

[37] Precut houses are assembled on-site from kits that contain the necessary quantities of lumber or logs that have been cut to exact size and length. Manufactured houses, also referred to as "HUD code housing," consist of one or more units on a permanent chassis that is transported to the site on wheels and that usually remains on temporary foundations. Gopal Ahluwalia, "Factory-Made Housing," Draft version, *Housing Economics*, NAHB, Nov. 2001, p. 6.

[38] Panels may be either open (with only exterior sheathing and/or insulation added) or closed (with sheathing, wiring, plumbing, and drywall). Evan Perez, "In More Homes, Foundations, Walls, Staircases Are Built Elsewhere and Trucked to Site," *Wall Street Journal*, Oct. 4, 2002, p. B1.

[39] *Factory Built Housing in the 1990's*, Hallahan Associates, Baltimore, MD, Sept. 1990, p. 1.

[40] Evan Perez, "In More Homes, Foundations, Walls, Staircases Are Built Elsewhere and Trucked to Site," *Wall Street Journal*, Oct. 4, 2002, p. B1.

[41] Ibid.

[42] "Factory-built housing outlook," *Eastern Quotes and Comments*, Dec. 20, 2002, p. 2.

market share of factory-built housing has been steady over the past 10 years,[43] factory-built housing is expected to grow by approximately 1 percent annually through 2005.[44] The estimated value of U.S. shipments of wall and floor panels more than doubled during 1997-2001, from $409 million to $985 million.[45, 46]

Engineered Wood Products

Glulam, I-joists, and SCL are EWP.[47] The APA defines engineered wood as wood products that are engineered for specific performance characteristics.[48] The development of EWP is a response to the need to optimize wood products output from a changing timber resource[49] and is primarily a North American phenomenon.[50] North American forest products companies have had to adjust as the supply of larger logs from natural forests has given way to smaller diameter logs from managed forests. EWP manufactured with wood veneer or strands of wood fiber utilize the fiber from smaller trees very efficiently, and in some cases can be manufactured from certain species of wood (e.g., aspen, birch, red maple, sweet gum) that are underutilized and relatively inexpensive and that, heretofore, have not been used for the production of structural wood products.[51]

The development of EWP is also a result of industry efforts to create products that perform better than traditional wood products. Solid sawn lumber is restricted by the size of the log from which it is cut, and its strength is inherently variable due to natural characteristics of the log (e.g., knots, sweep,[52] density). In contrast, EWP can be manufactured in a variety of sizes and dimensions to match specific applications. EWP have consistent, stable

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[43] Gopal Ahluwalia, "Factory-Made Housing," Final version, *Housing Economics*, NAHB, Nov. 2001, p. 7.

[44] "Factory-built housing outlook," *Eastern Quotes and Comments*, Dec. 20, 2002, p. 1.

[45] Responses to Commission producer questionnaire.

[46] U.S. Census Bureau, "Value of Product Shipments: 2000, Annual Survey of Manufactures," Feb. 2002, p. 29.

[47] APA considers all structural, glued, composite wood products to be EWP and identifies four subcategories: structural panels (plywood, OSB), glulam, wood I-joists, and SCL. However, industry usage of the term is somewhat vague and not always consistent with the APA definition. In some cases, structural panels are not included; in others, such products as finger-jointed (FJ) lumber and machine stress rated (MSR) lumber are included. Structural panels, FJ lumber, and MSR lumber are not in the scope of this investigation. Therefore, for the purposes of this report, reference to EWP should be interpreted to include only glulam, I-joists, and SCL. *A Guide To Engineered Wood Products*, APA - The Engineered Wood Association, Nov. 2002, and "Engineered Wood Products - Production, Trade, Consumption, and Outlook," *ECE/FAO Forest Products Annual Market Review*, *1999-2000*, p. 132, found at *http://www.unece.org/trade/timber/rev-00/11.pdf*, retrieved Jan. 22, 2003.

[48] "What is Engineered Wood?" found at *http://www.apawood.org/level_b.cfm?content=srv_abt_us*, retrieved Sept. 3, 2002.

[49] "A Profile of the Glulam Industry," found at *http://www.apawood.org/glu_level_b.cfm?content=prd_glu_gen_industry*, retrieved Sept. 3, 2002.

[50] "Engineered Wood Products - Production, Trade, Consumption, and Outlook," *ECE/FAO Forest Products Annual Market Review*, *1999-2000*, p. 132, found at *http://www.unece.org/trade/timber/rev-00/11.pdf*, retrieved Jan. 22, 2003.

[51] Ibid., p. 135.

[52] Sweep is the natural curvature or bend of a log.

dimensions, a high strength to weight ratio, the ability to span long distances,[53] and specific design values.[54] Other reported advantages to builders include reduced call backs and less job-site waste than with solid sawn lumber.[55]

First patented in Europe in 1900,[56] glulam has been made in the United States since the 1930s,[57] long before the term "engineered wood product" was coined. Made by gluing pieces of lumber (with a thickness of 2 inches or less) together along their length to form large timber beams, glulam, therefore, substitutes for solid sawn timbers, which can only be cut from large, old growth trees. Although an older product, it has been improved, first with the advent of water-resistant adhesives, which allow it to be used in outdoor applications,[58] and more recently with increased design values (i.e., higher strength).[59] It is well-suited to structural uses such as floor beams and garage door headers,[60] but there is an aesthetic element to glulam demand as well. Typically, appearance is important in structures designed with large timber beams.[61] Unlike other EWP or solid timbers, glulam can be easily manufactured so as to form graceful curved beams.[62]

With the exception of glulam, the development of EWP has been relatively recent and has coincided with advances in resin technology, flaking machines (wafer geometry), press design, and drying systems.[63] One company, Trus Joist, did much to make EWP a practical reality, first developing wood I-joists as a direct substitute for solid-sawn lumber in the commercial market in the 1960s and then in the residential market about 1980.[64] The company went on to develop LVL as a substitute for solid-sawn lumber I-joist flange stock.[65] A Canadian firm, MacMillan Bloedel Ltd. (MB), pioneered stranded lumber products (PSL and LSL) in the 1980s.[66] During 1997-2001, I-joists and SCL were in the expansionary phase

[53] "A Short History of Trus Joist," found at *http://www.tjm.com/about/index.cfm*, retrieved Oct. 4, 2002.

[54] *A Guide To Engineered Wood Products*, APA - The Engineered Wood Association, Nov. 2002.

[55] Barb McHatton, Dan McLeister, and Eric Benderoff, "Alternative Choices," *Professional Builder*, Sept. 1994, p. 138.

[56] "A Profile of the Glulam Industry," found at *http://www.apawood.org/glu_level_b.cfm?content=prd_glu_gen_industry,* retrieved Sept. 3, 2002.

[57] Testimony of Tom Denig, president, Trus Joist, transcript of the hearing, p. 84.

[58] "Product Guide: Glulam," Engineered Wood Systems, 2000, p. 4.

[59] "Glulam: Lower Cost, Higher Design Value," found at *http://www.apawood.org/glu_level_b.cfm?content=prd_glu_main*, retrieved Sept. 3, 2002.

[60] Craig Adair, *Regional Production and Market Outlook for Structural Panels and Engineered Wood Products 2002-2007*, APA - The Engineered Wood Association, Apr. 2002, p. 46.

[61] Sam Sherrill,"Technology and Timber Beams: Finding the Niche for Glulams," *Crow's Forest Industry Journal*, Vol. 59 (May/June 2002), p. 22.

[62] "Engineered Wood Products - Production, Trade, Consumption, and Outlook," *ECE/FAO Forest Products Annual Market Review*, *1999-2000*, p. 134, found at *http://www.unece.org/trade/timber/rev-00/11.pdf*, retrieved Jan. 22, 2003.

[63] Ibid., pp. 135, 141.

[64] Testimony of Tom Denig, president, Trus Joist, transcript of the hearing, p. 85.

[65] "A Short History of Trus Joist," found at *http://www.tjm.com/about/index.cfm*, retrieved Oct. 4, 2002.

[66] Trus Joist and MB formed a joint venture in 1991. Both firms were subsequently acquired by and are now a part of Weyerhaeuser Co.

of their product life cycles.[67] North American production (by quantity) of the two products grew at an average compound annual rate of approximately 12.7 percent during the period and by 2001 was equivalent to (on a board foot basis) 4 percent of North American softwood lumber production.[68]

Descriptions of the Production Processes

This section provides information on the production processes of wood structural building components. Data are presented for U.S. producers, but production methods for wood structural building components manufactured in Canada are similar to those used in the United States.

Trusses and Prefabricated Panels

Typically, builders solicit bids from truss manufacturers for their truss and panel requirements. The manufacturers' bids are based on the basic type of building and a rough cost estimate.[69] When the contract is awarded, the truss manufacturer receives documentation for the particular project and the truss designers begin the design phase, the process of translating the building design into the actual trusses necessary to complete the building. During the design phase, information and ideas concerning the particular project are exchanged by the designer, the builder, and the truss manufacturer.

Prior to the advent of computer design, manufacturers maintained catalogues of truss designs;[70] roof design was limited by the typical truss shapes and sizes contained in a manufacturer's catalogue. Now, however, truss design is done through the use of computer software that is proprietary to the truss plate company that supplies truss plates to the manufacturer.[71] The complexity of roof design is no longer constrained by reliance on preexisting designs, and architects and designers are limited only by their imaginations and esthetics, which now drive roof design.[72] Over time, roof shapes have become progressively

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[67] The market for the older EWP, glulam, is mature and did not exhibit the same growth rates as those for the newer products. "Engineered Wood Products - Production, Trade, Consumption, and Outlook," *ECE/FAO Forest Products Annual Market Review*, *1999-2000*, pp. 144 found at *http://www.unece.org/trade/timber/rev-00/11.pdf*, retrieved Jan. 22, 2003.

[68] USITC staff interview with industry official, Dec. 10, 2002.

[69] Ibid., Aug. 20, 2002.

[70] Ibid.

[71] The first total truss software design package was developed in 1970. At first, the software used dumb terminals and stand-alone computers, but now, PC based software has been developed. Initially, design software and truss plates were supplied by separate firms, but over time, truss plate manufacturers began to supply software as a convenience to their customers. The role of the engineer in the design process has been reduced. Rather than having to calculate and draw truss designs manually, the engineer need only approve the computer-based designs. As an added service, truss plate manufacturers often provide engineering services for their customers. "Component Industry Timeline," found at *http://www.woodtruss.com/timeline.htm*, retrieved Jan. 10, 2003 and USITC staff interview with industry officials, Aug. 20, 2002.

[72] USITC staff interview with industry official, Aug. 20, 2002.

more complex.[73] The latest design software can analyze not only trusses but also the pieces of each truss, correct a flawed building design, and accommodate differences in building codes.[74]

Lumber from a variety of different softwood species groups[75] is used to manufacture trusses.[76] Size (dimension), strength requirements, and local lumber markets influence the decision regarding the type of lumber used. Respondents to the Commission producer questionnaire reported that in 2001, on a national basis, southern yellow pine (SYP)[77] and Douglas fir were the predominant raw materials (figure 2-7 and table 2-4) in all but the smallest dimension (2x3). Of the Spruce-Pine-Fir (SPF)[78] used, most was in the smaller dimensions (2x3, 2x4, 2x6). A small amount of Hem-Fir[79] is used across all dimensions. On a regional basis, significant variation in lumber usage by species existed during 1997-2001 (table 2-5). SYP has the largest market share in the Northeast and South. SPF has the largest market share in the Midwest, and in the West, Douglas Fir,[80] was by far the predominant species. During 1997-2002, approximately 67 percent of lumber purchased by truss manufacturers was visually graded. The balance of lumber purchases was machine stress rated (MSR).[81] Reflecting the usage of SPF in smaller sizes, purchases of Canadian lumber by truss manufacturers were weighted heavily to those same dimensions (table 2-6). The current generation of design software allows the parameters of individual pieces of a particular truss to be analyzed. Thus, in some instances, the decision to substitute one species for another is made not just from truss to truss, but from piece of truss to piece of truss.[82]

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[73] Ibid., Oct. 2, 2002.

[74] Ibid., Aug. 20, 2002.

[75] Lumber grading agencies identify various combinations of species, which typically occur naturally together in the forest and which are not separated during production because the lumber from them has common characteristics.

[76] In its submission to the Commission pertaining to this investigation, the Coalition for Fair Lumber Imports expressed its position with respect to the issue of substitutability/interchangeability of softwood lumber. (John A. Ragosta, Dewey Ballantine LLP, written submission to the Commission on behalf of the Coalition for Fair Lumber Imports, Dec. 19, 2002, pp. 2-8.) In this regard, it should be noted that the softwood species that compete in this end use are a subset of all softwood species and that certain softwoods are not used for the manufacture of wood structural building components.

[77] Southern yellow pine is a species group that includes lumber of several species of southern pines including but not limited to Loblolly Pine, Slash Pine, Shortleaf Pine, and Longleaf Pine.

[78] The largest volume of SPF comes from Eastern Canada (Saskatchewan and east) where the principal species include Red Spruce, Black Spruce, Jack Pine, and Balsam Fir. The principal species of SPF in Western Canada (British Columbia and Alberta) are White Spruce, Engelmann Spruce, Lodgepole Pine, and Alpine Fir. *Terms of the Trade*, Random Lengths, fourth ed.

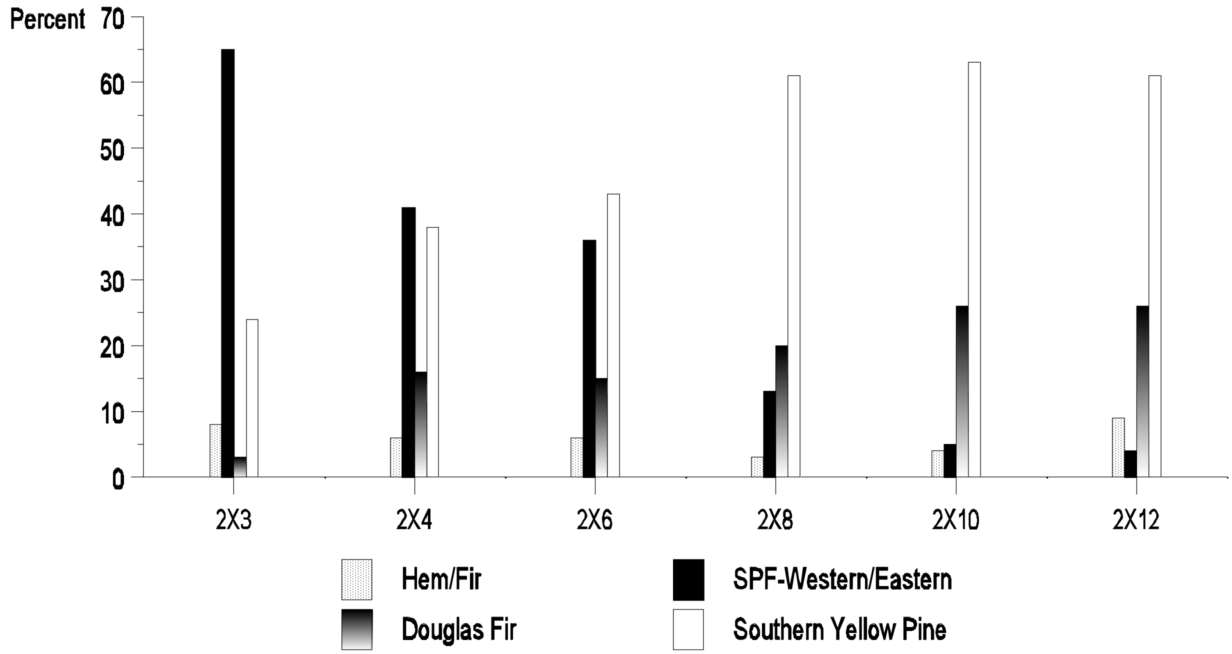
[79] Included in the Hem-Fir species group are Western Hemlock and White Fir, the two most important species in terms of volume, and California Red Fir, Grand Fir, Noble Fir, Pacific Silver Fir, and Shasta Fir. Two unofficial designations are used to classify this species group further. Hem-Fir (Coast) refers to lumber produced in Western Oregon, Western Washington, and coastal British Columbia that is generally understood to be primarily Western Hemlock. Hem-Fir (Inland) refers to lumber produced in Northern California or the Inland West and is generally understood to be White Fir and directly related species. *Terms of the Trade*, Random Lengths, 4th ed.

[80] Data on species used in the construction of roof trusses were obtained from NAHB Research Center Builder Practice Reports which aggregate the western species, Douglas Fir and Hem-Fir. However, based on data compiled from Commission producer questionnaire responses, a relatively small part of this group is Hem-Fir.

[81] Responses to the Commission producer questionnaire.

[82] USITC staff interview with industry official, Oct. 2, 2002.

Figure 2-7
U.S. truss manufacturers: Percentages of usage of wood species by lumber dimension, 2001



Source: Compiled from data submitted in response to Commission producer questionnaires.

Table 2-4
U.S. truss manufacturers: Usage of wood species by lumber dimension, 2001

Dimension	Hem/Fir	SPF Western	SPF Eastern	Douglas fir	Southern Yellow Pine	Total
	Percentage					
2X3	8	26	39	3	24	100
2X4	6	28	13	16	38	100
2X6	6	28	8	15	43	100
2X8	3	10	3	20	64	100
2X10	4	5	2	26	63	100
2X12	9	4	-	26	61	100

Source: Compiled from data submitted in response to Commission producer questionnaires.

Table 2-5
Lumber usage in roof trusses by species and region,[1] 1997-2001

Regions/wood species	1997	1998	1999	2000	2001
	Percent				
United States:					
Southern Yellow Pine	37.1	35.7	40.4	39.3	38.1
Douglas fir, hem-fir	22.1	30.7	24.4	26.4	32.2
Spruce/pine/fir	15.7	15.6	13.7	15.1	15.4
Other	24.6	16.8	18.4	18.7	14.1
Unknown	0.5	1.3	3.1	0.4	0.1
Total	100.0	100.0	100.0	100.0	100.0
Northeast:					
Southern Yellow Pine	34.5	42.7	59.8	25.5	47.9
Spruce/pine/fir	30.4	27.6	16.8	39.2	27.3
Douglas fir, hem-fir	7.1	16.0	13.7	24.9	12.0
Other	27.4	13.4	9.6	10.0	11.5
Unknown	0.7	0.3	0.1	0.4	1.4
Total	100.0	100.0	100.0	100.0	100.0
Midwest:					
Spruce/pine/fir	26.2	24.5	35.5	32.0	36.5
Southern Yellow Pine	38.8	35.6	28.7	31.0	32.2
Other	24.9	20.8	28.6	27.2	18.8
Douglas fir, hem-fir	9.8	16.4	4.8	8.3	12.4
Unknown	0.3	2.7	2.3	1.6	0.0
Total	100.0	100.0	100.0	100.0	100.0
South:					
Southern Yellow Pine	68.0	54.3	75.4	56.4	47.9
Spruce/pine/fir	10.6	17.8	5.2	17.9	27.8
Other	18.0	14.1	13.4	15.7	14.3
Douglas fir, hem-fir	3.5	12.3	2.2	9.7	10.0
Unknown	0.0	1.4	3.8	0.3	0.0
Total	100.0	100.0	100.0	100.0	100.0
West:					
Douglas fir, hem-fir	56.0	64.4	53.9	73.9	75.0
Other	31.4	19.5	25.8	15.6	17.3
Spruce/pine/fir	10.2	9.1	1.2	9.8	3.8
Southern Yellow Pine	1.4	4.2	18.4	0.7	3.7
Unknown	1.1	2.8	0.7	0.0	0.1
Total	100.0	100.0	100.0	100.0	100.0

[1] Regions correspond to U.S. Census regions as shown in figure 2-3.

Source: USITC estimates based on data from National Association of Home Builders Research Center.

Table 2-6
U.S. truss manufacturers: Lumber usage by country of origin and dimension, 2001

Dimension	United States	Canada	Other	Total
	Percentage			
2X3	34	66	-	100
2X4	57	43	-	100
2X6	59	41	-	100
2X8	79	20	1	100
2X10	84	15	1	100
2X12	86	12	2	100
All dimension	69	30	1	100

Source: Compiled from data submitted in response to Commission producer questionnaires.

The next step in the production process is to cut the different pieces of a truss. This entails cutting lumber of the appropriate dimension to a variety of different angles and lengths. Historically, this was accomplished with a large radial arm saw and a C-clamp arrangement. Now, saws are automatic; truss designs are sent electronically to the saw which, in turn, sets the blade automatically for the appropriate angle and length. Manual labor has been reduced o that necessary to feed the saw with the appropriate size lumber and to remove the freshly sawn pieces.[83] Cut pieces are then grouped (often by truss or by job) and staged to await assembly.

Truss assembly typically is performed on a large table that is long enough to allow one or more trusses to be assembled side by side. At regular intervals, slots run across the table (perpendicular to the table's length). The slots allow small round stops or "pucks" to be positioned in such a way that a jig is created in which to assemble the truss. Thus, a jig can be created for an infinite variety of truss designs, and once "set up," the jig serves to assemble any number of trusses.[84] As the complexity of roofs increases, so too do setup costs. The number of different trusses required for any given job has increased and the run quantities for any specific truss have decreased.[85] In order to avoid the cost of translating the truss pattern from a paper copy to the jig, some manufacturers have installed laser setup projectors at their assembly stations. By projecting a full size outline of each pattern on the jigs, the lasers provide precise, quick alignment of the jig and a continuous check of the alignment during the assembly. After aligning the jig, the assembler places the pieces of the truss in the appropriate positions in the jig and at each joint, manually "tacks"[86] an appropriately sized truss plate.[87] Once all the plates on one side have been tacked, a roller

[83] Ibid.

[84] Some manufacturers use a system that creates jigs with steel pedestals that are positioned in appropriate places (a pedestal at each "joint") and held to the steel floor magnetically. Once the pieces of the truss are positioned in the jig, the top and bottom truss plates are placed on the joint, and a large, hydraulic C-clamp mounted on an overhead arm is swung in place and presses the truss plates in. With this system, pressing is completed with one pass; the top and bottom plates are pressed at the same time avoiding the necessity of flipping the truss. USITC staff interviews with industry official, Oct. 2, 2002 and Dec. 12, 2002.

[85] USITC staff interview with industry official, Oct. 2, 2002.

[86] Tacking involves manually hammering the four corners of the truss plate just enough to keep it stationary until the pressing operation secures it firmly in place.

[87] Truss plates are toothed connector plates that transfer tensile and shear forces. They are stamped from various thicknesses of galvanized sheet steel and come in various sizes. "Truss Types," found at *http://www.cwc.ca/products/trusses/types.html*, retrieved Sept. 5, 2002.

gantry,[88] a large steel roller, rolls over the truss to initially seat the truss plates. The truss is then flipped, and the process is repeated for the other side. Finally, the assembled truss is passed through a second set of rollers which finishes seating the truss plates. Some firms still use older construction techniques (radial arm saws and manual assembly tables[89]) to assemble small trusses, which are often required by the features (e.g., dormer windows) of complex roof designs.[90]

The process for constructing floor trusses (and flat roof trusses) is much the same as that for roof trusses except that the tables (or purpose built jigs) and presses are generally narrower because floor trusses are generally not as tall and do not have as many shapes as roof trusses. In all cases the table or jig can be customized to allow the proper placement of the chords and webs of the particular truss being assembled.

Wall panels are generally built to standard vertical dimensions and are typically assembled in large purpose built jigs. Wall panel assembly is different from other components, however, in that the panels move from station to station as assembly progresses in the fashion of an assembly line. First, the appropriate pieces of framing lumber, headers, and components (e.g, window frames) are inserted and nailed together. Jigs may be equipped with lasers to insure that panels are perfectly square. Once the framing is assembled, the panel moves to the next station where whole sheets of sheathing (typically OSB) and/or insulation are attached with automatic nailers. It is not necessary to cut the sheathing for doors and windows beforehand. A router attached to the jig automatically routes out openings for windows, doors, and electrical receptacles. It is expected that the technical innovations incorporated into the next generation of wall panel jigs will greatly increase the automation and speed of wall panel production.[91]

Panels for tall walls and floors are inherently much larger, of heavier construction, and more unwieldy than wall panels. Construction is less automated than for wall panel construction; typically, assembly is done manually. Panels are assembled on purpose built tables or in some cases on the floor.

Engineered Wood Products

One feature common to all EWP is that they consist of various forms of wood fiber that have been reconstituted with adhesives to form larger beams or billets. To some extent, the particular form of the wood utilized depends on what is readily available. For instance, the basic raw material for glulam is lumber and the basic raw material for LVL and PSL is wood veneer of the sort typically produced for plywood. Another feature common to most EWP is that the beams or billets, once formed, can be subsequently sawn to various dimensions for a variety of end uses.

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[88] Initially, connector plates were pressed with large, vertical, hydraulic presses. The roller gantry was invented in the mid 1960s. "Component Industry Timeline," found at *http://www.woodtruss.com/timeline.htm*, retrieved Jan. 10, 2003.

[89] Manual assembly tables require jigs to be constructed manually by nailing blocks of wood to a wood-surfaced table. USITC staff interview with industry official, Aug. 20, 2002.

[90] USITC staff interview with industry official, Aug. 20, 2002.

[91] Ibid., Dec. 11, 2002.

Various softwood species are used to manufacture EWP, but in some cases, hardwood species are used.[92] For I-joists or glulam, SYP and Douglas Fir lumber are the predominant species in the larger dimensions. Of the SPF used, most was used in the smaller dimensions, particularly 2x3 (table 2-7). During 1997-2002, approximately 57 percent of lumber purchased by EWP manufacturers was visually graded. The balance of lumber purchases was machine stress rated (MSR).[93] Purchases of Canadian lumber by U.S. EWP manufacturers were weighted heavily to the smaller dimensions, particularly 2x3 (table 2-8).

Table 2-7
U.S. engineered wood product manufacturers' usage of wood species by lumber dimension, 2001

Dimension	Hem/Fir	SPF Western	SPF Eastern	Douglas fir	Southern Yellow Pine	Other	Total
	Percentage						
2X3	-	-	67	27	3	3	100
2X4	11	23	1	17	47	2	100
2X6	1	25	3	33	37	1	100
2X8	-	6	-	42	50	2	100
2X10	-	-	-	43	56	1	100
2X12	1	10	-	48	40	1	100

Source: Compiled from data submitted in response to Commission producer questionnaire.

Table 2-8
U.S. engineered wood product manufacturers' lumber usage by country of origin and dimension, 2001

Dimension	United States	Canada	Total
	Percentage		
2X3	15	85	100
2X4	61	39	100
2X6	66	34	100
2X8	83	17	100
2X10	97	3	100
2X12	86	14	100
All dimensions	71	29	100

Source: Compiled from data submitted in response to Commission producer questionnaire.

[92] Canadian Wood Council, "Introduction to LVL," found at *http://www.cwc.ca/products/ewp/lvl/intro.html*, retrieved Sept. 6, 2002.
[93] Responses to the Commission producer questionnaire.

LVL production[94]

LVL consists of alternating layers of wood veneer and adhesive that are formed into billets of varying thicknesses and widths and cured in a heated press. Typically, the wood fibers are oriented along the length of the billet (parallel lamination). Veneer production begins by removing the bark from logs and cutting them into 8-foot sections (or bolts). The bolts are soaked in hot water for 12 to 18 hours, placed in a large lathe, and rotated at high speed. A knife (as wide as the bolt) is brought in contact with the spinning bolt, and a continuous piece of veneer (1/8-1/10 of an inch thick) is "peeled." The long lengths of veneer are clipped into smaller pieces or sheets (nominally 4x8 feet), and the sheets are dried in large dryers. The grain (the direction of fiber orientation) is aligned with the length of the sheet. The sheets of veneer thus produced vary in quality and may be used to make other products (e.g., plywood). Some LVL plants do not have the facilities (log-handling operation, lathes, and dryers also known as the "green end") to produce veneer. Although veneer is an intermediate product, it is a commodity for which a market exists. An LVL plant without a green end purchases veneer from outside vendors, typically other forest products companies that have excess veneer production capacity or that need an outlet for high grade veneer.[95]

Because LVL is intended to meet specified design values, veneer quality is critical to the quality of the final product. Therefore, veneer is checked and graded to ensure that it meets specifications for moisture content and density. After grading, the edges of each of the short sides of graded veneer are scarfed,[96] and the veneer is stacked ready to use.

Next, veneer is fed automatically into the layup line. The design values necessary for the final product determine the grades and sequence of the veneer used. Final positioning of the veneer (shuffling) is done manually to ensure that the scarfed edges overlap properly. The individual sheets of veneer thus form a continuous ply within the piece of LVL. With the exception of the top ply, plies are passed through a curtain coater that applies adhesive to the surface, and subsequent plies are laid on top. The layup process is continuous. The entire sandwich of wood and adhesive is pressed lightly, a surface coat is applied as a moisture seal, and the piece (billet) is cut to length. Billets are placed in a large, heated press which completes pressing and cures the adhesive. Once removed from the press, billets are sawn to the proper dimension and either packaged for shipment or moved to an I-joist facility.[97]

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[94] By far, LVL, which is produced at 21 plants, accounts for the largest part of all structural composite lumber produced in the United States. The manufacturing processes for PSL and LSL, which are produced at 3 plants, are proprietary. Therefore, the production process for LVL is the only one discussed at length in this report. PSL is manufactured by gluing strands of wood veneer (either Douglas Fir or SYP) together oriented along their length, pressing, and curing the adhesive using proprietary technology. LSL is made in a similar way using strands of Aspen or Yellow Poplar. Trus Joist, "About Residential Products," found at *http://www.tjm.com/products/restim.cfm*, retrieved Nov. 7, 2002, and Canadian Wood Council, "Introduction to PSL," found at *http://www.cwc.ca/products/ewp/psl/intro.html*, retrieved Sept. 9, 2002.

[95] Robert Freres, Freres Lumber Co., Inc., written submission to the Commission on behalf of Freres Lumber Co., Inc., Nov. 13, 2002.

[96] Scarfing creates a "sharpened" edge, which allows one sheet of veneer to overlap and be glued to another sheet without adding additional thickness to the resulting layer of veneer.

[97] In 2001, approximately 50 percent of the LVL produced was used as I-joist flanges. Craig Adair, *Regional Production and Market Outlook for Structural Panels and Engineered Wood Products 2002-2007*, APA - The Engineered Wood Association, Apr. 2002, p. 51.

I-joist production

An I-joist consists of two components, the flanges and the web. Flanges are made of either LVL, solid sawn lumber, or LSL. As noted earlier, the lack of a sufficient supply of solid sawn flange material led directly to the development of LVL, and much of the LVL produced in the United States is used as flange stock for I-joists. In general, SPF lumber may be preferred as flange stock, in particular, Black Spruce (*Picea mariana* (Mill.) B.S.P.).[98,99,100] A high percentage of Eastern SPF 2x3 lumber is used for EWP (table 2-7).

Separate pieces of flange stock are joined end to end by finger-jointing to create continuous pieces of flange material. Next, a groove is cut in the center of one side of the flange. The groove is slightly narrower at the bottom than at the top but is of the correct width and depth for the web stock.

The above operations are continuous and are duplicated so that there are two lines of flange material being created, one for each edge of the I-joist.

The web of the I-joist is made from OSB or plywood. Sheets of web stock (4x8 feet) are cut to the proper dimension. This cut determines the depth of the I-joist, which varies depending on the size of the I-joist being made, and is generally made across the sheet so that the resulting pieces are four feet long. The edges of the web stock are then tapered to match the groove in the flange stock. A tongue is cut into one of the short edges of the web stock, and a groove is cut in the other.

The web stock thus prepared is fed into the heart of the I-joist manufacturing equipment which assembles the web (with edges joined by tongue and groove) and glues and inserts the tapered edges of the web stock into flange stock on either edge.[101] The process produces a continuous I-joist which then is cut to length.[102] Assembled I-joists are placed on revolving racks and heated in a kiln to cure the adhesive. Finally, they are wrapped and banded for shipment.

Nonwood Building Product Substitutes

During 1997-2001, wood maintained its dominant presence in the market for structural building materials for U.S. residential construction against the principal substitutes, concrete and steel. The wood market share was 86 percent in 2000, having declined approximately 2 percent since 1997.[103]

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[98] Matthew J. Clark, Arent Fox Kintner Plotkin & Kahn, PLLC, written submission to the Commission on behalf of the Government of the Province of Quebec, Canada, Dec. 19, 2002.

[99] Black Spruce is a small, slow growing tree that occurs across Canada to the northern limit of tree growth. Richard J. Preston, *North American Trees*, Iowa State University Press, 1976, p. 53.

[100] Because Black Spruce is slow growing, it is a relatively dense wood that offers a very high yield of usable flange stock. USITC staff e-mail correspondence with industry official, Jan. 27, 2003.

[101] The taper facilitates the insertion of the web stock into the flange by creating slightly more tolerance.

[102] I-joists are manufactured in lengths up to 72 feet. The actual length depends on shipping method and transport limits.

[103] "Wood's Market Share in Decline," *Wood Markets*, Vol. 7, No. 6, Aug. 2002, p. 5.

In the U.S. residential market for flooring material, the concrete market share increased during 1997-2001 due to more slab-on-grade houses being built, especially in the U.S. South (table 2-9).[104]

Table 2-9
Market share of selected building components used in floor systems in new U.S. residential construction, by region, 1997 and 2001[1]

Regions	Cast-in-place concrete 1997	Cast-in-place concrete 2001	Solid lumber joists 1997	Solid lumber joists 2001	Wood I-joists 1997	Wood I-joists 2001	Open-web wood floor trusses 1997	Open-web wood floor trusses 2001
	Percent[2]							
United States	29.2	33.5	40.2	28.5	19.5	26.0	9.7	10.4
Northeast	4.0	5.8	66.4	49.1	18.6	39.4	8.7	4.5
Midwest	10.4	13.4	58.8	44.3	20.9	28.2	9.4	13.6
South	37.8	46.3	34.4	24.4	14.6	16.5	12.2	12.0
West	40.5	36.6	23.3	15.4	27.7	36.6	6.0	7.3

[1] Based on square feet of floor area in new residential construction (includes single family detached, single family attached, and multifamily units).
[2] Difference between horizontal sum and 100 percent represents other methods and components including precast concrete, steel, and structural insulated panels.

Source: USITC estimates based on data from National Association of Home Builders Research Center.

