

**C I N T R A F O R**

**Working Paper**

**48**

**THE US MILLWORK INDUSTRY:  
HISTORICAL TRENDS BASED ON  
US DEPARTMENT OF COMMERCE STATISTICS**

**May 1994**

**David G. Briggs  
Lee Bialoznski  
Steve Shook**

**CINTRAFOR Working Paper 48**

**THE US MILLWORK INDUSTRY:  
HISTORICAL TRENDS BASED ON  
US DEPARTMENT OF COMMERCE STATISTICS**

**May 1994**

**David G. Briggs  
Lee Bialozznski  
Steve Shook**

This material is based upon work supported by the Cooperative State Research Service, US Department of Agriculture, and the State of Washington Department of Trade and Economic Development. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the funding agency.



**THE US MILLWORK INDUSTRY:  
HISTORICAL TRENDS BASED ON US DEPARTMENT OF COMMERCE  
STATISTICS**

**David G. Briggs, Lee Bialosynski, Steve Shook**

**EXECUTIVE SUMMARY**

According to US Department of Commerce census data:

- The millwork industry consisted of 2782 establishments in 1987 which produced millwork as the principal business.
- The millwork industry is dominated by small establishments; 69% had fewer than 20 employees and only 6% had more than 100 employees.
- Between 1987 and 1991,

- Total employment varied between 85,000 and 91,000; about 72% were production workers.

- Value of shipments varied between \$9.0 and \$9.7 billion, making millwork the largest of what are commonly called the secondary solid wood product industries. Of the 95% of these shipments which were millwork products,

doors	32%
windows	27%
moldings	12%
others	<u>29%</u>
	100%

- Total cost of materials, labor, energy, contracts, etc., varied from \$7.1 to \$7.7 billion, of which

materials	70%
production and non-production workers	25%
energy, contracts, etc.	<u>5%</u>
	100%

- Of the expenditures for materials, 43% was for wood materials, of which

lumber		87%
softwood	72%	
hardwood	15%	
hardwood veneer		6%
plywood		4%
softwood	1%	
hardwood	3%	
particleboard		2%
medium density fiberboard		<u>1%</u>
		100%

- Value added by manufacturing varied between \$3.7 and \$3.9 billion.
- The principal markets for millwork products are
 

new private construction	48%
repair and remodel	47%
public construction	3%
prefabricated housing	<u>2%</u>
	100%

According to US Department of Commerce trade statistics for 1989-1992: Exports as a percent of value of shipments have grown from 1.1% in 1989 to 2.4% in 1991.

- In nominal dollars, comparison of 1989 and 1992 trade data shows that US millwork exports grew from \$102 to \$272 million while imports declined from \$310 to \$306 million. The trade deficit in these products declined from \$208 to \$34 million.
- The composition of exports is (Table 31):

	<b>% of 4-year total</b>	<b>trend</b>
doors and components	44.6	increasing
softwood moldings	28.3	increasing
windows and frames	18.1	decreasing
hardwood moldings	7.0	decreasing
blinds, shutters & other	<u>2.1</u>	decreasing
	100.0	

- Export trade for all products is dominated by Canada and Mexico. Other important markets for specific products are the Pacific Rim (mainly Japan), Europe, and the Caribbean countries.
- The composition of imports is (Table 31):

	<b>% of 4-year total</b>	<b>trend</b>
softwood moldings	41.4	increasing
doors and components	27.2	stable
hardwood molding	19.4	decreasing
windows and frames	6.7	increasing
blinds, shutters, & others	<u>5.2</u>	decreasing
	100.0	

- Imports were also dominated by Canada and Mexico, but other regions were important sources of specific products. South America (Chile, Brazil) and the Pacific Rim (New Zealand) are important sources of softwood moldings. Both Chile and new Zealand have large plantations of radiata pine and are promoting this species for millwork. The Pacific Rim (Malaysia and Indonesia) is an important source of hardwood moldings. South America and the Pacific Rim are large suppliers of doors and components. The European Community was an important source of millwork in 1989 but its share sharply declined by 1992.

Washington Customs District has an important role in millwork trade.

- Exports through the District increased from \$18 to \$64 million between 1989 and 1992.
- Over 1989-1992, the District accounted for 22.8% of all US millwork exports.
- The District represents 42.2% of US exports of softwood moldings, 16.8% of doors and components, 13.6% of windows and frames, and 13.0% of hardwood moldings.
- No information is available to isolate exports manufactured by millwork establishments located within the State of Washington.
- Imports through the District declined from \$30 to 25 million between 1989 and 1992.
- Over 1989-1992, the District accounted for 9.0% of all US millwork imports.
- The District represents 14.8% of US imports of doors and components, 10.6% of hardwood moldings, 6.6% of softwood moldings, and 2.5% of windows and frames.

## TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY .....	i
LIST OF TABLES .....	v
LIST OF FIGURES .....	vii
INTRODUCTION .....	1
1. MILLWORK RELATIVE TO OTHER FOREST PRODUCT INDUSTRIES .....	1
The Standard Industrial Classification System .....	1
Census of Manufactures .....	2
Millwork Industry .....	3
2. MILLWORK INDUSTRY: GENERAL NATIONAL TRENDS .....	8
Number of Establishments .....	8
Employment .....	10
Value of Shipments and Cost of Materials .....	10
3. MILLWORK SHIPMENTS BY PRODUCT, APPLICATION IN NEW HOUSING, AND RAW MATERIALS CONSUMPTION .....	10
Industry Product Mix .....	10
Doors .....	10
Windows .....	16
Molding .....	16
Stairways .....	17
Other Millwork .....	19
Millwork Raw Material Consumption by Major End-Use Market .....	19
Aggregate Raw Material Consumption .....	21
4. REGIONAL AND STATE ANALYSIS .....	23
5. IMPORTS AND EXPORTS OF MILLWORK PRODUCTS .....	26
6. SUMMARY .....	31
LITERATURE CITED .....	59
APPENDIX A: Department of Commerce Millwork Industry Definition and SIC Product Classification .....	61
APPENDIX B: Department of Commerce Abbreviations and Definitions .....	65
APPENDIX C: Regional Aggregation of Countries .....	71

## LIST OF TABLES

Table	Page
1 SIC Industries Concerning Forest Products . . . . .	3
2 Secondary Forest Products Industry Value of Shipments, 1990 . . . . .	5
3 SIC 243- Industry Group Select Summary Statistics, 1987 . . . . .	7
4 SIC 243- Distribution of Establishments by Number of Employees and Total Value of Shipments, 1987 . . . . .	7
5 SIC 243- Industry Group Average Value of Depreciable Assets per Establishment, 1987 . . . . .	8
6 Millwork Industry Statistics, 1939, 1947, 1949-1990 . . . . .	9
7 Millwork Product Shipments, 1967-1991, Nominal Dollars . . . . .	14
8 Wood Raw Material Consumption per Interior Door, 1988 . . . . .	15
9 Wood Raw Material Consumption per Exterior Door, 1988 . . . . .	15
10 Per Parking Space Lumber and Panel Use For Wood Garage Doors, 1988 . . . . .	15
11 Wood Raw Material Preference and Lumber Use in Wood Windows by Region . . . . .	15
12 Window Framing Mix For Residential Construction and Repair and Remodel Industry . . . . .	17
13 Percentage of Single Family Houses With Stairways by Number of Stairways . . .	17
14 Materials Used for Stairway Treads and Risers in Single Family Houses, 1988 . . .	19
15 Lumber, Structural Panel, and Non-Structural Panel Consumption in New Residential Construction, 1988; Per Unit of Combined Single and Multi-Family Housing . . . . .	20
16 Nonstructural Wood Panel Consumption in New Residential Construction; Square Feet: 3/8" Basis, 1988; Per Unit of Combined Single and Multi-Family Housing . . . . .	20
17 US Millwork Industry Wood Raw Material Breakdown, Delivered Cost and Percentage of Total Raw Material Costs, 1987 . . . . .	21



18	Top Five Millwork Producing States: 1947, 1967, and 1987 . . . . .	23
19	Millwork Industry Statistics for Selected States, 1987 . . . . .	24
20	SIC Aggregation for Millwork Trade Summary . . . . .	36
21	Aggregate US Softwood Molding Exports by Region, 1989-1992 . . . . .	37
22	Aggregate US Softwood Molding Imports by Region, 1989-1992 . . . . .	38
23	Aggregate US Hardwood Molding Exports by Region, 1989-1992 . . . . .	39
24	Aggregate US Hardwood Molding Imports by Region, 1989-1992 . . . . .	40
25	Aggregate US Window and Frame Exports by Region, 1989-1992 . . . . .	41
26	Aggregate US Window and Frame Imports by Region, 1989-1992 . . . . .	42
27	Aggregate US Door and Component Exports by Region, 1989-1992 . . . . .	43
28	Aggregate US Door and Component Imports by Region, 1989-1992 . . . . .	44
29	Aggregate US Wood Blinds, Shutters and Components Exports by Region, 1989-1992 . . . . .	45
30	Aggregate US Wood Blinds, Shutters and Components Imports by Region, 1989-1992 . . . . .	46
31	Aggregate US Millwork Trade, 1989-1992 . . . . .	47
32	Aggregate Washington Customs District Millwork Trade, 1989-1992 . . . . .	48
33	Washington Customs District as a Percent of Total US Trade in Millwork Products . . . . .	49
34	US Millwork Exports Compared to Value of Shipments . . . . .	50

## LIST OF FIGURES

Figure	Page
1 Secondary Forest Products Industry Value of Shipments, 1990 . . . . .	4
2 Percentage of Establishments by Employee Size Class for SIC 243-Industries . .	6
3 Millwork Establishments by Employee Size, Census Years 1947-1987 . . . . .	11
4 Millwork Employment, 1947-1990 . . . . .	12
5 Cost of Materials and Value of Shipments in Nominal Dollars, 1947-1990 . . . .	13
6 Cost of Materials and Value of Shipments in Real Dollars, 1947-1990 . . . . .	13
7 Major End-Use Markets for Millwork Products . . . . .	18
8 Cost Structure of the US Millwork Industry, 1987 . . . . .	22
9 Top Ten Ranked Millwork States Based on Number of Establishments, 1987 . . .	25
10 US Trade in Millwork Products with Canada, 1989-1992 . . . . .	51
11 US Trade in Millwork Products with Mexico, 1989-1992 . . . . .	52
12 US Trade in Softwood Moldings Outside North America, 1989-1992 . . . . .	53
13 US Trade in Hardwood Moldings Outside North America, 1989-1992 . . . . .	54
14 US Trade in Windows and Frames Outside North America, 1989-1992 . . . . .	55
15 US Trade in Wood Doors and Components Outside North America, 1989-1992 .	56
16 US Trade in Wood Blinds, Shutters and Components Outside North America, 1989-1992 . . . . .	57
17 Trade in Millwork Products Through the Washington Customs District, 1989-1992 . . . . .	58



## INTRODUCTION

This report presents historic trends and a current profile of the US millwork industry. Information presented is primarily based on data collected by the US Department of Commerce Census of Manufactures and US Department of Commerce import and export data. Objectives of the report are:

1. To provide perspective on how the millwork sector has developed over time.
2. To gain insight on how the millwork sector compares with other secondary wood products industries.
3. To summarize recent trends in trade of millwork products.
4. To provide understanding of Census changes in classification of the millwork industry and other features and limitations of the data collected by the US Department of Commerce.
5. To provide a foundation and base for comparison with a national survey of the millwork industry sponsored by CINTRAFOR (Bialozynski and Briggs, 1994).