In the early 1990s as lumber prices were rising, the American Iron and Steel Institute (AISI) focused on residential construction markets.[105] Advantages of steel include price stability, dimensional stability, and immunity to mold or insect damage.[106] Disadvantages include high labor requirements, thermal bridging,[107] high price, lack of uniform building codes, and the fact that an engineer must design each building.[108] Efforts by the steel industry to increase market share include standardization of products (studs, headers, and floor joists), inclusion of prescriptive measures into model building codes, development of builder training tools, a public relations campaign,[109] and re-engineering standard wood plans to use steel wall panels.[110]

[104] Ibid.
[105] In 1998, AISI created the North American Steel Framing Alliance (NASFA). Kathy Price-Robinson, "The New Steel," found at *http://www.forestweb.com/APAweb/ewj/2001_fall/f_newsteel.html*, retrieved Sept. 4, 2002.
[106] In Hawaii, the market share of steel in residential markets is reported to be 50 percent due to the threat of the Formosan termite. Kathy Price-Robinson, "The New Steel," found at *http://www.forestweb.com/APAweb/ewj/2001_fall/f_newsteel.html*, retrieved Sept. 4, 2002; "Wood's Market Share in Decline," *Wood Markets*, Vol. 7, No. 6, Aug. 2002, p. 4.
[107] The characteristic of some materials to conduct temperature differences through a wall assembly.
[108] Kathy Price-Robinson, "The New Steel," found at *http://www.forestweb.com/APAweb/ewj/2001_fall/f_newsteel.html*, retrieved Sept. 4, 2002, and Barb McHatton, Dan McLeister, and Eric Benderoff, "Alternative Choices," *Professional Builder*, Sept. 1994, p. 133.
[109] Ibid., Sept. 4, 2002.
[110] Barb McHatton, Dan McLeister, and Eric Benderoff, "Alternative Choices," *Professional Builder*, Sept. 1994, p. 133.

In spite of steel industry efforts, the growth of steel market share has not been as fast as expected,[111] but has been most apparent in the market for interior wall framing, particularly in multifamily residential construction.[112] During 1997-2001, the steel market share in the U.S. market for interior wall materials increased from 3 percent to 5 percent (appendix table D-2-1). The use of steel in exterior wall framing is limited (because of its relatively poor insulation properties) to climates that do not experience extreme cold or hot weather.[113] During 1997-2001, the steel market share in the U.S. markets for exterior wall and roof truss material generally remained less than 1 percent (appendix table D-2-2 and D-2-3). A small number of manufacturers of wood structural building components also noted production of steel trusses or panels in their producer questionnaire responses. One manufacturer noted that its production of steel trusses was sold exclusively into the light commercial construction market.[114]

Steel has not made significant inroads into residential construction in Canada and is not anticipated to do so in the near future. According to industry sources, steel is harder to work with than wood in residential construction, steel is costlier than wood, construction workers lack the know-how to work with steel, and home builders are resistant to change.[115] Truss producers in Quebec and British Columbia indicated that steel is not a significant factor in residential construction in their markets. In British Columbia, industry officials indicate that a strong wood mentality for residential construction virtually precludes the use of steel.[116]

Description and Competitive Effects of Building Codes

Building codes are regulatory documents with the purpose of ensuring that buildings are built to minimum standards to protect the welfare of occupants. Building codes are generally adopted and enforced by state or local jurisdictions. In the first half of the 20th century, building code officials and administrators formed organizations to professionalize the process and develop uniform model building codes. Three groups and, therefore, three sets of model building codes emerged in the United States, whereas Canadian building codes have been based on a single model code. The Building Officials and Code Administrators, International (BOCA, formed in 1915) developed the *National Building Code* (NBC). The NBC is performance based and utilizes references to standards published by other entities. It is predominately used in the Eastern United States, and consequently reflects the needs of urbanized environments. The International Conference of Building Officials (ICBO, formed in 1922) developed the *Uniform Building Code* (UBC). The UBC is a mix of performance

[111] Kathy Price-Robinson, "The New Steel," found at *http://www.forestweb.com/APAweb/ewj/2001_fall/f_newsteel.html*, retrieved Sept. 4, 2002.

[112] "Wood's Market Share in Decline," *Wood Markets*, Vol. 7, No. 6, Aug. 2002, p. 4.

[113] Ibid.

[114] The manufacturer noted that the trend in light commercial construction was away from flat roofs. Thus, his firm's steel trusses competed primarily with heavy gauge steel. USITC staff interview with industry officials, Oct. 18, 2002.

[115] USITC staff interview with industry official, Nov. 6, 2002.

[116] USITC staff interviews, Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002; USITC staff telephone interview with industry official, Nov. 1, 2002.

based and prescriptive requirements.[117] It contains most materials needed to enforce and interpret the code without reference to outside standards. The UBC is predominately used in the Western United States, and consequently reflects the risk of earthquakes in the West. The Southern Building Code Congress, International (SBCCI, formed in 1940) developed the *Standard Building Code* (SBC). It is primarily performance based and relies on outside standards. The SBC is predominately used in the Southeastern United States, and consequently reflects the risk of high winds from tropical storms and hurricanes.[118]

Since 1941, all Canadian Provincial and territorial building codes have been based on the *National Building Code* (CNBC), which is published and maintained by the Canadian Commission on Building and Fire Codes (CCBFC).[119] The Canadian Constitution specifically assigns the regulation of buildings to the Provinces and territories. The CNBC contains both prescriptive and performance-based requirements.[120]

To address common issues and develop more uniform and consistent model codes, the three U.S. model code groups formed the Council of American Building Officials (CABO) in 1972. CABO established the Board for the Coordination of the Model Codes (BCMC) to identify conflicts among the three U.S. model codes and recommend revisions. This process initially resulted in a common format that was implemented in 1993 and 1994. The second collaborative effort among the three U.S. code groups was the *One- & Two-Family Dwelling Code* (OTFDC). The OTFDC was primarily prescriptive, but was not a mandatory document unless specifically adopted by a jurisdiction.

In 1994, the three U.S. code organizations formed a new umbrella organization called the International Code Council (ICC), which was charged with the development of a single set of primarily performance-based model building codes. The final sections of these ICC model codes, including the International Building Code (IBC) and the International Residential Code (IRC), were completed and published in 2000. Since then, 18 States have adopted the IBC, and 16 States have adopted the IRC. Local governments in 18 other States have adopted the IRC, and in 13 other States local governments have adopted the IBC.[121]

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[117] Prescriptive codes seek to assure minimum standards of performance by regulating the methods by which buildings are constructed and materials that can and cannot be used in building construction. Industry experts believe that prescriptive codes act as barriers to innovation. Performance-based codes do not specify methods and materials, but describe and specify the minimum level of performance that must be achieved. For further information see Greg C. Foliente, "Developments in Performance-Based Building Codes and Standards," *Forest Products Journal*, Vol. 50, No 7/8, July/Aug. 2000, pp. 12-21.

[118] Much of this section summarizes material from D.P. Tyree, and D.L. Pitts, *The International Building Code and International Residential Code and Their Impact on Wood-Frame Design and Construction*, found at *http://awc.org/Publications/papers/ASCEIBD-IRC.pdf*, retrieved Jan. 13, 2003; and S.W. Francis, and J.B. Stone, *The International Building Code and Its Impact on Wood-Frame Design and Construction,* found at *http://www.awc.org/Publications/papers/ASAE984007.pdf*, retrieved Jan. 13, 2003.

[119] The *National Building Code* published by BOCA and the *National Building Code* published by the CCBFC are separate and distinct building codes and documents.

[120] Canadian Commission on Building and Fire Codes, *Objective-Based Codes: A Canadian Approach to Building and Fire Codes for the 21st Century.*

[121] International Code Council, *International Codes - Adoption by State*, found at *http://www.intlcode.org/government/adoptions.htm*, retrieved Jan. 15, 2003.

The CCBFC is in the process of completing a major restructuring of the CNBC. The CCBFC believes that a purely performance-based code is inadequate and, therefore, has developed a unique concept called objective-based codes on which to base the redeveloped CNBC.[122] Building codes currently in effect across the United States and Canada may be based on at least five different sets of model codes. Several factors drive these efforts to develop and implement new, more consistent, primarily performance-based building codes.

As international trade in building products increased, the influence of building codes began to cross national borders. It was not always clear how a product that conformed to a purely prescriptive code in one country would perform subject to the prescriptive codes in another country. In addition, the World Trade Organization Code on Technical Barriers to Trade specifies that technical regulatory requirements must be specified, where possible, in terms of performance rather than design or descriptive characteristics. Therefore, it became increasingly possible to criticize prescriptive building codes as nontariff barriers to trade. Performance-based codes were viewed as more consistent with WTO obligations.[123]

Though the three U.S. model codes imposed similar regulations on many aspects of residential construction, they differed in format, content, and appearance. In addition, jurisdictions were not precluded from amending the model codes for local use. Some jurisdictions, such as the States of New York and Wisconsin, adopted codes that were developed independently of any of the three U.S. model codes. Differences among building codes in different jurisdictions can impose costs on architects, engineers, designers, contractors, builders, and manufacturers that operate across jurisdictional lines. Consequently, prescriptive building codes also function as barriers to entry into local housing markets.

Development and implementation of these new, primarily performance-based, building codes will be an evolutionary process. In the United States, while the ICC specifically discourages it, adopting jurisdictions may still amend and modify the model codes. Nonetheless, the objective of developing a single set of primarily performance-based model codes for use nationwide should allow architects, engineers, designers, contractors, and builders to market their services to broader geographical regions. This should also allow building product manufacturers to reduce research and development costs associated with meeting several different sets of standards, and consequently increasing the competitiveness of building product manufacturers over broader geographic areas.

Market Shares in Residential Construction

This section provides information on the market share of wood structural building components during 1997-2001 compared with their principal wood-based substitutes in the United States and Canada. The residential construction industry is very fragmented, consisting principally of thousands of small, privately-owned firms serving local markets. In the United States, there are over 65,000 home builders, of which approximately 68 percent

[122] Canadian Commission on Building and Fire Codes, *Objective-Based Codes: A Canadian Approach to Building and Fire Codes for the 21st Century.*

[123] Eleni Deroukakis, *Performance-Based Codes Impact on International Trade*, Institute for Research in Construction Occasional Paper, National Research Council of Canada, Oct. 2000.

construct 25 or fewer units per year and 5 percent construct 500 or more units per year.[124] Likewise, the Canadian industry is characterized by thousands of small home builders. There are an estimated 4,000 home builders in Ontario alone. In British Columbia, an average home builder builds less than 10 houses a year. There are some relatively large builders in Canada's major cities such as Toronto, which accounted for one-quarter of all housing starts in Canada in 2001. Nevertheless, these builders are small compared with the largest U.S. home builders. Few, if any, builders have operations in more than one Province in Canada. Very little consolidation of home builders is occurring in Canada. Any that is occurring is among builders within the same Province.[125] This fragmentation contributes to regional differences in the market share of wood structural building components.

United States

The NAHB Research Center, Inc. (Research Center) annually sends a Builder Practices Survey to active U.S. home building companies. The Research Center uses the data it collects to estimate the general characteristics and the average amount of material used in the construction of single family detached (SFD) and single family attached/multifamily (SFA/MF) housing units on a regional basis. The reported data provide a measure of trends in construction methods and are used as the basis for estimates of the market shares of wood structural building components shown in appendix tables D-2-4 to D-2-8. These data illustrate trends in selected wood structural building component usage during 1997-2001. The data are shown for the major end uses of wood structural building components (i.e., beams and headers, wood exterior walls, floors, and roofs) on a national and regional basis (U.S. Census regions).[126]

During 1997-2001, EWP increased market share in beam and header applications[127] at the expense of solid wood beams and headers.[128] In 2001, 44 percent of beams and headers in new U.S. residential housing was constructed of solid wood, either large dimension lumber or built-up dimension lumber, a decrease from 1997 when 53 percent of beams and headers was constructed of solid wood (table 2-10). The total use of the various EWP in beam and header applications increased from a total of 34 percent to 42 percent. These trends were generally evident in all regions of the country, though usage of various products did vary among regions as shown in table 2-10. Midwest builders were the most likely to use EWP for beams and headers. Builders in the South were the least likely to use EWP in beam and header applications.

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[124] National Association of Home Builders, "Builder Statistical Profile," Aug. 2002.

[125] Canada Mortgage and Housing Corp., *Canadian Housing Statistics 2001*, June 2002. USITC staff interviews, Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002; USITC staff interviews with industry officials, Nov. 6 and Dec. 18, 2002 and Jan. 6, 2003.

[126] NAHB Research Center, *Builder Practices Report*, various volumes, 1998-2002. Research Center estimates (which are subject to standard statistical uncertainty) were based on the following number of constructed housing units: 1997: 41,903 SFD units, 20,038 SFA/MF units; 1998: 38,190 SFD units, 20,904 SFA/MF units; 1999: 23,608 SFD units, 14,746 SFA/MF units; 2000: 38,857 SFD units, 19,671 SFA/MF units; 2001: 41,302 SFD units, 22,157 SFA/MF units.

[127] The values for beams and headers include wood structural building components used as rim board for I-joist construction. Rim board is the framing member used to tie the ends of the I-joists together.

[128] The use of open web wood trusses in beam and header applications was negligible.

Table 2-10
Market share of selected wood structural building components used for beam and header applications in new U.S. residential construction, by region,[1] 1997 and 2001[2]

			Engineered Wood Products							
	Solid wood[3]		Laminated veneer lumber (LVL)		Stranded-lumber products[4]		Glue laminated lumber (Glulam)		I-joists	
Region	1997	2001	1997	2001	1997	2001	1997	2001	1997	2001
	Percent[5]									
United States	52.5	43.9	9.3	14.5	15.1	16.8	3.9	5.7	5.4	4.8
Northeast	56.0	42.9	6.9	15.6	14.8	15.4	1.9	5.3	5.0	5.5
Midwest	47.7	35.8	9.8	24.2	16.3	14.8	4.6	6.5	5.0	2.4
South	57.3	51.3	10.1	13.6	11.5	9.9	2.2	3.7	5.3	6.0
West	47.1	39.0	8.8	8.1	20.5	29.4	7.0	8.3	5.9	4.3

[1] Regions correspond to U.S. Census regions as shown in figure 2-3.
[2] Based on linear feet of beams and headers in new U.S. residential construction (includes single family detached, single family attached, and multifamily units), and includes linear feet of engineered wood products used as rim board (framing member used to tie ends of I-joists together).
[3] Includes large dimension lumber and built-up dimension lumber.
[4] Includes parallel strand lumber, laminated strand lumber, and oriented strand lumber.
[5] Difference between horizontal sum and 100 percent represents other products including steel and open-web wood trusses.

Source: USITC estimates based on data from National Association of Home Builders Research Center.

Wood exterior walls are predominantly built using onsite light frame construction (table 2-11). During 1997-2001, the share of walls in new U.S. residential construction built with light frame construction ranged from 86 percent in 2000 and 2001 to 92 percent in 1999.[129] Wall panel usage ranged from 5 percent in 1999 to 12 percent in 2000. During 1997-2001, increased use of wall panels in the Northeast and Midwest was offset by decreased use in the South (table 2-11). Industry representatives attributed variation in wall panel usage to builders' attempts to balance construction schedules and labor supply. When demand is high, construction schedules tight, and labor in short supply, builders will increase their usage of wall panels to save labor. When demand is slack and builders have excess labor available, they will use on-site construction to avoid layoffs.[130]

During 1997-2001, residential floors were primarily constructed using cast-in-place concrete (houses built on concrete slabs), solid lumber joists, or wood I-joists (table 2-9). Open web wood floor trusses averaged 9.5 percent of total floor area during 1997-2001. Nationally, solid lumber joists lost market share to all other floor construction methods. The use of wood I-joists, a substitute for solid lumber joists, increased from 20 percent to 26 percent. The use of solid lumber joists decreased from about 40 percent to 29 percent. Solid lumber joists remain the predominant method of floor construction in the Northeast and Midwest, but demand has shifted to wood I-joists. Between 1997 and 2001, the to 28 percent in the Midwest. I-joist use also increased from 28 percent to 37 percent in the West.

[129] Estimates based on data reported by NAHB Research Center in *Builder Practices Report*, various volumes, 1998-2002.
[130] USITC staff interviews with industry officials at Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002.

Table 2-11
Market share of selected construction methods used for wood exterior wall systems in new U.S. residential construction, by region,[1] 1997 and 2001[2]

Regions	Light frame construction		Panelized construction		Modular construction	
	1997	2001	1997	2001	1997	2001
	Percent [3]					
United States	87.1	85.7	11.3	10.3	0.9	2.4
Northeast	82.8	74.0	14.8	22.1	1.9	2.6
Midwest	84.5	79.2	12.4	17.5	2.6	2.4
South	84.9	88.0	14.7	6.0	0.2	3.4
West	94.0	92.4	4.1	6.0	0.0	0.8

[1] Regions correspond to U.S. Census regions as shown in figure 2-3.
[2] Based on linear feet of exterior walls in new U.S. residential construction (includes single family detached, single family attached, and multifamily units).
[3] Difference between horizontal sum and 100 percent represents other methods including structural insulated panels, post and beam, and log construction.

Source: USITC estimates based on data from National Association of Home Builders Research Center.

The use of open web wood floor trusses varies by region and has been steady at 9 percent to 10 percent of the market. The use of floor trusses ranges from less than 5 percent in the Northeast to nearly 14 percent in the Midwest. Though national and regional market shares for the use of open web wood floor trusses were generally less than 15 percent, industry representatives indicated that some local markets have a preference for open web wood floor trusses. For example, some builders in the Phoenix, Arizona market prefer trusses because air conditioning duct work can be accommodated within the floor system.[131] The use of open web wood floor trusses is also more prevalent in multifamily units, ranging between 16 percent in 1998 to 28 percent in 1999.[132]

These trends are associated with several factors. Greater relative population growth and the associated increased housing demand in southern regions of the United States contribute to the trend towards cast-in-place concrete because the milder climate allows the use of this cost effective type of construction. Industry representatives attribute the trend toward increased use of wood I-joists to factors that have changed over time. Volatile and higher prices for wide-dimension lumber in the mid-1990s made I-joists, with more stable pricing, more attractive to builders. However, as the price of wide-dimension lumber moderated in the late 1990s, some builders continued to use I-joists because of both user and consumer preferences. Home designers may prefer I-joists for the versatility they allow in floor plans. Builders may prefer I-joists because they require less labor, especially in reduced post-sale call backs, and minimize job site waste. Home buyers may prefer I-joists because they provide open spans in basements and provide a more stable platform that minimizes floor noise.[133]

Residential roof construction is dominated by metal plate connected wood trusses and traditional site-constructed rafters. Nationally, during 1997-2001, an average of 64 percent of residential roof area was constructed with roof trusses, while 35 percent was constructed

[131] Ibid.
[132] Estimated from usage coefficient tables, NAHB Research Center, *Builder Practices Report*, various volumes, 1998-2002.
[133] USITC staff interviews with industry officials, Nov. 13-14, 2002.

with rafters.[134] The area constructed with roof trusses, however, fell slightly, from 68 percent in 1997 to 63 percent in 2001 (table 2-12). Trusses are the dominant form of roof construction in the Midwest and West, but rafters still account for nearly 45 percent of residential roof construction in the Northeast and more than one-half of residential roof construction in the South. Between 1997 and 2001, the percentage of roof area constructed of trusses in the South actually decreased (table 2-12). Discussions with truss manufacturers suggest that truss usage rates are related to cost, the skill level, and availability of labor. The use of trusses tends to increase as the availability of skilled roof framers decreases. In addition to these factors, some truss manufacturers attribute low usage rates in the South to resistance among smaller, low-volume builders.

Table 2-12
Market share of selected building components used in roof systems in new U.S. residential construction, by region,[1] 1997 and 2001[2]

	Trusses		Rafters	
Regions	1997	2001	1997	2001
	Percent [3]			
United States	67.5	62.8	32.0	35.5
Northeast	51.6	52.7	47.7	44.7
Midwest	80.7	81.9	19.0	17.8
South	54.7	45.0	44.9	52.6
West	85.0	85.8	14.4	13.1

[1] Regions correspond to U.S. Census regions as shown in figure 2-3.
[2] Based on square feet of roof area in new residential construction (includes single family detached, single family attached, and multifamily units).
[3] Difference between horizontal sum and 100 percent represents other methods and components including beams and purlins and structural insulated panels.

Source: USITC estimates based on data from National Association of Home Builders Research Center.

Canada

In recent years, wood structural building components have displaced dimensional lumber to some extent in certain residential construction applications. Roof trusses have replaced traditional roof framing, I-joists and floor trusses have taken market share from dimensional umber in floor joist applications, and LVL and glulam have taken market share from dimensional lumber in beam and header applications. This displacement has increased the demand for wood structural building components in Canada. The use of I-joists in single-family and multifamily home construction in Canada grew by approximately one-third between 1997 and 2001.[135] The average amount of engineered wood used per housing start for single family detached houses in Canada nearly tripled between 1995 and 1998. The average amount of engineered wood used per housing start for townhouses and apartments in Canada more than tripled between 1995 and 1998.[136] Roof trusses have largely displaced traditional roof framing in Canada. In British Columbia, Manitoba, Alberta, and Quebec,

[134] Estimated from product usage tables, NAHB Research Center, *Builder Practices Report*, various issues, 1998-2002.
[135] Elliot J. Feldman, Baker & Hostetler LLP, written submission to the Commission on behalf of Canadian I-Joist Producers, Dec. 19, 2002.
[136] Wood Products Council, *Wood Used in New Residential Construction 1998 and 1995*, Dec. 1999.

roof trusses are used in over 90 percent of all residential construction.[137] In Ontario, roof trusses have 70 percent of the residential roofing market versus 30 percent for traditional roof framing.[138] Floor trusses have made inroads into residential construction, although primarily in the multifamily and apartment markets and in some large custom-built houses. In single-family house construction, builders generally prefer I-joists or dimensional lumber over floor trusses.[139] Prefabricated panels have made only limited inroads into residential construction allegedly because of quality problems and the tendency for framing contractors to want to frame on site.[140]

Wood structural building components have increased their share of the residential construction market in Canada for a variety of reasons. Compared with dimensional lumber, many builders have found that these components are easier to work with and install, speed up the construction process, require less on-site labor, increase design flexibility by providing long spans and wider spacing, reduce the need for skilled construction workers, require less cleanup of the job site, are less likely to be stolen, and reduce callbacks. Consequently, although wood structural building components may cost more than dimensional lumber, many builders, particularly the larger ones, have found that the actual installed cost of the components, after factoring in lower labor costs at the job site and fewer callbacks for quality problems, is less than the cost of dimensional lumber.[141] The relative stability of wood structural building component prices versus dimensional lumber prices in recent years has proven attractive to builders by giving them more control over their costs.[142]

A serious shortage of skilled construction labor in Canada has also contributed to increased demand for wood structural building components. A shortage of young Canadians entering into construction trades, an aging work force of skilled construction labor, and a tendency for skilled workers to work in higher-paying commercial construction jobs may have left many home builders with an insufficient number of workers. In the spring of 2002, home builders in Toronto, in partnership with the Federal Government, began a program to recruit skilled construction workers from foreign countries to come to Toronto to work in home construction. If successful, the program may be expanded to other areas of Canada.[143]

Wood structural building components are also used in commercial construction in Canada but not nearly to the extent as in residential construction. Use is generally confined to light commercial construction and the construction of barns and sheds.[144] Producers of wood structural building components in Canada indicated that the majority of their sales are to the

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[137] USITC staff interviews, Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002; USITC staff telephone interview with industry official, Nov. 1, 2002.

[138] USITC staff telephone interview with industry official, Nov. 6, 2002.

[139] Ibid.

[140] Ibid., Oct. 8, 2002 and Nov. 1, 2002.

[141] USITC staff interviews, Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002; USITC staff interview with industry officials, Dec. 10, 2002.

[142] Ibid.

[143] Frank O'Brien, "Home builders recruit foreign workers in effort to curtail labor shortage," May 16, 2002, found at *http://db.inman.com/inman/content/subscribers/inman/column.cfm?StoryId=020502FB*, retrieved Sept. 20, 2002.

[144] An exception to this is glulam, which has traditionally been used in some large commercial construction projects such as sports arenas and bridges. USITC staff telephone interview with industry official, Oct. 8, 2002; USITC staff interview with industry officials, Dec. 10, 2002.

residential construction market.[145] Penetration of the commercial construction market has been difficult because steel and concrete have traditionally dominated. Commercial designers typically know how to design only with steel and concrete, commercial contractors lack familiarity with wood, and both designers and contractors are resistant to change.[146] Nevertheless, the Wood *WORKS!* Project, a national effort begun in 1998 by the Canadian Wood Council to promote the use of wood in commercial construction, has achieved some success in expanding the market for Canadian wood building products. Through seminars, meetings, and advertising campaigns, this project has educated commercial designers, commercial builders, building owners, and public officials to the advantages of building with wood. Over the past 4 years, more than 400 municipalities in Canada have adopted *Build with Wood* policies, which require that government construction projects consider and use wood when cost-effective. As a result of these policies, over C$200 million in commercial construction has been built with wood rather than with steel or concrete.[147]

Demand for wood structural building components in Canada is expected to continue to grow over the next few years but at a slower rate than in years past. Roof trusses have already replaced traditional roof framing in most areas of Canada so there is very little growth to be gained by further displacement. Dimensional lumber still maintains a large share of the residential flooring market and the beam and header markets so EWP have room to grow but this growth will be harder to come by. Although many home builders have already embraced EWP, other builders, because of less familiarity with these products and low dimensional lumber prices, have been slower to adopt them. Over the next few years, industry officials expect that abundant and competitively priced dimensional lumber will slow further growth in the use of EWP among these builders.[148]

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[145] USITC staff interviews, Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002; USITC staff interview with industry officials, Dec. 10, 2002.

[146] USITC staff interview with industry officials, Dec. 10, 2002.

[147] Canadian Wood Council, 2000 Annual Review, found at *http://www.cwc.ca/cwc/about_us/mission/index.html*, retrieved Sept. 5, 2002.

[148] USITC staff interview with industry officials, Nov. 14 and Dec. 10, 2002.

CHAPTER 3
THE NORTH AMERICAN WOOD STRUCTURAL BUILDING COMPONENT INDUSTRY

This chapter provides information on industry structure, production, consumption, capacity, investment, production costs, raw material supply, transportation costs, markets, and marketing practices for wood structural building components in the North American market. Information is provided for the U.S. and Canadian industries,[1] the major suppliers.

United States

Introduction

Shipments of the U.S. wood products industry totaled about $80 billion in 2001. This industry includes thousands of firms and employees located across the United States. Manufactured products are varied and include lumber, wood structural building components, panel products (e.g., OSB, plywood, etc.), millwork (e.g., windows, doors, flooring, etc.), and wood containers and pallets. In recent years, shipments of wood structural building components (about 7.5 percent of the total) have accounted for a growing part of this mix.

Driven by strong construction markets during 1997-2002, production of wood structural building components increased in value at an average compound annual rate of 8.0 percent to $10.3 billion in 2001 (table 3-1) and is likely to reach $10.7 billion in 2002. During 1997-2002, production of trusses and prefabricated panels increased steadily at an estimated average compound annual rate of 9.0 percent (table 3-1).[2] Trusses and prefabricated panels represented 80 percent of total production of wood structural building components in 1997 but increased to 84 percent in 2001 as a result of strong growth relative to EWP. In 2001, production of trusses and prefabricated panels was an estimated $8.5 billion and is estimated to reach $9.0 billion in 2002.

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[1] Finland supplies minor amounts of LVL to the U.S. market.

[2] The nature of wood structural building components, highly variable sizes and designs, makes them inherently difficult to measure in quantity terms in a meaningful way. (In recognition of this fact, the U.S. Customs Service does not require quantities to be reported for imports of these items.) The Commission producers questionnaire did include space for manufacturers to report quantities. Not unexpectedly, however, data received were incomplete or shown in different units of measure and, therefore, are not reported.

Table 3-1
U.S. wood structural building components: Estimated production, 1997-2002

Items	1997	1998	1999	2000	2001	2002[1]
	Million dollars					
Trusses and prefabricated panels	6,006	6,528	7,544	7,822	8,487	8,953
Engineered wood products	1,540	1,618	1,855	1,842	1,785	1,767
Total	7,546	8,146	9,399	9,664	10,272	10,720

[1] 2002 data estimated from 6 month YTD data.

Source: Compiled from data submitted in response to Commission producer questionnaires.

EWP have exhibited strong growth since 1990,[3] although the value of EWP production exhibited more moderate growth compared with truss growth. The average compound annual growth rate was 3.8 percent during the period; production increased from $1.5 billion in 1997 to $1.9 billion in 1999 but decreased slightly to $1.8 billion in 2001. Production of EWP is expected to be essentially unchanged in 2002.

Trusses and Prefabricated Panels

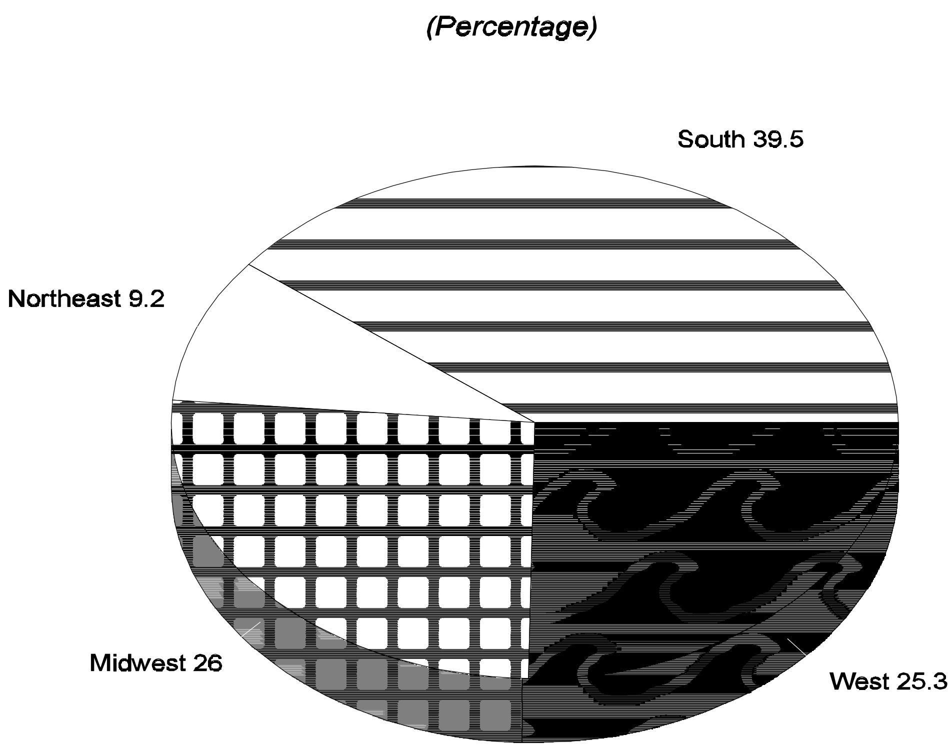
Industry structure

In 2002, there were approximately 1,690 U.S. firms that manufactured trusses and/or prefabricated panels (wall panels and floor panels) at more than 1,800 plants.[4] Firms vary in size from those with less than $1 million in annual sales to those with annual sales of more than $50 million. However, there are few manufacturers with sales of more than $50 million;[5] most are small firms. A 2000 survey of WTCA member firms indicated that 56 percent have annual sales of less than $7 million.[6] Truss manufacturers are generally close to the markets that they serve. The geographic distribution of U.S. truss plants is shown by figure 3-1. Their location generally is closely aligned with U.S. demand for residential housing construction (figure 2-2). In 2001, the average value of production per plant was $4.7 million. The average cost of a new truss plant was $2.9 million,[7] and industry representatives report that it would take about 1 year to build.[8]

During 1997-2002, the Midwest region accounted for the largest percentage of truss and panel production (table 3-2). However, over the period, the Midwest share of production decreased as compared with shares of other regions. Though most housing starts are in the South, both the Midwest and West regions had larger shares of truss and panel production reflecting the high market shares of trusses in those regions as well as the low market share of trusses in the South (table 2-12).

[3] USITC staff interview with industry officials, Dec. 10, 2002.
[4] WTCA lists of corporate contacts and manufacturers.
[5] WTCA membership list shows less than 10 firms with more than $50 million in sales.
[6] WTCA, "Financial Performance Survey 2001 for Fiscal Year 2000," p. 5.
[7] Responses to Commission producer questionnaire.
[8] USITC staff interview with industry official, Oct. 2, 2002.

Figure 3-1
U.S. truss and prefabricated panel production: Distribution of manufacturers by region,[1] 2002



[1] Regions correspond to U.S. Census regions as shown in figure 2-3.

Source: Wood Truss Council of America.

Table 3-2
U.S. truss and panel production: Percentages by region,[1] 1997-2002

Items	1997	1998	1999	2000	2001	2002[2]
	Percentage					
Northeast	2	2	2	5	5	5
Midwest	53	52	49	45	43	44
South	19	19	19	22	23	22
West	26	27	30	29	29	29
Total	100	100	100	100	100	100

[1] Regions correspond to U.S. Census regions as shown in figure 2-3.
[2] Based on 6 month YTD data.

Note.—Figures may not add to 100 due to rounding.

Source: Compiled from data submitted in response to Commission producer questionnaires.

In recent years, truss-manufacturing firms have tended to consolidate their operations. However, large consolidated firms typically own multiple manufacturing plants, each serving different geographic markets. For instance, one respondent indicated ownership of 15 separate plants in 15 separate markets.[9] Because market attributes (e.g., channels of distribution, delivery requirements) differ across markets, the opportunities to realize economies of scale are diminished,[10] and consolidations of truss manufacturers reportedly have not been as successful as consolidations in other industries.[11]

Coincident with strong growth in truss shipments during 1997-2001, the total number of people employed increased at an average compound annual rate of 5.2 percent to 39,307 in 2001 (table 3-3). Likewise, the average number of persons employed per manufacturer increased in all regions (table 3-4). On a national basis, average employment increased at an average compound annual rate of 5.6 percent to 112 employees per manufacturer in 2002. Seasonal employment peaks were somewhat more pronounced in the Northeast than in other regions of the country (table 3-4).

Production, capacity, and investment

Truss production, which varies seasonally with the construction cycle (i.e., heavy activity during the summer months), is heaviest in the second and third quarters. Most producers (80 percent) who responded to the producer questionnaire reported that the cyclic pattern remained the same during 1997-2002. They indicated that 58 percent of annual production occurred in the second and third quarters in 2001. Production was seasonal in all regions of the country, although slightly more so in the Northeast and Midwest (table 3-5).

[9] Response to Commission producer questionnaire.
[10] USITC telephone interview with industry official, Feb. 13, 2003.
[11] Testimony of Kent Pagel, president, Pagel, Davis & Hill, P.C., transcript of the hearing, p. 74.

Table 3-3
U.S. wood structural building components: Employment, 1997-2001

Items	1997	1998	1999	2000	2001
	Number of employees				
Truss manufacturing:[1]					
All employees	32,069	34,661	37,649	38,597	39,307
Production workers	24,266	26,401	28,856	29,276	29,634
Engineered wood products:[2]					
All employees	5,372	5,811	5,884	5,709	5,724
Production workers	4,469	4,869	5,049	4,844	4,932

[1] Employment data for truss manufacturing, NAICS code 321214.
[2] Employment data for engineered wood members, NAICS code 321213, which includes some products not in the scope of this investigation.

Source: U.S. Census Bureau Annual Survey of Manufactures, M019(AS)-1.

Table 3-4
U.S. truss and panel manufacturers: Average number of employees per manufacturer and rate of seasonal employment increase, by region,[1] 1997-2002

	1997	1998	1999	2000	2001	2002[2]
Northeast:						
Average no. of employees	55	62	59	77	89	95
Seasonal percent increase	40	32	25	33	34	23
Midwest:						
Average no. of employees	123	136	155	144	144	150
Seasonal percent increase	12	13	9	14	17	11
South:						
Average no. of employees	63	69	76	78	82	79
Seasonal percent increase	9	8	9	9	10	11
West:						
Average no. of employees	89	98	112	111	106	111
Seasonal percent increase	11	12	8	8	12	14
United States:						
Average no. of employees	90	99	109	109	109	112
Seasonal percent increase	12	13	10	12	15	13

[1] Regions correspond to U.S. Census regions as shown in figure 2-3.
[2] Based on 6 month YTD data.

Source: Compiled from data submitted in response to Commission producer questionnaires.

Table 3-5
U.S. truss manufacturers: Percentage of annual production, by region[1] and by quarter, 2001

Region	1st quarter	2nd quarter	3rd quarter	4th quarter
	Percent			
Northeast	15	26	33	27
Midwest	16	26	32	26
South	19	28	30	23
West	21	26	29	24
Total U.S.	18	27	31	24

[1] Regions correspond to U.S. Census regions as shown in figure 2-3.

Note.—Figures may not add to 100 due to rounding.

Source: Compiled from data submitted in response to Commission producer questionnaires.

During 1997-2002 production of floor trusses, as a percentage of total reported production, remained steady at 9 percent. However, the growth noted in chapter 2, in the value of U.S. shipments of unassembled building components during 1997-2000[12] was reflected in the responses of truss manufacturers to the Commission producer questionnaire. Production of wall and floor panels, as a percentage of total reported production, increased from 5 percent in 1997 to 10 percent in 2001 and is projected to be 11 percent in 2002. The relative growth of reported wall and floor panel production was offset by a drop in roof truss production, as a percentage of total reported production, which decreased from 84 percent in 1997 to 79 percent in 2001. Although some U.S. truss manufacturers have been discouraged from producing wall and floor panels by the reported disadvantages (noted in chapter 2),[13] other U.S. manufacturers are working aggressively to overcome the disadvantages and expressed optimism with regard to the future of panel markets.[14]

During 1997-2002, U.S. manufacturers generally operated one or two shifts per day; the number of manufacturers that responded to the producer questionnaire was evenly split between those working one and those working two shifts. During the period, the average work day remained unchanged at 1.5 shifts per day.[15] Most respondents worked 8 hours per shift during 1997-2002. The average was 8.7 hours per shift. Of those firms reporting work days of more than 16 hours, some operated three shifts per day, but more often, they operated two 10-hour shifts per day. Some producers add shifts to meet seasonal demand or to make up for lost time.[16] Although operating a second shift does not necessarily double output,[17] substantial unused capacity appears to exist, and 67 percent of truss manufacturers responding to the producer questionnaire indicated that production is easily expanded or contracted in response to changes in demand.[18]

Production costs

Based on survey data provided to the Commission by the WTCA, the overall cost of goods sold for WTCA member companies was nearly unchanged, averaging 70.6 percent of net sales in 1998 and 70.1 percent of net sales in 2000. Although the total cost of materials declined from an average of 49.8 percent to 45.6 percent of net sales between 1998 and 2000, the cost of labor and overhead increased from 20.8 percent to 24.5 percent of net sales during this time frame. Thus, increased labor and overhead costs offset the decline in material costs.[19] The section below on raw material supply discusses trends in material costs in more detail.

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[12] U.S. Census Bureau, "Value of Product Shipments: 2000, Annual Survey of Manufactures," Feb. 2002, p. 29.

[13] USITC staff interviews with industry officials, Aug. 21, 2002 and Oct. 18, 2002.

[14] Ibid., Dec. 11, 2002.

[15] Responses to Commission producer questionnaire.

[16] USITC staff interview with industry official, Aug. 21, 2002.

[17] Some manufacturers have encountered difficulties operating second shifts such as staffing, quality, or delivery problems. USITC staff interview with industry official, Aug. 21, 2002.

[18] Responses to Commission producer questionnaire.

[19] WTCA, "Financial Performance Survey 1999 for the Fiscal Year 1998," p. 12, and WTCA, "Financial Performance Survey 2001 for Fiscal Year 2000," p. 14. Data from the 1999 survey reflect responses from all 109 reporting companies. Data from the 2001 survey reflect responses from all 128 reporting companies.

During 1998-2000, direct labor costs increased by 1.6 percent relative to net sales and indirect labor costs increased by 0.6 percent relative to net sales.[20] Factors affecting increased labor costs include cost of living wage increases, merit-based wage increases, and "other" increases such as a larger workforce, bonuses, increased hours, and wage adjustments to meet competition.[21]

Overhead costs have been affected by increased costs of litigation and liability insurance related to mold. The presence of mold in residential and commercial buildings has generated a wave of litigation against builders, building owners, and property managers,[22] and insurers have been inundated with mold claims.[23] In 2002, insurance payments for mold claims in the United States were greater than $1 billion.[24] Large sums have been awarded in highly publicized mold cases, and it is reported that there are more than 10,000 mold related suits pending in the United States.[25]

The insurance industry response to the mold issue has affected the ability of some building materials firms to maintain adequate liability coverage.[26] The WTCA expects that insurance companies will add language excluding mold from liability policies as those policies are renewed.[27] Although the presence of mold on construction materials is not a known cause of mold infestation, more builders are requesting that building materials be delivered to the job site without any visible mold or discoloration.[28] Other builders are requesting broad warranties and indemnification that assign much of the liability for mold claims to component manufacturers.[29] Even in a hot, humid environment, mold growth depends on a continued source of wetness.[30] However, one manufacturer noted that surface mold was typically a bigger problem for his deliveries of SYP lumber.[31]

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[20] WTCA, "Financial Performance Survey 1999 for Fiscal Year 1998," p. 12, and WTCA, "Financial Performance Survey 2001 for Fiscal Year 2000," p. 14.

[21] WTCA, "Wage & Benefit Survey 2002 for Fiscal Year 2001," p. 25, WTCA, "Wage & Benefit Survey 2000 for Fiscal Year 1999," p. 25.

[22] Wood is not a preferred food source for most fungi. Only some molds (fungi) are able to digest cellulose; still fewer are able to digest the lignin surrounding the cellulose fibers, but mold can occur on lumber. In addition to wood, which serves as the food source, sustained growth requires suitable temperature (40 to 100 degrees F) and moisture. Kent J. Pagel, "Our Reality Whose Mold Is It?" Structural Building Components, Jan./Feb. 2003, p. 28, and "Mold on Lumber," Western Wood Products Association, July 2001, p. 1., and "Mold in Residential Buildings," NAHB Research Center, 2001, pp. 1 and 2.

[23] Christopher Wanjek, "It's Everywhere," *The Washington Post*, Sept. 17, 2002, found at *http:www.washingtonpost.com/wp-dyn/articles/A26083-2002Sep16.html*, retrieved Sept. 17, 2002.

[24] Michael McCagg, "Mold suits top 10,000; $1 billion at stake," found at *http://www.cmmonline.com/news.asp?mode=4&N_ID=37925*, retrieved Feb. 3, 2003.

[25] Ibid.

[26] Michael A. Fritz, "The Debate on Mold: A Growing Problem for the Housing Sector," NLBMDA testimony to the House Financial Services Committee, Subcommittee on Oversight and Investigations, Subcommittee on Housing and Community Opportunity, July, 18, 2002.

[27] Kent J. Pagel, "Our Legal Reality: Whose Mold Is It?" *Structural Building Components*, Jan/Feb. 2003, p. 29.

[28] Michael A. Fritz, "The Debate on Mold: A Growing Problem for the Housing Sector," NLBMDA testimony to the House Financial Services Committee, Subcommittee on Oversight and Investigations, Subcommittee on Housing and Community Opportunity, July, 18, 2002, and Ibid.

[29] Kent J. Pagel, "Our Legal Reality: Whose Mold Is It?" *Structural Building Components*, Jan/Feb. 2003, p. 29.

[30] Ibid., p. 28.

[31] USITC staff interview with industry official, Oct. 2, 2002.

Raw material supply

The cost of lumber is the largest expense borne by U.S. truss manufacturers. Consistent with the general decline in cost of materials noted earlier, the cost of lumber declined. In 1998, lumber accounted for 52.4 percent of the cost of goods sold, but in 2000 lumber accounted for 50.5 percent of the cost of goods sold.[32]

Random Lengths, Inc. collects weekly lumber price data from suppliers and purchasers and calculates weighted-average prices based on such factors as the size of the transaction and the quality of the lumber. Random Lengths, Inc. publishes these data in its weekly and annual publications. Five high-volume price series were taken from the *Random Lengths 2002 Yearbook*, to show long-term price trends. These data are presented on a quarterly basis from 1997 through 2002 in appendix table D-3-1 and figure 3-2.[33] The specific products for which price trends are reported are as follows: (1) Southern yellow pine – eastside (SYP), kiln-dried, 2x4, #2, random lengths, net f.o.b. mill; (2) Douglas fir, kiln-dried, 2x4, standard and better, random lengths, net f.o.b. mill; (3) Hem-fir – coast, kiln-dried, 2x4, standard and better, random lengths, net f.o.b. mill; (4) Western spruce pine fir (WSPF), kiln-dried, 2x4, random lengths, base prices;[34] and (5) Eastern spruce pine fir (ESPF), kiln-dried, 2x4, #1&2, random lengths, net delivered Boston.

The following chronology of events in the U.S. softwood lumber market during 1997-2002 was reported by Random Lengths, Inc.[35] Weakened Asian demand, particularly Japanese demand, and weakened demand in Australia for U.S. and Canadian softwood lumber exports combined with strong North American softwood lumber production during 1997-98 reportedly contributed to increased U.S. lumber supplies and generally weakening U.S. softwood lumber prices during this period. Strong U.S. softwood lumber prices developed during 1999 as U.S. housing starts reached a decade-high level for the 1990s of 1.6 million. Decreasing U.S. softwood lumber prices in 2000 were accompanied by a somewhat lower number of housing starts and strong lumber production. The continued strong U.S. dollar in 2000 reportedly led to further weakness in foreign demand for U.S. softwood lumber exports, and also reportedly contributed to lower U.S. prices for lumber during this period. In early 2001, framing lumber prices hovered near 8-year lows, then spiked higher after antidumping and countervailing duty petitions were filed upon expiration of the U.S./Canada SLA. By the third quarter, prices began declining and continued to do so for the remainder of the year despite the lowest mortgage interest rates in 30 years.

Prices generally increased during the first half of 2002 compared with late 2001 levels owing in part to a warm winter which moderated the typical seasonal drop-off in construction activity, as well as inventory buildup in anticipation of a strong building season and uncertainty over the final determinations in the softwood lumber antidumping and countervailing duty investigations. During the third and fourth quarters of 2002, lumber prices again declined. Factors attributed to the decline include strong softwood lumber

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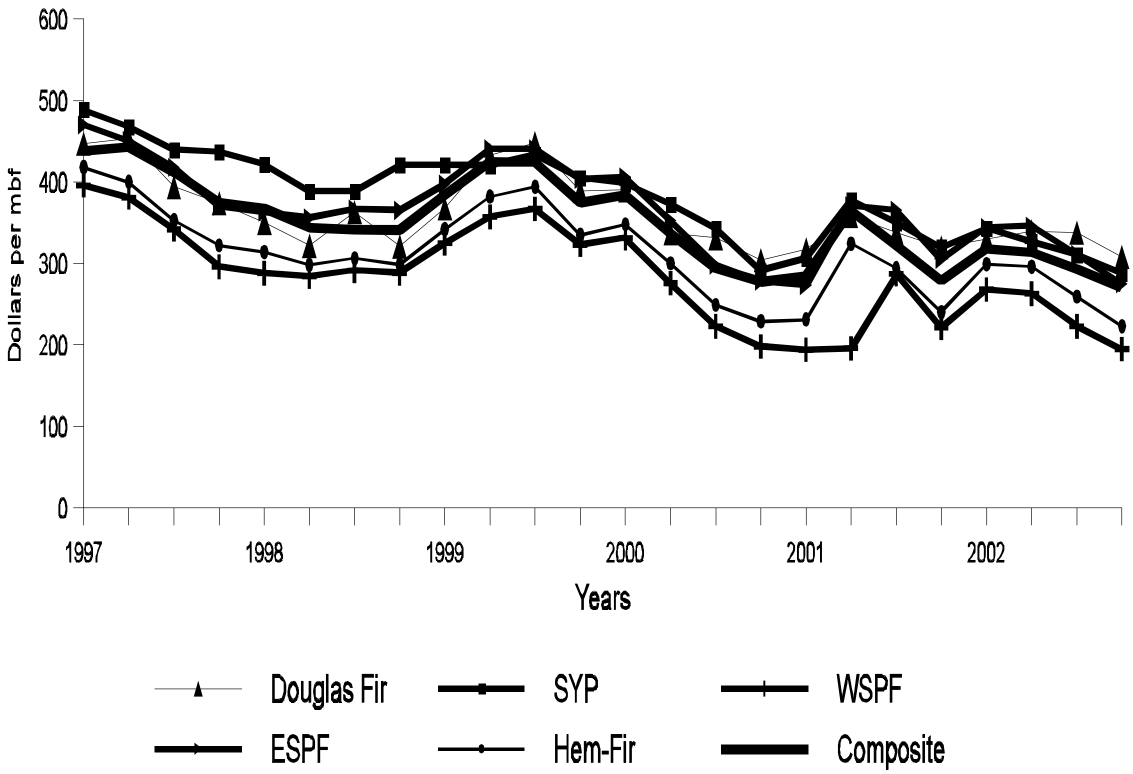
[32] WTCA, "Financial Performance Survey 1999 for the Fiscal Year 1998," p. 12, and WTCA, "Financial Performance Survey 2001 for Fiscal Year 2000," p. 14.

[33] The quarterly prices were calculated as simple averages of the reported monthly prices. Both the table and figure contain framing lumber composite data for additional comparisons.

[34] Base price is somewhat analogous to an f.o.b. mill price but is not net of any mill returns and is derived by deducting an estimate for freight from the quoted delivered price based on an estimated weight.

[35] *Random Lengths 2001 Yearbook*, pp. 258-259 and 286.

Figure 3-2
Framing lumber composite prices of kiln-dried, random length, 2X4 softwood lumber products sold in the United States, by quarters, January 1997 to December 2002



Source: Random Lengths.

imports from Europe, weak demand for U.S. softwood lumber in offshore export markets, and increased production at North American mills. In 2002, U.S. imports of softwood lumber from Europe were 63 percent higher than in 2001 and amounted to 986 million board feet, roughly 2 percent of the U.S. market.[36] Lumber imports from Germany, which had soft domestic demand, led all European countries. U.S. exports of lumber to Japan, a large offshore export market, have been affected by increasing Japanese imports of both European and Russian lumber.[37] Shipments to Japan dropped by 37 percent in 2002, and U.S. lumber exports finished 2002 at 830 million board feet, the lowest level since 1966.[38] Combined offshore shipments of softwood lumber from Canada and the United States dropped from 4.5 billion board feet in 1997[39] to 2.5 billion board feet in 2002.[40]

Finally, U.S. southern pine producers reportedly have not decreased production,[41] and Canadian production also has remained strong. Some major Canadian producers with low-cost, technologically advanced saw mills reportedly chose to increase production by operating their mills three shifts per day,[42] reportedly in an attempt to lower production costs prior to the U.S. Department of Commerce review of antidumping duties in 2004.[43] By October, the price of WSPF was reported to be below cash costs for virtually every Canadian mill.[44] The harvesting of timber killed by the mountain pine beetle in northern British Columbia has made available to BC mills supplemental log supplies at discounted prices.[45]

Transportation costs

Deliveries of trusses and panels are made with purpose-built "roll-off" trailers[46] or with normal flat bed trailers if cranes are to be used to offload the trusses. In some markets, trucks mounted with small cranes are used, and the trusses are placed directly on top of the walls

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[36] *Lumber Track*, Western Wood Products Association, Dec. 2002, p. 3.

[37] "Shifting Positions Between American and European Timber in the Japanese Market," *Japan Lumber Journal*, Vol. 43, No. 16, Aug. 31, 2002, p. 1, and "Japanese Wholesalers and Sawmillers of Russian Timber Held a Joint Meeting," *Japan Lumber Journal*, Vol. 43, No. 18, Sept. 30, 2002, p. 1.

[38] "U.S. lumber exports hit 36-year low," *Lumber Track*, Western Wood Products Association, Oct. 2002, p. 2, and "Lumber exports continue to decline, *Lumber Track*, WWPA, Dec. 2002, p. 4.

[39] Lumber & Building Materials Daily, found at *http://www.lbmdaily.com/newsletter.html*, retrieved Sept. 9, 2002.

[40] *Lumber Track*, WWPA, Dec. 2002, p. 3.

[41] Gary Zauner, "The U.S. and Canadian Lumber Dispute: A Proven Opportunity For Other Countries to Grab a Share of the Prize," *Crow's Forest Industry Journal*, C. C. Crow Publications, Vol. 61, Sept./Oct. 2002, p. 11.

[42] It is further reported that in the wake of the AD/CVD duties U.S. sawmills are curtailing operations at a faster rate than Canadian mills due to prices that are below breakeven. "Lumber Market Sinkhole," *Wood Markets*, Vol. 7, No. 7, Sept. 2002, p. 1.

[43] Andrew Caffrey, "U.S. Tariff on Canadian Lumber Backfires," *Wall Street Journal*, Oct. 21, 2002, p. A2, and Matthew M. Nolan, Miller & Chevalier Chartered, written submission to the Commission on behalf of Trus Joist (Weyerhaeuser), Dec. 19, 2002.

[44] "U.S. Lumber Paralyzed," *Wood Markets*, Vol. 7, No. 8, Oct. 2002, p. 1.

[45] "B.C.'s New Wood Supply," *Wood Markets*, Vol. 7, No. 10, Dec. 2002/Jan. 2003, p. 1.

[46] Roll-off trailers have built-in rollers, which, when the bed is inclined allow trusses to roll off the trailer as the truck and trailer are driven out from underneath. Often, trailers can mechanically "stretch" lengthwise to accommodate longer trusses.

of the building being constructed when delivered. In other markets, builders secure crane service themselves.[47] The scheduling of deliveries is an especially important factor. Early deliveries may arrive before the builder has the walls ready; late deliveries may mean lost construction time. Because of the necessity for special equipment and schedules, manufacturers typically own or lease their own trucks rather than relying on common carriers.

In their questionnaire responses, U.S. producers of wood structural building components were asked to report average and maximum haul distances to their customers for the years 1997-2002. Among truss manufacturers, average haul distances showed slight year-over-year increases from 61 miles in 1997 to 67 miles in 2002, while maximum haul distances increased irregularly from 233 miles in 1997 to 253 miles in 2002.[48] Available industry data for truss manufacturers' delivery expenses appear to correspond to questionnaire responses regarding increased haul distances. From 1998 to 2000, total delivery expenses increased from 5.3 percent of net sales to 5.6 percent.[49] Thus, the trend of increased haul distances, coupled with rising fuel costs[50] in the U.S. market during this time frame, had some impact on overall profitability for U.S. producers of trusses and panels during the period.

Markets, marketing practices

In 2001, 86 percent of reported truss and panel sales went to residential construction (74 percent to single family and 12 percent to multifamily) and 11 percent went to commercial construction.[51] Export markets are not a significant factor for truss manufacturers.[52]

Figure 3-3 illustrates the typical flows of material to manufacturers of wood structural building components and the channels of distribution for components in the U.S. market. (Boxes represent different activities or processing steps; ovals represent material flows.) In general, components follow one of two distinct pathways, either direct to the customer (one-step) or through a building materials dealer/distributor and then to the customer (two-step). Manufacturers responding to the Commission producer questionnaire indicated that in 2001 approximately 29 percent of reported truss sales was to building material dealers (two-step) and 68 percent was one-step sales, either to the home builder (56 percent) or to the framing contractor (12 percent).[53] In either case, prior to the final delivery of a component, a great deal of information flows back and forth between designers and architects, framers and builders, and the manufacturer (represented by broken lines in figure 3-3).

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[47] Multistory construction or areas with hilly terrain may require a larger crane than the relatively small, truck-mounted cranes of the sort used to deliver trusses.

[48] WTCA, "Financial Performance Survey 1999 for Fiscal Year 1998," p. 12, and WTCA, "Financial Performance Survey 2001 for Fiscal Year 2000," p. 14.

[49] Ibid.

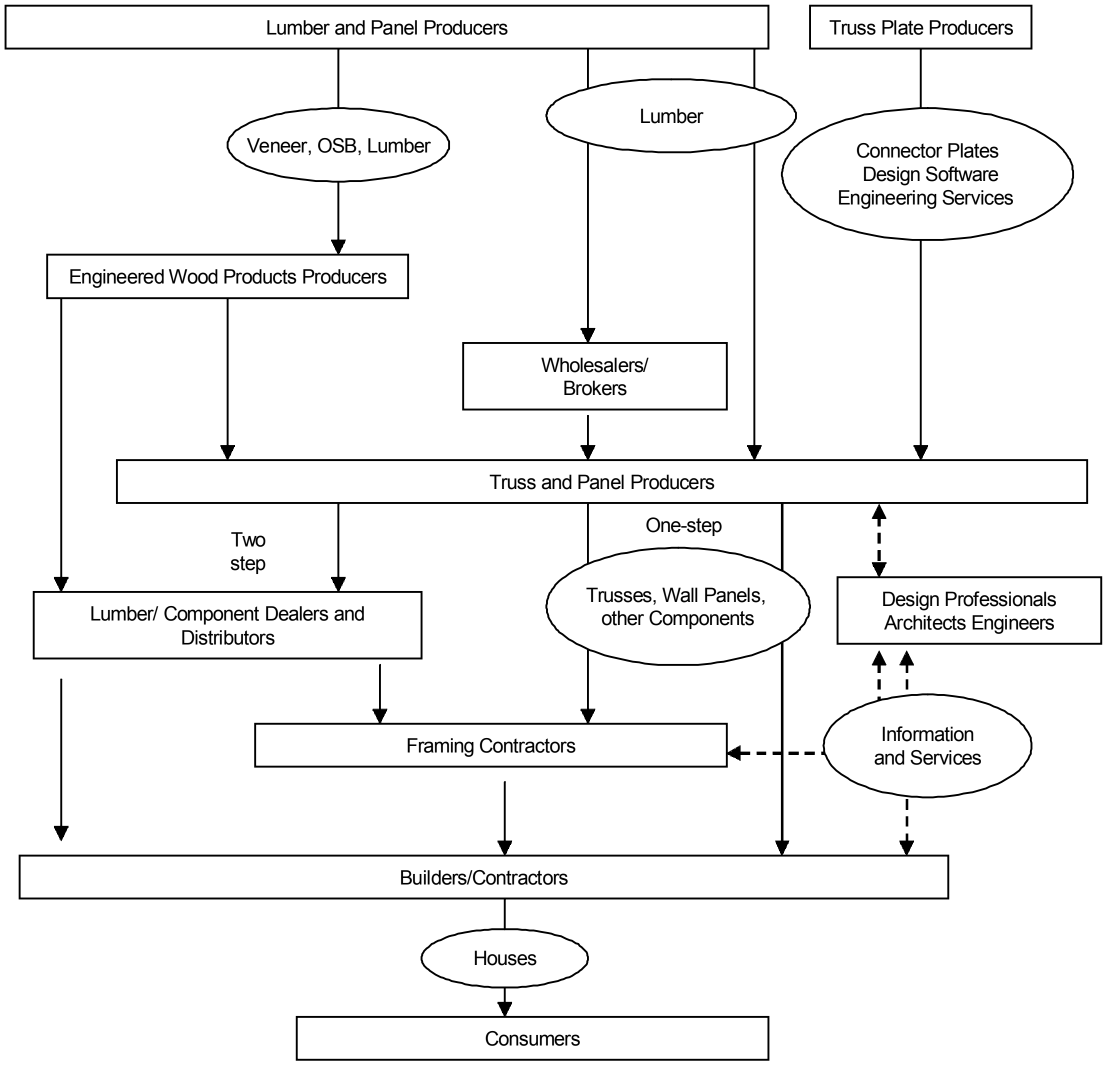
[50] During 1997-2002, the U.S. retail price per gallon of on-highway diesel fuel, as reported by the Department of Energy, increased at an average compound annual rate of 3.8 percent, from $1.29 per gallon to $1.50 per gallon. "Weekly Retail On-Highway Diesel Prices," found at *http://www.fwccinc.com/doefuel.html*, retrieved Mar. 26, 2003.

[51] Two percent of reported truss sales went to postframe construction and 1 percent went to other customers. Responses to the Commission producer questionnaire.

[52] Few truss manufacturers reported exporting any product at all, and those that did only exported minimal amounts. Responses to the Commission producer questionnaire.

[53] Three percent of sales went to other customers. Responses to the Commission producer questionnaire.

Figure 3-3
Major distribution channels for wood structural building components



Source: U.S. International Trade Commission.

Traditionally, the activities of many firms often encompassed both manufacturing and distribution activities but were much less likely to encompass both manufacturing and construction activities. Manufacturers of EWP often produce a full range of wood products, and both EWP and truss manufacturers are often distributors of building materials.[54] However, the traditional distinction between manufacturing firms and construction firms appears to be changing. On the one hand, large home building firms have integrated backwards into component manufacturing. On the other hand, builders are pushing for more "installed sales,"[55] which in turn pushes distributors and manufacturers to integrate forward. The WTCA anticipates that more of its members will forward integrate into house framing,[56] a process already undertaken by some component manufacturers.[57] For manufacturers, providing installation service will facilitate information flow from design to manufacturing to construction, and enhance their ability to utilize components effectively.[58] Because providing installation as well as the component will require that manufacturers develop and maintain a presence in each of the housing markets they serve, increasing demand for installed sales will increase the difficulty of market entry by outside firms and thereby accentuate the local nature of U.S. residential construction markets and, hence, markets for wood structural building components.

The levels of service demanded of truss and panel manufacturers by builders vary according to the customs and practices of local construction markets. In some markets, it is expected that truss manufacturers provide extra services related to their products such as sheeted gable trusses,[59] nailed double thickness trusses, or special pieces (e.g., box ladder panels). Likewise, market expectations with regard to delivery practices (e.g., crane service, sequentially loaded trusses and panels) also vary.

Respondents to the Commission producer questionnaire overwhelmingly noted the importance of building and maintaining good customer relations as a source of sustainable competitive advantage.[60] Respondents to the Commission purchaser questionnaire, on the other hand, were less concerned with supplier relationships but typically used only one or two suppliers for their purchases of wood structural building components.[61] Truss manufacturers reported that large parts of their business came from a few customers and that

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[54] More than one-half (53 percent) of respondents to the Commission producer questionnaire indicated that EWP (most often LVL and I-joists) were purchased for resale. Responses to the Commission producer questionnaire.

[55] Al Schuler, "The Factory Built Components Industry is Almost as Large as the Softwood Lumber Industry," Draft Copy, *Structural Building Components*, Apr. 2003.

[56] Testimony of Kirk Grundahl, executive director, WTCA, transcript of the hearing, p. 20.

[57] USITC staff interview with industry official, Dec. 11, 2002.

[58] Besides the structural components (trusses, wall panels, and floor panels), other nonstructural elements of the house (e.g., columns, fireplaces, staircases) can be assembled as components and shipped to the job site either assembled or as kits. USITC staff interview with industry official, Dec. 11, 2002.

[59] The gable trusses (those on the outside or end) require sheathing (typically with OSB). In order to save the builder the time and effort required to cut the OSB to the correct shape on the job site, the truss manufacturer may "sheet" or sheath the gable trusses at the plant.

[60] Responses to the Commission producer questionnaire.

[61] Respondents to the Commission purchaser questionnaire ranked the importance of the supplier relationship below that of product quality, price, and service with respect to their purchasing decision. Responses to the Commission purchaser questionnaire.

some customers used their firms as sole-source suppliers.[62] Good customer relations do not have much impact on selling price, however, because the bid process typically prevents a manufacturer from exploiting the advantage.[63]

Although truss manufacturers use the same or similar design software, manufacturers nonetheless consider design competency (e.g., the ability to handle complex roof and truss designs) as a source of competitive advantage. Also noted were in-house engineering services, technical support, and knowledge of local building codes.[64] With respect to manufacturing, respondents to the Commission producer questionnaire most often reported that providing reliable, quality products provided a sustainable competitive advantage,[65] and at the same time, purchasers of wood structural building components ranked product quality as the most important factor affecting their purchasing decision.[66] Product quality is determined by raw material inputs and manufacturing methods. Methods reported by manufacturers to insure quality include in-house MSR equipment, using lumber that exceeds grade specifications, using EWP, or upgrading from 2x3 to 2x4 lumber.[67] As panelized construction is at a relatively early stage of development, manufacturers of wall and floor panels consider that manufacturing these items provides a niche for their firms.[68] Because trusses are bulky and difficult to ship and delivery schedules are sensitive, proximity to major markets is an advantage for truss manufacturers who must provide short lead times and on-time delivery schedules.

Segments of both residential and commercial markets offer truss manufacturers opportunities to develop niche markets. In residential markets, manufacturers reported specializing both in high-volume production homes and large, single-family, custom homes. In commercial markets, truss manufacturers identified hotels, assisted living facilities, and nursing homes as significant market niches.[69] One manufacturer of wood trusses reported that it also manufactured steel trusses. The steel trusses extended the firm's product line into the market for light commercial construction and took advantage of that market's trend away from heavy gauge steel (flat) roofs.[70]

Engineered Wood Products

Industry structure

There are 38 U.S. firms that manufacture EWP, of which two distinct groups can be identified: those that produce two or more types of EWP and those that only produce

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[62] One truss manufacturer had pushed the necessity of maintaining good customer relations to the limit by not employing a sales force and depending strictly on word-of-mouth advertising for business. USITC staff interview with industry officials, Oct. 2 and Oct. 18, 2002.

[63] USITC staff interview with industry officials, Oct. 2, 2002.

[64] Responses to the Commission producer questionnaire.

[65] Ibid.

[66] Responses to the Commission purchaser questionnaire.

[67] Responses to the Commission producer questionnaire.

[68] USITC staff interviews with industry officials, Aug. 20, 2002 and Dec. 11, 2002.

[69] Responses to the Commission producer questionnaire.

[70] USITC staff interview with industry officials, Oct. 18, 2002.

glulam. Thirteen firms manufacture two or more different types of EWP;[71] typically, they produce a complete line of EWP. Included in this group are most of the largest, integrated U.S. forest products companies. The top three U.S. manufacturers of EWP are Trus Joist (Weyerhaeuser), Boise Cascade, and Louisiana-Pacific. The firms within this group have consolidated.[72] However, there have also been new entrants. As a result, the market share of the top three producers reportedly declined from 83 percent in 1991 to 74 percent in 2002.[73]

Although some of the large firms also produce glulam, the remaining 25 EWP manufacturers only produce glulam and are generally much smaller firms. The production of EWP affords large forest product firms opportunities to realize manufacturing synergies,[74] opportunities to add value to existing products,[75] and opportunities to market EWP as part of an integrated product line (i.e., building system).[76]

The reported number of persons employed in the manufacture of EWP during 1997-2001 increased at an average compound annual rate of 1.6 percent to 5,724 in 2001 (table 3-3). Generally, the number of persons employed by producers of LVL and I-joists is much larger than the number of persons employed by companies that produce glulam exclusively. The average number of employees per firm for producers of LVL and I-joists was 804 in 1997 and 931 in 2002.[77] On the other hand, for firms that only manufacture glulam, total reported employment was flat during the period, and the average number of employees per firm was 70 in 1997 and 69 in 2002.[78] Although EWP production is seasonal, the impact of seasonality on employment is limited. Manufacturers of glulam reported peaks in employment of 2 to 3 percent during the period. Manufacturers of LVL and I-joists reported seasonal peaks ranging from no change to 2 percent during the period.[79]

Production, capacity, and investment

I-joists accounted for most of the value of U.S. EWP production during 1997-2001. The estimated value of U.S. I-joist production ranged from 46 percent to 50 percent of the value of U.S. EWP production, which was $1.8 billion in 2002. On the basis of quantity, apparent U.S. consumption of I-joists increased at an average compound annual rate of 9.3 percent during 1997-2001, and U.S. production increased at an average compound annual rate of 8.1 percent (table 3-6). According to the APA, I-joists are now a commodity; the process of developing standard sizes took place during 1990-1995.[80] Framing crews for large builders

[71] Craig Adair, *Regional Production & Market Outlook Structural Panels & Engineered Wood Products 2002-2007*, APA - The Engineered Wood Association, Apr. 2002, pp. 56-57.

[72] It was estimated that at one time there were approximately 28 EWP manufacturers in this group. USITC staff interview with industry officials, Dec. 10, 2002.

[73] USITC staff interview with industry officials, Dec. 10, 2002.

[74] For instance, high grade veneer generated in plywood manufacturing operations might be utilized more efficiently by making LVL.

[75] For instance, the manufacture of I-joists affords manufacturers of OSB the opportunity to add value to a portion of their output of that product.

[76] Testimony of Tom Denig, president, Trus Joist, transcript of the hearing, p. 87.

[77] Responses to the Commission producer questionnaire.

[78] Ibid.

[79] Ibid.

[80] USITC staff interview with industry officials, Dec. 10, 2002.

Table 3-6
I-Joists: U.S. production, exports, imports, and apparent U.S. consumption, 1997–2001

Year	U.S. production	U.S. exports[1]	U.S. imports[1]	Apparent U.S. consumption	Ratio of imports to consumption
	Million linear feet				*Percentage*
1997	547	2	36	581	6.2
1998	619	2	41	658	6.2
1999	733	16	73	790	9.2
2000	693	16	78	755	10.3
2001	747	16	99	830	11.9

[1] U.S. exports and imports have been estimated by APA-The Engineered Wood Association.