This report is organized as follows: Section 1 explains the US Department of Commerce Standard Industrial Code (SIC) system for classifying industry, introduces the Census of Manufactures, and places the millwork industry in context of other solid wood products industries. Section 2 presents trends and a current profile of the millwork industry in terms of number of establishments, employment, cost of materials and value of shipments. Section 3 details the millwork industry product mix and raw materials consumption. Section 4 summarizes data by region and state and Section 5 presents 1989-1992 import and export activity in selected millwork products.

### 1. MILLWORK RELATIVE TO OTHER FOREST PRODUCT INDUSTRIES

#### The Standard Industrial Classification System

Most government data and much of the privately collected data on US industries and markets is organized according to the Standard Industrial Classification (SIC) system. The SIC system divides economic activity into eleven divisions, each of which contains major industry groups classified by a two-digit number. For example, one of the eleven divisions represents manufacturing industries with two-digit codes ranging from 20 to 39. The two manufacturing groups SIC24 and SIC25, representing solid wood products, are presented in Table 1. The other major wood product group, SIC26: Paper and Allied Products, is not considered in this report. Within each two-digit group, industry subgroups are further defined by three- and four-digit codes. SIC coding extends to seven digits for specific products. For example, SIC 243 refers to "millwork, plywood, and structural members, not elsewhere classified," SIC 2431 refers

specifically to millwork, and SIC 24311 refers to wood window units (see Appendix A for definitions of this industry). Each business establishment at a single physical location is assigned a four-digit code according to the **principal** product produced, sold, or exchanged in that facility.

The four-digit industries are often regrouped by analysts according to the nature of raw material used (cants or logs versus lumber or plywood) or the extent of value-added activity reflected in the final product (lumber or plywood versus a window unit or a piece of furniture). The term "primary industry" refers to processing centers that convert raw materials such as logs or cants into lumber, plywood, or similar products. In contrast, the term "secondary" or "remanufacturing" industry refers to establishments that convert lumber, plywood, or other output from primary industries into products such as moldings, windows, furniture, *etc.* The 18 industries in Table 1 that are labeled "secondary" in boldface are commonly considered to comprise the secondary industry (Dirks and Briggs, 1991). The secondary industries comprise a diverse group. Some produce industrial products such as component parts that are used by other secondary industries while others produce finished consumer goods such as furniture. These industries differ in their labor and wood use intensities and other factors. For a good discussion of these differences, see Kingslien and Greber (1993). Not all analysts group firms in the same way. For example, Kingslien and Greber (1993) considered 20 SIC groups as comprising the remanufacturing industry. They consider Hardwood Veneer and Plywood (SIC 2435) as secondary, Hardwood Dimension and Flooring (SIC 2426) as primary, and added Household Furniture, n.e.c. (SIC 2519) and Drapery Hardware (SIC 2591).

### **Census of Manufactures**

Economic censuses, known as the Census of Manufactures, are conducted by the US Department of Commerce, Bureau of the Census. They are the major source of facts about the structure and functioning of the US economy. They provide valuable data on measures of the well being of the economy, to aid government in formulating policies, and for studying trends in industries and markets. Since 1967, economic censuses have been conducted as an integrated program every five years. Prior to 1967, individual industry censuses were taken separately at varying intervals. In each of the four years between the Census of Manufactures, an Annual Survey of Manufactures is conducted, gathering the same information as the Census but from a sample of establishments. Statistics gathered by the Census and discussed in this report are defined in Appendix B.

Using Census data for analyzing forest product industries has certain limitations. The Census places an establishment into a four-digit SIC class according to its principal product. As a consequence, Census data may under-represent the full scope of activity in an industry. For example, other researchers have found that the Census underestimated the number of establishments in the Ohio hardwood sawmill industry (Bratkovich and Passewitz, 1991), the US sawmill industry (Phelps and McCurdy, 1992), the Ohio pallet industry (Floyd, *et al.*, 1993). These researchers identified all establishments that manufactured the product of interest rather than just those for which it was the principal product.

**Table 1. SIC Industries Concerning Forest Products**

<b>SIC Industry Group 24: Lumber and Wood Products</b>		
2411	Logging	raw material
2421	Sawmills and planing mills, general	primary
2426	Hardwood dimension and flooring mills	secondary
2429	Special product sawmills, n.e.c. <sup>1</sup>	primary
2431	Millwork	secondary
2434	Wood kitchen cabinets	secondary
2435	Hardwood veneer and plywood	primary
2436	Softwood veneer and plywood	primary
2439	Structural wood members, n.e.c.	secondary
2441	Nailed and lock corner wood boxes and shook	secondary
2448	Wood pallets and skids	secondary
2449	Wood containers, n.e.c.	secondary
2451	Mobile homes	secondary
2452	Prefabricated wood buildings and components	secondary
2491	Wood preserving	secondary
2493	Reconstituted wood products	primary
2499	Wood products, n.e.c.	secondary
<b>SIC Industry Group 25: Furniture and Fixtures</b>		
2511	Wood household furniture, except upholstered	secondary
2512	Wood household furniture, upholstered	secondary
2514	Metal household furniture	not applicable
2515	Mattresses, Foundations and Convertible Beds	not applicable
2517	Wood television, radio, phonograph and sewing machine cabinets	secondary
2519	Wood furniture, n.e.c.	secondary
2521	Wood office furniture	secondary
2522	Office furniture, except wood	not applicable
2531	Public building and related furniture	secondary
2541	Wood office and store fixtures, partitions, shelving and lockers	secondary
2542	Office and store fixtures, partitions, shelving and lockers, except wood	not applicable
2591	Drapery hardware and window blinds and shades	not applicable
2599	Furniture and fixtures, n.e.c.	secondary

<sup>1</sup>n.e.c. = not elsewhere classified

Source: National Technical Information Service, 1987

### **Millwork Industry**

Analysis of millwork industry trends is complicated by two Census reclassifications. In 1951, four years after millwork was identified separately, wood window and door screens (formerly SIC 2561) were included as part of the millwork group. In 1967, wood kitchen cabinets were removed from millwork and given a separate identity (SIC 2434). Data are not adjusted for these reclassifications.

Using 1990 value of shipments as a measure of industrial activity and magnitude, the \$9.5 billion of the millwork industry makes it the largest secondary industry. Only millwork and wood

Industry Sector SIC code

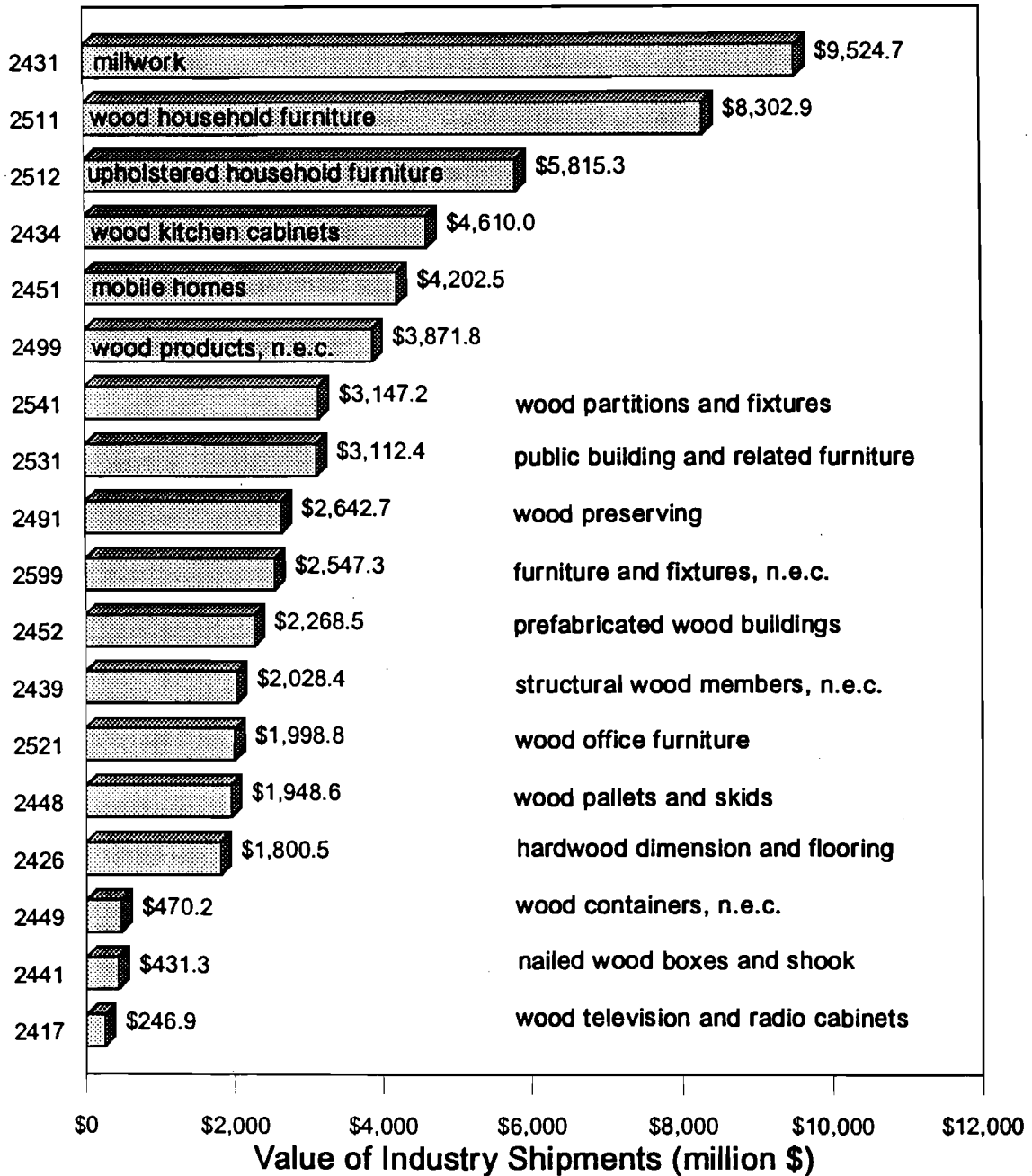


Figure 1. Secondary Forest Products Industry Value of Shipments, 1990.

household furniture comprise more than 10% of value of shipments by secondary industries (Figure 1, Table 2).

Of the twenty-five industries comprising the solid wood industry (Table 1), millwork ranks third in value of products shipped and is surpassed only by logging (SIC 2411) and sawmills and planing mills (SIC 2421).

**Table 2. Secondary Forest Products Industry Value of Shipments, 1990.**

SIC Code	Description	Value of Industry Shipments (million \$)	Percentage of Total Shipments
2426	Hardwood dimension and flooring	1,800.5	3.1%
2431	Millwork	9,524.7	16.2%
2434	Wood kitchen cabinets	4,610.0	7.8%
2439	Structural wood members, n.e.c.	2,028.4	3.4%
2441	Nailed wood boxes and shoo	431.3	0.7%
2448	Wood pallets and skids	1,948.6	3.3%
2449	Wood containers, n.e.c.	470.2	0.8%
2451	Mobile homes	4,202.5	7.1%
2452	Prefabricated wood buildings	2,268.5	3.8%
2491	Wood preserving	2,642.7	4.5%
2499	Wood products, n.e.c.	3,871.8	6.6%
2511	Wood household furniture	8,302.9	14.1%
2512	Upholstered household furniture	5,815.3	9.9%
2417	Wood television and radio cabinets	246.9	0.4%
2521	Wood office furniture	1,998.8	3.4%
2531	Public building and related furniture	3,112.4	5.3%
2541	Wood partitions and fixtures	3,147.2	5.3%
2599	Furniture and fixtures, n.e.c.	2,547.3	4.3%
	Total	58,970.0	100.0%

Source: Department of Commerce, Annual Survey of Manufactures.