Source: APA–The Engineered Wood Association.

were the first to recognize the advantages of I-joists (particularly from productivity gains and fewer call backs), and many large builders have switched from wide dimension lumber joists to I-joists.[81] The growth in consumption of I-joists is expected to slow as the number of large builders not yet using I-joists decreases and as the industry begins to focus on getting the small and medium size builders to switch to I-joists.[82] Low prices for lumber have also slowed the growth of I-joist market share, but it is not expected that there will be much backward substitution.[83] The value of I-joist production increased at a more modest rate, an average compound annual rate of 4.5 percent, during 1997-2001.[84] Two factors noted by U.S. manufacturers of I-joists, general overcapacity in the U.S. I-joist market[85] and low lumber prices,[86] resulted in a general decline in I-joist prices during 1997-2001 of approximately 3.4 percent compounded annually.[87, 88]

During 1997-2002, U.S. EWP plants typically operated two 8 hour shifts per day.[89] Of the EWP manufacturers responding to the Commission producer questionnaire, 79 percent indicated that production could be easily expanded or contracted in response to changes in demand.[90, 91] Like truss production, EWP production varies seasonally with the construction cycle with most production occurring in the second and third quarters of the year. In 2001, 24 percent of annual production occurred in the first quarter, 27 percent occurred in each of the second and third quarters, and 22 percent occurred in the fourth quarter.[92] Most producers (73 percent) reported that the seasonality of production remained the same during 1997-

[81] Ibid.
[82] Ibid.
[83] That is, builders switching back to wide dimension lumber from I-joists. Ibid.
[84] Responses to the Commission producer questionnaire.
[85] Louisiana-Pacific Corp., *2001 Annual Report and 10-K*, p. 27.
[86] USITC staff interview with industry officials, Dec. 10, 2002.
[87] Boise, *Annual Report 2001*, p. 52.
[88] An industry analyst noted that average prices for various I-joists (by type of flange and size) declined at average compound annual rates of 3.3 percent to 3.7 percent. USITC staff telephone interview with industry official, Dec. 30, 2002.
[89] Responses to the Commission producer questionnaire.
[90] Ibid.
[91] EWP producers may invest in additional manufacturing equipment to provide the surge capacity necessary for the busy months. USITC staff interview with industry officials, Dec. 10, 2002. USITC interview with industry officials, Nov. 14, 2002.
[92] USITC interview with industry officials, Nov. 14, 2002.

2002,[93] but one manufacturer noted that, over time, production has become somewhat less seasonal. At one time, about 60 percent of annual production occurred in the second and third quarters.

Between 1997 and 2001, usage of glulam and SCL in beams and headers in new U.S. residential housing increased by nearly 75 percent.[94] The share of all beams and headers in new U.S. residential housing constructed from glulam and SCL increased from 22 percent in 1997 to 33 percent in 2001. At the same time, the share of beams and headers constructed from lumber (built-up dimension lumber and solid wood) decreased from 66 percent to 57 percent.

The estimated value of U.S. LVL production during 1997-2001 ranged from 20 percent to 29 percent of the total value of EWP production.[95] During 1997-2001, U.S. production (by quantity) of LVL increased at an average compound annual rate of 9.1 percent, as shown in the following tabulation.

LVL: U.S. production,[1] 1997-2001

Year	U.S. production
	Million cubic feet
1997	37.7
1998	41.0
1999	47.9
2000	47.6
2001	53.4

[1] U.S. exports, imports, and apparent consumption are not available.

Source: APA–The Engineered Wood Association.

The usage of LVL has grown as large dimensions of solid sawn lumber have become less available.[96] However, LVL prices also declined during 1997-2001 at an average compound annual rate of approximately 1.5 percent.[97]

The estimated value of U.S. glulam production during 1997-2001 ranged from 26 to 34 percent of the total value of EWP production.[98] Although apparent U.S. glulam consumption grew at an average compound annual rate of 6.4 percent during 1997-2001

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[93] Ibid.

[94] Estimates from data provided by the NAHB Research Center showed that usage of these products in beams and headers, not including rim board, increased from 54.3 million linear feet to 94.8 million linear feet. NAHB Research Center, *Builders Practice Reports,* various volumes, 1998-2002.

[95] Responses to the Commission producer questionnaire.

[96] USITC staff interview with industry officials, Dec. 10, 2002.

[97] One LVL manufacturer reported an average compound annual decrease in prices of 1.5 percent during 1997-2001 (Boise, *Annual Report 2001*, p. 52). However, an industry analyst estimated that the price decline was somewhat larger, approximately 5.1 percent on an average compound annual basis during the period. (USITC staff telephone interview with industry official, Dec. 30, 2002.)

[98] Responses to the Commission producer questionnaire.

(table 3-7), U.S. glulam production increased at a much more modest rate (2.8 percent compound annually). It is reported that U.S. exports of glulam, which declined at an average compound annual rate of 21 percent from 44 million board feet to 17 million board feet during 1997-2002, have been adversely affected by competition from European glulam in the Japanese market.[99] One U.S. glulam manufacturer contacted during this investigation indicated that his firm had lost sales to a German timber export company that was selling glulam at prices approximately 15 percent less than his.[100]

Table 3-7
Glulam: U.S. production, exports, imports, and apparent U.S. consumption, 1997-2001

Year	U.S. production	U.S. exports[1]	U.S. imports[1]	Apparent U.S. consumption	Ratio of imports to consumption
	Million board feet				*Percentage*
1997	300	44	0	256	0.0
1998	287	19	0	268	0.0
1999	316	22	2	296	0.7
2000	356	23	8	341	2.3
2001	335	17	10	328	3.0

[1] U.S. exports and imports have been estimated by APA-The Engineered Wood Association.

Source: APA–The Engineered Wood Association.

In their questionnaire responses regarding haul distances, U.S. EWP manufacturers reported similar trends (albeit at greater distances) as did truss manufacturers. Average haul distances for EWP manufacturers increased irregularly from 551 miles in 1997 to 568 miles in 2002, while maximum haul distances showed year-over-year increases from 1,973 miles in 1997 to 2,111 miles in 2002.

The capital investment required to manufacture SCL is typically much larger than for I-joists alone[101] or glulam. Producers of LVL reported average plant replacement cost of $72 million, whereas producers of I-joists and glulam reported average plant replacement cost of $9 million.[102]

Markets, marketing practices

As outlined in figure 3-3, EWP typically follow one of two distinct pathways, either direct to the customer (one-step) or through a building materials dealer/distributor and then to the customer (two-step). Unlike sales of trusses which are mostly one-step, U.S. EWP manufacturers reported that in 2001, 64 percent of sales went to building material dealers (two-step), and 21 percent was one-step sales (of which 7 percent was to home builders and

[99] Sam Sherrill, "Technology and Timber Beams: Finding the Niche for Glulams," *Crow's Forest Industry Journal*, Vol. 59, May/June 2002, p. 22.
[100] USITC staff telephone interview and follow-up fax with industry official, Jan. 2, 2003.
[101] Testimony of Tom Denig, president, Trus Joist, transcript of the hearing, p. 86.
[102] Responses to Commission producer questionnaire.

14 percent to framers).[103] Of the truss manufacturers who responded to the Commission producer questionnaire, 60 percent indicated that their firms purchased EWP for resale. One industry official noted that it was not unusual for builders to purchase EWP from two different sources for one job.[104]

EWP manufacturers reported that in 2001 64 percent of their EWP sales went to residential construction (57 percent to single family and 7 percent to multifamily). They also reported sales to commercial construction in 2001 were 25 percent, somewhat more than the commercial sales reported by truss manufacturers.[105] In 2001, 89 percent of U.S. I-joist production (by quantity) went to new residential and remodeling markets, and 11 percent went to nonresidential markets.[106] The same year, 60 percent of U.S. glulam production (by quantity) went to new residential and remodeling markets, and 40 percent went to nonresidential markets.[107]

Overall, EWP manufacturers responding to the Commission questionnaire reported that exports accounted for 2 percent of sales in 2001. However, exports were not evenly distributed among reporting firms. The firms reported exports to Japan, Taiwan, the United Kingdom, Canada, and Australia.[108] Other sources indicate that a small volume of U.S.-produced I-joists are exported, principally to Japan.[109]

The market for glulam is somewhat distinct from the markets for other EWP for two reasons. The glulam market developed earlier than (hence, independently of) the markets for other EWP. Also, glulam is used in end uses for which other EWP are not suited. In particular, it is used in structural applications where appearance (exposure to view) is of prime importance, particularly in wooden structures requiring large open spaces such as churches and arenas. Unlike other EWP, which can only be manufactured as straight members, glulam beams may be manufactured with curves, a feature that enhances its architectural and visual appeal. Glulam is also used in concealed applications often in conjunction with other EWP, but other EWP are not suited for the appearance applications.[110]

Industry officials noted that the markets for particular EWP are not discreet, independent markets; I-joists and SCL are sold together as part of a complete building system.[111] In

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[103] Fifteen percent of 2001 sales was reported to have gone to other customers. Responses to the Commission producer questionnaire.

[104] EWP for applications below the ceiling line (e.g., wall headers, floor joists) are typically obtained from the dealer that supplies the framing lumber, and EWP used for applications above the ceiling (e.g., ridge beams) are typically supplied by the truss manufacturer. USITC staff interview with industry official, Oct. 2, 2002.

[105] Five percent of reported 2001 EWP sales went to post-frame construction, and 6 percent went to other customers. Responses to the Commission producer questionnaire.

[106] Craig Adair, *Regional Production & Market Outlook Structural Panels & Engineered Wood Products 2002-2007*, APA - The Engineered Wood Association, Apr. 2002, p. 48.

[107] Ibid., p. 45.

[108] Responses to the Commission producer questionnaire.

[109] Craig Adair, *Regional Production & Market Outlook Structural Panels & Engineered Wood Products 2002-2007*, APA - The Engineered Wood Association, Apr. 2002, p. 49.

[110] Testimony of Tom Denig, president, Trus Joist, transcript of the hearing, pp. 84-85.

[111] Ibid., p. 87.

particular, I-joists and beams, whether LVL, OSL, or glulam,[112] are made to the same dimension (depth) to facilitate the construction of floors and ceilings. EWP manufacturers that responded to the Commission producer questionnaire most often noted service factors as sources of sustainable competitive advantage. In addition to quick order turn-around and fast deliveries, engineering support was identified as a key competitive factor.[113] A few EWP manufacturers noted particular market segments (e.g., residential, custom built timber frames, churches and schools) as sources of competitive advantage.[114]

Canada

Introduction

By virtue of extensive forest resources and a long tradition of harvesting and processing these resources, Canada maintains one of the largest wood products industries in the world. Canada's forests consist of softwoods (67 percent), mixedwoods (18 percent), and hardwoods (15 percent). Seventy-one percent of the forest land is owned by the Provinces. Each Province governs access to, and management of, its forest lands through its own laws and regulations. Approximately one million hectares of commercial forest land in Canada is harvested each year.[115]

In recent years, the wood products industry in Canada has had to adjust to changing public perceptions about the proper use of forests. The needs of the wood products industry no longer necessarily take precedence over environmental concerns, recreational opportunities, or Aboriginal land claims.[116] In response, Canadian Provinces have changed their regulations governing forest practices and forest management to ensure that forests provide multiple benefits. In practice, these regulatory changes have meant the withdrawal of forest land from harvesting, greater public involvement in the development of forest policies, and more restrictions on commercial harvesting.[117]

For the wood products industry in Canada, the changes in regulations have made harvesting more difficult and costly. Accessible areas of forest land have been harvested or closed to harvesting, forcing the industry to harvest in more remote locations and to increase its harvest of smaller second- and third-growth trees. Sustainable forest management requirements have expanded to include not only the regeneration of harvested areas but also multiple uses such as ecosystem health, wildlife protection, and recreational opportunities.[118]

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[112] APA notes that several companies are manufacturing glulam that is compatible with I-joists. Craig Adair, *Regional Production & Market Outlook Structural Panels & Engineered Wood Products 2002-2007*, APA - The Engineered Wood Association, Apr. 2002, p. 46.

[113] Responses to the Commission producer questionnaire.

[114] Ibid.

[115] Natural Resources Canada, *The State of Canada's Forests 2001-2002*, found at *http://www.nrcan.gc.ca/cfs-scf/national/what-quoi/sof/latest_e.html*, retrieved Jan. 14, 2003.

[116] Ibid.

[117] Ibid.

[118] Ibid. Certification of forest practices has become another factor facing the wood products industry in Canada. In response to increased consumer environmental awareness in Canada, some wood products producers have begun to offer products that have been certified as originating from

To maintain its competitiveness, the wood products industry in Canada has slowly begun to diversify away from traditional commodity wood products and to increase output of value-added wood products. With a changing forest resource base, wood product producers have begun to make more efficient use of existing wood fiber, including the use of small-diameter trees.[119] Concurrent advances in wood-processing technology have enabled producers to make high quality EWP from these trees as well as to achieve a higher product yield (from the log) compared with the yield achieved from traditional sawmilling.[120]

Complementing the efforts of the wood products industry in Canada to maintain its competitiveness have been initiatives undertaken at the Federal Government level and the Provincial level to assist the industry in diversifying into more value-added wood products and to develop and expand export markets. In May 2002, the Minister of Natural Resources Canada announced that the Federal Government would spend C$75 million on three initiatives to enhance the competitiveness of the wood products industry.[121] In the spring of 2002, the British Columbia Ministry of Forests announced that the Province would spend C$20 million to assist the wood products industry in British Columbia to expand export markets and develop new products.[122] BC Wood, a not-for-profit association of over 600 value-added wood products manufacturers in British Columbia, already works to increase sales and opportunities for its members through various programs and services, including foreign market research and development, trade shows, and trade missions.[123]

The wood products industry produces a wide range of products, from lumber, plywood, and OSB to millwork, wood structural building components, and prefabricated log cabins. Much of this production is exported, mostly to the United States. Wood structural building components account for a growing, although still relatively small, part of the Canadian wood products industry. During 1997-2002, economic growth and brisk construction activity in Canada and the United States fueled demand for Canadian-produced wood structural building components. Selected indicators for wood structural building components in Canada are shown in table 3-8.[124] Shipments of wood structural building components in Canada

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sustainably managed forests. Currently, there are three certification systems in Canada–the Canadian Standards Association, the Forest Stewardship Council, and the Sustainable Forestry Initiative. All three certification systems require independent third-party audits of a company's forest practices.

[119] Natural Resources Canada, *The State of Canada's Forests 2001-2002*, found at *http://www.nrcan.gc.ca/cfs-scf/national/what-quoi/sof/latest_e.html*, retrieved Jan. 14, 2003.

[120] UN/ECE Timber Committee, *Forest Products Annual Market Review, 1999-2000.*

[121] C$29.7 million would be allocated for the Canada Wood Export Program, an initiative with wood industry associations located throughout Canada to expand wood products exports, particularly to Asia; C$30 million to support research and development activities by Canada's three national forest research institutes; and C$15 million for the Value-Added Research Initiative for Wood Products to be conducted by one of Canada's national forest research institutes and by three Canadian universities. USDA, FAS, *Canada Solid Wood Products, Canadian Forestry Sector Receives Investment of C$75 Million,* Ottawa, GAIN Report No. CA2064, May 30, 2002.

[122] C$8 million of the total would be spent on new product development and improving manufacturing processes; the remainder would be spent on international marketing efforts to expand existing export markets and to develop new markets. USDA, FAS, *Canada Solid Wood Products, British Columbia Ministry of Forests to Fund Education and Market Development Initiatives,* Ottawa, GAIN Report No. CA2035, Apr. 17, 2002.

[123] BC Wood, found at *http://www.bcwood.com*, retrieved Sept. 9, 2002.

[124] Official Canadian Government statistics for wood structural building components are available only through 1999 and may not encompass all of the products included in the scope of this investigation. The data herein provide a rough gauge of the size of the industry.

Table 3-8
Selected indicators for wood structural building components in Canada, 1997-2001

Year	Value of shipments	Total number of employees	Total salaries and wages
	Canadian $1,000		*Canadian $1,000*
1997	479,640	4,176	113,104
1998	550,310	4,710	133,472
1999	553,324	4,517	126,952
2000	([1])	([1])	([1])
2001	([1])	([1])	([1])

[1] Data not available.

Source: Structural Wood Product Manufacturing (NAICS 321215), Annual Survey of Manufactures, Statistics Canada. The Canadian NAICS code 321215 corresponds to U.S. NAICS codes 321213 (Engineered Wood Members except Trusses) and 321214 (Wood Trusses). NAICS code 321215 includes the manufacture of finger-jointed lumber, which is not a wood structural building component.

increased from C$480 million in 1997 to C$553 million in 1999. The total number of employees grew from 4,176 in 1997 to 4,517 in 1999, and total salaries and wages of these employees increased from C$113 million to C$127 million. The United States accounts for more than 90 percent of Canadian exports of wood structural building components; the only other export market of significance is Japan.[125]

Trusses and Prefabricated Panels

Industry structure

In Canada, roof trusses and floor trusses and prefabricated panels are produced primarily by small family-owned businesses, many of which operate just one production facility. Only a few producers have production facilities in more than one Province.[126] There are approximately 300 wood truss production facilities throughout Canada. Two-thirds are in British Columbia, Ontario, and Quebec, and the remainder are in the Prairie Provinces and the Atlantic Provinces (figure 3-4). Many are in or near large cities to serve the builders in that area. Most truss producers also distribute EWP, frequently selling them as a package with their trusses and prefabricated panels to the builder. Some producers also operate lumber yards.[127]

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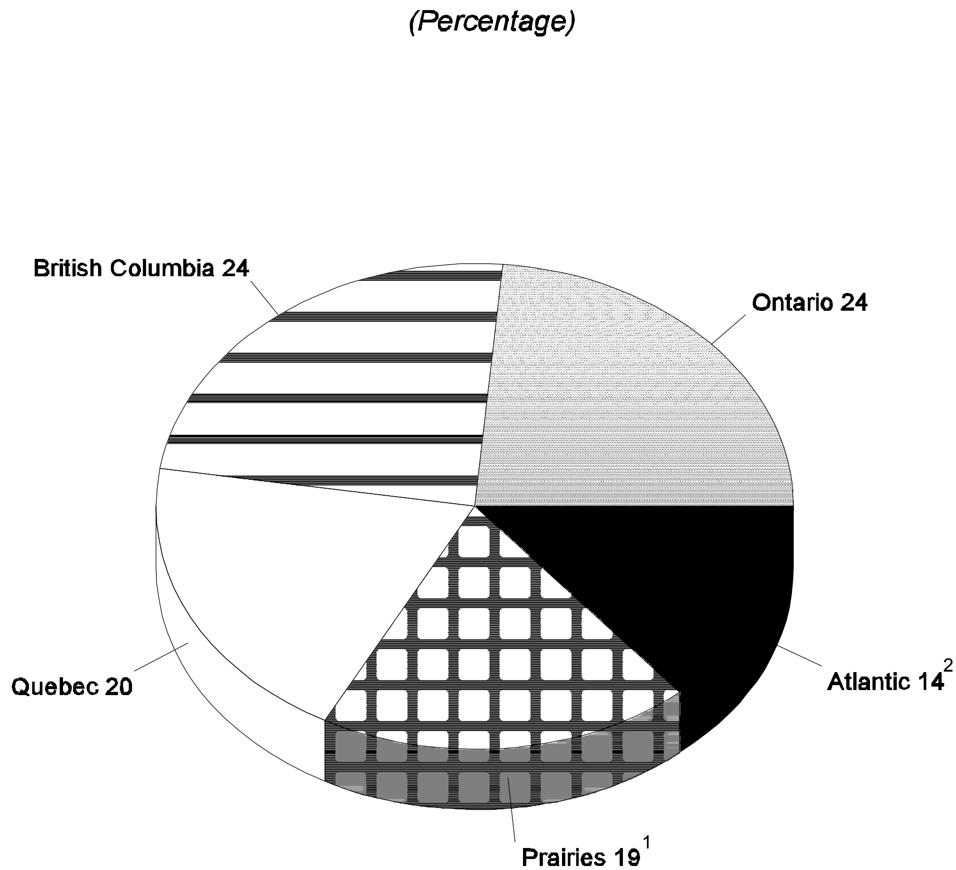
[125] Statistics Canada, Canadian exports under HS 441890.

[126] USITC staff interviews, Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002; USITC staff telephone interviews with industry officials, Oct. 8, 2002 and Nov. 1, 2002.

[127] Ibid. In years past, integrated forest products companies needed to develop channels of distribution for their newly developed EWP. Truss producers were one avenue for the forest products companies to concentrate their marketing efforts because truss producers already had extensive relationships with builders and could bundle their trusses and prefabricated panels with EWP.

Figure 3-4
Location of Canadian wood truss production facilities: Share by region, 2002



[1] The Provinces of Manitoba, Saskatchewan, and Alberta.
[2] The Provinces of Newfoundland, Prince Edward Island, Nova Scotia, and New Brunswick.

Source: Canadian Wood Truss Association.

Production, capacity, and investment

Shipments of roof trusses in Canada totaled C$308.6 million in 1997, declined to C$281.7 million in 1998, and then rose to C$296.1 million in 1999 (table 3-9).[128] Shipments of roof trusses in Canada likely increased during 2000 and 2001 as a strong Canadian housing market and U.S. housing market stimulated demand for trusses. During 2002, a large jump in housing starts in Canada likely led to a further increase in roof truss shipments. A large truss producer in Ontario, the biggest Provincial housing market in Canada, reported that its truss shipments rose by 20 percent during 2002 over shipments in 2001.[129]

Table 3-9
Roof trusses: Canadian shipments, exports, imports, and apparent Canadian consumption, 1997-2001

Year	Canadian shipments	Canadian exports[1]	Canadian imports	Apparent Canadian consumption	Ratio of imports to consumption
	Million Canadian dollars				Percentage
1997	308.6	37.3	([2])	271.3	([2])
1998	281.7	58.5	([2])	223.2	([2])
1999	296.1	105.5	([2])	190.6	([2])
2000	([3])	113.3	([2])	([3])	([3])
2001	([3])	108.2	([2])	([3])	([3])

[1] According to industry sources, almost all Canadian exports of roof trusses are exported to the United States. Canadian exports are the value of U.S. imports of roof trusses from Canada (as reported by the U.S. Department of Commerce) converted to Canadian dollars using the annual average exchange rate of the U.S. dollar/Canadian dollar, as reported by the International Monetary Fund.
[2] According to industry sources, Canadian imports of roof trusses are minimal.
[3] Data not available.

Source: Statistics Canada; official trade statistics of the U.S. Department of Commerce.

The number and complexity of roof trusses in a typical new home in Canada have increased in recent years as builders, architects, and designers have taken advantage of advances in truss design software to design more intricate and complicated structures. A new home now may have as many as 60 to 70 different truss designs. Truss production consequently has become more customized as producers have fewer large production runs of a few truss shapes and many more small production runs involving many different truss shapes. To remain competitive, truss producers have increased their use of computerized saws, which

[128] Roof truss shipment data for 2000-2002 are unavailable. Shipment data for floor trusses and prefabricated panels are unavailable. Canadian industry officials indicate that shipments of floor trusses and prefabricated panels, however, are considerably less than that of roof trusses. USITC staff interviews, Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002; USITC staff telephone interviews with industry officials, Oct. 8, Nov. 1, and Nov. 6, 2002.

[129] USITC staff interviews, Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002; USITC staff telephone interviews with industry officials, Oct. 8, Nov. 1, and Nov. 6, 2002. Shipments of floor trusses and prefabricated panels are also believed to have risen during the period in response to strong residential construction markets in Canada and the United States.

quickly and automatically cut the various angles and lengths of wood required for each truss based upon instructions received from the truss designer's computer.[130]

Canadian truss producers contend with a slowdown in construction during the winter months by reducing production of trusses and prefabricated panels and then resuming full production in the spring. Production workers are generally laid off during winter and rehired in the spring; truss producers, however, usually keep their engineers and designers employed year round.[131] Several truss producers in Canada produce EWP as well as distribute them. A license agreement with NASCOR Inc., a Canadian manufacturer of building components (including I-joists, wall systems, and roof trusses), has enabled these producers to diversify, in a low cost and low risk manner, into the manufacture of I-joists. Under the agreement, NASCOR supplies the licensee with I-joist manufacturing equipment, design and engineering software, testing and quality control equipment, and marketing and technical support. The licensee can produce the full line of NASCOR's Strong Quiet Type I-joists but is responsible for the purchase of raw materials and the pricing and marketing of the I-joists.[132]

Raw material procurement and production costs are similar for truss producers throughout Canada. Producers purchase primarily Canadian SPF, much of it visually graded lumber or MSR lumber. Most lumber is purchased from lumber brokers rather than directly from lumber mills. Although some lumber mills in Canada have shut down in the past year, other mills have been running at full capacity. Consequently, truss producers indicated that lumber, in general, is abundant and lumber prices in Canada have fallen in recent months.[133] Lumber accounts for 40 percent to 65 percent of the cost of producing a truss, while labor costs range from 15 percent to 36 percent. Metal connector plates account for a relatively small portion of the total production cost of a truss.[134] Producers typically purchase metal connector plates and truss design software programs from the same vendor.[135]

Truss and prefabricated panel plants are situated throughout Canada, although most of the industry's capacity is located near major population centers. Much of the capacity is in Ontario, Quebec, and Alberta; British Columbia has a large number of plants but overall capacity lags that of Ontario. Changes in truss and prefabricated panel capacity have been uneven throughout the country in the past 5 years. Capacity has increased in Alberta but fallen in British Columbia. Capacity has remained stable in Quebec and Ontario. To the extent that there has been any overall increase in capacity in recent years it has been due more to new equipment purchases and additional work shifts at existing plants rather than to construction of new plants.[136] Very little consolidation of truss producers has occurred in

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[130] USITC staff interviews, Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002; USITC staff telephone interviews with industry officials, Oct. 8, Nov. 1, and Nov. 6, 2002.

[131] Ibid.

[132] USITC staff telephone interview with industry official, Oct. 31, 2002. Welcome to Nascor Building a Better Home for the Global Community, found at *http://www.nascor.com.htm*, retrieved Jan. 23, 2003.

[133] USITC staff interviews, Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002; USITC staff telephone interviews with industry officials, Oct. 8, Nov. 1, and Nov. 6, 2002.

[134] Ibid.

[135] Ibid.

[136] Ibid.

Canada. The nature of the industry, small family-owned businesses with limited capital, has precluded the type of consolidation that is occurring in the United States.[137]

Cross-border investment by Canadian truss producers or U.S. truss producers has been limited. The relatively small size of the Canadian truss and prefabricated panel market relative to the U.S. market has kept U.S. investment in Canada to a minimum. For Canadian producers, investment in the U.S. market has been hindered by a lack of capital and a depreciating currency relative to the U.S. dollar.[138] Nevertheless, some cross border investment has occurred. In 2000, Universal Forest Products, Inc., a large U.S. wood products producer, purchased two Canadian truss firms located in Ontario. One firm produces roof trusses and the other makes floor trusses.[139] Century Truss Co., a Michigan truss producer, began construction in 2002 of a truss plant in Ontario. The plant will cost C$12 million and eventually employ 150 people. More than 90 percent of the plant's output will be shipped back to the United States. An important factor in the investment decision reportedly was the availability of cheaper lumber in Canada than in the United States.[140] A truss producer in Ontario began production of roof trusses and floor trusses at a plant in North Carolina in 2000. Reasons reported for the investment in the United States included a desire to diversify production locations and reduce the winter slowdown in output, to participate in the large U.S. truss market, and to make and ship trusses north to the border States and back into Canada.[141]

Markets, marketing practices, and trade

Apparent Canadian consumption of roof trusses declined between 1997 and 1999, from C$271.3 million to C$190.6 million (table 3-9).[142] Consumption of roof trusses is believed to have increased during 2000 and 2001 in response to an upturn in Canadian housing starts. 2002 witnessed a large increase in housing starts in Canada over starts in 2001.[143] Consumption of roof trusses is likely to have risen in response.[144]

Although truss producers in Canada typically make roof trusses, floor trusses, and prefabricated panels and distribute EWP, most of their business is derived from the manufacture and sale of roof trusses. Floor trusses and prefabricated panels have not made the inroads into the construction markets in Canada that roof trusses have. Floor trusses face stiff competition from I-joists and dimensional lumber, while prefabricated panels face

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[137] Ibid.

[138] Ibid.

[139] Universal Forest Products, Inc., *2001 Annual Report.*

[140] "Announcements," *Structural Building Components Magazine*, 2002.04 Archive, found at *http://www.structuralbcmag.com/inarchive/2002.04.htm*, retrieved Oct. 8, 2002.

[141] USITC staff telephone interview with industry official, Nov. 6, 2002.

[142] Apparent consumption data for roof trusses for 2000-2002 are unavailable. Apparent consumption data for floor trusses and prefabricated panels are unavailable.

[143] See chapter 2 for detailed information on Canadian housing starts.

[144] USITC staff interviews, Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002; USITC staff telephone interviews with industry officials, Oct. 8, Nov. 1, and Nov. 6, 2002. Consumption of floor trusses and prefabricated panels is also believed to have risen during the period in response to the strong residential construction market in Canada.

competition from framers who prefer to frame on site.[145] Roof trusses generally account for well over 50 percent of total manufactured product sales. As a percentage of total company sales, manufactured product sales typically account for two thirds or more and the remainder is accounted for by the distribution of EWP.[146]

Trusses and prefabricated panels are sold directly to residential and commercial builders or sold to these builders through lumber yards and building suppliers. One Canadian truss producer noted that truss sales in urban areas, which have relatively large builders, tend to be direct to builders, while truss sales in rural areas, which have small builders, tend to be to lumber yards, which then sell to builders.[147] Trusses and prefabricated panels in Canada are used primarily in residential construction. In general, 75 percent or more of sales of these products are to the residential construction market and the remainder are to the commercial construction market. Shipping radiuses for trusses and prefabricated panels range from a few miles to 300 miles, with the cost of freight becoming an increasingly important factor as the shipping distance increases. One producer, located in a big city, indicated that 90 percent of its shipments is within 40 miles; another producer noted that it shipped within a 200 to 300-mile radius.[148]

Truss and prefabricated panel producers in Canada see their business as more than simply the mass production of trusses or prefabricated panels. With a staff of truss designers and engineers using the latest truss design software, producers work closely with builders and architects, taking their rough drawings and designing trusses for their planned structures. A single structure may involve dozens of different truss designs, requiring many small production runs of different truss shapes. Producers frequently couple the sale of trusses and prefabricated panels with EWP. Here, too, they work closely with the builder to provide the EWP suitable to the house or building structural requirements. Producers thus offer an engineering solution to a builder's construction needs, not simply a truss or prefabricated panel or EWP.[149]

Reflecting the custom nature of the truss business in Canada, almost all truss and prefabricated panel production is made to order. Producers make few, if any, stock trusses (trusses built for inventory). Stock trusses are typically used in garages and sheds but even these structures have become more customized in recent years. EWP are generally not sold off the shelf but combined with trusses and prefabricated panels as part of a package. One producer noted its interest in knowing exactly how its customers intended to use the EWP. Truss producers usually distribute the EWP of just one manufacturer, rather than many, finding this to be more efficient from an inventory and software perspective.[150]

Almost all Canadian exports of roof trusses go to the United States. These exports almost tripled between 1997 and 1999, from C$37.3 million to C$105.5 million, and in 1999 were equivalent to nearly 36 percent of Canadian shipments. Exports leveled off during the next

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[145] USITC staff interviews, Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002; USITC staff telephone interviews with industry officials, Oct. 8, Nov. 1, and Nov. 6, 2002.
[146] Ibid.
[147] Ibid.
[148] Ibid.
[149] Ibid.
[150] Ibid.

2 years, totaling C$113.3 million in 2000 and C$108.2 million in 2001 (table 3-9).[151] Trends in the value of exports, though, may not be indicative of trends in exports on a unit basis. According to industry sources, exports of Canadian roof trusses to the United States, on a unit basis, have likely increased each year since 2000.[152] These exports are concentrated in the border states but some have been shipped as far south as Southern California and Las Vegas.[153] The primary market for these trusses has been single-family residential construction, although inroads have also occurred in multifamily construction and light commercial construction.[154] The strong residential construction market in Canada during 2002 has led to a slowdown in truss exports to some of the border States as some Canadian truss producers have shipped more production into the domestic market rather than to the United States. Other border States, however, have not experienced a decline in exports from Canada.[155] Canadian imports of trusses and prefabricated panels are minimal.[156]

Engineered Wood Products

Industry structure

EWP in Canada are generally produced by much larger, and considerably fewer, firms than those that produce trusses and prefabricated panels. Some of these firms are publicly owned, and some are family owned. Some are the Canadian operations of large U.S. forest products companies, which consider the United States and Canada as a single integrated market with the location of production facilities determined primarily by the proximity of raw materials and submarkets.[157] These firms have production facilities in Canada as well as the United States, serve both markets with output from their Canadian plants, and source raw materials internally and from unrelated firms from both sides of the border.[158]

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[151] In U.S. dollars, these exports grew from $26.9 million in 1997 to $71.0 million in 1999. Exports totaled $76.3 million in 2000, $69.8 million in 2001, and $74.8 million in 2002. Data for Canadian exports of floor trusses and prefabricated panels are not available. Exports of these products to the United States are believed to have increased during the past 5 years. Testimony of Kent Pagel, president, Pagel, Davis & Hill, P.C., transcript of the hearing, pp. 15, 16, and 42. Exports of floor trusses and prefabricated panels are considerably less than exports of roof trusses.

[152] Testimony of Roy Schiferl, operations manager, Woodinville Lumber, Inc., transcript of the hearing, p. 61.

[153] Testimony of Kent Pagel, president, Pagel, Davis & Hill, P.C., transcript of the hearing, pp. 25 and 26; testimony of Jack Louws, owner, Louws Truss Inc., transcript of the hearing, p. 27.

[154] Ibid., p. 76.

[155] Testimony of Kirk Grundahl, executive director, WTCA, transcript of the hearing, pp. 62 and 63; testimony of Jack Louws, owner, Louws Truss Inc., transcript of the hearing, pp. 63 and 64; testimony of Phil Luneack, vice president, Bear Truss Co., transcript of the hearing, p. 65.

[156] USITC staff interviews, Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002; USITC staff telephone interviews with industry officials, Oct. 8, Nov. 1, and Nov. 6, 2002. See chapter 4 for a more detailed discussion of U.S.-Canadian trade in trusses and prefabricated panels.

[157] Paul C. Rosenthal, Collier Shannon Scott, PLLC, written submission to the Commission on behalf of Louisiana-Pacific Corp., Dec. 20, 2002.