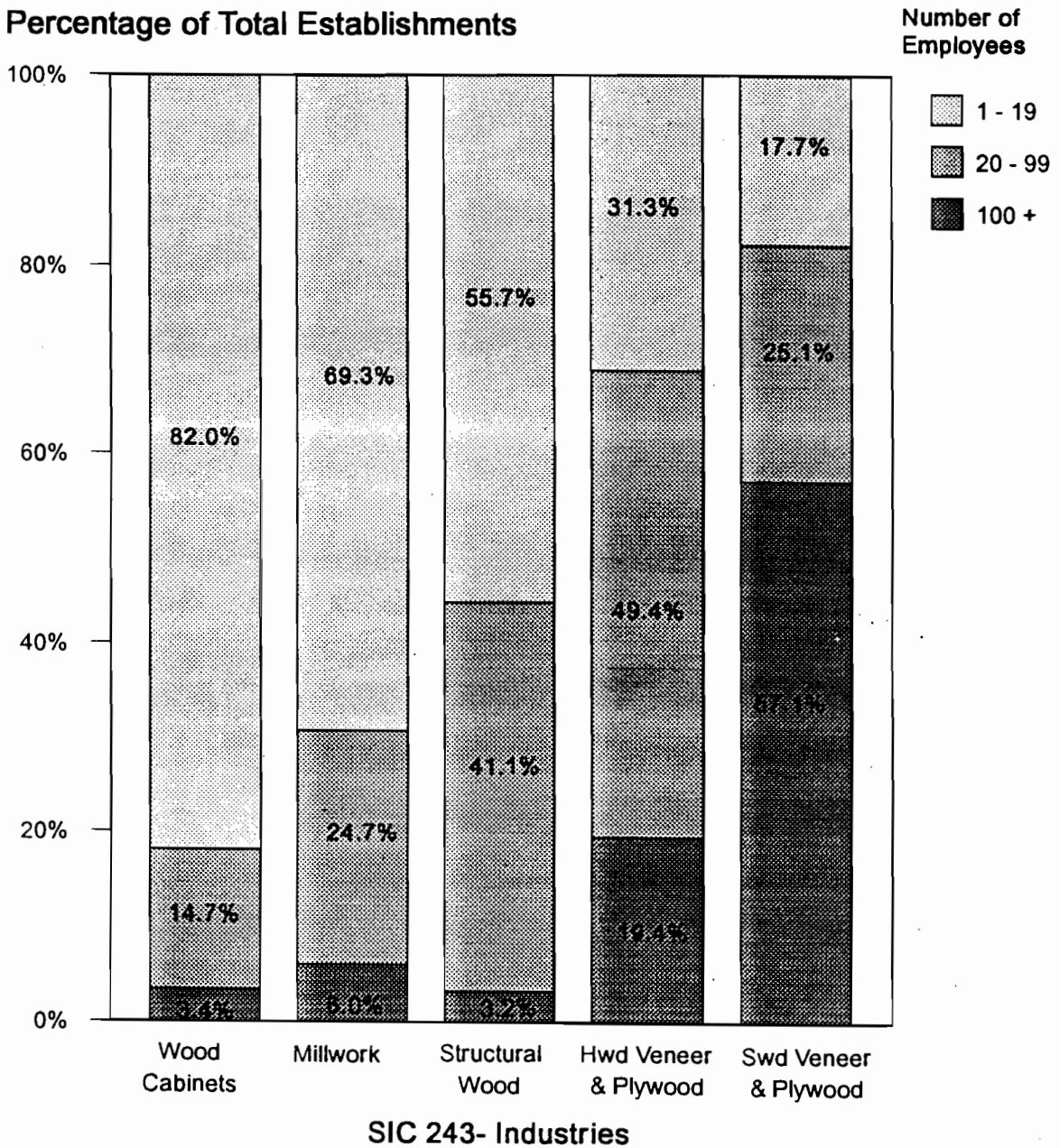
Tables 3-5 and Figure 2 summarize 1987 Census data and selected ratios for SIC 243. The SIC 243 group includes two primary and three secondary solid wood industries (Table 1).

The more specialized secondary industries contain establishments that are more numerous and much smaller than the primary industries. The number of companies, as well as the number of establishments, decreases as the industry's level of product specialization decreases. Several statistics in Tables 3-4 and the average value of depreciable assets per firm (Table 5) are related to establishment size. Gross book value of depreciable assets is used as an indicator of an establishment's fair market value or replacement cost.

Table 3 fails to reveal any distinct association between selected ratios (payroll per employee, production worker proportion, average worker earnings, cost of materials percent, or value-added per worker hour) and degree of product specialization. The millwork industry is noted for



## Percentage of Total Establishments



Source: Department of Commerce, Census of Manufactures, 1987.

Figure 2. Percentage of Establishments by Employee Size Class for SIC 243 Industries

**Table 3. SIC 243-Industry Group: Select Summary Statistics, 1987.**

Item	unit	Wood Kitchen Cabinets	Millwork	Structural Wood Members	Hardwood Veneer and Plywood	Softwood Veneer and Plywood
<u>Companies</u>	no.	3,642	2,639	831	274	130
<u>Establishments</u>	"	3,713	2,782	893	310	231
1-19 employees	"	3,045	1,927	497	97	41
20-99 employees	"	544	688	367	153	58
100+ employees	"	124	167	29	60	132
<u>Employees</u>	1,000	67.0	89.0	24.6	20.5	38.9
Prod. Workers/Estab.	"	53.7	71.6	18.5	17.4	35.1
Prod'n Workers	%	80	80	75	85	90
<u>Wages</u>	mil \$	833.3	1,302.8	272.3	246.4	766.6
Avg. Wage	"	7.72	9.27	7.76	7.00	9.97
<u>Value Added by Mfg</u>	"	2,495.1	3,932.1	770.8	750.6	1,956.0
Value-added per prod'n worker hour	"	23.12	27.97	21.96	21.32	25.44
<u>Total Value of Shipments</u>	"	4,376.6	9,325.9	1,928.8	2,058.1	4,926.0
primary products	"	4,129.2	8,459.4	1,794.4	1,754.8	4,192.5
secondary products	"	151.7	399.7	49.8	149.6	603.9
misc. receipts	"	95.7	466.8	84.6	153.8	129.6
<u>Payroll/employee</u>	"	17.7	20.3	17.7	16.6	22.8
<u>Cost of materials</u>	%	44	59	60	64	60

Source: Department of Commerce, 1987 Census of Manufactures.

**Table 4. SIC 243-Distribution Establishments by Number of Employees and Total Value of Shipments, 1987.**

Item	Wood Kitchen Cabinets (2434)	Millwork (2431)	Structural Wood Members (2439)	Hardwood Veneer and Plywood (2435)	Softwood Veneer and Plywood (2436)
<u>Establishments</u>					
1-19 employees	82.0%	69.3%	55.7%	31.3%	17.7%
20-99 employees	14.7%	24.7%	41.1%	49.4%	25.1%
100+ employees	3.3%	6.0%	3.2%	19.4%	57.1%
<u>Total Value of Shipments</u>					
principal product	94.3%	90.7%	93.0%	85.3%	85.1%
secondary products	3.5%	4.3%	2.6%	7.3%	12.3%
misc. receipts	2.2%	5.0%	4.4%	7.5%	2.6%

Source: Department of Commerce, Census of Manufactures

relatively high average hourly wage and having the highest value added per production worker hour among the 5-industry groups.

Table 4 indicates a tendency for the two primary industries also to manufacture secondary products. Examples would be a sawmill that produces moldings in its planer mill and a plywood establishment using a portion of its output as raw material for producing retail knock-down shelving or applying specialized paper overlays.

**Table 5. SIC 243-Industry Group Average Value of Depreciable Assets per Establishment, 1987 (\$000).**

Item	Wood Kitchen Cabinets	Millwork	Structural Wood Members	Hardwood Veneer and Plywood	Softwood Veneer and Plywood
<u>Beginning of year</u>	208	547	553	1,554	9,439
New capital expenditures	27	66	52	101	477
Used capital expenditures	4	7	9	17	38
Retirements	4	13	14	69	265
<u>End of year</u>	236	607	600	1,603	9,688

Source: Department of Commerce, Census of Manufactures

## 2. MILLWORK INDUSTRY: GENERAL NATIONAL TRENDS

### Number of Establishments

The millwork industry increased from 2,381 establishments in 1947 to 3,770 establishments in 1963 (Table 6, Figure 3). After kitchen cabinets were placed in a separate SIC category, the next Census, in 1967, showed 3342 establishments. Millwork numbers declined to a low of 2321 in 1982 but recovered to 2,782 establishments in 1987.

Millwork shipments and the number of millwork establishments are highly dependent upon new housing starts which account for 48% of millwork consumption (Business Trend Analysts, 1987). Small establishments (less than 20 employees), which comprise 69.3% of establishments, experience the greatest fluctuation in absolute numbers and percent change. One can speculate that there may be relatively lower barriers to entry and exit for the small, less capital intensive establishments.

Due to the cyclical nature of millwork employment and wide fluctuations in the number of millwork establishments, it is difficult to detect trends in industrial concentration. For example, the percentage of large firms has only changed from 4.2% in 1947 to 6.0% in 1987.

Table 6. Millwork Industry General Statistics, 1939, 1947, 1949-1990<sup>1</sup>.