[158] USITC staff interviews with industry officials, Nov. 14 and Dec. 10, 2002.

There are nine glulam producers in Canada in Quebec, British Columbia, Manitoba, and Alberta. Eight of these nine producers operate one glulam plant apiece; the other operates two.[159] Most are relatively small, family-owned businesses. There are three producers of LVL in Canada–International Paper Co. in Alberta, Louisiana-Pacific Corp. in British Columbia, and Tembec Inc. in Quebec. I-joists are produced by approximately 14 companies, including small truss producers who have licensed the manufacture of I-joists from NASCOR, Inc. and Trus Joist (part of Weyerhaeuser and the world's largest producer of EWP).[160]

Production, capacity, and investment

Canadian production of glulam, LVL, and I-joists is quite small compared with U.S. output of these products. U.S. production of glulam is more than 10 times that of Canada; U.S. production of LVL is 10 times that of Canada; and U.S. production of I-joists is 4 times that of Canada. Canadian production of glulam rose by 67 percent between 1997 and 2001, from 15 million board feet to 25 million board feet (table 3-10). Much of this output was exported; in 2001 an estimated 13 million board feet (52 percent of total glulam production) was exported. In the first three quarters of 2002, production of glulam fell by 36 percent compared to the same period of 2001 as a decline in nonresidential construction and exports reduced glulam demand.[161]

Table 3-10
Glulam: Canadian production, exports, imports, and apparent Canadian consumption, 1997-2001

Year	Canadian production	Canadian exports	Canadian imports	Apparent Canadian consumption	Ratio of imports to consumption
	Million board feet				*Percentage*
1997	15	7.5	(1)	7.5	(1)
1998	13	3.5	(1)	9.5	(1)
1999	15	5	(1)	10	(1)
2000	21	11	(1)	10	(1)
2001	25	13	(1)	12	(1)

[1] According to industry sources, Canadian imports of glulam are minimal.

Source: APA–The Engineered Wood Association.

Production of LVL in Canada began in 1998 and has risen steadily since then. By 2001, LVL production totaled 5.5 million cubic feet (table 3-11). Output continued to expand in 2002 in response to strong residential construction markets in Canada and the United States. In the first three quarters of 2002, LVL production rose by 12 percent over the comparable period in 2001.[162]

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[159] APA - The Engineered Wood Association, *Regional Production & Market Outlook for Structural Panels and Engineered Wood Products, 2002-2007,* Apr. 2002.

[160] Ibid. Trus Joist has a plant in British Columbia that produces parallel strand lumber and a new plant in Ontario that makes laminated strand lumber. These two products are proprietary, patented products made exclusively by Trus Joist.

[161] APA-The Engineered Wood Association, *Engineered Wood Statistics, Third Quarter 2002,* Oct. 2002.

[162] Ibid.

Table 3-11
LVL: Canadian production, exports, imports, and apparent Canadian consumption, 1997-2001

Year	Canadian production	Canadian exports	Canadian imports	Apparent Canadian consumption	Ratio of imports to consumption
	Million cubic feet				*Percentage*
1997	0	0	([2])	([3])	([3])
1998	1.7	([1])	([2])	([3])	([3])
1999	4.0	([1])	([2])	([3])	([3])
2000	4.4	([1])	([2])	([3])	([3])
2001	5.5	([1])	([2])	([3])	([3])

[1] According to industry sources, Canadian LVL producers export an unknown, but not insignificant, volume of LVL to the United States.
[2] According to industry sources, Canadian imports of LVL are minimal.
[3] Data not available.

Source: APA–The Engineered Wood Association.

Canadian production of I-joists more than doubled during 1997-2001, from 80 million linear feet to 179 million linear feet (table 3-12). Much of this output is destined for export markets, principally the United States. In 2001, 49 percent of I-joist production was exported. Strong residential construction activity in Canada and the United States spurred increased output of I-joists during 2002. Canadian production grew by 22 percent between January-September 2001 and the same period of 2002.[163]

Table 3-12
I-Joists: Canadian production, exports, imports, and apparent Canadian consumption, 1997-2001

Year	Canadian production	Canadian exports	Canadian imports	Apparent Canadian consumption	Ratio of imports to consumption
	Million linear feet				*Percentage*
1997	80	2	([1])	78	([1])
1998	92	2	([1])	90	([1])
1999	162	62	([1])	100	([1])
2000	173	67	([1])	106	([1])
2001	179	88	([1])	91	([1])

[1] According to industry sources, Canadian imports of I-joists are minimal.

Source: APA–The Engineered Wood Association.

Producers of glulam, LVL, and I-joists in Canada vary production and employment in response to the seasonal nature of construction. Some producers reduce output during the winter months and lay off production workers. During the spring and summer, workers are called back and production increases. Other producers maintain steady production

[163] Ibid.

throughout the year, building inventory during the winter months to meet increased demand during the spring and summer. Seasonal layoffs are consequently held to a minimum.[164]

Raw materials and the composition of production costs for glulam, LVL, and I-joists differ in Canada. Glulam is typically made from a special grade of dimensional lumber (lamstock) which is dried to a maximum moisture content of 15 percent. Most of this lumber is of Canadian origin.[165] Many glulam producers purchase their lumber on the open market but a few source some or all of it internally. One producer noted that it purchased 50 percent of its lumber direct from lumber mills and the other 50 percent from lumber brokers. This producer also indicated that lumber accounted for 45 percent to 65 percent of the cost of producing glulam; glue, 7 percent to 8 percent; and labor, 15 percent to 30 percent.[166] LVL is made from layers of softwood or hardwood veneer. All three LVL producers in Canada source almost all of their veneer from related veneer operations. Veneer accounts for approximately 50 percent to 60 percent of the cost of producing LVL, glue is less than 10 percent of the cost, and labor is less than 15 percent.[167] To make I-joists, producers in Canada typically use OSB for the web and visually graded lumber or MSR lumber (much of it eastern Canadian black spruce) for the flanges. There is very little production of I-joists in Canada with LVL flanges. Many I-joist producers buy their OSB and flange stock on the open market. Others, which are part of larger forest products firms, source some of their raw materials internally and buy the rest on the open market. OSB, flange stock, and glue account for well over 50 percent of the cost of producing I-joists; labor accounts for a relatively small portion of total production costs.[168]

The EWP industry in Canada during the past several years has witnessed consolidation, new investment, capacity growth, and new entrants into the market. Some producers have bought other producers in order to expand and diversify their EWP offerings and increase their market share. Some have built new capacity to meet growing demand for EWP, while others, heretofore traditional lumber producers, have begun to move into engineered wood production reportedly in order to grow their business and to hedge the risks associated with the ongoing lumber trade dispute between the United States and Canada. The net result of all of this activity has been intensified competition and a rapid growth in capacity that has outstripped growth in production.

In late 1999, Louisiana-Pacific Corp. purchased Evans Forest Products, a British Columbia wood products firm with several facilities, including a new LVL mill. This purchase increased Louisiana-Pacific's market share in LVL and enabled it to better serve customers in expanding West Coast markets.[169] In early 2000, Weyerhaeuser Co. completed the takeover of Truss Joist MacMillan, the world's largest producer of EWP with production facilities in the United States and Canada. This takeover transformed Weyerhaeuser into the

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[164] USITC staff interviews with industry officials, Nov. 14 and Dec. 10, 2002; USITC staff telephone interviews with industry officials, Jan. 10 and Jan. 23, 2003.

[165] Canadian Wood Council, Products, Glulam, Introduction, found at *http://www.cwc.ca/products/glulam/intro.html*, retrieved Sept. 6, 2002.

[166] USITC staff telephone interview with industry official, Jan. 10, 2003.

[167] Ibid., Feb. 5, 2003.

[168] Ibid., Jan. 23, 2003.

[169] Louisiana-Pacific Corp., news release, Dec. 1, 1999, "Louisiana-Pacific Corp. Acquires Evans Forest Products," found at *http://www.lpcorp.com/press/release*, retrieved Feb. 5, 2003.

leading EWP producer and provided it with new opportunities for growth in this product area.[170] In order to expand its product line of EWP, Boise, in June 2000, bought Alliance Forest Products-Joists, Inc. (AllJoist), a producer of I-joists with solid wood flanges in New Brunswick.[171] As part of a strategy to further expand into EWP, Tembec Inc., a large Canadian softwood lumber producer, formed a joint venture in August 2001 to acquire Jager Building Systems, a producer of I-joists with plants in Alberta, Ontario, and Quebec.[172]

New capacity to produce EWP in Canada includes a large laminated strand lumber plant in Ontario built by Trus Joist (Weyerhaeuser) and joint ventures created by Anthony Forest Products Co. (El Dorado, Arkansas) and Domtar, Inc. (Montreal, Quebec) and by Abitibi-Consolidated Inc. and Louisiana-Pacific Canada Ltd. to produce I-joists with solid wood flanges in eastern Canada.[173] These two joint ventures provide an opportunity for Domtar, Inc. and Abitibi-Consolidated Inc., two large Canadian softwood lumber producers, to diversify into EWP.[174] They are also indicative of a trend in the past few years of increased solid wood flange I-joist capacity in eastern Canada. Reasons reportedly for this capacity growth include an abundance of lower cost black spruce in eastern Canada that is well suited for flange stock; lower capital costs for the construction of a solid wood flange I-joist plant compared with an LVL flange I-joist plant; lower variable manufacturing costs for solid wood flange I-joists compared with LVL flange I-joists; and U.S. trade restrictions on imports of softwood lumber from Canada which provide an incentive for Canadian lumber producers to use some of their lumber in the manufacture of value-added lumber products not subject to the trade restrictions.[175]

Capacity to produce LVL and I-joists has grown rapidly in Canada in recent years. LVL capacity more than quadrupled between 1997 and 2001, while I-joist capacity more than doubled.[176] I-joist capacity increased further in 2002. Although production of LVL and I-joists in Canada has also grown during the period, these product markets have suffered from

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[170] Weyerhaeuser Co., news release, Nov. 23, 1999, "Weyerhaeuser to Acquire TJ International for $720 Million," found at *http://investor.weyerhaeuser.com*, retrieved Feb. 5, 2003.

[171] Boise, *Annual Report 2001.*

[172] Tembec Inc., *Annual Report 2001.*

[173] Trus Joist, A Weyerhaeuser Business, news release, Oct. 26, 2000, "Kenora Trus Joist Plant Moving Ahead," found at *http://www.tjm.com/PressReleases/PRKenora.cfm*, retrieved Jan. 30, 2003; Anthony-Domtar, Inc., Communique, Jan. 22, 2002; Abitibi-Consolidated Inc., press release, Nov. 7, 2002, "Abitibi-Consolidated and LP to Create a Joint Venture to Produce Engineered Wood," found at *http://micro.newswire.ca/releases/November2002/07/c9436.html*, retrieved Nov. 19, 2002.

[174] Two other Canadian softwood lumber producers have diversified into engineered wood production within the past 3 years. Chantiers Chibougamau, a Quebec firm, now produces I-joists and glulam. Slocan Forest Products Ltd., a British Columbia firm, produces glulam for the Japanese market. Slocan indicated that production of EWP was one way to counter the business uncertainties associated with the ongoing softwood lumber trade dispute between the United States and Canada. Chantiers Chibougamau, found at *http://www.chibou.com/english/bienvenue.html*, retrieved Nov. 18, 2002; Slocan Forest Products Ltd., *Annual Report 2000, Annual Report 2001.*

[175] Robert Berg, "Engineered Lumber: Wood I-Joist and LVL," *RISI North American Lumber Forecast, Long-Term*, July 2001.

[176] Ibid.

overcapacity.[177] Prices for LVL and I-joists have been weak, in some cases declining.[178] Canadian glulam capacity has likely grown during the period as two new producers (Chantiers Chibougamau and Slocan Forest Products Ltd.) have entered the market. One large Canadian glulam producer noted that it was not operating at capacity.[179]

Markets, marketing practices, and trade

Apparent consumption of glulam in Canada rose steadily between 1997 and 2001, from 7.5 million board feet to 12 million board feet (table 3-10). Consumption likely declined in 2002 due to a drop in nonresidential construction.[180] Data for Canadian consumption of LVL are not available. However, growth in Canadian production of LVL coupled with a strong housing market in the country suggest that consumption increased during the period. Canadian consumption of I-joists grew irregularly from 78 million linear feet in 1997 to 91 million linear feet in 2001 (table 3-12). Consumption remained strong during 2002, driven by a big increase in Canadian housing starts and further penetration by I-joists into residential construction.[181]

In recent years, growth in demand for EWP in Canada has occurred not only because of increased residential construction activity but also because of some displacement of dimensional lumber by EWP in certain residential construction applications. Marketed as stronger and more versatile than dimensional lumber, EWP have made inroads among many residential builders in Canada. The market share these products have attained in residential construction in Canada is comparable to that in the United States.[182] Although traditionally used in large commercial construction projects as beams and arches to span long distances, glulam, in more recent years, has penetrated residential and light commercial construction markets in Canada. Producers have successfully marketed glulam for beam and header applications in residential construction, dispelling the notion of glulam as solely a product for commercial construction.[183] LVL is used primarily for beams and headers in residential construction, although some is used as flange stock for I-joists made in the United States.[184] I-joists, in Canada, are used principally in residential floor construction, competing against dimensional lumber.[185]

The success enjoyed by EWP, however, has brought changes in the market. The market has evolved from one major producer during the 1970s and 1980s, Trus Joist Corp. (making proprietary, patented EWP accompanied by engineering and technical support for customers), to a multitude of firms today supplying EWP. More capacity and more

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[177] Ibid. USITC staff interview with industry officials, Nov. 14, 2002.

[178] E-mail message from industry official, Jan. 16, 2003; Boise, *Annual Report 2001;* Louisiana-Pacific Corp., *2001 Annual Report and 10-K.*

[179] USITC staff telephone interview with industry official, Jan. 10, 2003.

[180] APA-The Engineered Wood Association, *Engineered Wood Statistics, Third Quarter 2002,* Oct. 2002.

[181] USITC staff telephone interview with industry official, Jan. 23, 2003.

[182] Testimony of Tom Denig, president and CEO, Trus Joist, a subsidiary of Weyerhaeuser Co., transcript of the hearing, p. 106.

[183] USITC staff interview with industry officials, Dec. 10, 2002; USITC staff telephone interview with industry official, Jan. 10, 2003.

[184] USITC staff interview with industry officials, Nov. 14, 2002.

[185] USITC staff telephone interview with industry official, Jan. 23, 2003.

competition have made EWP more of a commodity.[186] EWP compete against themselves and against dimensional lumber. One Canadian glulam producer noted that it has lost market share in residential construction to LVL.[187] As more residential builders use and become knowledgeable about EWP, they are less willing to pay a premium for the service and technical support provided by EWP firms.[188]

Glulam production consists of custom fabricated glulam made for a specific building project (usually commercial) or stock glulam, usually 60-feet long glulam beams manufactured to standard dimensions and characteristics and generally used for residential construction. In Canada, custom fabricated glulam typically accounts for 60 percent to 65 percent of glulam producers' sales and stock glulam accounts for the remainder. Custom fabricated glulam is sold principally to commercial general contractors; stock glulam is generally sold to retail lumber yards, which frequently cut it into smaller lengths and then sell it primarily to residential home builders.[189]

LVL and I-joists are produced to order and for inventory. I-joist producers in Canada build up inventories of I-joists during the winter to sell during the busy spring and summer building season.[190] Channels of distribution for these products vary. One Canadian LVL producer indicated that it sells LVL primarily to wholesale building distributors who then sell it to lumber yards for ultimate sale to builders; a smaller volume of LVL is sold to truss producers for further distribution to builders.[191] An I-joist producer noted that it sells virtually all of its output to distributors such as lumber yards and truss producers.[192] Another producer indicated that its EWP in Canada move through a two-step distribution process–through a wholesaler to a pro dealer to a builder (the final consumer).[193] A few large producers sell some of their output through their own wholesale building materials distribution operations.[194] LVL and I-joists are used primarily in residential construction. A Canadian I-joist producer noted that more than 90 percent of its I-joist sales are for residential construction.[195] Another producer indicated that 75 percent to 80 percent of its EWP sales are into residential construction and the remainder are into commercial construction.[196]

Canadian glulam producers generally ship most of their glulam output regionally, rather than nationally. The relatively small size of the producers, coupled with their greater familiarity with the construction markets and builders in their region, have tended to keep much of the

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[186] USITC staff interview with industry officials, Dec. 10, 2002.
[187] USITC staff telephone interview with industry official, Jan. 10, 2003.
[188] "Engineered wood takes more market share," *Yardstick, Random Lengths Publications, Inc.*, Jan. 2002.
[189] USITC staff telephone interview with industry official, Jan. 10, 2003.
[190] Ibid., Jan. 23, 2003.
[191] USITC staff interview with industry officials, Nov. 14, 2002.
[192] USITC staff telephone interview with industry official, Jan. 23, 2003.
[193] Testimony of Tom Denig, president and CEO, Trus Joist, a subsidiary of Weyerhaeuser Co., transcript of the hearing, p. 103. A pro dealer, or building materials professional dealer, specializes in sales of building materials to professional builders, remodeling firms, and trade contractors that are involved in residential home construction and light commercial construction. Louisiana-Pacific Corp., *2001 Annual Report and 10-K.*
[194] Boise, *Annual Report 2001.*
[195] USITC staff telephone interview with industry official, Jan. 23, 2003.
[196] Testimony of Tom Denig, president and CEO, Trus Joist, a subsidiary of Weyerhaeuser Co., transcript of the hearing, p. 111.

output confined to regional markets. One western Canadian glulam producer noted that 65 percent to 70 percent of its glulam sales was in western Canada, with the remainder in eastern Canada and export markets.[197] LVL and I-joists also tend to be shipped regionally, generally within a 500 to 600-mile radius of the production facility.[198] Producers with multiple production facilities thus serve a particular region's customers with the output of a plant in that region. Nevertheless, for these producers, shipping distance reportedly is less important than an optimal and efficient production mix at all facilities, which at times means supplying a customer with product from a more distant facility.[199]

In an effort to distinguish themselves from their competitors, some EWP producers have tried to add value to their products by offering technical and software support to their customers. One Canadian glulam producer maintains a staff of engineers to assist customers with preliminary project development, design and technical support, and detailed cost analysis.[200] The firm has also developed design software for its glulam. Another glulam producer provides similar value-added services for its customers.[201] Boise, a Canadian and U.S. producer of EWP, provides software programs to its distributors and retailers to assist them in the sale of EWP to builders and to help ensure that these products are installed and used properly. One software program analyzes the builder's house plan to determine the proper floor joists and beams necessary to meet the builder's requirements and applicable building codes. Another software program assists the builder by creating detailed drawings of the structure and providing customized installation instructions for all of the EWP.[202]

Canadian exports of glulam rose from 7.5 million board feet in 1997 to 13 million board feet in 2001 (table 3-10). The United States is the destination for most of these exports; a smaller volume is exported to Asia, principally Japan.[203] In recent years, the Japanese market for glulam has grown rapidly, but Canadian exports of glulam to Japan have lost market share to increased European glulam exports.[204] European glulam producers reportedly have made inroads into the Japanese market because of the low price and good quality of their glulam, strong customer service, and the construction of glulam plants specifically designed to serve the Japanese market.[205] Data are not available for Canadian exports of LVL, but industry sources indicate that all three Canadian LVL producers export LVL to the United States.[206] Canadian exports of I-joists grew rapidly from 2 million linear feet in 1997 to 88 million linear feet in 2001 (table 3-12). The United States was the principal market for these I-joists;

[197] USITC staff telephone interview with industry official, Jan. 10, 2003.
[198] Paul C. Rosenthal, Collier Shannon Scott, PLLC, written submission to the Commission on behalf of Louisiana-Pacific Corp., Dec. 20, 2002.
[199] USITC staff interview with industry officials, Nov. 14, 2002.
[200] Western Archrib, Technical Information, found at *http://www.westernarchrib.com/technical_information/technical_main.html*, retrieved Sept. 6, 2002.
[201] Structurlam Products, Products and Services, found at *http://www.structurlam.com/prod-services.htm*., retrieved Nov. 21, 2002.
[202] Boise, *Annual Report 2001.*
[203] USITC staff interview with industry officials, Dec. 10, 2002.
[204] USDA, FAS, *Japan Solid Wood Products, Record Glulam Production and Imports in 2001*, Tokyo, GAIN Report No. JA2037, Sept. 12, 2002.
[205] USITC staff interview with industry officials, Dec. 10, 2002.
[206] Ibid., Nov. 14, 2002.

a small volume was exported to Asia and Europe.[207] Canada's imports of glulam, LVL, and I-joists are minimal.[208]

Finland

Other than Canada, the only other supplier of any appreciable volume of EWP to the United States is Finland.[209] Imports from Finland, however, consist only of a relatively small volume of LVL sold primarily for industrial applications such as scaffold plank and concrete forming.[210] This LVL is made by Finnforest Corp., a large Finnish forest products producer with operations in 21 countries and 7,500 employees. Finnforest is the only producer of LVL in Europe. It produces a variety of solid wood and EWP, including softwood lumber, LVL, plywood, glulam, and I-joists. LVL is produced on three production lines at a facility in Lohja, Finland, and on a new line at a facility in Punkaharju, Finland that commenced operations in 2001. Total LVL capacity is an estimated 6 million cubic feet. During 2001 and 2002, Finnforest ran the LVL production lines at full capacity. Most of the LVL output is exported, primarily to European markets; LVL has been exported to the United States for more than a decade. McCausey Wood Products, a U.S.-based member of Finnforest, is the North American importer and distributor of Finnforest LVL.[211]

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[207] Ibid., Dec. 10, 2002; Ibid., Jan. 23, 2003.

[208] USITC staff interviews with industry officials, Nov. 14 and Dec. 10, 2002; USITC staff telephone interview with industry official, Jan. 10, 2003. See chapter 4 for a more detailed discussion of U.S.-Canadian trade in EWP.

[209] Virtually all U.S. imports of trusses and prefabricated panels come from Canada.

[210] Testimony of Tom Denig, president and CEO, Trus Joist, a subsidiary of Weyerhaeuser Co., transcript of the hearing, p. 109.

[211] Finnforest Corp., *Annual Report 2001*; Finnforest Corp., press release, "Finnforest Corp. Final Accounts 2002," Feb. 6, 2003; Finnforest Corp., Bulletin, "Interim Report for the Finnforest Corp. 1-9/2002," Oct. 30, 2002; "Benchmarking: Major Global Forest Products Producers," *Wood Markets Monthly,* Aug. 2002; McCausey Wood Products, found at *http://www.finnforestus.com/welcome.html*, retrieved Dec. 6, 2002.

CHAPTER 4
U.S. TRADE IN WOOD STRUCTURAL BUILDING COMPONENTS

This chapter discusses factors affecting the trade patterns, imports, and exports of wood structural building components during the period of investigation. Wood structural building components are considered to be builders' joinery and carpentry of wood and were classified in HTS subheading 4418.90.40 during 1997-2001 and subheading 4418.90.45 during 2002, subheadings that include other products in addition to wood structural building components. Included is a description of the analysis undertaken to account for imports of out-of-scope products in these subheadings and to estimate imports, and hence import penetration, of wood structural building components.

Factors Affecting Trade Patterns

In the course of the investigation, industry officials identified two factors (other than demand in North American construction markets) that may have influenced the level of U.S. imports of wood structural building components during 1997-2002. Because softwood lumber is a principal raw material of some wood structural building components (e.g., trusses, glulam, and I-joists), both the Softwood Lumber Agreement (SLA) and subsequent antidumping and countervailing duty orders on softwood lumber may have influenced U.S. imports of wood structural building components during the period of investigation. The SLA quotas did not apply to imports of trusses and EWP from Canada, and likewise, the antidumping and countervailing duty orders do not apply to imports of trusses and EWP from Canada. Therefore, these trade actions may have provided an incentive for Canadian firms, the dominant suppliers of softwood lumber and wood structural building components to the United States, to increase shipments to the United States of wood structural building components that contain softwood lumber, thereby avoiding the duties or quotas that would otherwise have applied to softwood lumber contained therein. The Commission also considered the extent to which exchange rates may have influenced U.S. imports as the Canadian dollar declined in value relative to the U.S. dollar between 1997 and 2002.

The Softwood Lumber Agreement (SLA) between the Governments of Canada and the United States

On May 29, 1996, the United States and Canada formally entered into a 5-year agreement intended to ensure that there was no material injury or threat thereof to an industry in the

United States from imports of softwood lumber from Canada. The agreement was originally announced on April 2, 1996,[1] and the legal details were finalized over the next 8 weeks.

The SLA established annual allocations and fees for softwood lumber exports to the United States from the Canadian Provinces of British Columbia, Quebec, Alberta, and Ontario. The agreement stipulated that up to 14.7 billion board feet of softwood lumber could be exported annually without fees (i.e., export tax); for quantities between 14.7 billion board feet and 15.35 billion board feet, a fee of US$50 per 1,000 board feet would be assessed; and a fee of US$100 per 1,000 board feet would be assessed for exports in excess of 15.35 billion board feet per year. The Government of Canada was responsible for allocating export allowances to the four Provinces.[2] Each Province had an allocation and amounts exported over the allocation were assessed fees. On March 31, 2001, the 5-year agreement expired, and softwood lumber produced in Canada again entered the United States unconditionally free of duty.

Softwood Lumber AD/CVD Investigations[3]

On April 2, 2001, petitions were filed with the U.S. Department of Commerce (Commerce) and the U.S. International Trade Commission (Commission) by the Coalition for Fair Lumber Imports Executive Committee (CFLI), Washington DC; the United Brotherhood of Carpenters and Joiners, Portland, Oregon; and the Paper, Allied-Industrial, Chemical and Energy Workers International Union, Nashville, TN, alleging that an industry in the United States is materially injured and threatened with material injury by reason of imports of subsidized and less-than-fair-value (LTFV) imports of softwood lumber from Canada. On March 21, 2002, Commerce determined that certain softwood lumber products from Canada are being sold, or are likely to be sold, in the United States at LTFV and are subsidized. The Commission subsequently determined that an industry in the United States is threatened with material injury by reason of imports of softwood lumber from Canada found to be subsidized and sold in the United States at LTFV. Information relating to the background of the investigations is provided in the following tabulation:

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[1] Office of the United States Trade Representative, "Statement of Ambassador Kantor on finalizing the Softwood Lumber Agreement," press release 96-35, Apr. 2, 1996; Canadian Department of Foreign Affairs and International Trade, "Agreement on Softwood Exports Preserves U.S. Market Access for Five Years, Eggleton Says," press release No. 56, Apr. 2, 1996.

[2] Canada decided to base the allocations on historical trade levels. Allocations were distributed as follows: British Columbia, 59 percent; Quebec, 23 percent; Ontario, 10.3 percent; and Alberta, 7.7 percent. Exports originating in Manitoba, Saskatchewan, and the Maritime Provinces were not subject to the SLA.

[3] For information on earlier softwood lumber investigations see USITC pub. 3509, May 2002.

Date	Action
April 2, 2001	Petitions filed with Commerce and the Commission; institution of Commission investigations (66 FR 18508, April 9, 2001)
April 30, 2001	Commerce's notices of initiation of countervailing duty investigation (66 FR 21332) and antidumping duty investigation (66 FR 21328)
May 16, 2001	Commission's preliminary determination (66 FR 28541, May 23, 2001)
August 17, 2001	Commerce's preliminary countervailing duty determination (66 FR 43186)
March 21, 2002	Commerce's final determination of sales at less than fair value and final affirmative countervailing duty determination (67 FR 15539), April 2, 2002, (67 FR 15545), April 2, 2002.
May 16, 2002	Commission's final determination that an industry in the United States is threatened with material injury by reason of imports of softwood lumber from Canada (67 FR 36022)
May 22, 2002	Commerce's amended final determination of sales at less than fair value (67 FR 36068) and amended final determination of countervailing duties

The impact of the SLA and the subsequent trade action on the U.S. market for wood structural building components appears to differ for trusses and prefabricated panels and for EWP. Therefore, the impact on each industry is discussed separately.

Trusses and prefabricated panels

North America was considered by wood structural building component industry officials to be a single market for softwood lumber. During the 1990s (particularly during the term of the SLA), a two-tiered North American pricing structure reportedly developed.[4] Industry officials alleged that prices for softwood lumber in Canada (relative to prices in U.S. lumber markets) were depressed as a result of more Canadian lumber being sold in the home market due to U.S. quota restrictions.[5] They contend that while the Canadian price advantage was larger during the SLA (as high as 35 percent)[6] than at present,[7] the two-tiered North American pricing remains in place since the imposition of AD/CVD duties, albeit at a lower level.[8] One industry official estimated that the Canadian price advantage for lumber was 18 percent in the fourth quarter of 2002.[9] Other impacts of the U.S. trade actions noted by producers included shortages of lumber during periods when the SLA quota had been met and higher volatility in the price of lumber.[10]

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[4] Both U.S. and Canadian industry officials have acknowledged the existence of the two-tiered pricing. Matthew M. Nolan, Miller & Chevalier Chartered, written submission to the Commission on behalf of Trus Joist (Weyerhaeuser), Dec. 19, 2002, and testimony of Peter Woodbridge, president, Peter Woodbridge & Associates Ltd., transcript of the hearing, p. 94.

[5] Matthew M. Nolan, Miller & Chevalier Chartered, written submission to the Commission on behalf of Trus Joist (Weyerhaeuser), Dec. 19, 2002.

[6] Testimony of Jack Louws, owner, Louws Truss Inc., transcript of the hearing, p. 41.

[7] Ibid., p. 63.

[8] Testimony of Kirk Grundahl, executive director, WTCA, transcript of the hearing, p. 30; and USITC staff telephone interview with industry official, Dec. 30, 2002.

[9] Testimony of Jack Louws, owner, Louws Truss Inc., transcript of the hearing, p. 31.

[10] Responses to the Commission producer questionnaire.

Industry officials alleged that Canadian manufacturers of trusses and prefabricated panels have parlayed the lumber price advantage into increased exports to the United States.[11] Truss manufacturers from the Midwest and the Pacific Northwest testified before the Commission that they first observed Canadian trusses in their markets during 1996 to 1998,[12] that Canadian trusses are allegedly sold at prices approximately 30 percent less than trusses from domestic manufacturers,[13] and that their firms have lost sales[14] and laid off workers.[15] Of those U.S. truss firms responding to the Commission producer questionnaire, 31 percent indicated that their firms had lost sales or revenue to Canadian competition.[16]

Because trusses are typically custom built, it is difficult to measure unit price, but one Midwest industry official testified that his firm was producing more units for the same or fewer dollars.[17] U.S. industry officials allege that the Canadian price advantage also extends to precut pieces of trusses or subassemblies of trusses. Imports of these items are allegedly available at a cost that is below the cost of manufacturing them in the United States[18] and, in some cases, at a cost equal to the U.S. manufacturers' cost of lumber.[19]

Industry officials indicated that the impact of Canadian truss imports in the U.S. market was not felt immediately upon commencement of the SLA, because the ability to service accounts requires manufacturers to have a local service presence.[20] Truss manufacturers are required to meet the needs of a variety of parties, such as building material distributors, engineers,[21] framers, and home builders.[22] As a result, time is required to establish business relationships in new markets.[23] Although Canadian truss manufacturers are selling directly in markets close to the border[24] and have shipped as far as Southern California,[25] certain industry officials indicated that the impact of Canadian trusses has yet to be felt heavily in

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[11] Testimony of Jack Louws, owner, Louws Truss Inc., transcript of the hearing, p. 41 and testimony of Phil Luneack, vice president, Bear Truss Co., transcript of the hearing, p. 14.

[12] All manufacturers indicated that Canadian product began to be seen during 1996-1998. Testimony of Jack Louws, owner, Louws Truss Inc., Roy Schiferl, operations manager, Woodinville Lumber, Inc., Stephen Yoder, president, Stark Truss Co., Inc., and Phil Luneack, vice president, Bear Truss Co., transcript of the hearing, pp. 80-81.

[13] Testimony of Phil Luneack, vice president, Bear Truss Co., transcript of the hearing, p. 14.

[14] Testimony of Jack Louws, owner, Louws Truss Inc., Roy Schiferl, operations manager, Woodinville Lumber, Inc., and Kent Pagel, president, Pagel, Davis & Hill, P.C., transcript of the hearing, pp. 8-9, 11, 16.

[15] Testimony of Jack Louws, owner, Louws Truss Inc., transcript of the hearing, pp. 8-9.

[16] Responses to the Commission producer questionnaire.

[17] Testimony of Phil Luneack, vice president, Bear Truss Co., transcript of the hearing, p. 65.

[18] Testimony of Jack Louws, owner, Louws Truss Inc., and Roy Schiferl, operations manager, Woodinville Lumber, Inc., transcript of the hearing, pp. 9, 12.

[19] USITC staff interview with industry official, Dec. 11, 2002.

[20] Testimony of Kirk Grundahl, executive director, WTCA, transcript of the hearing, p. 50.

[21] Trusses manufactured in Canada for the U.S. market must be "sealed" (approved) by a U.S. licensed engineer.

[22] Testimony of Peter Woodbridge, president, Peter Woodbridge & Associates Ltd., transcript of the hearing, p. 93.

[23] Testimony of Kent Pagel, president, Pagel, Davis & Hill, P.C., transcript of the hearing, p. 42, and testimony of Stephen Yoder, president, Stark Truss Co., Inc., transcript of the hearing, p. 45.

[24] Testimony of Jack Louws, owner, Louws Truss Inc., transcript of the hearing, p. 55.

[25] Ibid., p. 27.

some U.S. markets, particularly the south and parts of the west.[26] All of the firms that indicated lost sales or revenue to Canadian competition on the Commission producer questionnaire were from regions directly adjacent to the Canadian border.

U.S. manufacturers of trusses and prefabricated panels have responded to the Canadian competition in a number of ways. Some regard bidding on jobs against Canadian manufacturers as a futile gesture and avoid doing so.[27] One firm has changed its focus, moving away from commercial and multifamily business toward residential business, expanding its wall and floor panel business, and forward integrating into contract framing.[28] A few U.S. manufacturers have reportedly postponed expansion plans as a result of the duties on Canadian softwood lumber,[29] but several have built or have announced plans to build production facilities in Canada[30] or have obtained Canadian business licenses.[31] In response to market changes allegedly resulting from U.S. trade actions, some U.S. producers reported carrying larger inventories, increasing the number of lumber suppliers used, and purchasing or using different types or grades of lumber.[32]

Engineered wood products

Industry officials indicate that LVL and glulam markets have not been impacted substantially by either the SLA or subsequent duties.[33] Industry officials allege that the trade actions have affected the market for I-joists to a certain extent. They state that I-joist production is driven primarily by the cost of flange stock (which is covered by the AD/CVD duty orders),[34] and that the U.S. trade actions may have created an incentive for investment in I-joist manufacturing capacity in Eastern Canada.[35] For example, during 1997-2001, Canadian I-joist capacity was added at a rate greater than justified by North American market growth.[36]

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[26] Testimony of Kent Pagel, president, Pagel, Davis & Hill, P.C., transcript of the hearing, p. 25.