Year	# Estab.	Establishments with an Average of			Value All Employees		Production Workers		Value Added by Mfgr. (Mil \$)	Cost of Ma- terials (Mil \$)	Value of Ship- ments (Mil \$)
		1-19 Emp	20-99 Emp	100+ Emp	No. (1000)	Payroll (Mil \$)	No. (1000)	Wages (Mil \$)			
1939	2,260	NA	NA	NA	NA	NA	41.5	47.2	103.4	113.7	217.0
1947	2,381	1,692	520	100	59.8	162.1	51.9	128.7	266.5	279.8	546.2
1949	NA	NA	NA	NA	62.5	189.4	52.5	142.5	272.4	319.4	591.8
1950	NA	NA	NA	NA	74.1	234.7	62.2	178.5	370.2	435.5	805.7
1951	NA	NA	NA	NA	73.0	254.7	62.2	195.3	399.7	486.7	886.4
1952	NA	NA	NA	NA	69.4	253.8	58.1	191.7	380.8	460.9	840.4
1953	NA	NA	NA	NA	70.3	263.7	58.1	201.1	388.0	474.4	862.4
1954	3,348	2,617	611	120	68.7	258.2	55.7	188.2	408.5	608.5	1,011.3
1955	NA	NA	NA	NA	73.8	287.0	60.6	211.5	454.3	597.6	1,010.8
1956	NA	NA	NA	NA	71.5	289.4	57.6	208.6	444.6	566.8	979.3
1957	NA	NA	NA	NA	69.0	281.3	54.9	200.8	419.7	529.2	916.8
1958	3,163	2,425	607	106	62.0	268.0	50.3	196.9	412.5	639.3	1,049.6
1959	NA	NA	NA	NA	65.1	290.2	57.0	214.3	411.9	720.7	1,161.2
1960	NA	NA	NA	NA	60.3	270.0	52.1	196.1	395.2	661.5	1,066.3
1961	NA	NA	NA	NA	58.5	266.7	50.4	194.5	400.9	644.2	1,045.6
1962	NA	NA	NA	NA	59.0	276.0	51.0	200.3	424.8	672.9	1,094.5
1963	3,770	3,022	625	113	65.3	320.8	53.5	240.7	524.0	749.7	1,270.6
1964	NA	NA	NA	NA	66.6	334.2	54.1	247.2	556.5	793.7	1,348.2
1965	NA	NA	NA	NA	65.8	345.3	53.9	253.4	558.2	831.0	1,392.2
1966	NA	NA	NA	NA	62.8	342.3	51.1	249.7	544.4	801.2	1,344.6
1967	3,342	2,575	645	122	64.8	373.0	53.9	274.1	636.4	840.2	1,472.4
1968	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,336.5
1969	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,849.5
1970	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,446.6
1971	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,751.0
1972	2,434	1,714	573	147	70.5	524.5	58.4	383.6	962.7	1,485.4	2,426.8
1973	NA	NA	NA	NA	72.0	567.6	51.5	418.0	1,087.9	1,715.6	2,756.6
1974	NA	NA	NA	NA	59.1	517.3	48.1	367.9	923.1	1,544.1	2,471.3
1975	NA	NA	NA	NA	54.8	538.1	44.3	375.2	1,028.6	1,486.7	2,499.5
1976	NA	NA	NA	NA	60.5	633.0	49.8	459.2	1,276.0	1,946.0	3,185.7
1977	2,333	1,641	546	146	68.6	742.2	56.6	542.0	1,497.9	2,460.4	3,928.1
1978	NA	NA	NA	NA	72.0	835.7	59.5	608.9	1,798.8	2,872.2	4,617.1
1979	NA	NA	NA	NA	73.0	893.1	59.4	650.2	1,960.2	2,971.6	4,898.0
1980	NA	NA	NA	NA	65.5	876.7	51.9	620.4	1,770.6	2,787.6	4,569.0
1981	NA	NA	NA	NA	65.2	944.8	52.2	672.1	1,924.5	2,951.0	4,859.7
1982	2,321	1,679	538	104	56.8	859.4	44.7	645.6	1,712.5	2,502.0	4,248.3
1983	NA	NA	NA	NA	67.9	1,125.6	54.7	819.4	2,268.7	3,437.6	5,627.3
1984	NA	NA	NA	NA	74.1	1,277.0	60.3	905.8	2,641.5	3,860.8	6,489.3
1985	NA	NA	NA	NA	73.1	1,359.5	59.2	961.2	2,637.6	4,186.7	6,812.8
1986	NA	NA	NA	NA	77.2	1,493.4	61.1	1,054.9	3,091.0	4,692.9	7,748.9
1987	2,782	1,927	688	167	89.0	1,809.8	71.6	1,302.8	3,932.1	5,467.2	9,325.9
1988	NA	NA	NA	NA	90.7	2,013.7	73.0	1,464.1	3,899.6	5,553.1	9,385.2
1989	NA	NA	NA	NA	90.9	1,976.7	73.5	1,433.2	3,864.7	5,755.1	9,654.3
1990	NA	NA	NA	NA	90.5	1,960.9	72.1	1,377.5	3,851.6	5,655.3	9,524.7
1991	NA	NA	NA	NA	84.9	1,835.9	66.7	1,304.1	3,732.9	5,235.4	8,969.4

Source: Department of Commerce

<sup>1</sup>An explanation of symbols and terms used in this, and other Department of Commerce-sourced tables is found in Appendix A. All values, unless otherwise noted are actual (not adjusted) values.

## **Employment**

Table 6 and Figure 4 present trends in total millwork employment and millwork establishments. The number of employees per establishment reached a low of 17.3 in 1967. In 1987, average employment was 32.0 employees per establishment. Total industry employment reached record levels of about 90000 starting in 1987 and peaked in 1989 with 90,900 employees.

Production worker employment fluctuates more than staff employment in both absolute and relative terms. The aberration in the number of staff employees appearing in the 1973 Annual Survey of Manufactures (ASM), is unexplainable. The staff to production worker ratio has remained relatively constant in the past 43 years, it is currently 1:4.5.

## **Value of Shipments and Cost of Materials**

Figures 5 and 6 present the millwork industry's cost of materials and value of shipments in nominal and real dollars, respectively. Real dollars are based on the US Department of Labor Producer Price Index (PPI).

Value of shipments represent the received or receivable net selling values, f.o.b. plant and includes the value of primary and secondary products, as well as miscellaneous receipts for contract work, etc. Cost of materials includes the raw materials employed in the production process plus other direct charges such as freight, fuel, etc., incurred in the procurement process. As of 1987, cost of materials represented 59% of the total value of shipments. In the 16 years the Department has been reporting this figure, it has remained relatively constant, ranging between 59% and 63%.

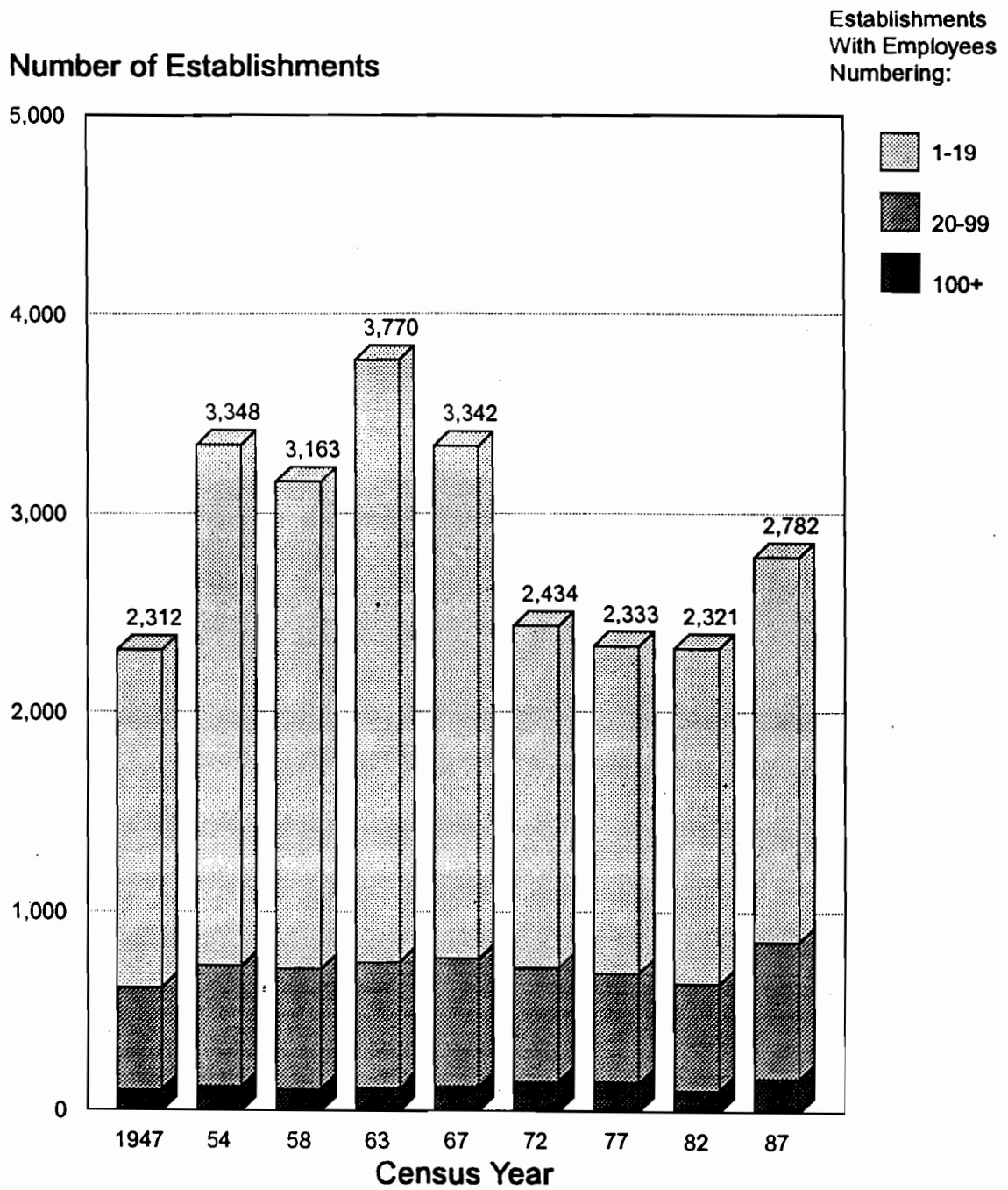
### **3. MILLWORK SHIPMENTS BY PRODUCT, APPLICATIONS IN NEW HOUSING AND RAW MATERIALS CONSUMPTION**

#### **Industry Product Mix**

The Census presents shipment data for four millwork product aggregates: doors, windows, moldings, and other millwork products. Table 7 summarizes shipments of these products since 1967. Although millwork product shipments are classified by the Census in greater detail, similar detail is not available for exports and imports (Appendix A). Consequently, this report maintains a level of aggregation appropriate for comparing shipments, exports, and imports.

#### **Doors**

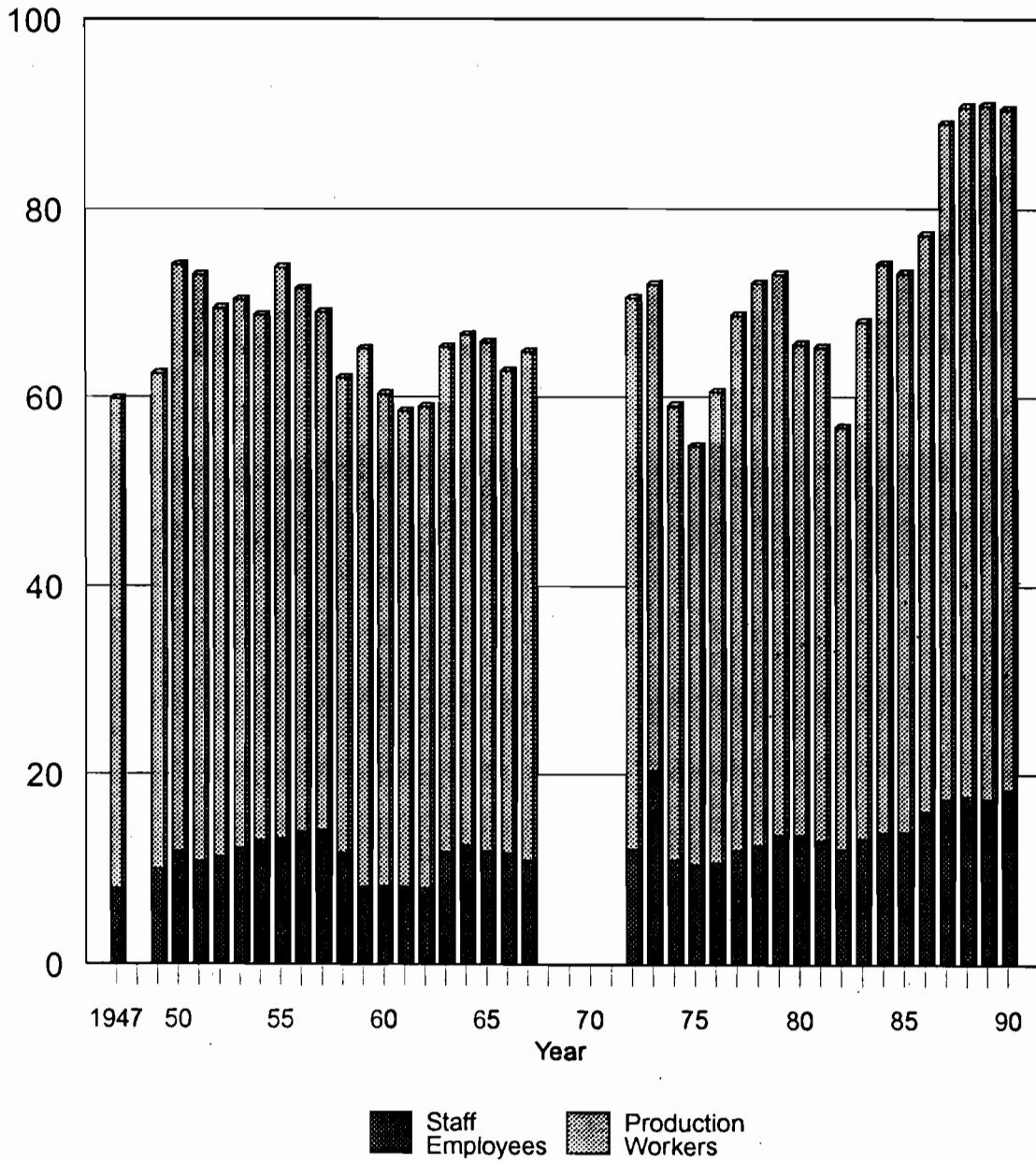
Doors have always been the largest segment of the millwork industry. However, the door share of total shipments has declined from between 35-40% to about 32%. Seventy-five percent of all wood doors are consumed in new construction. The balance, 25%, is used in the repair and remodel industry (Anderson and McKeever, 1988).



Source: Department of Commerce, Census of Manufactures.

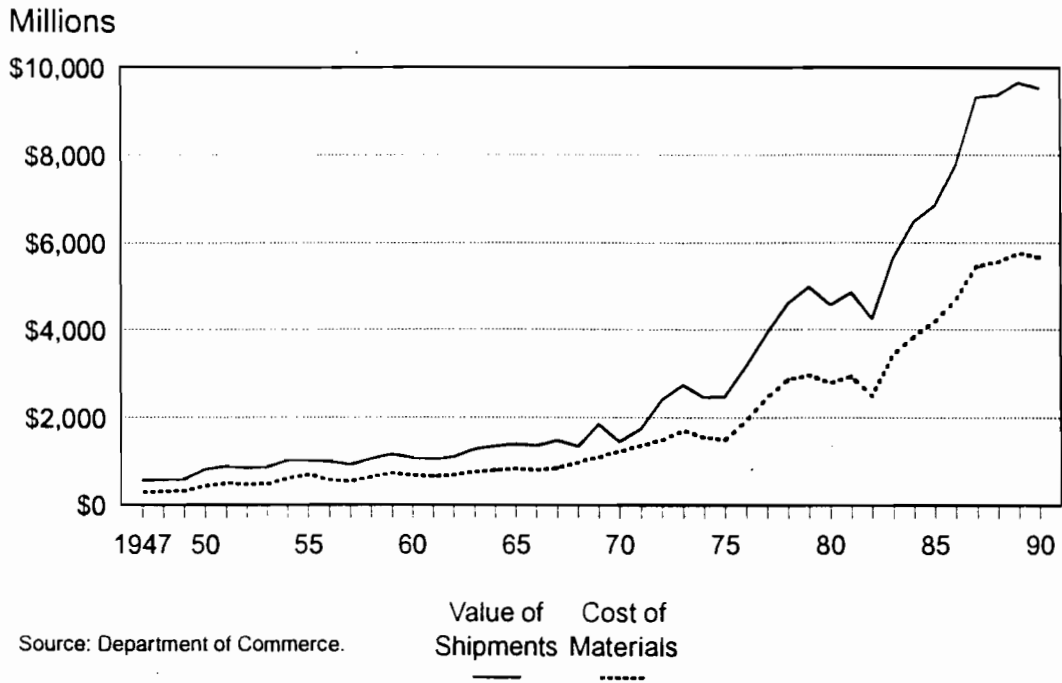
**Figure 3. Millwork Establishments by Employee Size Class, Census Years 1947-1987.**

Number of Employees (000)

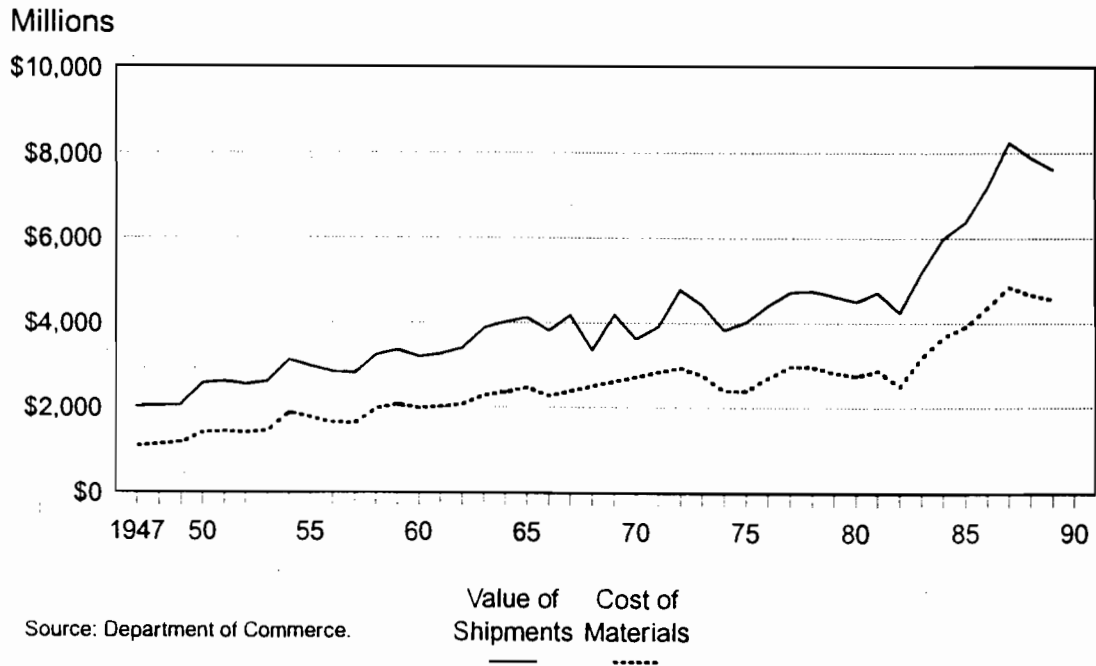


Source: Department of Commerce, Census of Manufactures.

Figure 4. Millwork Employment, 1947-1990.



**Figure 5. Cost of Materials and Value of Shipments in Nominal Dollars, 1947-1990.**



**Figure 6. Cost of Materials and Value of Shipments in Real Dollars (1982 = 100), 1947-1990.**



Table 7. Millwork Product Shipments, 1967-1991 Nominal Dollars.

Year	Doors <sup>1</sup>		Windows <sup>2</sup>		Moldings <sup>3</sup>		Other Millwork Products <sup>4</sup>		Total
	(Mil \$)	% of Total	(Mil \$)	% of Total	(Mil \$)	% of Total	(Mil \$)	% of Total	
1967	448.1	37.2	210.5	17.5	195.7	16.3	349.3	29.0	1,203.6
1968	522.2	39.1	245.4	18.4	232.2	17.4	336.8	25.2	1,336.6
1968	574.2	38.5	256.4	17.2	287.5	19.3	371.4	24.9	1,489.5
1970	518.9	35.9	224.4	15.5	296.7	20.5	406.6	28.1	1,446.6
1971	594.2	33.9	305.2	17.4	365.6	20.9	486.0	27.8	1,751.0
1972	813.0	38.2	294.9	13.8	480.9	22.6	540.9	25.4	2,129.7
1973	1,009.8	39.3	444.7	17.3	517.2	20.1	595.1	23.2	2,566.8
1974	833.3	37.8	461.1	20.9	442.0	20.1	467.0	21.2	2,203.4
1975	849.4	38.1	525.2	23.5	406.1	18.2	450.6	20.2	2,231.3
1976	1,045.3	36.5	744.5	26.0	572.6	20.0	497.9	17.4	2,860.3
1977	1,346.8	36.5	809.1	21.9	644.1	17.4	893.4	24.2	3,693.4
1978	1,644.5	37.5	960.2	21.9	868.6	19.8	916.9	20.9	4,390.2
1979	1,641.6	36.3	994.7	22.0	839.8	18.6	1,049.4	23.2	4,525.5
1980	1,527.1	37.1	841.0	20.4	749.3	18.2	998.5	24.3	4,115.9
1981	1,503.5	34.8	924.9	21.4	759.3	17.6	1,137.0	26.3	4,324.7
1982	1,381.6	34.6	819.3	20.5	607.0	15.2	1,180.6	29.6	3,988.5
1983	1,745.3	32.9	1,263.9	23.8	906.5	17.1	1,385.4	26.1	5,301.1
1984	1,887.2	33.3	1,336.2	23.6	963.1	17.0	1,478.6	26.1	5,665.1
1985	1,974.0	33.7	1,379.0	23.5	984.8	16.8	1,524.1	26.0	5,861.9
1986	2,337.3	32.2	1,846.2	24.9	1,099.0	15.3	2,043.4	27.6	7,325.9
1987	2,700.6	30.7	2,313.4	26.3	1,213.1	13.8	2,562.7	29.1	8,788.9
1988	2,738.5	30.5	2,356.6	26.3	1,206.9	13.5	2,671.2	29.8	8,973.2
1989	2,937.6	31.9	2,490.8	27.0	1,091.3	11.8	2,703.4	29.3	9,223.1
1990	2,930.5	32.4	2,507.4	27.7	1,067.2	11.8	2,547.1	28.1	9,052.2
1991	2,703.6	32.1	2,402.6	28.2	1,050.1	12.4	2,307.5	27.3	8,463.9

<sup>1</sup>SIC 2431315, 50% of SIC 2431300, SIC 24314, SIC 24315

<sup>2</sup>SIC 24311, SIC 24312, SIC 24313 (except 2431315 and 50% of 2431300)

<sup>3</sup>SIC 24316, SIC 24317

<sup>4</sup>SIC 24318, SIC 24310

**Note:** Total value of shipments of these products is less than the value of all shipments (Table 6), which includes value of resales, contract receipts, sales of residues, *etc.*

Source: US Department of Commerce

**Table 8. Wood Raw Material Consumption per Interior Door, 1988.**

Wood Raw Material	Basis	Unit	Type of Door				
			Wood		Hardboard		Non-wood
			Flush	Panel	Flush	Panel	
lumber <sup>1</sup>	NA	bd. ft.	23.0	28.5	16.9	23.5	trace
structural panels	3/8"	sq. ft.	1.1	-	-	-	-
hardwood plywood	1/8"	"	28.1	-	-	-	-
hardboard	1/8"	"	-	-	31.2	32.7	-
particleboard	3/4"	"	2.2	-	1.9	-	-

<sup>1</sup>Includes 7.8 board feet for door jam and trim.

Source: Anderson and McKeever, 1988

**Table 9. Wood Raw Material Consumption in Exterior Doors by Type, 1988.**

Wood Raw Material	Basis	Unit	Type of Door		
			Flush Doors		Wood Panel Doors
			solid core	hollow core	
lumber <sup>1</sup>	NA	board feet	26.1	28.6	49.0
-softwood plywood	3/8"	square feet	1.3	1.3	-
hardwood plywood	1/8"	"	36.0	36.0	-
particleboard	3/4"	"	27.4	-	-

<sup>1</sup>Includes 14.4 board feet for door jam and trim.