[27] Testimony of Jack Louws, owner, Louws Truss Inc., and Roy Schiferl, operations manager, Woodinville Lumber, Inc., transcript of the hearing, pp. 9, 11, 40.

[28] USITC staff interview with industry official, Dec. 11, 2002.

[29] Bradley Meacham, "Lumber tariffs nail state's wood-products plants," *Seattle Times*, Jan. 6, 2003.

[30] "Century Truss to Build Manufacturing Facility in St. Clair Township," press release found at *http://www.structuralbcmag.com/inarchive/2002.04.htm*, retrieved Oct. 8, 2002.

[31] Testimony of Jack Louws, owner, Louws Truss Inc., transcript of the hearing, p. 9.

[32] Responses to the Commission producer questionnaire.

[33] Although industry officials testified that the market for LVL had not been impacted substantially by either the SLA or subsequent duties, one U.S. manufacturer of softwood veneer, the basic raw material of LVL, indicated that his firm had been severely impacted by increases in U.S. imports of Canadian softwood veneer. (Robert Freres, Freres Lumber Co., Inc., written submission to the Commission on behalf of Freres Lumber Co., Inc., Nov. 13, 2002.) Industry officials acknowledged that softwood veneer is an intermediate product that is traded freely across the U.S.-Canadian border. (Testimony of Tom Denig, president, Trus Joist, transcript of the hearing, p. 87.)

[34] Testimony of Tom Denig, president, Trus Joist, transcript of the hearing, p. 89.

[35] Ibid.; and Elliot J. Feldman, Baker & Hostetler LLP, written submission to the Commission on behalf of Canadian I-joist producers, Dec. 19, 2002, p. 22.

[36] Written statement of Tom Denig, president, Trus Joist, p. 9, and Elliot J. Feldman, Baker & Hostetler LLP, written submission to the Commission on behalf of Canadian I-Joist Producers, Dec. 19, 2002, p. 1.

However, Canadian producers stated that the extent to which Canadian capacity was influenced by this incentive or by the availability of black spruce, a species used for solid wood flange stock, is not clear.[37] In late 2002, Louisiana-Pacific announced a joint venture with a Canadian firm, Abitibi-Consolidated, to build an I-joist plant in Quebec.[38, 39]

Exchange Rates

Quarterly data reported by the International Monetary Fund indicate that the real and nominal values of the Canadian dollar trended similarly for the period January 1997 through September 2002. The real value of the Canadian dollar depreciated by 7.5 percentage points relative to the U.S. dollar from the first quarter of 1997 through the fourth quarter of 1998. The real value of the Canadian dollar then appreciated by 5.4 percentage points through the first quarter of 2000, before depreciating by 7.7 percentage points through the first quarter of 2001. From the first quarter of 2001 through the third quarter of 2002, the real value of the Canadian dollar was relatively stable, increasing by 2.0 percentage points overall (figure 4-1). Overall, the real value of the Canadian dollar depreciated by 7.8 percentage points from January 1997 through September 2002, thus contributing to the competitiveness of Canadian products in the U.S. market during this period.

Wood Structural Building Component Imports

A number of factors (discussed in greater detail below) may have contributed to growth and variability in the value of U.S. imports in HTS subheading 4418.90.40. To assess more accurately the value of wood structural building component imports, the Commission analyzed the transactions within HTS statistical reporting number (SRN) 4418.90.4090 for imports from Canada during 1999-2001. A detailed discussion of this analysis is provided in the section, Other Builders' Joinery and Carpentry (4418.90.40). Numerous company and industry information sources were used to identify the products manufactured by companies that accounted for at least 90 percent of U.S. imports in each year. Those companies that did not produce any products identified within the scope of this investigation were identified as such, and a ratio of in-scope and out-of-scope value was determined.[40] Furthermore, the

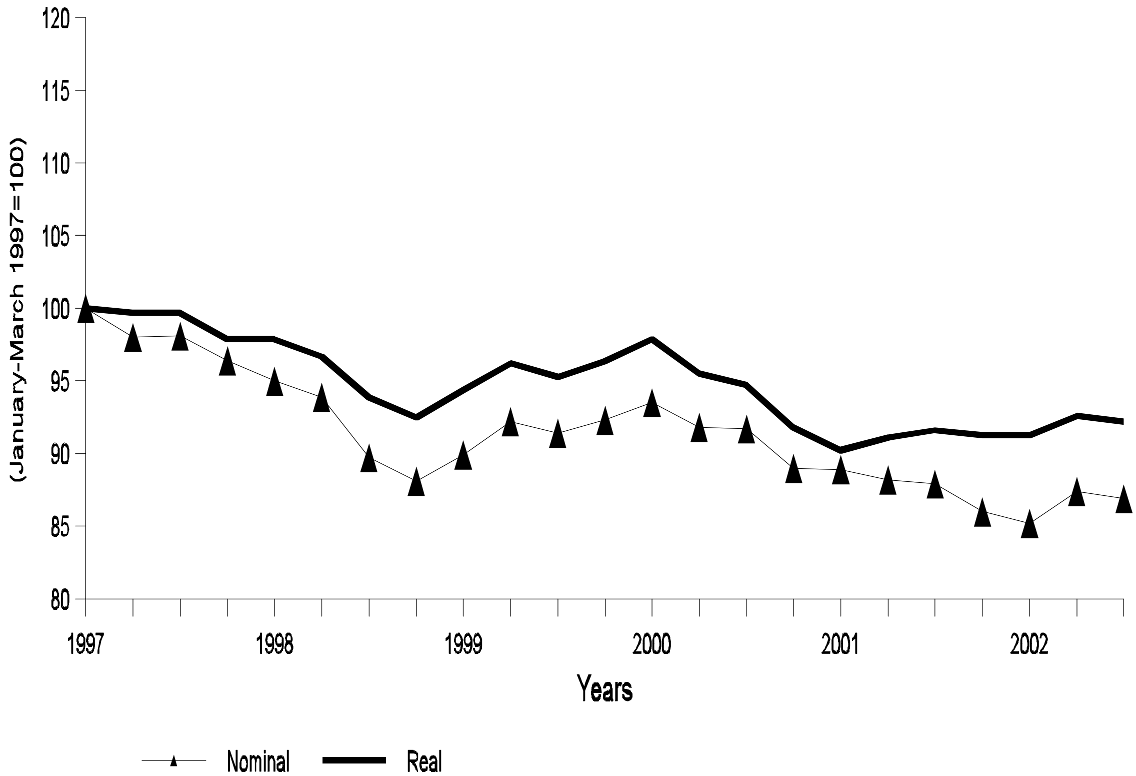
[37] Canadian manufacturers suggest that the availability of black spruce was the primary driver for the expansion of Canadian I-joist production capacity. Elliot J. Feldman, Baker & Hostetler LLP, written submission to the Commission on behalf of Canadian I-Joist Producers, Dec. 19, 2002, p. 15.

[38] In what amounts to a relocation of a plant from the United States to Canada, Abitibi will supply black spruce flange stock and Louisiana-Pacific will supply the web stock and market the finished I-joists. The necessary manufacturing equipment will be brought from a Louisiana-Pacific plant in Oregon. "Abitibi-Consolidated and LP to Create a Joint Venture to Produce Engineered Wood," found at *http://www.lpcorp.com/press/release.jsp?ID=386*, retrieved Dec. 18, 2002.

[39] Certain industry officials contend that the joint venture was planned prior to the imposition of duties and was driven by the supply of black spruce flange stock. However, the duties reportedly accelerated the pace of the project. USITC staff interview with industry official, Nov. 14, 2002.

[40] Companies that could not be confirmed as producing only out-of-scope products were maintained within the in-scope product grouping.

Figure 4-1
Exchange rates: Indexes of the nominal and real values of the Canadian dollar relative to the U.S. dollar, by quarters, January 1997-September 2002



Source: International Monetary Fund, *International Financial Statistics, http://imfstatistics.org.*

Commission determined that imports from other major suppliers (Brazil, China, Indonesia, and Chile), as explained below, were primarily products outside the scope of the investigation and not included in this estimate. Out-of-scope products most often classified in HTS SRN 4418.90.4090 included: flooring, staircase components, door and window frame components, and exterior deck components.

Also, as described below, predrilled studs were temporarily reported under HTS SRN 4418.90.4040 during a period from February 1997 through June 1998. To adjust this value, the Commission estimated the growth that would have taken place had predrilled studs not been included in this HTS statistical subheading and adjusted monthly imports accordingly to estimate in-scope value. Imports from other major suppliers (China, Indonesia, Mexico, and Germany) not known to produce products within the scope of this investigation were also not included in this estimate. The adjusted values for U.S. imports of wood structural building components during 1997-2002 are shown in table 4-1.

From 1997 to 1999, the estimated value of U.S. imports of wood structural building components increased by 170 percent, from $169 million to $456 million. From 1999 to 2001, the value of these imports dropped by 17 percent, from $456 million to $380 million (table 4-1). Imports in 2002 rebounded to $394 million. This pattern is consistent with the pattern of U.S. housing starts. However, the peak in total value in 1999 was driven primarily by the peak in other structural building components (HTS 4418.90.4090) in 1999, which may still contain out-of-scope products.[41] Moreover, many manufacturers of in-scope products also make products outside the scope of this investigation. Because all of the imports from these companies remain in the estimated values, some value for products not within the scope of this investigation may still be present in these estimates.

U.S. Import Penetration

Table 4-2 shows estimated U.S. shipments, trade, apparent consumption, and import penetration for wood structural building components. During 1997-2002, U.S. shipments of wood structural building components grew at an average annual rate of 5.4 percent.[42] Estimated imports of wood structural building components grew at an average annual rate of 15.2 percent, from $169 million in 1997 to $394 million in 2002. Import penetration increased from 3.4 percent in 1997 to 5.5 percent in 2002.

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[41] In 1997, U.S. Customs ruled that notched studs should be reported under HTS SRN 4418.90.4090 (U.S. Customs Service, Customs rulings NY B85796, June 4, 1997; NY C82044, Dec. 11, 1997; and NY B89813, Oct. 7, 1997, found at *http://customs.rulings.gov*, retrieved Feb. 7, 2003). In May 2000, however, U.S. Customs reclassified notched studs under HTS heading 4407, which would have a direct effect on the value of imports in HTS SRN 4418.90.4090 (U.S. Customs Service, Customs rulings HQ 963814, May 9, 2000, found at *http://customs.rulings.gov*, retrieved Feb. 7, 2003).

[42] For the purposes of determining apparent consumption and import penetration, U.S. shipments of wood structural building components shown in table 4-2 are based upon U.S. Census Bureau, Annual Survey of Manufactures data, which do not include freight and delivery charges. As a result, these figures are somewhat less than the production figures shown in chapter 3.

Table 4-1
Wood structural building components: Estimated U.S. imports, 1997-2002

Description	1997	1998	1999	2000	2001	2002
	Value *(1,000,000 dollars)*					
Laminated beams and arches[1]	21.0	15.5	16.5	37.5	14.8	16.7
Roof trusses[2]	26.9	39.5	71.0	76.3	70.6	75.6
Other prefabricated structural members[3]	35.8	69.5	107.6	133.6	151.6	162.1
Panels and partitions[4]	5.7	8.5	21.2	33.5	40.2	37.2
Other structural building components[5]	79.8	118.8	239.7	114.0	103.2	102.7
Total	169.2	251.8	456.0	394.9	380.4	394.3

[1] Includes total imports classified in Harmonized Tariff Schedule of the United States (HTS) reporting number SRN 4418.90.4010 during 1997-2001 and 4418.90.4510 during 2002.
[2] Includes total imports classified in HTS SRN 4418.90.4020 during 1997-2001 and 4418.90.4520 during 2002.
[3] Includes imports classified in HTS SRN 4418.90.4040 during 1997-2001 and 4418.90.4540 during 2002, adjusted to remove imports of predrilled studs from Canada and imports from countries not known to produce products within the scope of USITC investigation No. 332-445.
[4] Includes total imports classified in HTS SRN 4418.90.4050 during 1997-2001 and 4418.90.4550 during 2002.
[5] Includes imports classified in HTS SRN 4418.90.4090 during 1997-2001 and 4418.90.4590 during 2002, adjusted to remove imports, to the extent possible, from manufacturers and countries not known to produce products within the scope of USITC investigation No. 332-445.

Source: Commission estimates and data compiled from tariff and trade data from the U.S. Department of Commerce, the U.S. Treasury, and the U.S. International Trade Commission.

Table 4-2
U.S. wood structural building components: Estimated shipments, exports, imports, apparent consumption, and import penetration, 1997-2002

Year	Shipments[1]	Exports[2]	Imports[3]	Apparent consumption	Import penetration
	Million dollars				
1997	5,044	247	169	4,966	3.4
1998	5,701	207	252	5,746	4.4
1999	6,323	189	456	6,590	6.9
2000	6,357	191	395	6,561	6.0
2001	6,316	149	380	6,548	5.8
2002	6,908	116	394	7,186	5.5

[1] 1997 to 2001 shipments are the sum of U.S. Census Bureau, Annual Survey of Manufactures shipments for NAICS no's. 321213 - engineered wood members (except trusses), 321214 - wood trusses, and 3219921 - components of prefabricated stationary wood buildings (not sold as complete units). 2002 shipments are USITC estimates. NAICS no. 321213 includes some products (e.g., finger-jointed lumber) that are not in the scope of this investigation. Annual Survey of Manufactures shipments do not include freight and are, therefore, less than the production figures reported in Chapter 3 of this report.
[2] Exports include Schedule B subheading 4418.90, which potentially includes products outside the scope of this investigation.
[3] Commission estimates.

Source: U.S. Department of Commerce, Census Bureau data.

Classification of Applicable Products within the Harmonized Tariff Schedule

The U.S. Customs Service (U.S. Customs) classified wood structural building components under heading 4418 in the Harmonized Tariff Schedule of the United States (HTS), describing them as builders' joinery and carpentry of wood. The nonbinding *Explanatory*

Notes (EN) to that heading describe builders' joinery and carpentry as woodwork used in the construction of any kind of building in the form of assembled goods or as recognizable unassembled pieces.[43] Specifically, during 1997-2001, the products covered by this investigation were classified in subheading 4418.90.40, which was changed to 4418.90.45 as of January 10, 2002 (appendix table D-4-1).[44]

Several factors complicate the interpretation of the reported levels of imports and exports in relation to this investigation. First, many products not within the scope of this investigation were, and continue to be, classified under subheading 4418.90.40 (table D-4-2). Therefore, imports and exports reported in these categories are not necessarily limited to imports and exports of wood structural building components. Furthermore, changes in the classification of products since 1997 resulted in highly variable imports within some statistical reporting categories. Finally, because volume is difficult to measure, or is inconsistent across products or transactions, trade in this HTS category is reported only in terms of value. (Changes in value are not necessarily reflective of changes in volume).

Imports of Other Builders' Joinery and Carpentry (4418.90.40)[45]

During 1997-2001, annual U.S. imports of products classified as other builders' joinery and carpentry of wood averaged $660 million. Between 1995, the first full year before the Softwood Lumber Agreement (SLA) was implemented, and 1999, U.S. imports increased by 516 percent, from $138 million to $851 million (appendix table D-4-3).[46] Because HTS heading 4418 was not subject to SLA quotas, the increase may be due, in part, to Canadian lumber manufacturers shifting production to remanufactured products that could be exported

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[43] Joinery is described as comprising builders fittings, such as doors, windows, shutters, stairs, and door or window frames, while carpentry is described as woodwork (such as beams, rafters, and roof struts) used for structural purposes, or in scaffolding and arch supports. The *Explanatory Notes* specifically identify glue-laminated timbers (glulam) as builders' carpentry. World Customs Organization, *Harmonized Commodity Description and Coding System, Explanatory Notes, Third Edition (2002)*, Vol. 2, Sec. VI - XI, Chapters 30 - 63, pp. 819-821.

[44] In 1996, the Harmonized System Committee (HSC) of the World Customs Organization (WCO) decided that tongue-and-groove flooring strips worked at the ends should be classified in heading 4409. To implement this change in product content, the USITC and U.S. Customs recommended changes to the HTS (USITC, *Proposed Modification to the Harmonized Tariff Schedule of the United States, Investigation No. 1205-5 (Final),* Publication 3430, June 2001). The changes were implemented by Presidential Proclamation 7515 of Dec. 18, 2001, published in the Federal Register on Dec. 26, 2001 (*Federal Register,* Vol. 66, No. 247, Dec. 26, 2001, pp. 66620-21). Consequently, after Jan. 10, 2002, U.S. Customs no longer distinguished between solid wood that is tongued and grooved on the edges and solid wood flooring that is tongued and grooved on both the edges and ends. As a result, solid wood flooring products that would have been reported under HTS 4418.90.4090 before Jan. 10, 2002 will be reported under HTS 4409 after this date (U.S. Customs Service, Ruling letter HQ 965428, Feb. 28, 2002).

[45] This discussion includes the total value of products imported in HTS subheading 4418.90.40, which was in effect during 1995-2001, and subheading 4418.90.45 which was in effect during 2002. The values provided in this section include the value of products not within the scope of this investigation and, therefore, represent an upper bound on the value of U.S. imports of in-scope wood structural building components.

[46] While the Senate request letter specified that the investigation should cover the period 1997-2002, this discussion uses earlier data where applicable to demonstrate significant changes in imports and exports within this HTS subheading.

to the United States outside of the SLA quota restrictions. After peaking in 1999, total imports decreased by 15 percent to $723 million in 2001, but rebounded to $806 million in 2002.

Canada is the dominant supplier of these products to the U.S. market. The Canadian share of U.S. imports (by value) averaged 81 percent during 1997 to 2001. From 1995 to 1999, imports from Canada of products classified in HTS subheading 4418.90.40 increased from $101 million (73 percent of total U.S. imports) to $731 million (86 percent of total U.S. imports). Many of these products were initially classified by U.S. Customs as builders' joinery and carpentry. However, U.S. Customs issued rulings which reclassified various products, such as drilled studs and combed fascia boards, out of HTS subheading 4418.90.40. Consequently, imports from Canada dropped 25 percent, and the Canadian share of total U.S. imports fell to 76 percent between 1999 and 2001. Imports from Canada rebounded slightly to $563 million in 2002. Nonetheless, Canada continues to lose market share as imports from other suppliers increase at a faster rate than Canadian products. Other major suppliers include Brazil, China, Chile, and Indonesia, but a review of U.S. Customs rulings for imports from these countries suggests that many of the products imported from these countries are not within the scope of this investigation.

Laminated wood beams and arches (4418.90.4010)[47]

The products reported under SRN 4418.90.4010 include glulam[48] and SCL that are used in beams and arches.[49] In several rulings, U.S. Customs identified several characteristics used to distinguish between laminated products classified in HTS heading 4418 and goods of HTS heading 4412.[50] Orientation of the wood grain in the laminates is used to distinguish plywood products (4412), which have the grain of alternative piles oriented at an angle or perpendicular, from LVL products typically reported under HTS SRN 4418.90.4010, which generally have wood grains that run parallel, layers of veneer that are of similar quality, and

[47] In 2002, HTS SRN 4418.90.4510 replaced HTS SRN 4418.90.4010. Though HTS SRN 4418.90.4010 is used throughout this discussion, discussion of 2002 imports refers to HTS SRN 4418.90.4510. Product coverage did not generally change between 2001 and 2002.

[48] The *Explanatory Notes* (EN) specifically describe glulam as a structural timber product obtained by gluing together wood laminations having their grain essentially parallel. The EN further indicate that massive products such as laminated beams and arches (so-called "glulam" products) should not be classified in heading 4412, which includes plywood, veneered panels, and similar laminated wood. *Explanatory Notes, Third Edition*, p. 815.

[49] In January 1990, U.S. Customs ruled that LVL manufactured by T.J. International in thicknesses of 3/4 to 2½ inches and lengths of 8 to 60 feet was a structural building component similar to glulam. In March 1991, U.S. Customs ruled that PSL manufactured by MacMillan Bloedel, Ltd. is similar to, and is a substitute for, glulam. Nonetheless, some LVL and PSL imports may be classified elsewhere, as U.S. Customs ruled that the 9th and 10th digits of the subheading would be determined by the condition of the merchandise at the time of entry. U.S. Customs Service, Customs rulings HQ 086256, Jan. 23, 1990, and HQ 088284, Mar. 27, 1991, found at *http://rulings.customs.gov*, retrieved Oct. 9, 2002.

[50] U.S. Customs Service, Customs rulings HQ 085227, Aug. 7, 1989, HQ 086256, Jan. 23, 1990, HQ 088284, Mar. 27, 1991, and HQ 086255, Jan. 23, 1990, found at *http://ruling.customs.gov*, retrieved Sept. 20, 2002.

are typically of large dimensions.[51] A review of National Evaluation Reports for glulam and SCL clearly demonstrates that these products are manufactured and marketed as substitutes in structural building applications.[52]

During 1997-2002, U.S. imports of products classified as laminated beams and arches (HTS SRN 4418.90.4010) fluctuated. U.S. imports of these products ranged from $16 million to $21 million during 1997-1999, jumped to $38 million in 2000, and then dropped to $17 million in 2002 (appendix table D-4-4). Canada supplied 91 percent of the products imported as laminated beams and arches during 1997-2002. The Canadian share grew from 83 percent in 1997 to 94 percent in 2002. In 1997, Mexico supplied $3.6 million, or 17 percent, of U.S. imports of laminated beams and arches, but supplied only $3,000 by 2002. Between 2001 and 2002, imports of laminated beams and arches from Germany, Brazil, Thailand, and China increased from $41,000 to $799,000. Products reported under HTS SRN 4418.90.4010 represented 3.3 percent of all imports under subheading 4418.90.40 during 1997-2001.

Though the data are not sufficient to estimate the level of market penetration for imported products used in beams and headers, usage trends (chapter 3) and the $38 million surge in laminated beam imports in 2000 suggest that the potential for imports of laminated beams and arches to increase does exist.

Roof trusses (4418.90.4020)[53]

This HTS SRN is narrowly defined and includes only metal plate connected wood roof trusses. Imported roof trusses do not need to be assembled to be covered by this HTS SRN.[54] In 1998, U.S. Customs ruled that unassembled wood roof trusses that could be identified as

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[51] Despite these rulings, in Oct.1997, U.S. Customs described LVL manufactured by Finnforest and imported from Finland as a multiuse product that should be reported under HTS SRN 4412.99.9590 (U.S. Customs Service, Customs ruling HQ 960469, Oct. 24, 1997, found at *http://rulings.customs.gov*, retrieved Sept. 20, 2002). Further investigation revealed that the Finnforest LVL product is available in a variety of configurations for nonstructural uses, such as stair treads and window framing, and scaffolding, as well as structural uses (USITC staff interviews with industry officials, Building Component Manufacturers Conference, Columbus, Ohio, Oct. 15-18, 2002).The Finnforest LVL product has been evaluated and standards have been developed for its structural use in the United States (National Evaluation Service, National Evaluation Report No. NER-555, February 2000). However, USITC staff could not establish that any of this product was actually being used in structural applications in the United States. Nonetheless, the amounts imported are small relative to the size of the U.S. market. Subsequent to the Customs ruling in Oct. 1997, imports reported under HTS SRN 4412.99.9590 increased by more than a factor of six, from $900,000 in 1997 to $6.9 million in 1998, and continued to increase thereafter, reaching $12.2 million in 2002 (HTS SRN 4412.99.9690).

[52] The National Evaluation Service publishes technical reports that contain descriptions of building construction materials together with the conditions necessary for compliance with model building codes. National Evaluation Service, *National Evaluation Reports No. NER-481, June 1, 2001, NER-555, Feb. 1, 2000, NER-622, Nov 1, 2001, and NER-267, Nov. 1, 1996.*

[53] In 2002, HTS SRN 4418.90.4520 replaced HTS SRN 4418.90.4020. Though HTS SRN 4418.90.4020 is used throughout this discussion, discussion of 2002 imports refers to HTS SRN 4418.90.4520. Product coverage did not generally change between 2001 and 2002.

[54] It is generally true of all tariff lines that unassembled goods are reported as fully assembled products (HTS General Rules of Interpretation 2(a)). Nonetheless, each individual shipment is evaluated and reported based on its condition at the time of import.

specific sets of trusses associated with particular engineering designs, whether or not the wood components were accompanied by the required hardware for assembly, would be classified in HTS SRN 4418.90.4020.[55] During 1997-2002, imports of roof trusses in HTS SRN 4418.90.4020 represented 8.8 percent of all imports under HTS subheading 4418.90.40.

During 1997-2002, imports of wood roof trusses averaged $60.0 million annually. Canada accounted for virtually all of these imports during this period. Between 1997 and 2000, the total value of roof truss imports increased 183 percent from $26.9 million to $76.3 million (appendix table D-4-5), but dropped by 7.4 percent between 2000 and 2001. The value of roof truss imports rebounded to $76 million in 2002. Import penetration in the U.S. roof truss market rose from 0.9 percent in 1997 to 1.8 percent in 2001 (appendix table D-4-6).

It should be noted that changes in import values do not necessarily imply similar changes in import volumes (value changes are the net effect of both volume and price changes). Roof trusses are typically bid and priced on a per job basis. Each job is unique, which makes it difficult to report price and volume information. Bids are based on expected cost of production, of which about 40 percent is accounted for by the cost of lumber. Industry testimony indicated that given low lumber prices in 2001, in spite of the drop in import value between 2000 and 2001, volume may have increased 10 percent to 12 percent.[56] Additional industry testimony indicated that Michigan truss manufacturers faced both lower prices and increased import volume and suggests further that changes in import volume cannot be inferred from changes in import value.[57] Thus, import volume may have increased in those years when import value decreased, and volume may have increased at a greater rate than value in those years when values increased.

Canadian export data show that exports of roof trusses to the United States were highly concentrated geographically. Forty-eight percent (by value) of all Canadian roof truss exports went to the Midwest in 2001 (table 4-3). Michigan alone accounted for 40 percent of Canadian roof truss exports in 2001 (appendix table D-4-7), while no other individual Midwestern State accounted for more than 3 percent. The Northeast accounted for nearly 30 percent of Canadian roof truss exports. New Hampshire accounted for nearly 8 percent, New York for more than 7 percent, and Vermont for nearly 4 percent. All other Northeastern States accounted for less than 3 percent of total Canadian roof truss exports. Western States

Table 4-3
Canadian roof truss exports: Share of total value by region of destination, 1997-2001

Region	1997	1998	1999	2000	2001
	Percent				
Midwest	58.7	59.0	57.3	57.3	48.2
Northeast	22.0	20.3	22.0	23.6	29.4
West	13.4	17.2	14.9	15.0	18.2
South	5.8	3.5	5.8	4.1	4.2

Source: USITC estimates based on export data from Statistics Canada.

[55] U.S. Customs Service, Customs rulings NY C89668, Aug. 17, 1998, NY D80342, Sept. 18, 1998, and NY D81970, Sept. 30, 1998, found at *http://rulings.customs.gov*, retrieved Sept. 19, 2002.

[56] Testimony of Roy Schiferl, operations manager, Woodinville Lumber, Inc., transcript of the hearing, p. 61.

[57] Testimony of Phil Luneack, vice president, Bear Truss Co., transcript of the hearing, p. 65.

accounted for 18 percent of Canadian roof truss exports, with Washington alone taking nearly 8 percent and California with 4 percent. Less than 5 percent of Canadian roof truss exports went to States in the south in 2001.

Other fabricated structural wood members (4418.90.4040)[58]

This HTS SRN accounted for 21 percent of imports under subheading 4418.90.40 during 1997-2001. Canada accounted for 97 percent of the imports in this category during this period, which annually averaged $139 million (appendix table D-4-8). Total U.S. imports jumped nearly 570 percent, from $26 million in 1996 to $175 million in 1998. From 1998 to 1999, U.S. imports, however, dropped 37 percent to $109 million. Between 1999 and 2002, imports in this category increased again and totaled $169 million by 2002, a 54-percent increase from 1999. This highly variable import pattern does not, however, reflect the trend in the import of wood structural building components.

Based on a U.S. Customs ruling on February 18, 1997, predrilled studs were reported as other fabricated structural members.[59] Consequently, U.S. imports from Canada (under this SRN) increased from less than $3 million per month in January 1997 to more than $20 million per month during February 1998-June 1998 (figure 4-2). This ruling was revoked on June 26, 1998, and imports subsequently fell to less than $7 million per month in July-December 1998. Nonetheless, there appears to have been an upward trend in other products imported in this category (figure 4-2), which includes I-joists.

Prefabricated partitions and panels (4418.90.4050)[60]

Based on U.S. Customs ruling letter HQ 088051, issued on January 3, 1991, products in this category appear to be within the scope of this investigation. This ruling used two critical elements to determine whether prefabricated panels and partitions were classified in this category. First, the panels or partitions must have the essential characteristics that allow them to be used as structural elements in roofing, flooring, or wall applications. Second, the rigidness and strength that allow the panels to be used as a structural element must be provided by the wood portion of the panels. Panels where wood only provides support for an exterior surface of other materials are classified elsewhere.

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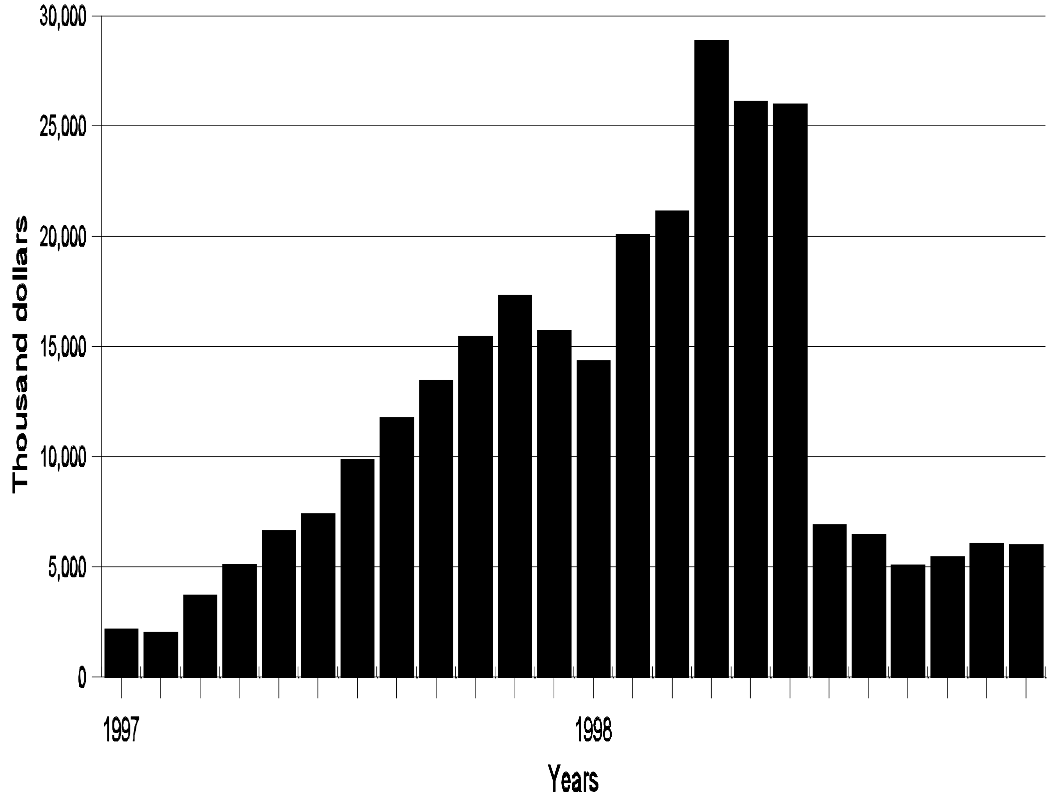
[58] In 2002, HTS SRN 4418.90.4540 replaced HTS SRN 4418.90.4040. Though HTS SRN4418.90.4040 is used throughout this discussion, discussion of 2002 imports refers to HTS SRN 4418.90.4540. Product coverage did not generally change between 2001 and 2002.

[59] U.S. Customs Service, Customs Ruling NY B81564, Feb. 18, 1997, found at *http://rulings.customs.gov*, retrieved Sept. 19, 2002. Additional documents pertaining to the classification of drilled studs can be found at: *http://www.customs.gov/fed-reg/notices/h961555p.htm*; *http://www.customs.gov/fed-reg/notices/960635.htm;* *http://www.customs.gov/fed-reg/notices/softwood.htm*; *http://www.customs.gov/fed-reg/notices/l.htm*; *http://www.customs.gov/fed-reg/notices/lumberl.htm*; and *http://www.customs.gov/red-reg/archives.htm*, retrieved Oct 2, 2002.

[60] In 2002, HTS SRN 4418.90.4550 replaced HTS SRN 4418.90.4050. Though HTS SRN 4418.90.4050 is used throughout this discussion, discussion of 2002 imports refers to HTS SRN 4418.90.4550. Product coverage did not generally change between 2001 and 2002.

Figure 4-2
Monthly imports of other fabricated structural wood members from Canada (HTS 4418.90.4040), January 1997-December 1998[1]



[1] HTS 4418.90.4040 included predrilled studs from March 1997-June 1998.

Source: U.S. Census Bureau.

During 1997-2001, on average, this HTS category represented only 3.3 percent of all imports in HTS subheading 4418.90.40. During this period, the value of imports increased from $5.9 million in 1997 to $40.2 million in 2001, but dropped back to $37.2 million in 2002 (appendix table D-4-9). The share of imports under this HTS statistical category supplied by Canada ranged from 68 percent to 97 percent. Other suppliers included China, Germany, Hong Kong, and Italy.

Builders' joinery and carpentry of wood, NESOI (4418.90.4090)[61]

The products in this category represented about 64 percent of the value of products imported within HTS subheading 4418.90.40 during 1997-2001. U.S. imports under this SRN annually averaged $420 million during 1997-2001. From 1997 to 1999, U.S. imports increased by 159 percent, from $244 million to $632 million (appendix table D-4-10). These imports then dropped by 32 percent between 1999 and 2001, but rebounded to $507 million in 2002. The share of these products supplied by Canada averaged 72 percent during 1997-2001. The Canadian share increased from 71 percent in 1997 to 82 percent in 1999, but dropped to 54 percent in 2002. This basket category, however, includes a wide variety of products not within the scope of this investigation (appendix table D-4-2). Therefore, these amounts overestimate the actual value of imports of wood structural building components within the scope of this investigation.