Source: Anderson and McKeever, 1988

**Table 10. Per Parking Space Lumber & Panel Use For Wood Garage Doors, 1988.**

Wood Raw Material	Basis	Unit	Wood Garage Door Type			
			All Wood	Wood & Softwood Plywood	Wood & Hardwood Plywood	Wood & Hardboard
lumber	NA	bd. ft.	60.0	22.0	22.0	22.0
softwood plywood	3/8"	sq. ft.	-	32.5	-	-
hardwood plywood	1/8"	"	-	-	97.5	-
hardboard	1/8"	"	-	-	-	138.0

Source: Anderson and McKeever, 1988

**Table 11. Window Raw Material Preference and Lumber Use in Wood Windows by Region.**

Raw Material	Region		US West	Lumber Use Average	million board feet
	North	South			
Wood	69%	44%	32%	49%	43
Metal	16%	53%	66%	44%	34
Vinyl	15%	3%	2%	7%	14
	100%	100%	100%	100%	91

Source: Anderson and McKeever, 1988

**Interior Doors:** The average single family house built in 1988 was constructed with 15.6 interior doors (Anderson and McKeever, 1988). Ninety-nine percent of all interior doors constructed that year were made of wood or wood products. Interior doors made of wood or wood products are typically classified into two subgroups: 1) wood interior doors; made of lumber, softwood plywood, or hardwood plywood, and 2) hardboard interior doors; made of hardboard skins and a lumber frame. The former subgroup comprises 73% of the interior door market, the latter, 26%. The remaining 1% of interior doors are made of non-wood products. Consumption of raw materials for each type is interior door is presented in Table 8.

**Exterior Doors:** Excluding garage doors, an average house has 3.3 exterior doors. Wood doors are used 41% of the time with sliding glass and steel doors constituting the remainder (Anderson and McKeever, 1988). Of the wood exterior doors, flush wood doors represent 86% and panel doors 14% of the wood door market. There are two types of flush doors; 75% are solid core and 25% are hollow core. The raw materials used in each type are presented in Table 9.

**Garage Doors:** Approximately 70% of all newly constructed houses are built with a garage and 92% of all garages are built with wood garage doors. An average garage on a single family house contains 1.6 parking spaces. Table 10 identifies the volume of wood raw material used in each wood garage door type. Garage construction trends have changed little since the mid-1970's.

## **Windows**

The window share of millwork shipments increased from 17.5% in 1967 to 28.2% in 1991. The total value of wood window production has increased despite widespread competition from non-wood windows. An average single family house contains 16.4 windows. In 1988, half of the windows used in single family construction were wood, 44% were metal (primarily aluminum) and 7% vinyl (Anderson and McKeever, 1988). Both metal and vinyl windows frequently include some wood as part of the construction. Regional window material preferences are presented in Table 11. The North is the only region where wood is the preferred material for new single family houses.

New residential construction accounts for 40% of the total window market. More than half (56%) of all windows are used in repair and remodel activity. The remaining 4% is used in new commercial construction (Business Trend Analysts, 1986).

Window framing material differs markedly depending upon the end use market (Table 12). New residential construction relies more heavily upon metal, and less upon wood and vinyl than does the repair and remodel market.

## **Molding**

After reaching a high of 22.6% in 1972, the molding share of millwork shipments declined to 12.4% in 1991. A trend toward less use of molding in new residential construction may partially

**Table 12. Window Framing Mix For Residential Construction and Repair & Remodel Industry.**

Window Framing Material	New Residential Construction	Repair & Remodel Industry
Wood	32.3%	43.9%
Metal	61.9%	35.9%
PVC	<u>5.8%</u>	<u>20.2%</u>
	100.0%	100.0%

Source: Business Trend Analysts, 1986

explain this decrease. According to Anderson and McKeever (1988), the biggest competition to wood molding is no molding at all. Compared to other millwork products, moldings sustain the most intense competition from foreign producers. Wood moldings and carvings have recently been the single largest category of imported millwork products: another possible cause for the decrease of domestic shipments (Anderson and McKeever, 1988).

When molding is used, it is almost always wood; 72% of all wood moldings used in new multifamily construction were made of softwood, 28% were hardwood (Anderson and McKeever 1988). It is estimated that a new residential house uses 0.098 board feet of molding for every square foot of floor space (Anderson and McKeever, 1988). Since an average single-family house contains approximately 1,746 square feet of floor space, total molding consumption would be 171 board feet.

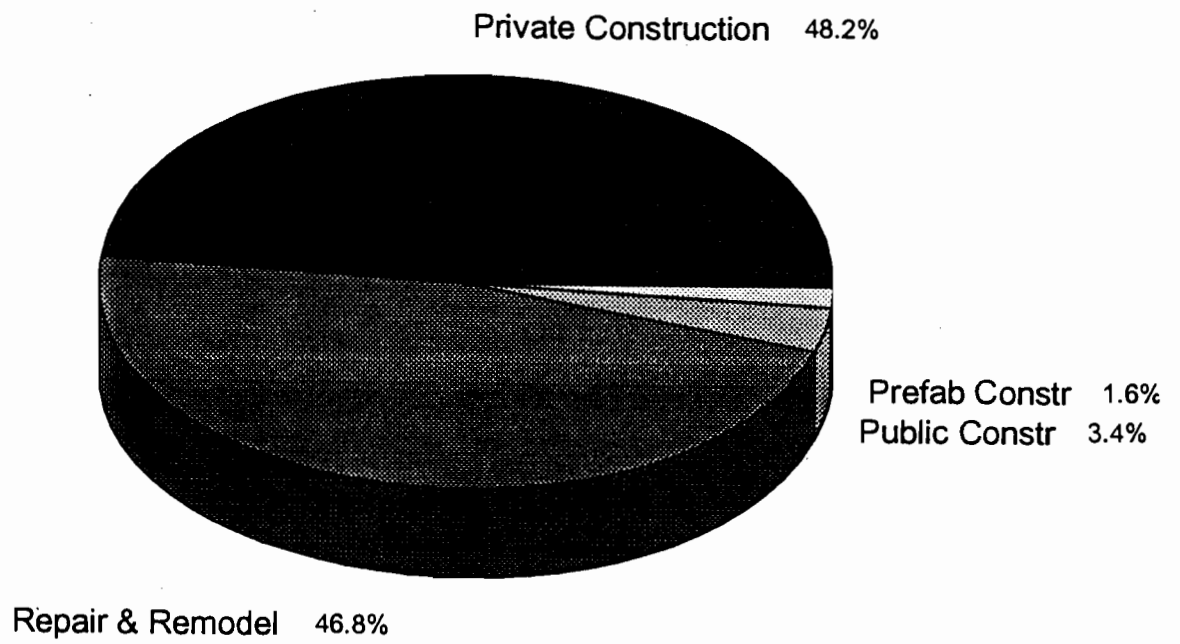
### Stairways

At least one stairway was built in 66% of all single family houses constructed in 1988 (Table 13). The most important factors determining the occurrence of stairways are the type of foundation and number of stories. Table 14 identifies material use in stairways which are typically made with three wood stringers and are usually 36" or 48" wide. The most common wood raw material used for the treads and risers is lumber, followed by particleboard, and OSB. Nonwood materials account for only 5% of stairways.

**Table 13. Percentage of Single Family Houses With Stairways by Number of Stairways.**

Number of Stairways	Percentage of Single Family Houses With Stairways
0	34%
1	39%
2	23%
3	3%
≥4	<u>1%</u>
	100%

Source: Anderson and McKeever, 1988



Source: Business Trend Analysts.

**Figure 7. Major End-Use Markets for Millwork Products.**

**Table 14. Materials Used for Stairway Treads and Risers in Single Family Houses, 1988.**

Material	Percentage of Stairways
Wood	
lumber	59%
particleboard	7%
plywood/OSB	6%
Non-wood	
steel	3%
concrete	24%
other	<u>1%</u>
Total	100%

Source: Anderson and McKeever, 1988

### **Other Millwork**

The percentage share of "other millwork products" declined from 29% in 1967 to 17.4% in 1976. Since then it has recovered to the 1967 level (Table 7). Very little detail is available on this category although the 1987 Census of Manufactures reports that stairwork products represent 9.6% of the this category. This would be about 2.8% of all millwork shipments that year.

### **Millwork Raw Material Consumption by Major End-Use Market**

Figure 7 presents the major markets for millwork products. More than 95% of shipments enter into the new construction and repair and remodel markets.

**New Residential Construction:** The Department of Commerce reports that 1,085,000 single family houses and 445,000 multifamily units were constructed in 1988. Figure 8 shows that new housing is the largest (48.2%) market for millwork, closely followed by repair and remodel (46.8%). Table 15 presents the average consumption of wood products per housing unit (Anderson and McKeever 1988). Although wood use patterns in single and multiple family housing are somewhat different, they have been aggregated in the table. Furthermore, cabinets have been combined with millwork. One can assume that a large share of the structural and nonstructural panel volumes listed for millwork are in reality cabinets.

Of the 19.7 billion board feet of lumber consumed by the residential construction market in 1988, only 7.4% (1.5 billion board feet) was used in millwork which is the smallest application of lumber.

Use of structural panels in new residential construction is heavily concentrated in roofing (35.5%) and flooring (34.8%) applications. Millwork applications involve only a very small use (0.9%) of structural panels.

**Table 15. Lumber, Structural Panel, and Non-Structural Panel Consumption in New Residential Construction, 1988; Per Unit of Combined Single and Multiple-Family Housing**

Application	Lumber		Structural Panel (3/8" basis)		Non-Structural Panel (3/8" basis)	
	Bd Ft/Unit	% of Total	Sq Ft/Unit	% of Total	Sq Ft/Unit	% of Total
floors	2,501	19.4	2,440	35.4	438	17.9
garages, decks	1,584	12.3	528	7.7	198	8.1
millwork (incl. cabinets)	952	7.4	61	0.9	1,095	44.8
roof	2,990	23.2	2,448	35.5	90	3.7
walls	4,842	37.6	1,420	20.6	624	25.5
Total	12,869	100.0	6,898	100.0	2,444	100.0

Source: Anderson and McKeever, 1988

In contrast to lumber and structural panels, consumption of non-structural panels is heavily concentrated in millwork applications. In 1988, 3.74 billion square feet (3/8" basis) of non-structural wood panels were consumed in the new residential construction market of which 44.8% (1.68 billion square feet) was used in millwork products. It is likely that a large percentage of this nonstructural panel consumption is, in reality, cabinetry. The majority, 54.1%, of all nonstructural panel consumption in new residential construction is particleboard (Table 16). Slightly more than two-thirds of particleboard is used in millwork applications with the balance used in flooring.

**Table 16. Nonstructural Wood Panel Consumption in New Residential Construction; Square Feet--3/8" basis, 1988; Per Unit of Combined Single and Multiple-Family Housing.**

Application	Particleboard	Fiberboard	Hardboard	Hardwood Plywood	Total
floors	431.4	-	3.3	3.3	437.9
garages, decks	-	98.0	100.0	-	198.0
millwork (incl. cabinets)	891.5	-	57.5	146.4	1,094.8
roof	-	50.3	39.2	-	89.5
walls	-	303.3	320.3	-	623.5
Total	1,322.9	451.6	520.3	149.7	2,443.8

Source: Anderson and McKeever, 1988

Only 11.1% of hardboard, the second most common nonstructural wood panel, is used in millwork products, and essentially no fiberboard is used as millwork. However, nearly all (97.8%) of the hardwood plywood consumed in a new house is used in millwork applications. An unknown portion of hardwood plywood use may be attributable to cabinet production, an activity no longer considered a component of the millwork industry by the US Department of Commerce.

**Other millwork markets:** Although new residential construction is the largest market for the millwork products and insight can be gained by analyzing residential consumption patterns, two other markets, repair and remodel and exporting, are growing in importance. Consumption by

the repair and remodel market is almost as large as new housing (Figure 7) and exports are an important market. Unfortunately no research has been done on consumption patterns of specific products within the repair and remodel market.