U.S. Exports[62]

During 1997-2001, annual U.S. exports of builders' joinery and carpentry of wood averaged $197 million. Between 1995 and 1997, U.S. exports increased 30 percent, from $190 million to $247 million, but then decreased to $116 million in 2002 (appendix table D-4-11).[63] Industry representatives indicated that the loss of the Japanese glulam market contributed to these decreases.[64] U.S. exports in 2002 were 53 percent below the 1997 peak.

Japan and Canada were the major markets for U.S. exports of builders' joinery and carpentry of wood, accounting for 54 percent of total U.S. exports during 1997-2001. Japan was the largest U.S. export market during 1995-1997. However, a 52-percent decrease in the value of exports to Japan between 1996 and 1998, combined with an 85-percent increase in exports to Canada between 1996 and 1998, elevated Canada to the top market for U.S. exports. Other major export markets include the Bahamas, Australia, Korea, and the United Kingdom.

[61] In 2002, HTS SRN 4418.90.4590 replaced HTS SRN 4418.90.4090. Though HTS SRN 4418.90.4090 is used throughout this discussion, discussion of 2002 imports refers to HTS SRN 4418.90.4590. Product coverage in this HTS category was not consistent among time periods.

[62] Exports include items classified in Schedule B subheading 4418.90.

[63] While the Senate request letter specified that the investigation should cover the period 1997-2002, this discussion uses earlier data where applicable to demonstrate significant changes in exports within this HTS subheading.

[64] USITC staff interviews with industry officials, Dec. 10, 2002.

U.S. exports of builders' joinery and carpentry to Japan decreased apparently as the result of losing the Japanese glulam market to price competitive European producers.[65] Japanese imports of U.S. glulam decreased 75 percent, from 123,143 cubic meters (53 percent of total Japanese glulam imports) in 1996 to 30,846 cubic meters (6 percent of total Japanese glulam imports) in 2001 (appendix table D-4-12). At the same time, Japanese glulam imports from Europe increased by 482 percent, from 61,900 cubic meters (27 percent of total Japanese glulam imports) in 1996 to 360,202 cubic meters (66 percent of total Japanese glulam imports) in 2001. During this time, total Japanese glulam imports increased by 138 percent, from 230,761 cubic meters to 549,604 cubic meters.

[65] Ibid.

CHAPTER 5
COMPETITIVE CONDITIONS FOR U.S. AND CANADIAN PRODUCERS IN THE U.S. MARKET

This chapter provides a comparative assessment of various economic factors affecting U.S. and Canadian producers of wood structural building components in the U.S. market. The assessment is based upon information gathered during the investigation including the research of third parties and/or the opinions and reports of persons knowledgeable of existing conditions. Items assessed include raw material cost and availability, technological capability and plant and equipment modernization, transportation cost, industry size and capacity, labor cost, and exchange rates. The conditions affecting each are discussed below and summarized in table 5-1. Information on these factors can also be found in prior chapters of this report.

Table 5-1
Wood structural building components: Competitive conditions[1] for U.S. and Canadian producers in the U.S. market

	Competitive conditions
Trusses and prefabricated panels:	
Raw material cost (wood)	2
Raw material supply (wood)	3
Technology	3
Transportation cost/market location	1
Industry size and capacity	1
Labor cost	3
Exchange rates	2
EWP:	
Raw material cost (wood)	2
Raw material supply (wood)	2
Technology	3
Transportation cost/market location	1
Industry size and capacity	1
Labor cost	3
Exchange rates	2

[1] May vary according to area of country considered; judgment is based on entire country.

1 = competitive advantage for U.S. producers
2 = competitive advantage for Canadian producers
3 = competitive conditions comparable

Source: Estimated by the U.S. International Trade Commission.

Raw Material Cost and Supply

In testimony before the Commission, U.S. and Canadian wood structural building component industry officials alleged the existence of two-tiered pricing for lumber in the North American market resulting from trade actions.[1,2,3] As discussed above, manufacturers maintained that the magnitude of the difference between domestic and Canadian lumber costs depends on the level of construction activity in the U.S. market, with periods of greater construction activity allegedly leading to larger price differences.[4,5] They contend that border State truss manufacturers experience the largest competitive disadvantage because of any two-tiered price system.[6]

The United States and Canada have ample wood supplies for the production of wood structural building components. However, Canada enjoys an advantage relating to supplies of flange stock materials (e.g., black spruce).

Technological Capabilities and Plant and Equipment Modernization

The wood structural building components industries in the United States and Canada are very similar in terms of technological capabilities and plant and equipment modernization. The industries in both countries are well established and the knowledge and skill level of the work forces are comparable. The technological know-how involved in the production of wood structural building components is widespread, and the production processes and equipment used in the manufacture of the various structural building components are generally the same in both countries. Producers in the United States and Canada attend the same industry trade shows and purchase the same production equipment and software from the same vendors.[7]

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[1] According to an industry analyst, North America generally has been considered a single market for softwood lumber. Two-tiered pricing allegedly developed as a result of U.S. trade actions, the first of which was the Memorandum of Understanding between Canada and the United States (1986), which established a 15 percent export tax on Canadian exports of softwood lumber to the United States, as well as the SLA and following its expiration, antidumping and countervailing duty orders. USITC staff telephone interview with industry official, Dec. 30, 2002.

[2] Matthew M. Nolan, Miller & Chevalier Chartered, written submission to the Commission on behalf of Trus Joist (Weyerhaeuser), Dec. 19, 2002, and Testimony of Peter Woodbridge, president, Peter Woodbridge & Associates Ltd., transcript of the hearing, p. 94.

[3] Although both U.S. and Canadian industry officials have testified that the Canadian manufacturers enjoy lower lumber costs, the Commission was not able to develop comparable lumber price series for Canada and the United States to address this issue directly.

[4] Testimony of Kent Pagel, president, Pagel, Davis & Hill, P.C., transcript of the hearing, p. 34.

[5] Testimony of Jack Louws, owner, Louws Truss Inc., transcript of the hearing, p. 31.

[6] Testimony of Kent Pagel, president, Pagel, Davis & Hill, P.C., transcript of the hearing, p. 33.

[7] Testimony of Peter Woodbridge, president, Peter Woodbridge & Associates Ltd., transcript of the hearing, pp. 116 and 117; testimony of Tom Denig, president and CEO, Trus Joist, a subsidiary of Weyerhaeuser Co., transcript of the hearing, pp. 116 and 117; USITC staff telephone interviews with industry officials, Oct. 8 and Dec. 16, 2002; USITC staff interviews with industry officials, Nov. 14 and Dec. 10, 2002.

Truss design software, a critical component of the truss-manufacturing process, is sold by a handful of vendors to both U.S. and Canadian truss producers. A truss producer with a truss plant in the United States and one in Canada noted that the two plants are identical with respect to technology and production equipment.[8] A U.S. truss producer is constructing a truss plant in Ontario, Canada, that will be "almost identical" to its truss plant in Michigan.[9] A number of Canadian EWP facilities are owned by large U.S. EWP producers. NASCOR Inc., a Canadian I-joist producer, has licensed the manufacture of I-joists to companies in Canada and the United States. Under the agreement, NASCOR provides the licensees with I-joist manufacturing equipment, design software, and testing and quality control equipment to enable them to produce the complete line of NASCOR's Strong Quiet Type I-joists.[10] A recently announced joint venture between Abitibi-Consolidated Inc. and Louisiana-Pacific Canada Ltd. to produce I-joists in Quebec, Canada will involve the transfer of I-joist assembly equipment from an existing Louisiana-Pacific Corp. I-joist plant in Oregon to the new plant in Quebec.[11]

Transportation Cost and Market Location

With demand for wood structural building components driven principally by residential construction activity, the location of this activity plays an important role in the competitive landscape facing U.S. and Canadian producers. Although residential construction in Canada has been strong since 1997, it is one-tenth the size of the residential construction market in the United States. In 2001, housing starts in Canada totaled 162,733 units compared with housing starts in the United States of 1.6 million units (figure 2-5 and figure 2-1). Within the United States, housing starts are concentrated primarily in the South and the West, with these two regions accounting for 70 percent of all housing starts during 1997-2001. The South, alone, accounted for 46 percent of all housing starts during the period. Much of the large U.S. demand for wood structural building components is thus concentrated in areas that are greater distances from Canadian production facilities. Increased freight costs in many instances may reduce Canadian producers' ability to be competitive in these geographic areas with local U.S. producers.[12] As noted earlier, Canadian exports of roof trusses to the United States have been concentrated in the border States, whose relative proximity to Canadian truss plants lessens the impact of freight costs.[13]

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[8] USITC staff telephone interview with industry official, Nov. 6, 2002.

[9] Scott Stephenson, "U.S. company picks Corunna," Jan. 16, 2002, found at *http://www.observer-sarnia.com/2002/pts_020116.html*, retrieved Oct. 8, 2002.

[10] USITC staff telephone interview with industry official, Oct. 31, 2002. Welcome to Nascor Building a Better Home for the Global Community, found at *http://www.nascor.com.htm*, retrieved Jan. 23, 2003.

[11] Abitibi-Consolidated Inc., press release, Nov. 7, 2002, "Abitibi-Consolidated and LP to Create a Joint Venture to Produce Engineered Wood," found at *http://micro.newswire.ca/releases/November2002/07/c9436.html*, retrieved Nov. 19, 2002.

[12] Testimony of Tom Denig, president and CEO, Trus Joist, a subsidiary of Weyerhaeuser Co., transcript of the hearing, p. 88; testimony of Jack Louws, owner, Louws Truss Inc., transcript of the hearing, p. 77.

[13] Testimony of Jack Louws, owner, Louws Truss Inc., transcript of the hearing, p. 77.

Present Capacity and Potential Capacity Expansion

The characteristics of capacity for wood structural building components in the United States and Canada are varied. In both countries, producers of trusses and prefabricated panels tend to be small family-owned businesses primarily serving the builders in their area. Capacity is unconcentrated. Producers of EWP in the United States and Canada are generally larger business entities than truss and prefabricated panel manufacturers. Although there are many producers of EWP, capacity in this industry is much more concentrated, with a few large U.S. producers dominating the market.[14] Truss and prefabricated panel capacity is usually near areas with active construction markets, while EWP capacity is typically near the wood raw material suitable for the plant's output.[15]

U.S. capacity to produce trusses and prefabricated panels and EWP far surpasses that of Canada. Data for truss and prefabricated panel capacity are not available, but the magnitude of the difference in capacity can be gauged by shipment data. The value of U.S. shipments of roof trusses is more than 10 times that of Canadian shipments. On a quantity basis, U.S. I-joist capacity is more than 4 times that of Canada, while U.S. LVL capacity is 9 times that of Canada.[16] Relatively low Canadian capacity levels may limit the ability of Canadian producers to serve a significant share of the large U.S. market for trusses and prefabricated panels and EWP, given also that much of this capacity serves the Canadian market and other export markets.[17]

Not only is U.S. capacity greater than Canadian capacity on an aggregate basis, it is also, in some cases, larger on an individual firm basis. Although consisting primarily of small firms, the U.S. truss and prefabricated panel industry in recent years has seen the emergence, through internal expansion or consolidation, of some large producers with numerous production facilities. Trussway, Ltd., with 13 facilities across the United States, and Stark Truss Co., with 17 plants in the Midwest, are two of these firms.[18] Some large publicly owned building materials suppliers and distributors have integrated backwards into the manufacture of building components, including trusses and prefabricated panels.[19] Very little of this activity has occurred in Canada. With respect to EWP, the plants of major U.S. producers tend to be bigger and more numerous than those of their Canadian competitors. In some instances, the larger capacity of these U.S. truss, prefabricated panel, and EWP producers may provide them with greater economies of scale and lower unit production costs than those of their Canadian counterparts.[20] By virtue of their larger size, these U.S.

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[14] USITC staff interview with industry officials, Dec. 10, 2002.

[15] Paul C. Rosenthal, Collier Shannon Scott, PLLC, written submission to the Commission on behalf of Louisiana-Pacific Corp., Dec. 20, 2002.

[16] Robert Berg, "Engineered Lumber: Wood I-Joist and LVL," *RISI North American Lumber Forecast, Long-Term*, July 2001.

[17] Testimony of Kent Pagel, president, Pagel, Davis & Hill, P.C., transcript of the hearing, pp. 25 and 26.

[18] Ibid., p. 8; testimony of Stephen Yoder, president, Stark Truss Co., Inc., transcript of the hearing, p. 13.

[19] Peter Woodbridge, president, Peter Woodbridge & Associates Ltd., written submission to the Commission, Nov. 20, 2002.

[20] Ibid.

producers may also have more opportunities and avenues for raising capital to expand capacity than their Canadian competitors.

Other factors affecting present capacity and potential capacity expansion for wood structural building components include wood raw materials and the extent of unused capacity. The United States and Canada have suitable wood resources for the production of trusses and prefabricated panels and EWP. The large U.S. producers of EWP consider the United States and Canada as one integrated market and have located production facilities in both countries to serve regional housing markets as well as to take advantage of the various quality characteristics offered by different wood species.[21] Rapid growth in LVL and I-joist capacity in both countries during the past several years has led to overcapacity in the market, which may slow further expansion in the future.[22]

Labor Cost

U.S. Government statistics and discussion with industry officials provide information about labor costs in the United States and Canada. According to the U.S. Department of Labor, hourly compensation costs for production workers in all manufacturing in Canada in 2001 were 77 percent of compensation costs in the United States.[23] Labor cost differentials in wood structural building components appear less. Hourly compensation costs for production workers in lumber and wood products manufacturing in Canada were the same as those in the United States in 1998, the most recent year for which data are available.[24] Two EWP producers with production facilities in the United States and Canada indicated that their labor costs were comparable in the two countries. Two truss producers noted that their labor costs for truss operations in the United States and Canada were roughly comparable.[25]

Exchange Rates

Quarterly data reported by the International Monetary Fund indicate that the real and nominal values of the Canadian dollar trended similarly for the period January 1997 through September 2002. Overall, the real value of the Canadian dollar depreciated by 7.8 percentage points relative to the U.S. dollar from January 1997 through September 2002, thus contributing to the competitiveness of Canadian products in the U.S. market during this period.

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[21] Paul C. Rosenthal, Collier Shannon Scott, PLLC, written submission to the Commission on behalf of Louisiana-Pacific Corp., Dec. 20, 2002.

[22] Robert Berg, "Engineered Lumber: Wood I-Joist and LVL," *RISI North American Lumber Forecast, Long-Term*, July 2001.

[23] U.S. Department of Labor, Bureau of Labor Statistics, *Indexes of hourly compensation costs for production workers in manufacturing, 30 countries or areas and selected economic groups, 1975-2001,* Sept. 2002.

[24] Ibid., *Hourly compensation costs for production workers, lumber and wood products manufacturing,* June 25, 2001.

[25] USITC staff telephone interviews with industry officials, Jan. 28 and Feb. 7, 2003; e-mail communications from industry officials, Jan. 10 and Jan. 16, 2003.

APPENDIX A
REQUEST LETTER FROM THE SENATE FINANCE COMMITTEE

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TOM DASCHLE, SOUTH DAKOTA
JOHN BREAUX, LOUISIANA
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JOHN ANGELL, STAFF DIRECTOR
KOLAN DAVIS, REPUBLICAN STAFF DIRECTOR AND CHIEF COUNSEL

United States Senate

COMMITTEE ON FINANCE
WASHINGTON, DC 20510-6200

ER — JUL 29 2002 — 136

July 29, 2002

DOCKET NUMBER 2258
Office of the Secretary
Int'l Trade Commission

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RECEIVED
OFC OF THE SECRETARY
US INT'L TRADE COMM.

The Honorable Deanna Tanner Okun
Chairman
U.S. International Trade Commission
500 E Street, SW
Washington, DC 20436

Dear Madam Chairman:

We are writing to request that the Commission conduct an assessment of the structural building component industry.

Global competitiveness of U.S. industries is a continuing concern of the Senate Finance Committee. As part of the policy making process, we are seeking impartial and detailed information on the competitiveness of the industry producing structural building components (e.g. wood trusses, wall panels and related structural components also known as the panelized construction industry).

The structural building components industry has been growing at a rapid pace in the last decade. Total US production of all structural components is estimated to total more than $7.8 billion on annual sales. Little public information on this industry is available, and U.S. and international trade statistics are available for only a few of these products. What information is available indicates that growth in the US market has been significant, from $5.5 billion in 1992 to $7.8 billion in 2000. Imports of builders joinery, which covers many of the products of this industry, have significantly increased since 1996, and imports of unspecified fabricated building materials have increased two-fold in the same period (1996-2000).

The recent strong market for building products, and its expected continuation, has significant implications for the industry, consumers, new product development, substitute building products, energy savings, new home construction and domestic and trade policy issues. In order to gain a better understanding of the industry the Committee requests, pursuant to section 332(g) of the Tariff Act of 1930, that the U.S. International Trade Commission (the Commission) conduct a study to gather information on competitive conditions in the US structural building components industry.

In its report, the Committee requests that the Commission provide, to the extent possible, the following:

- An overview of the North American market for prefabricated wood structural building components (including a description of the principal structural wood components in production and trade, and their non-wood substitutes);

- a description of the U.S. industry, and the industry in the principal countries supplying the U.S. market, including recent trends in production, capacity, employment, and consumption;

- trade patterns (both imports and exports), factors affecting trade patterns (including tariffs and other border measures), and competitive conditions affecting U.S. production and trade;

- views of industry, homebuilders, and other interested parties on future developments in the supply of and the demand for US wood structural building components, including the affect of imports (including factors affecting imports such as tariffs and other border measures) and non-wood substitutes on U.S. production and housing construction; and

- a comparison of the strengths and weaknesses of the U.S. industry and major U.S. suppliers in such areas as raw material supply, technological capabilities, plant and equipment modernization, and present capacity and potential capacity expansion.

The scope of the investigation should cover structural building components including, but not limited to, beams and arches, roof and floor trusses, I-joists, prefabricated partitions and panels (including headers) for buildings and other structural wood members, and should cover the period 1997-2002 to the extent possible.

The Commission should provide its completed report on February 28, 2003 or 9 months from the receipt of the request, whichever is later. Thank you for your time and consideration of this request.

Sincerely,

Max Baucus

Senator Baucus

Chuck Grassley

Senator Grassley

APPENDIX B
FEDERAL REGISTER NOTICE

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

Notice of Public Meeting, Alaska Resource Advisory Council

AGENCY: Bureau of Land Management, Alaska State Office, Interior.

ACTION: Notice of public meeting.

SUMMARY: In accordance with the Federal Land Policy and Management Act (FLPMA) and the Federal Advisory Committee Act of 1972 (FACA), the U.S. Department of the Interior, Bureau of Land Management (BLM) Alaska Resource Advisory Council will meet as indicated below.

DATES: The meeting will be held October 15–16, 2002, at the Anchorage Federal Office Building, located at 7th and C Street, beginning at 8:30 a.m. The public comment period will begin at 1 p.m. October 15.

FOR FURTHER INFORMATION CONTACT: Teresa McPherson, Alaska State Office, 222 W. 7th Avenue #13, Anchorage, AK 99513. Telephone (907) 271–3322 or e-mail *Teresa_McPherson@ak.blm.gov.*

SUPPLEMENTARY INFORMATION: The 13-member Council advises the Secretary of the Interior, through the Bureau of Land Management, on a variety of planning and management issues associated with public land management in Alaska. At this meeting, topics we plan to discuss include:

- Status of planning for the National Petroleum Reserve Alaska (NPR–A)
- Status of planning for the Colville River Special Area
- Status of state selections in the Denali Block
- Other topics the Council may raise

All meetings are open to the public. The public may present written comments to the Council. Each formal Council meeting will also have time allotted for hearing public comments. Depending on the number of persons wishing to comment and time available, the time for individual oral comments may be limited. Individuals who plan to attend and need special assistance, such as sign language interpretation, transportation, or other reasonable accommodations, should contact BLM.

Dated: August 21, 2002.

Henri R. Bisson,

State Director.

[FR Doc. 02–21880 Filed 8–27–02; 8:45 am]

BILLING CODE 4310–JA–M

DEPARTMENT OF THE INTERIOR

Bureau of Reclamation

Meeting of the Yakima River Basin Conservation Advisory Group, Yakima River Basin Water Enhancement Project, Yakima, WA

AGENCY: Bureau of Reclamation, Interior.

ACTION: Notice of meeting.

SUMMARY: As required by the Federal Advisory Committee Act, notice is hereby given that the Yakima River Basin Conservation Advisory Group, Yakima River Basin Water Enhancement Project, Yakima, Washington, established by the Secretary of the Interior, will hold a public meeting. The purpose of the Conservation Advisory Group is to provide technical advice and counsel to the Secretary and the State on the structure, implementation, and oversight of the Yakima River Basin Water Conservation Program.

DATES: Thursday, September 26, 2002, 10 a.m.–1 p.m.

ADDRESSES: Bureau of Reclamation Office, 1917 Marsh Road, Yakima, Washington.

FOR FURTHER INFORMATION CONTACT: James Esget, Manager, Yakima River Basin Water Enhancement Project, 1917 Marsh Road, Yakima, Washington 98901; (509) 575–5848, extension 267.

SUPPLEMENTARY INFORMATION: The purpose of the meeting will be to review water marketing opportunities in the Yakima River Basin and develop recommendations. This meeting is open to the public.

Dated: August 22, 2002.

James A. Esget,

Program Manager.

[FR Doc. 02–21881 Filed 8–27–02; 8:45 am]

BILLING CODE 4310–MN–M

INTERNATIONAL TRADE COMMISSION

[Investigations Nos. 701–TA–422–425 and 731–TA–964–983 (Final)]

Certain Cold-Rolled Steel Products From Argentina, Australia, Belgium, Brazil, China, France, Germany, India, Japan, Korea, the Netherlands, New Zealand, Russia, South Africa, Spain, Sweden, Taiwan, Thailand, Turkey, and Venezuela

AGENCY: United States International Trade Commission.

ACTION: Reopening of the record.

EFFECTIVE DATE: August 22, 2002.

FOR FURTHER INFORMATION CONTACT: Fred Fischer (202–205–3179/ *ffischer@usitc.gov*), Office of Investigations, U.S. International Trade Commission, 500 E Street SW., Washington, DC 20436. Hearing-impaired persons can obtain information on this matter by contacting the Commission's TDD terminal on 202–205–1810. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202–205–2000. General information concerning the Commission may also be obtained by accessing its Internet server *(http://www.usitc.gov).* The public record for these investigations may be viewed on the Commission's electronic docket (EDIS-ON-LINE) at *http://dockets.usitc.gov/eol/public.*

SUPPLEMENTARY INFORMATION: On August 22, 2002, the Department of Commerce announced the final set of products to be excluded from the safeguard measure on steel products. The Commission is reopening the record in the subject investigations for the sole purpose of accepting the final list of safeguard exclusions and imports thereof. Parties may comment on this list of exclusions in a submission not to exceed five pages in length that must be filed by no later than 2 p.m. on Monday, August 26, 2002, pursuant to Commission rule 207.30.

For further information concerning these investigations see the Commission's notice cited above and the Commission's rules of practice and procedure, part 201, subparts A through E (19 CFR part 201), and part 207, subparts A and C (19 CFR part 207).

Authority: These investigations are being conducted under authority of title VII of the Tariff Act of 1930; this notice is published pursuant to section 207.21 of the Commission's rules.

Issued: August 23, 2002.

By order of the Commission.

Marilyn R. Abbott,

Secretary to the Commission.

[FR Doc. 02–21930 Filed 8–27–02; 8:45 am]

BILLING CODE 7020–02–P

INTERNATIONAL TRADE COMMISSION

[Investigation No. 332–445]

Conditions of Competition in the U.S. Market for Wood Structural Building Components

AGENCY: United States International Trade Commission.

ACTION: Institution of investigation and scheduling of public hearing.

EFFECTIVE DATE: August 19, 2002.

SUMMARY: Following receipt of the request on July 31, 2002, from the Senate Committee on Finance, the Commission instituted investigation No. 332–445 Conditions of Competition in the U.S. Market for Wood Structural Building Components, under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)).

As requested by the Committee, the Commission will conduct an investigation and provide a report on competitive conditions in the U.S. market for structural building components. In its report the Commission will provide, to the extent possible, the following:

1. An overview of the North American market for prefabricated wood structural building components (including a description of the principal structural wood components in production and trade, and their non-wood substitutes);
2. A description of the U.S. industry, and the industry in the principal countries supplying the U.S. market, including recent trends in production, capacity, employment, and consumption;
3. Trade patterns (both imports and exports), factors affecting trade patterns (including tariffs and other border measures), and competitive conditions affecting U.S. production and trade;
4. Views of industry, homebuilders, and other interested parties on future developments in the supply of and the demand for U.S. wood structural building components, including the effect of imports (including factors affecting imports such as tariffs and other border measures) and non-wood substitutes on U.S. production and housing construction; and
5. A comparison of the strengths and weaknesses of the U.S. industry and major U.S. suppliers in such areas as raw material supply, technological capabilities, plant and equipment modernization, and present capacity and potential capacity expansion.

As requested by the Committee, the Commission's report will cover structural building components including, but not limited to, beams and arches, roof and floor trusses, I-joists, prefabricated partitions and panels (including headers) for buildings and other structural wood members, and cover the period 1997–2002 to the extent possible. As requested, the Commission will transmit its report to the Committee by April 30, 2003.

FOR FURTHER INFORMATION CONTACT: Industry-specific information may be obtained from Alfred Forstall, Project Leader (202–205–3443 or *AForstall@usitc.gov*) or Vincent Honnold, Deputy Project Leader (202–205–3314 or *VHonnold@usitc.gov*), Office of Industries, U.S. International Trade Commission, Washington, DC 20436. For information on legal aspects of this investigation, contact William Gearhart of the Office of General Counsel (202–205–3091or *wgearhart@usitc.gov*). Hearing impaired individuals are advised that information on this matter can be obtained by contacting the TDD terminal on (202–205–1810).

Public Hearing: A public hearing in connection with the investigation will be held at the U.S. International Trade Commission Building, 500 E Street SW., Washington, DC beginning at 9:30 a.m. on December 5, 2002. All persons shall have the right to appear, by counsel or in person, to present information and to be heard. Requests to appear at the public hearing should be filed with the Secretary, United States International Trade Commission, 500 E Street SW., Washington, DC 20436, no later than 5:15 p.m., November 21, 2002. Any prehearing briefs (original and 14 copies) should be filed not later than 5:15 p.m., November 25, 2002; the deadline for filing post-hearing briefs or statements is 5:15 p.m., December 19, 2002. In the event that, as of the close of business on November 21, 2002, 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 non-participant may call the Secretary (202–205–1806) after November 21, 2002, to determine whether the hearing will be held.

Written Submissions: In lieu of or in addition to participating in the hearing, interested parties are invited to submit written statements (original and 14 copies) concerning the matters to be addressed by the Commission in its report on this investigation. Commercial or financial information that a submitter desires the Commission to treat as confidential must be provided on separate sheets of paper, each clearly marked "Confidential Business Information" at the top. All submissions requesting confidential treatment must conform with the requirements of section 201.6 of the Commission's rules of practice and procedure (19 CFR 201.6). All written submissions, except for confidential business information, will be made available in the Office of the Secretary to the Commission for inspection by interested parties. The Senate Committee on Finance has requested that the Commission prepare a public report (containing no confidential business information). Accordingly, any confidential business information received by the Commission in this investigation and used in preparing the report will not be published in a manner that would reveal the operations of the firm supplying the information. To be assured of consideration by the Commission, written statements relating to the Commission's report should be submitted to the Commission at the earliest practical date and should be received no later than the close of business on December 19, 2002. All submissions should be addressed to the Secretary, United States International Trade Commission, 500 E Street SW., Washington, DC 20436. The Commission's rules do not authorize filing submissions with the Secretary by facsimile or electronic means. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202–205–2000. General information concerning the Commission may also be obtained by accessing its Internet server *(http://www.usitc.gov)*.

List of Subjects

Wood structural building components, tariffs, and imports.

Issued: August 23, 2002.

By order of the Commission.

Marilyn R. Abbott,

Secretary to the Commission.

[FR Doc. 02–21929 Filed 8–27–02; 8:45 am]

BILLING CODE 7020–02–P

DEPARTMENT OF JUSTICE

Drug Enforcement Administration

Agency Information Collection Activities: Proposed Collection; Comment Request

ACTION: 60-day Notice of Information Collection Under Review: New collection; Prescription Monitoring Program Questionnaire.

SUMMARY: The Department of Justice (DOJ), Drug Enforcement Administration (DEA) has submitted the following information collection request to the Office of Management and Budget (OMB) for review and approval in accordance with the Paperwork Reduction Act of 1995. The proposed information collection is published to obtain comments from the public and affected agencies. Comments are encouraged and will be accepted until October 28, 2002. This process is

APPENDIX C
HEARING PARTICIPANTS

Those listed below were scheduled to appear as witnesses at the United States International Trade Commission's hearing:

Subject:	Conditions of Competition in the U.S. Market for Wood Structural Building Components
Inv. No.:	332-445
Date and Time:	December 5, 2002 - 9:30 a.m.

Sessions were held in connection with the investigation in the Main Hearing Room, (room101), 500 E Street, SW,Washington, DC.

ORGANIZATION AND WITNESS:

PANEL 1

Wood Truss Council of America
Madison, Wisconsin

Jack Louws, Owner, Louws Truss Incorporated,
Lyndon, Washington

Roy Schiferl, Operations Manager, Woodinville Lumber,
Incorporated, Woodinville, Washington

Stephen Yoder, President, Stark Truss Company, Incorporated,
Canton, Ohio

Phil Luneack, Vice President, Bear Truss Company,
St. Louis, Michigan

Kirk Grundahl, Executive Director, Wood Truss Council
of America, Madison, Wisconsin

Kent Pagel, President, Pagel, Davis & Hill, P.C.,
Houston, Texas

ORGANIZATION AND WITNESS:

PANEL 2

Miller & Chevalier
Washington, DC
on behalf of

Weyerhaeuser Company

Tom Denig, President and CEO, Trus Joist, Boise, Idaho, a subsidiary of Weyerhaeuser Company

Matthew M. Nolan)
) – OF COUNSEL
Mitchell W. Dale)

Peter Woodbridge & Associates Ltd
West Vancouver, British Columbia, Canada

Peter Woodbridge, President, Peter Woodbridge & Associates Ltd.

- END -

APPENDIX D
TABLES

Table D-2-1
Materials used in interior wall systems of new U.S. residential construction, by region,[1] 1997-2001

Region	1997	1998	1999	2000	2001
	Percent				
United States:					
Wood	96.6	94.7	94.7	93.9	94.8
Steel	3.1	4.8	4.9	6.9	5.0
Other	0.0	0.0	0.0	0.0	0.1
Masonry	0.3	0.5	0.4	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0
Northeast:					
Wood	98.9	96.1	93.6	95.3	98.0
Steel	0.0	0.0	0.0	0.0	1.2
Other	1.1	3.9	6.3	4.7	0.7
Masonry	0.0	0.0	0.3	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0
Midwest:					
Wood	100.0	97.6	98.6	99.6	99.6
Steel	0.0	2.4	1.4	0.4	0.4
Other	0.0	0.0	0.0	0.0	0.0
Masonry	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0
South:					
Wood	93.1	91.7	92.2	91.2	90.8
Steel	6.2	7.1	6.9	8.6	9.0
Masonry	0.7	1.2	0.9	0.2	0.1
Other	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0
West:					
Wood	98.7	97.4	96.1	92.4	97.3
Steel	1.3	2.6	3.9	7.6	2.6
Masonry	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0

[1] Regions correspond to U.S. Census Regions as shown in figure 2-3.

Source: USITC estimates based on data from National Association of Home Builders Research Center.

Table D-2-2
Materials used in exterior wall systems of new U.S. residential construction, by region,[1] 1997-2001

Region	1997	1998	1999	2000	2001
			Percent		
United States:					
Wood	89.1	87.8	88.3	89.9	87.6
Masonry	10.2	11.7	10.9	8.5	11.7
Steel	0.7	0.5	0.9	1.6	0.7
Total	100.0	100.0	100.0	100.0	100.0
Northeast:					
Wood	96.1	94.1	95.9	95.6	93.2
Masonry	3.7	5.9	3.8	3.8	6.4
Steel	0.2	0.0	0.3	0.6	0.4
Total	100.0	100.0	100.0	100.0	100.0
Midwest:					
Wood	96.2	95.4	98.4	98.5	95.1
Masonry	3.8	4.6	1.6	1.4	4.4
Steel	0.0	0.1	0.0	0.1	0.6
Total	100.0	100.0	100.0	100.0	100.0
South:					
Wood	80.0	77.7	79.3	83.5	78.1
Masonry	19.8	21.9	20.6	16.3	21.8
Steel	0.3	0.5	0.2	0.2	0.1
Total	100.0	100.0	100.0	100.0	100.0
West:					
Wood	96.6	97.1	91.7	92.3	96.2
Steel	2.3	1.2	3.3	5.9	2.2
Masonry	1.1	1.7	5.0	1.8	1.6
Total	100.0	100.0	100.0	100.0	100.0

[1] Regions correspond to U.S. Census Regions as shown in figure 2-3.

Source: USITC estimates based on data from National Association of Home Builders Research Center.

Table D-2-3
Materials used in roof systems of new U.S. residential construction, by region,[1] 1997-2001

Region	All roof systems[2] 1997	1998	1999	2000	Trusses 2001	Rafters 2001
	Percent					
United States:						
Dimensional lumber	97.5	97.3	96.7	95.9	99.1	97.8
Engineered wood products	2.1	2.4	2.9	2.7	0.8	2.2
Steel	0.4	0.3	0.2	1.2	0.1	0.0
Structural insulated panels	0.0	0.1	0.2	0.2	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Northeast:						
Dimensional lumber	93.5	98.8	95.9	95.8	95.3	95.2
Engineered wood products	6.4	1.2	2.1	4.0	4.5	4.8
Steel	0.0	0.0	1.6	0.1	0.3	0.0
Structural insulated panels	0.1	0.0	0.4	0.1	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Midwest:						
Dimensional lumber	98.5	97.1	97.4	97.0	99.4	96.2
Engineered wood products	1.4	2.7	2.2	2.7	0.5	3.7
Steel	0.1	0.1	0.2	0.1	0.0	0.0
Structural insulated panels	0.1	0.1	0.1	0.1	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
South:						
Dimensional lumber	98.5	98.2	99.5	97.9	98.8	99.7
Engineered wood products	0.8	0.7	0.0	0.3	0.6	0.0
Steel	0.7	0.9	0.5	1.7	0.6	0.3
Structural insulated panels	0.0	0.1	0.1	0.1	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
West:						
Dimensional lumber	95.6	94.5	90.4	91.1	99.2	89.1
Engineered wood products	3.7	5.0	9.1	4.2	0.7	10.7
Steel	0.7	0.4	0.1	4.6	0.1	0.3
Structural insulated panels	0.0	0.4	0.3	0.1	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

[1] Regions correspond to U.S. Census Regions as shown in figure 2-3.
[2] Reporting method changed between 1997-2000 and 2001. All roof systems include trusses, rafters, structural insulated panels, beam and purlin, and other. Only roof trusses and rafters were reported in 2001.