### Aggregate Raw Material Consumption

The US Department of Commerce is the only known source of information on raw materials consumed by the millwork industry. Unfortunately, most data available are for the value rather than quantities used. In 1987, the millwork industry spent \$5.058 billion on raw materials, parts, and supplies (Figure 8). Of this, 95.4% was purchased or transferred from domestic sources. Of this total expenditure 42.7% (\$2.160 billion) was for wood raw materials (Table 17). The remainder of expenditures include hardware (5.3%), boxes and containers (0.8%), all other materials and components, parts, containers, and supplies (22.7%), and materials, parts, and supplies not specified by kind (26.6%).

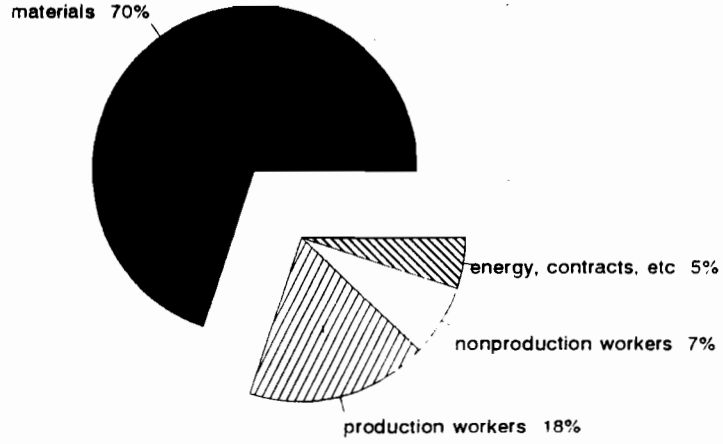
**Table 17. US Millwork Industry Wood Raw Material Breakdown, Delivered Cost and Percentage of Total Raw Material Costs, 1987.**

Wood Raw Material Item	Delivered Cost (mil \$)	% of Total
logs, bolts and unsliced flitches		
softwood	7.9	0.4
hardwood	-	-
Subtotal	7.9	0.4
lumber		
softwood	1,528.5	70.8
hardwood	313.1	14.5
Subtotal	1,841.6	85.3
plywood		
softwood	28.1	1.3
hardwood	59.6	2.8
Subtotal	87.7	4.1
veneer		
softwood	-	-
hardwood	118.5	5.5
Subtotal	118.5	5.5
reconstituted wood products		
particleboard	39.6	1.8
hardboard	43.5	2.0
MDF	20.7	1.0
Subtotal	103.8	4.8
Total	2,159.5	100.0

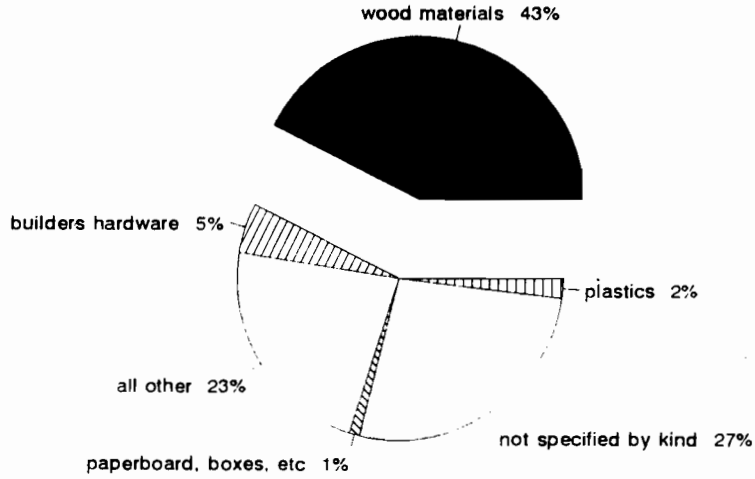
Source: Department of Commerce, 1987 Census of Manufactures



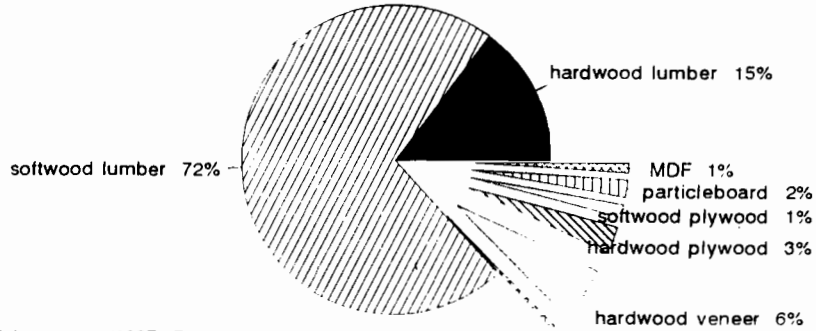
A. \$7,277 Million Cost of Materials & Labor



B. \$5,058 Million Cost of Materials, Parts & Supplies



C. \$2,160 Million Cost of Wood Raw Materials



Source: US Department of Commerce (1987) Census of Manufacturers.

Figure 8. Cost Structure of the US Millwork Industry, 1987.

According to Table 17, softwood lumber dominates (70.8%) the expenditures for wood materials, followed by hardwood lumber (14.5%). It is interesting to note that the millwork industry spent more on purchases of plastics (\$94.0 million) than for plywood (\$87.7 million).

#### 4. REGIONAL AND STATE ANALYSIS

As New England's timber resources became depleted, the timber industry, as well as the millwork industry, moved to the Lake States in the late 1800's to utilize that region's vast pineries. Since railroad access was initially limited, the Mississippi River and its major tributaries were used to transport the Eastern white pine logs from their source in Minnesota, Wisconsin, and Michigan closer to their markets. Hence, in the late 19th and early 20th century, the millwork industry was concentrated along the Mississippi River system (Sherrill, 1987). As the national railroad network expanded and supplies of Eastern white pine declined, the Pacific Coast states became a significant millwork producing region in the early part of this century. The introduction of plywood at Lewis and Clark exposition in 1905 in Portland, Oregon, stimulated growth of the west coast millwork industry by providing a durable panel for door construction (Sherrill, 1987). The Pacific Coast states have gained a dominant role and eastern US millwork production has shifted slightly to the Northeastern states. The South has also become an increasingly important millwork producing region.

Since 1947, California has led the nation in millwork, consistently accounting for approximately 12% of the total value of shipments (Table 18). Wisconsin, which currently ranks second, has been one of the top 5 ranking states over the past 40 years. It is the last of the Great Lakes region states to remain in the top 5. Oregon's millwork industry has grown steadily and currently ranks as the third largest millwork producing state.

**Table 18. Top Five Millwork Producing States--1947, 1967, and 1987.**

Rank	1947			1967			1987		
	State	Value of Shipments (mil \$)	% of Total Shipments	State	Value of Shipments (mil \$)	% of Total Shipments	State	Value of Shipments (mil \$)	% of Total Shipments
1	CA	66.7	12.7	CA	180.0	12.2	CA	1,095.2	11.7
2	WA	62.6	11.9	WI	125.0	8.5	WI	703.8	7.5
3	WI	37.1	7.0	TX	94.0	6.4	OR	683.0	7.3
4	IL	31.8	6.0	OR	84.7	5.8	NY	312.9	3.4
5	IA	31.2	5.9	NY	81.1	5.5	WA	302.0	3.2

Source: Department of Manufacturers

As can be seen in Table 19, California leads the millwork industry in virtually all categories accounting for 394 (14.2%) of US millwork establishments, 10,500 (11.8%) of all millwork employees, and \$1.1 billion (11.7%) of shipments.

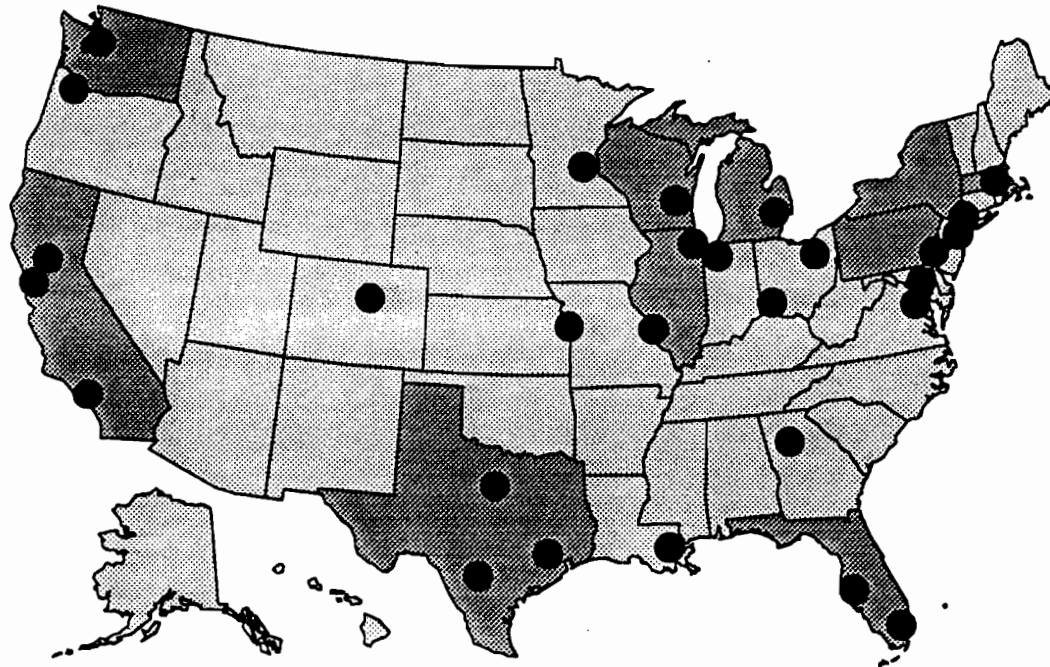
**Table 19. Millwork Industry Statistics for Selected States, 1987.**

	<b>All Establishments Total (#)</b>	<b>Employees or More (#)</b>	<b>All Employees Number (1000)</b>	<b>Production Workers Number (1000)</b>	<b>Value Added By Manufacture (mil \$)</b>	<b>Value of Materials (mil \$)</b>	<b>Shipments (mil \$)</b>
United States	2,782	855	89.0	71.6	3,932.1	5,467.2	9,325.9
Alabama	52	25	2.1	1.7	69.7	120.4	190.7
Arizona	56	22	1.5	1.2	54.2	78.0	131.2
Arkansas	19	7	0.4	0.3	14.5	18.5	33.0
California	394	128	10.5	8.4	401.3	702.3	1,095.2
Colorado	65	13	1.0	0.7	38.9	46.4	84.7
Connecticut	53	10	0.7	0.4	23.0	21.3	44.4
Florida	154	38	2.7	2.2	87.0	139.5	225.8
Georgia	72	14	1.3	1.1	69.5	88.3	157.7
Idaho	19	6	EE	(D)	(D)	(D)	(D)
Illinois	99	31	2.6	2.0	123.2	147.7	272.5
Indiana	61	25	2.3	1.9	82.7	125.9	208.0
Kentucky	26	7	0.6	0.5	29.0	34.1	63.0
Louisiana	35	7	0.4	0.3	11.6	20.1	31.5
Maine	15	5	0.4	0.3	12.9	12.7	25.9
Maryland	42	12	1.2	0.9	46.1	77.1	123.5
Massachusetts	85	23	1.5	1.1	69.0	86.9	155.1
Michigan	93	23	2.1	1.6	86.6	113.2	198.3
Minnesota	43	12	FF	(D)	(D)	(D)	(D)
Mississippi	27	6	0.4	0.4	15.6	29.5	43.3
Missouri	52	14	1.1	0.8	48.2	44.1	90.3
Montana	10	2	0.3	0.2	13.1	13.2	26.1
New Hampshire	27	9	0.8	0.6	42.3	53.7	95.6
New Jersey	60	19	1.2	0.9	51.8	79.5	131.2
New Mexico	19	6	0.3	0.3	15.7	29.7	45.2
New York	154	42	3.4	2.6	139.6	175.2	312.9
North Carolina	84	38	2.1	1.7	83.3	111.8	191.1
Ohio	91	42	FF	(D)	(D)	(D)	(D)
Oregon	84	35	6.6	5.6	222.4	471.2	683.0
Pennsylvania	119	37	2.3	1.7	101.5	174.9	273.6
Rhode Island	16	3	0.3	0.2	13.8	8.9	22.6
South Carolina	27	10	0.6	0.5	23.0	44.8	67.2
Tennessee	45	16	1.3	1.0	47.1	65.6	113.1
Texas	169	45	FF	(D)	(D)	(D)	(D)
Utah	24	3	0.5	0.4	11.1	11.6	22.8
Virginia	57	18	2.4	1.8	110.8	122.3	231.7
Washington	109	35	2.8	2.4	121.8	180.2	302.0
Wisconsin	85	34	7.3	6.0	313.6	392.4	703.8

Source: Department of Commerce, Census of Manufacturers, 1987.