Source: USITC estimates based on data from National Association of Home Builders Research Center.

Table D-2-4
Market share of wood structural building components and their substitutes in new residential construction in the United States, by end use, 1997-2001

Components and substitutes	1997	1998	1999	2000	2001
	Percent				
Beams and headers[1]:					
Built-up dimension lumber	45.4	41.8	41.4	36.0	35.3
LVL	9.3	10.8	10.5	14.2	14.5
Timberstrand	11.1	12.0	12.2	15.3	14.0
Other	9.0	9.9	10.1	9.3	9.3
Solid wood	7.1	8.2	8.3	6.7	8.6
Glulam	3.9	5.7	5.8	5.4	5.7
I-joists	5.4	3.3	3.3	4.6	4.8
Steel (all types)	4.3	4.3	4.4	4.9	3.2
Parallam	4.0	3.3	3.4	3.0	2.8
Open web wood truss	0.5	0.5	0.5	0.6	1.8
Total	100.0	100.0	100.0	100.0	100.0
Wood exterior walls[2]:					
Light frame construction	87.1	88.9	92.4	86.1	85.7
Panelized construction	11.3	9.3	5.2	12.4	10.3
Modular construction	0.9	1.2	1.4	0.6	2.4
Post & beam	0.5	0.3	0.7	0.6	0.8
Logs	0.1	0.1	0.1	0.1	0.6
Structural insulated panels	0.1	0.1	0.1	0.2	0.2
Total	100.0	100.0	100.0	100.0	100.0
Floor area[3]:					
Cast-in-place concrete	29.2	29.2	31.3	34.5	33.5
Lumber joists	40.2	38.5	35.0	31.0	28.5
Wood I-joists	19.5	22.0	22.6	23.4	26.0
Open web wood truss	9.7	8.7	9.6	9.2	10.4
Precast concrete	0.3	0.9	0.5	0.2	1.2
Steel (all types)	0.5	0.4	0.7	1.3	0.3
Other wood	0.5	0.2	0.3	0.2	0.1
Structural insulated panels	-	-	0.1	0.1	-
Total	100.0	100.0	100.0	100.0	100.0
Roof area[4]:					
Trusses	67.5	62.0	63.4	62.9	62.8
Rafters	32.0	36.8	35.4	34.9	35.5
Beam and purlin	0.3	0.7	0.7	0.7	1.3
Structural insulated panels	-	0.1	0.2	0.2	0.3
Other	0.1	0.4	0.3	1.4	0.2
Total	100.0	100.0	100.0	100.0	100.0

[1] Based on linear feet of beams and headers, including rim board.
[2] Based on linear feet of exterior walls.
[3] Based on square feet of floor area.
[4] Based on square feet of roof area.

Source: USITC estimates based on data from National Association of Home Builders Research Center.

Table D-2-5
Market share of wood structural building components and their substitutes in new residential construction, Northeast Region,[1] by end use, 1997-2001

Components and substitutes	1997	1998	1999	2000	2001
	Percent				
Beams and headers[2]:					
Built-up dimension lumber	53.8	50.6	47.7	42.6	36.8
LVL	6.9	9.2	10.5	13.0	15.6
Other	10.2	10.3	10.4	5.6	12.5
Timberstrand	7.9	14.6	15.2	16.6	10.1
Solid wood	2.2	1.5	1.4	2.5	6.1
I-joists	5.0	1.9	1.9	2.0	5.5
Parallam	6.9	4.7	5.0	7.6	5.3
Glulam	1.9	3.5	3.7	4.2	5.3
Steel (all types)	5.0	3.6	4.1	4.9	2.5
Open web wood truss	0.4	0.1	0.1	0.9	0.2
Total	100.0	100.0	100.0	100.0	100.0
Wood exterior walls[3]:					
Light frame construction	82.8	88.3	96.9	85.8	74.0
Panelized construction	14.8	10.0	1.5	12.3	22.1
Modular construction	1.9	1.2	1.0	0.8	2.6
Post & beam	0.3	0.2	0.3	0.6	0.9
Structural insulated panels	0.1	0.1	0.0	0.3	0.3
Logs	0.1	0.1	0.2	0.2	0.2
Total	100.0	100.0	100.0	100.0	100.0
Floor area[4]:					
Lumber joists	66.4	62.7	57.9	55.3	49.1
Wood I-joists	18.6	26.3	28.2	29.9	39.4
Cast-in-place concrete	4.0	5.3	7.1	5.0	5.8
Open web wood truss	8.7	5.5	3.2	8.7	4.5
Precast concrete	0.0	0.0	2.2	0.1	0.7
Steel (all types)	1.9	0.2	1.4	1.0	0.4
Structural insulated panels	0.0	0.0	0.0	0.0	0.1
Other wood	0.3	0.1	0.1	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0
Roof area[5]:					
Trusses	51.6	40.3	38.7	44.6	52.7
Rafters	47.7	59.3	58.8	53.3	44.7
Beam and purlin	0.1	0.4	1.4	2.0	1.6
Structural insulated panels	0.1	0.0	0.4	0.1	0.8
Other	0.5	0.0	0.7	0.0	0.3
Total	100.0	100.0	100.0	100.0	100.0

[1] Regions correspond to U.S. Census Regions as shown in figure 2-3.
[2] Based on linear feet of beams and headers including rim board.
[3] Based on linear feet of exterior walls.
[4] Based on square feet of floor area.
[5] Based on square feet of roof area.

Source: USITC estimates based on data from National Association of Home Builders Research Center.

Table D-2-6
Market share of wood structural building components and their substitutes in new residential construction, Midwest Region,[1] by end use, 1997-2001

Components and substitutes	1997	1998	1999	2000	2001
	Percent				
Beams and headers[2]:					
Built-up dimension lumber	46.7	41.2	41.5	40.3	32.9
LVL	9.8	12.3	12.2	19.4	24.2
Timberstrand	13.6	13.5	13.2	12.3	12.5
Other	7.7	9.3	9.2	7.3	8.8
Steel (all types)	8.5	8.8	8.8	8.5	6.6
Glulam	4.6	4.6	4.7	4.3	6.5
Solid wood	1.0	1.1	1.1	2.1	2.9
I-joists	5.0	6.1	6.1	2.9	2.4
Parallam	2.7	2.4	2.4	2.5	2.3
Open web wood truss	0.4	0.8	0.9	0.5	0.9
Total	100.0	100.0	100.0	100.0	100.0
Wood exterior walls[3]:					
Light frame construction	84.5	87.9	85.8	84.0	79.2
Panelized construction	12.4	10.2	9.8	13.7	17.5
Modular construction	2.6	1.7	4.1	1.8	2.4
Logs	0.2	0.1	0.1	0.1	0.1
Structural insulated panels	0.1	0.1	0.1	0.3	0.1
Post & beam	0.1	0.1	0.1	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0
Floor area[4]:					
Lumber joists	58.8	58.0	51.0	54.4	44.3
Wood I-joists	20.9	24.5	23.7	25.1	28.2
Open web wood truss	9.4	8.4	13.8	10.7	13.6
Cast-in-place concrete	10.4	8.7	10.8	8.6	13.4
Steel (all types)	0.5	0.2	0.3	0.6	0.3
Other wood	0.2	0.1	0.2	0.3	0.2
Precast concrete	0.1	0.0	0.0	0.4	0.0
Structural insulated panels	0.0	0.1	0.2	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0
Roof area[5]:					
Trusses	80.7	75.7	79.9	80.6	81.9
Rafters	19.0	24.2	19.5	19.0	17.8
Structural insulated panels	0.1	0.1	0.1	0.1	0.3
Beam and purlin	0.2	0.1	0.1	0.2	0.1
Other	0.0	0.0	0.3	0.1	0.0
Total	100.0	100.0	100.0	100.0	100.0

[1] Regions correspond to U.S. Census Regions as shown in figure 2-3.
[2] Based on linear feet of beams and headers including rim board.
[3] Based on linear feet of exterior walls.
[4] Based on square feet of floor area.
[5] Based on square feet of roof area.

Source: USITC estimates based on data from National Association of Home Builders Research Center.

Table D-2-7
Market share of wood structural building components and their substitutes in new residential construction, South Region,[1] by end use, 1997-2001

Components and substitutes	1997	1998	1999	2000	2001
			Percent		
Beams and headers[2]:					
Built-up dimension lumber	54.6	52.0	51.9	46.1	47.1
LVL	10.1	13.1	12.1	13.7	13.6
Other	9.8	12.0	12.5	10.9	11.1
Timberstrand	8.1	7.8	8.1	11.3	8.2
I-joists	5.3	2.1	2.1	5.6	6.0
Solid wood	2.7	4.0	4.0	4.0	4.2
Glulam	2.2	3.4	3.5	3.6	3.7
Open web wood truss	0.6	0.4	0.4	0.6	3.1
Parallam	3.4	2.7	2.7	1.5	1.7
Steel (all types)	3.2	2.7	2.8	2.7	1.3
Total	100.0	100.0	100.0	100.0	100.0
Wood exterior walls[3]:					
Light frame construction	84.9	86.9	91.7	85.1	88.0
Panelized construction	14.7	11.0	6.1	13.9	6.0
Modular construction	0.2	1.7	0.6	0.2	3.4
Post & beam	0.0	0.1	1.3	0.6	1.4
Logs	0.0	0.1	0.1	0.1	1.1
Structural insulated panels	0.1	0.2	0.2	0.1	0.1
Total	100.0	100.0	100.0	100.0	100.0
Floor area[4]:					
Cast-in-place concrete	37.8	38.3	43.5	49.3	46.3
Lumber joists	34.4	32.7	29.8	24.6	24.4
Wood I-joists	14.6	17.4	15.3	15.8	16.5
Open web wood truss	12.2	9.3	10.5	9.4	12.0
Precast concrete	0.6	1.8	0.2	0.2	0.7
Other wood	0.3	0.2	0.1	0.1	0.1
Steel (all types)	0.1	0.3	0.5	0.5	0.1
Structural insulated panels	0.0	0.0	0.0	0.1	0.0
Total	100.0	100.0	100.0	100.0	100.0
Roof area[5]:					
Rafters	44.9	48.8	46.9	48.7	52.6
Trusses	54.7	49.0	52.2	49.8	45.0
Beam and purlin	0.3	1.2	0.8	0.8	1.9
Other	0.1	0.8	0.0	0.5	0.3
Structural insulated panels	0.0	0.1	0.1	0.2	0.2
Total	100.0	100.0	100.0	100.0	100.0

[1] Regions correspond to U.S. Census Regions as shown in figure 2-3.
[2] Based on linear feet of beams and headers including rim board.
[3] Based on linear feet of exterior walls.
[4] Based on square feet of floor area.
[5] Based on square feet of roof area.

Source: USITC estimates based on data from National Association of Home Builders Research Center.

Table D-2-8
Market share of wood structural building components and their substitutes in new residential construction, West Region,[1] by end use, 1997-2001

Components and substitutes	1997	1998	1999	2000	2001
			Percent		
Beams and headers[2]:					
Timberstrand	15.6	16.9	17.	23.3	25.9
Solid wood	22.5	27.6	27.5	17.0	20.6
Built-up dimension lumber	24.6	18.7	18.7	13.6	18.4
Glulam	7.0	12.6	12.5	9.7	8.3
LVL	8.8	6.0	6.0	10.9	8.1
Other	8.2	6.6	6.6	10.5	5.6
I-joists	5.9	3.4	3.4	6.0	4.3
Steel (all types)	2.0	2.9	2.7	5.3	4.1
Parallam	4.9	4.6	4.9	3.2	3.5
Open web wood truss	0.6	0.6	0.8	0.4	1.2
Total	100.0	100.0	100.0	100.0	100.0
Wood exterior walls[3]:					
Light frame construction	94.0	93.1	98.7	89.8	92.4
Panelized construction	4.1	5.6	0.8	8.8	6.0
Modular construction	0.0	0.1	0.0	0.0	0.8
Post & beam	1.8	0.9	0.5	1.0	0.4
Logs	0.0	0.2	0.0	0.2	0.2
Structural insulated panels	0.1	0.0	0.0	0.1	0.2
Total	100.0	100.0	100.0	100.0	100.0
Floor area[4]:					
Wood I-joists	27.7	27.1	34.1	34.5	36.6
Cast-in-place concrete	40.5	39.5	37.8	40.6	36.6
Lumber joists	23.3	22.6	19.0	12.8	15.4
Open web wood truss	6.0	9.3	6.4	7.7	7.3
Precast concrete	0.2	0.4	1.0	0.0	3.4
Steel (all types)	0.9	0.9	1.1	3.6	0.7
Other wood	1.3	0.2	0.7	0.6	0.1
Structural insulated panels	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0
Roof area[5]:					
Trusses	85.0	82.0	79.7	80.1	85.8
Rafters	14.4	17.3	18.3	14.6	13.1
Beam and purlin	0.4	0.5	0.9	0.5	0.9
Structural insulated panels	0.0	0.0	0.3	0.1	0.3
Other	0.2	0.1	0.6	4.7	0.0
Total	100.0	100.0	100.0	100.0	100.0

[1] Regions correspond to U.S. Census Regions as shown in figure 2-3.
[2] Based on linear feet of beams and headers including rim board.
[3] Based on linear feet of exterior walls.
[4] Based on square feet of floor area.
[5] Based on square feet of roof area.

Source: USITC estimates based on data from National Association of Home Builders Research Center.

Table D-3-1
Framing lumber composite prices, price index, prices and price indexes of kiln-dried, random length, 2X4 softwood lumber products sold in the United States, by quarters, January 1997–December 2002

	Framing lumber composite[1]		(SYP), East, #2, net f.o.b. mill		Douglas Fir, standard and better, net f.o.b mill		Hem–fir – Coast, standard and better, net f.o.b mill		(WSPF), standard and better, base prices[2]		(ESPF), #1 and #2, net delivered Boston	
Period	**$/mbf**	**Index**	**$/mbf**	**Index**	**$/mbf**	**Index**	**$/mbf**	**Index**	**$/mbf**	**Index**	**$/mbf**	**Index**
1997:												
Jan.–Mar.	438	100.0	$489	100.0	$447	100.0	$418	100.0	$396	100.0	$470	100.0
Apr.–June	443	101.1	468	95.6	453	101.4	400	95.5	381	96.0	451	96.0
July–Sept.	412	94.1	440	89.9	394	88.3	353	84.3	342	86.3	418	89.0
Oct.–Dec.	375	85.8	437	89.2	374	83.8	322	76.9	296	74.6	370	78.7
1998:												
Jan.–Mar.	368	84.0	422	86.3	350	78.3	314	75.1	288	72.7	363	77.3
Apr.–June	344	78.6	389	79.4	322	72.2	298	71.2	284	71.6	356	75.7
July–Sept.	342	78.1	389	79.4	363	81.3	306	73.2	291	73.3	367	78.0
Oct.–Dec.	341	77.8	421	86.1	321	71.8	298	71.2	288	72.8	365	77.7
1999:												
Jan.–Mar.	384	87.7	421	86.1	368	82.5	342	81.7	325	82.0	397	84.5
Apr.–June	425	97.1	420	85.8	433	97.0	382	91.4	357	90.0	441	93.8
July–Sept.	424	96.9	434	88.8	448	100.2	394	94.1	367	92.7	441	93.9
Oct.–Dec.	375	85.8	405	82.7	389	87.2	335	80.1	323	81.4	403	85.7
2000:												
Jan.–Mar.	384	87.8	398	81.3	390	87.3	348	83.1	331	83.5	406	86.5
Apr.–June	337	77.0	373	76.2	337	75.5	300	71.8	276	69.6	353	75.0
July–Sept.	294	67.2	343	70.1	331	74.1	249	59.6	223	56.2	298	63.5
Oct.–Dec.	277	63.3	291	59.5	304	68.0	229	54.7	198	50.0	278	59.1
2001:												
Jan.–Mar.	284	64.8	306	62.6	317	71.0	231	55.3	194	49.0	273	58.2
Apr.–June	364	83.1	378	77.2	358	80.2	324	77.5	296	74.7	371	79.0
July–Sept.	322	73.6	350	71.5	338	75.7	294	70.4	287	72.4	365	77.7
Oct.–Dec.	279	63.7	320	65.4	320	71.6	240	57.3	221	55.7	305	65.0
2002:												
Jan.–Mar.	318	72.6	343	70.1	330	73.8	299	71.5	268	67.7	344	73.3
Apr.–June	313	71.6	327	66.8	339	75.8	296	70.7	263	66.3	346	73.5
July–Sept.	293	67.0	311	63.5	338	75.7	259	61.8	223	56.3	311	66.2
Oct.–Dec.	270	61.7	288	58.9	308	69.0	223	53.4	195	49.3	275	58.4

[1] The framing lumber composite prices include prices of softwood lumber encompassing four grades, two dimensions, and six species (kiln–dried fir/larch, hem fir, ESPF, SYP, WSPF, and green Douglas fir).

[2] Base price is somewhat analogous to an f.o.b. mill price but is not net of any mill returns and is derived by deducting an estimate for freight from the quoted delivered price based on an estimated weight.

Note.—MBF=Million board feet.

Source: Random Lengths.

Table D-4-1
Harmonized Tariff Schedule of the United States: Subheadings, descriptions, and duties of categories that contain wood structural building components within the scope of USITC investigation No. 332-445, 2002

Heading/ subheading	Statistical suffix	Article description	2002 rates of duty[1] 1 General	1 Special	2
4418		Builders' joinery and carpentry of wood, including cellular wood panels and assembled parquet panels; shingles and shakes:			
4418.90		Other:			
4418.90.45[2]		Other:	3.2%	Free (A, CA, E, IL, J, JO, MX)	33 1/3%
	10	Beams and arches, laminated			
	20	Roof trusses			
	40	Other fabricated structural wood members			
	50	Prefabricated partitions and panels for buildings			
	90	Other			

[1] The general tariff rate for 4418.90.40 was 4 percent in 1997, 3.6 percent in 1998, and 3.2 percent in 1999-2001.
[2] From 1997 to 2001, subheading 4418.90.45 was identified as 4418.90.40. The subheading was changed in 2002 to accommodate reclassification of end-worked flooring strips. USITC *Proposed Modifications to the Harmonized Tariff System of the United States*, Investigation No. 1205-5 (Final), Publication 3430, June 2001, p. 7.

Source: Harmonized Tariff Schedule of the United States (2002).

Table D-4-2
U.S. Customs Service ruling letters: Products classified as other builders' joinery and carpentry of wood that are not within the scope of USITC investigation No. 332-445, 1991-2002[1]

Date of ruling letter	Ruling number	Product description
Feb. 7, 1991	HQ 088294	Finger-jointed door jamb sets
Apr. 17, 1991	NY 861959	Stained wood siding
Dec. 17, 1992	NY 880658	Primed, combed, spruce fascia boards
Mar. 24, 1993	HQ 952940	Solid oak floor boards, tongued and grooved on edges and ends
Aug. 18, 1993	NY 888696	Wooden window supports
Jan. 6, 1994	NY 893478	Wood balusters (see also NY 893479)
Feb 2, 1994	NY 893902	Solid wood flooring (Australian cypress) worked on the edges and ends.
Apr. 20, 1994	HQ 955712	Solid wood flooring, worked on edges and ends, tongued and grooved.
May 11, 1994	NY 896800	Wood balusters
Sep. 2, 1994	HQ 956363	Hardwood flooring, tongued and grooved on edges and ends.
Oct. 13, 1994	NY 802028	Staircase components: regular steps, rounded on edge, made of solid oak or maple.
Oct. 13, 1994	NY 802028	Staircase components: regular steps and connection steps, made of glued-up wood.
Oct. 13, 1994	NY 802028	Staircase components: handrails, fillets, and shoe rails made of edge-glued wood.
Nov. 3, 1994	NY 803538	Primed, broken-knife, planer boards
Feb. 15, 1995	NY 806012	Components for prefabricated conservatories: side slats cut-to-shape.
Feb. 24, 1995	NY 806603	Solid wood flooring made from solid oar or birch, tongued and grooved along the edges and ends.
Apr. 8, 1995	NY 807854	Wood door frames: door stop moldings, shaped and lacquered.
Apr. 8, 1995	NY 807854	Wood door frames: door frames and sidelight frames without door stop moldings and glass pane moldings.
Apr. 8, 1995	NY 807854	Wood door frames: complete door frames and sidelight frames made of laminated wood with moldings attached.
Aug. 3, 1995	NY 812223	Components of prefabricated conservatories: rafter, sills, headplates, fascia boards and other shaped and worked parts.
Aug. 18, 1995	NY 813011	Solid wood flooring: tongued and grooved on edges and ends, made of Haldu, Cinnamon, and Pyinkado.
Nov. 1, 1995	NY 815420	Door jamb moldings, with cutouts
Nov. 2, 1995	NY 514464	Oak handrail fittings
Nov. 2, 1995	NY 814469	Spindle-shaped balusters
Nov 19, 2001	HQ 961848	Wood flooring, tongued and grooved, made of hardwood
Nov. 22, 1995	NY 816080	Wood deck accessories: stringers (side supports for stairs)
Nov. 22, 1995	NY 816080	Wood deck accessories: spindles

See footnote at end of table.

Table D-4-2—*Continued*
U.S. Customs Service ruling letters: Products classified as other builders' joinery and carpentry of wood that are not within the scope of USITC investigation No. 332-445, 1991-2002[1]

Date of ruling letter	Ruling number	Product description
Nov. 22, 1995	NY 816080	Wood deck accessories: worked porch posts
Jan. 11, 1996	NY 817389	Veneered door jamb moldings
Jan. 25, 1996	NY 817990	Door jamb moldings with cutouts
May 1, 1996	NY A82656	Veneered door frame moldings with wood edges.
Jun. 28, 1996	NY A84764	Spruce paneling, tongued and grooved edges and ends, stained and lacquered
Jul. 3, 1996	NY A84670	Pine corner brackets, worked on two edges, used as decorative woodwork
Jul. 31, 1996	NY A85712	Beveled Balusters
Jan. 15, 1997	NY B80485	Plywood and veneer door jambs.
Jan. 15, 1997	NY B80541	Floor joist bridging with angle-cut ends
Feb 6, 1997	NY B80908	Finger-jointed door jambs, worked on the ends
Mar. 14, 1997	NY B82545	Cut-out studs
Apr. 4, 1997	PD B83257	Wooden fireplace mantles
May 29, 1997	NY B 85410	Door casings and moldings, dadoed ends
Jun. 4, 1997	NY B85796	Cut-out studs
Oct. 7, 1997	NY B 89813	Notched studs
Dec. 11, 1997	NY C82044	Notched studs
Dec. 19, 1996	NY A89854	Deck panels, Chippendale and lattice deck panels
Jul. 15, 1998	NY C89444	Wood balusters
Jun. 30, 2000	NY F88343	Carved wood arches, pillars, columns and wall panels
Sep. 18, 2000	NY G81559	Fireplace mantels, and surround units
Nov. 9, 2000	NY G83061	Lathe-turned coped building logs
Nov. 20, 2000	NY G83563	Solid floor planks and strips of oak, maple, and birch
Feb. 21, 2001	NY G86605	Unassembled timber frames for homes, precisely worked timbers including rafters, plates, posts, ties, and braces
Feb. 22, 2001	NY G86388	Wood siding with plastic track
Apr. 27, 2001	NY G89486	Wood flooring, solid strip
May 21, 2001	NY H81166	Solid cherry flooring
Jun. 22, 2001	HQ 965083	Teak wood flooring, tongued and grooved on edges and ends
Aug. 10, 2001	NY H83517	Solid wood flooring of beech, tongued and grooved on edges and ends
Dec. 20, 2001	HQ 964510	Wood flooring, stair treads
Jan. 14, 2002	HQ 965179	Tongued and grooved hardwood flooring

See footnote at end of table.

Table D-4-2—*Continued*
U.S. Customs Service ruling letters: Products classified as other builders' joinery and carpentry of wood that are not within the scope of USITC investigation No. 332-445, 1991-2002[1]

Date of ruling letter	Ruling number	Product description
Jan. 30, 2002	NY H87471	Flat jambs
May 9, 1996	NY A82523	Door parts: door jambs with dadoed ends
May 9, 1996	NY A82523	Door parts: hinge stiles, lock stiles, and door rails with dadoed ends
May 17, 2002	NY I80895	Flooring and decking components: any species, tongued and grooved on the edges and the ends, and notched across the width.
Jun. 7, 2002	NY I82516	Face-grooved solid wood floor planks, lacquered
Jun. 7, 2002	NY I82516	Tongued and grooved solid wood floor planks, lacquered
Jun. 7, 2002	NY I82516	Various solid wood moldings, lacquered
Jul. 25, 2002	NY I83439	Solid wood flooring planks, finished
Aug. 12, 2002	NY I84103	Door jambs, moldings with cutouts
Aug. 19, 2002	NY I847322	Beveled balusters (upright members of a railing)

[1] Products classified in subheading 4418.90.40 in the Harmonized Tariff Schedule of the United States.

Source: U.S. Customs Service.

Table D-4-3
Other builders' joinery and carpentry of wood: U.S. imports by principal suppliers, 1995-2002[1]

Country	1995	1996	1997	1998	1999	2000	2001	2002
	1,000 dollars							
Canada	100,852	157,316	332,031	489,616	730,676	572,316	550,385	562,973
Brazil	1,696	3,542	9,610	10,687	15,775	23,649	38,348	64,545
China	310	1,180	1,901	5,135	13,652	22,435	26,452	36,594
Chile	1,007	228	13,602	14,899	24,056	7,673	13,629	33,099
Indonesia	6,355	8,748	14,712	24,388	26,751	32,837	18,263	16,666
All others	27,807	33,500	38,995	42,939	40,153	66,119	76,110	92,148
Total	138,027	204,514	410,851	587,664	851,063	725,029	723,187	806,027

[1] Includes total imports under the Harmonized Tariff Schedule of the United States subheading 4418.90.40 for 1995-2001 and 4418.90.45 for 2002.

Sources: Compiled from tariff and trade data from the U.S. Department of Commerce, the U.S. Treasury, and the U.S. International Trade Commission.

Table D-4-4
Laminated wood beams and arches: U.S. imports by principal suppliers, 1997-2002[1]

Country	1997	1998	1999	2000	2001	2002
	1,000 dollars					
Canada	17,485	13,177	14,383	36,313	14,194	15,721
Germany	0	0	0	16	41	303
Brazil	0	0	0	0	0	171
Thailand	0	0	0	0	0	167
China	0	2	0	0	0	158
Mexico	3,576	2,041	2,058	1,135	510	3
All others	26	316	94	179	20	152
Total	21,087	15,534	16,535	37,627	14,765	16,675

[1] Includes imports reported under HTS SRN 4418.90.4010 for 1997-2001 and 4418.90.4510 for 2002.

Sources: Compiled from tariff and trade data from the U.S. Department of Commerce, the U.S. Treasury, and the U.S. International Trade Commission.

Table D-4-5
Roof trusses: U.S. imports by principal suppliers, 1997-2002[1]

Country	1997	1998	1999	2000	2001	2002
	1,000 dollars					
Canada	26,918	39,462	71,029	76,265	69,848	74,825
Mexico	2	0	2	0	715	422
United Kingdom	0	0	0	0	0	246
All others	10	18	10	59	77	93
Total	26,930	39,480	71,041	76,324	70,640	75,586

[1] Includes imports reported under HTS SRN 4418.90.40.20 for 1997-2001 and 4418.90.4520 for 2002.

Sources: Compiled from tariff and trade data from the U.S. Department of Commerce, the U.S. Treasury, and the U.S. International Trade Commission.

Table D-4-6
Roof trusses: U.S. shipments, imports, exports, apparent consumption, and import penetration, 1997-2001

Year	Shipments[1]	Imports	Exports	Apparent consumption	Import penetration
	Million dollars				*Percent*
1997	3,139	27	([2])	3,166	0.9
1998	3,558	39	([2])	3,597	1.1
1999	3,892	71	([2])	3,063	1.8
2000	3,935	76	([2])	4,011	1.9
2001	3,794	71	([2])	3,865	1.8

[1] Shipments are estimated from U.S. Census Bureau shipments for NAICS code 321214, wood trusses, adjusted by the reported ratio of roof trusses to floor trusses, as reported in Commission producer questionnaire.
[2] According to industry sources, U.S. exports of roof trusses are minimal.

Sources: Compiled from tariff and trade data from the U.S. Department of Commerce, the U.S. Treasury, and the U.S. International Trade Commission; USITC estimates.

Table D-4-7
Canadian roof truss exports: Share of total value by primary State of destination, 1997-2001

State	1997	1998	1999	2000	2001
	Percent				
Michigan	52.4	47.0	36.1	36.6	39.9
Washington	2.9	6.5	6.3	6.5	7.6
New Hampshire	2.9	2.2	4.1	5.5	7.6
New York	3.5	5.1	5.3	6.1	7.1
Vermont	4.7	2.9	4.2	3.5	4.0
California	2.3	1.1	0.9	2.2	3.9
Maine	3.4	2.0	2.3	2.2	3.0
Minnesota	0.2	1.9	2.1	2.1	2.5
Massachusetts	3.5	2.8	1.9	2.6	2.3
Ohio	2.1	2.9	11.2	13.0	2.3
All others[1]	22.1	25.6	25.6	19.8	20.0

[1] Includes all states that received less than 2 percent of Canadian roof truss exports in 2001.

Source: USITC estimates based on export data from Statistics Canada.

Table D-4-8
Other fabricated structural wood members: U.S. imports by principal suppliers, 1997-2002[1]

Country	1997	1998	1999	2000	2001	2002
	1,000 dollars					
Canada	110,780	172,676	107,616	133,588	151,587	162,062
China	383	257	144	1,475	3,163	3,063
Indonesia	1,066	1,665	1,143	3,724	2,248	1,424
Mexico	35	40	485	435	766	604
Germany	33	41	19	292	234	275
All others	167	56	67	221	659	1,693
Total	112,464	174,735	109,474	139,735	158,657	169,121

[1] Includes imports reported under HTS SRN 4418.90.4040 for 1997-2001 and 4418.90.4540 for 2002.

Sources: Compiled from tariff and trade data from the U.S. Department of Commerce, the U.S. Treasury, and the U.S. International Trade Commission.

Table D-4-9
Prefabricated partitions and panels for buildings: U.S. imports by principal suppliers, 1997-2002[1]

Country	1997	1998	1999	2000	2001	2002
	1,000 dollars					
Canada	4,078	7,085	18,866	32,384	37,305	34,365
China	0	43	0	0	121	939
Germany	774	406	353	262	542	832
Hong Kong	0	0	0	0	1,188	157
Italy	437	399	1,177	224	316	156
All others	664	692	970	831	822	752
Total	5,953	8,625	21,366	33,701	40,294	37,201

[1] Includes imports reported under HTS SRN 4418.90.4050 for 1997-2001 and 4418.90.4550 for 2002.

Sources: Compiled from tariff and trade data from the U.S. Department of Commerce, the U.S. Treasury, and the U.S. International Trade Commission.

Table D-4-10
Builders' joinery and carpentry of wood, not elsewhere specified or included: U.S. imports by principal suppliers, 1997-2002[1]

Country	1997	1998	1999	2000	2001	2002
	1,000 dollars					
Canada	172,770	257,215	518,782	293,766	277,451	276,001
Brazil	9,327	10,662	14,895	23,951	38,250	64,228
Chile	13,281	14,899	24,056	7,639	13,629	33,099
China	1,518	4,815	13,509	20,960	23,169	32,433
Indonesia	13,612	22,579	25,515	28,854	15,915	15,093
All others	33,292	38,941	34,935	61,747	70,297	86,590
Total	243,800	349,111	631,692	436,917	438,711	507,444

[1] Includes imports reported under HTS SRN 4418.90.4090 for 1997-2001 and 4418.90.4590 for 2002.

Sources: Data compiled from tariff and trade data from the U.S. Department of Commerce, the U.S. Treasury, and the U.S. International Trade Commission.

Table D-4-11
Builders' joinery and carpentry of wood, other: U.S. exports by principal markets, 1995-2002[1]

Country	1995	1996	1997	1998	1999	2000	2001	2002
	1,000 dollars							
Canada	39,738	30,118	53,083	55,694	54,921	56,131	49,844	52,396
Japan	77,894	100,752	80,119	48,594	41,723	44,387	45,232	32,140
Bahamas	6,516	4,104	15,332	21,120	20,587	19,238	14,905	9,628
Australia	1,610	1,290	730	1,271	2,864	2,544	5,236	6,273
Korea	2,501	7,025	9,306	4,029	3,703	3,382	1,443	2,066
United Kingdom	1,416	1,291	1,097	2,621	4,268	5,160	1,614	1,516
All others	59,904	77,469	87,089	74,118	60,888	59,828	30,733	11,752
Total	189,579	222,049	246,756	207,447	188,954	190,670	149,007	115,771

[1] Includes Schedule B subheading 4418.90.

Sources: Compiled from tariff and trade data from the U.S. Department of Commerce, the U.S. Treasury, and the U.S. International Trade Commission.

Table D-4-12
Annual Japanese imports of glue laminated lumber (glulam), 1996-2001

Country	1996	1997	1998	1999	2000	2001
	Cubic meters					
United States	123,143	121,389	32,499	44,816	41,728	30,846
Canada	30,153	38,942	18,376	25,785	36,309	40,725
New Zealand	12,048	14,362	13,660	18,342	24,392	26,190
Germany	10,720	42,149	10,701	31,541	67,145	94,778
Finland	14,775	19,759	13,259	34,574	67,186	85,437
Austria	613	6,271	17,983	50,393	86,817	84,548
Sweden	33,394	43,506	19,719	40,192	65,211	72,760
Denmark	47	3,373	0	1,435	12,528	14,777
Norway	860	1,047	504	590	6,336	6,136
Netherlands	1,491	9,184	3,322	1,147	3,788	1,766
Total Europe	61,900	125,289	65,488	159,872	309,011	360,202
Russia	0	0	30,604	32,936	35,586	36,516
China	3,517	15,852	15,269	32,663	47,444	55,125
Total	230,761	315,834	175,896	314,414	494,470	549,604

Source: APA–The Engineered Wood Association.