In 1982, half of the country's millwork product shipments was concentrated in six states. Those states, with their corresponding share of total shipment value are:

1. California 12.0%
2. Minnesota 9.8%



- Urbanized Areas With Populations of 1,000,000 or more
- Top Ten States with Most Millwork Establishments

Sources: Census of Manufactures, U.S. Statistical Abstract

**Figure 9. Top Ten Ranked Millwork States Based on Number of Establishments, 1987.**

3. Texas	9.1%
4. Wisconsin	8.6%
5. Oregon	6.6%
6. <u>Washington</u>	<u>4.0%</u>
Total	50.1%

In 1987, it is not clear whether the industry has become more or less diverse since shipment data are lacking for key states such as Texas and Minnesota (Table 19).

The ten states with the highest number of millwork establishments in 1987 are shown in Figure 9 along with the location of urban areas with one million or more inhabitants. The pattern of industry concentration in populous states suggests an industry that may have a localized market focus and which prefers to locate close to the customer rather than close to the raw material base.

## 5. IMPORTS AND EXPORTS OF MILLWORK PRODUCTS

Information presented in this section was obtained from the CINTRAFOR database of US Department of Commerce trade statistics. This section summarizes trade for 1989-1992. The 1989 starting date was chosen since it reflects information collected subsequent to the adoption of the harmonized system of classification. Appendix A presents classification of millwork products. Table 20 presents comparable SIC product class and import/export aggregates used in this report. More detailed statistics, while desirable, are not presented due to lack of comparable detail in the trade vs domestic production statistics.

Data are presented for total US trade in current year dollars. Trade for each year and for the combined four years are summarized by region of the world (Tables 21-31, Figures 10-16). Appendix C presents the organization of countries by region. Detailed trade for each product group and country are not presented in this report; only the principal countries involved in trade in these products will be identified. In addition to dollar value, data are presented on the number of countries with which trade was conducted in any of the four years, the number of countries with which trade occurred in each specific year, and the number of countries with which trade occurred in all four years. These counts provide some indication of the diversity of the markets and degree of consistent or steady trade with established markets. In the discussion of trade with North America, Canada and Mexico are treated individually due to their obvious differences in raw material supplies and their dominance of trade in millwork products. In presenting the US trade data, products produced by another country imported into the US, and then exported from the US without change are ignored. In general, such transshipments were very small, never exceeding 1.3% for any product in any year, and averaging less than 0.5% for all products and years combined.

In addition to US total trade, some statistics are presented for trade through the Washington Customs District (Tables 32-33, Figure 17). This provides insight on the relative importance of

the district for each product and trading region. No attempt is made to segregate Washington Customs District exports into that which was produced by establishments located within the District as opposed to products originating elsewhere in the US and transported to the District for export. Information to accomplish this is not generally available in the export statistics so the Customs District exports should be interpreted with this in mind.

### **Softwood Moldings** (Tables 21-22; Figures 10-12)

Trade in softwood moldings was very dynamic during the 1989-1992 period. Value of exports grew from \$18.1 to \$85.5 million (373%). The softwood molding share of all millwork export value increased from 17.8% to 31.4%. For the four-year period, 96% of softwood molding exports were to North America and almost 93% were to Canada which grew from \$16.8 to \$80.3 million, accounting for virtually all of the softwood molding export growth. The second largest export market was Mexico (2.6% of the four-year total) which has grown from \$0.4 to \$3.2 million. For the four years, (\$0.3 to \$2.3 million, 2.4% of the four-year total) of softwood molding exports were to the Pacific Rim. Most (90%) of this is to Japan which was the third largest market for the four years, taking about 2% of softwood molding exports. The only other region of significance, taking 1.2% of the four-year total, is the region composed of various Caribbean island countries. Exports of softwood moldings to Europe and other regions is very small. Over the four-year period, softwood moldings were exported to 44 different countries while, in any given year, shipments were made to 23-26 of them and 11 countries received shipments in each of the four years.

The patterns of imports are quite different. Total imports were slightly over \$100 million until 1992 when they grew to \$140.5 million. The share of US millwork imports increased from 33.6% to 45.9%. Imports were received from 41 different countries but in any given year the number of suppliers was smaller and has declined from 31 to 22. Only 17 countries were suppliers in every year. Softwood molding imports are dominated by North American countries which supplied 87.4% of the total. Mexico is the leading supplier and has grown from \$74.9 to \$117.0 million or about 91.8% of the four-year total from North America (80.3% of softwood moldings from all regions). Since Mexico does not have a large resource of softwood species preferred for molding, it must be acting as a remanufacturer of lumber that it imports from elsewhere. Sources may be the US, Canada, Chile, and New Zealand; the latter two being large producers of radiata pine lumber. The second largest source over the four years was Canada (8.2% of North America, 7.2% of all regions) which declined from \$10.6 to \$7.6 million. South America has been the third largest source for the four years (4.8%) and more than doubled from \$4.1 to \$8.9 million. Most (68.6%) of these South American imports are from Chile, one of the largest growers of radiata pine; most of the remainder is from Brazil. The European Community supplied 3.8% of the four-year total but this region has declined from \$8.2 to \$0.6 million. The Pacific Rim, fluctuating between \$1.6 to \$6.5 million, supplied 3.7% of the four-year total. New Zealand, another large grower of radiata pine, is the dominant Pacific Rim supplier (28.1% of the four-year regional total). Several other countries from the Pacific Rim are also steady suppliers; Indonesia, Malaysia, Singapore, Taiwan, Japan, Philippines and Thailand. Most of these are not

traditional growers of softwood species, hence must be obtaining softwood lumber or logs that are subsequently manufactured into these products.

The Washington Customs district is a major center for trade in softwood moldings. Exports have grown from \$7.3 to \$38.6 million and imports declined from \$9.5 to \$6.7 million. The district has accounted for at least 40% of US exports of softwood moldings, reaching a high in 1992 of 45%. Its share of US imports of these products declined from 9.1 to 4.7%.

### **Hardwood Moldings** (Tables 23-24; Figures 10, 11, 13)

Trade in hardwood moldings is much smaller than softwood moldings. From 1989 to 1992, US exports grew 73%, from \$9.0 to \$15.5 million. However, the share of total millwork exports declined from 9% to 5%. North America is the principal market, taking 85% of the four-year total and growing 152% over this time. Almost all of these exports are to Canada which grew from \$5.3 to \$12.9 million. Exports to Mexico have grown from \$0.4 to \$1.6 million. Almost 8% of hardwood moldings were exported to the Pacific Rim but this market has declined 74% from \$1.7 to \$0.4 million. Almost 6% were exported to the European Community but this market has also declined. Over the four-year period, hardwood moldings were exported to 38 countries. In each year, exports actually went to 15-26 countries and 11 countries received hardwood molding exports in all four years.

US imports of hardwood moldings declined 52%, from \$89.9 to \$42.7 million; a drop in total share of millwork imports from 29% to 14%. Over the four years, hardwood moldings were imported from 50 countries but in any single year the number has been declining from about 40 to less than 30. Imports from 23 countries occurred in all four years. The largest source of imports has been the Pacific Rim, 54.8% of the four-year total. This region includes countries with tropical species such as Indonesia and Malaysia, and others. Imports from this region dropped from \$42 to \$27 million. Taiwan supplied 27% of the four-year Pacific Rim total but dropped from being the largest Pacific Rim source, \$16.4 million in 1989, to \$1.9 million in 1992. Thailand declined from \$7.87 to \$0.5 million and the Philippines declined from \$2.0 to \$1.0 million. Malaysia fluctuated between \$6.3 and \$12.3 million and supplied 32% of the four-year Pacific Rim total. Indonesia doubled from \$5 to \$10 million and supplied 24% of the four-year Pacific Rim total. North America has been the second largest source, 27.8% of the four-year total but has declined from \$36.1 to \$10.4 million. Mexico has been the largest North American source (53.0% of imports from North America; 16.3% of total imports) but has dropped from \$25.4 to \$4.3 million and Canada has fluctuated between \$5.2 and \$10.7 million (46.9% of imports from North America, 14.4% of total imports). The European Community supplied 8% of the four-year total but also declined, from \$9.0 to \$2.9 million. South America has supplied 7.4%, fluctuating between \$2.6 and \$13.4 million.

The Washington Customs District exports of hardwood moldings rose from \$10 to \$2.2, a gain from 11.2% to 14.0% of US exports of these products. Imports through the District declined from \$8.0 to \$4.0 million and varied between 6.7% and 12.3% of the US total.

It is apparent that many declining sources of hardwood moldings are suppliers of tropical species or countries that obtained tropical hardwood lumber and remanufactured it. Causes of these changes need to be better understood. Some of this change may represent reductions in supply from tropical forests, some may represent changes in exchange rates and other economic factors affecting market flows, and some change may be due to policies in countries such as Indonesia to process more value-added products for the export market rather than supply raw materials to others. The large decline in imports from Mexico should be examined more closely. Mexico may be in a period of transition from manufacturing moldings from tropical hardwood lumber to using temperate hardwood lumber from the US and Canada or shifting capacity to softwood species.

### **Windows and Frames (Tables 25-26; Figures 10, 11, 14)**

During 1989-1992, exports of these products were static at \$33.0-33.6 million, a loss in share of total millwork exports from 32% to 12%. North America has been the largest market, taking 67.6% of exports during the four years. Almost all, \$20-22 million (96.3% of exports to North America, 65.2% of all window & frame exports), was exported to Canada. Mexico is a small market that has grown from \$0.2 to \$1.7 million. The second largest market, \$6.0-\$7.8 million, 20.7% of the four-year total, is the Pacific Rim. Almost all (86%) of this is to Japan which accounted for 17.9% of window and frame exports over the four-year period. The third largest market was Caribbean countries which vary between \$1.1 and \$3.1 million, 7.8% of the four-year total. Exports to the European Community were 1.8% of the four-year total.

Over the four years, windows and frames were exported to 46 different countries. In any given year, exports went to 29-33 of them and 15 countries received exports in each of the four years.

Imports of windows and frames grew 57.4%, from \$15.5 to \$24.4 million; an increase in share of total millwork imports from 5% to 8%. Imports from North America grew 140% (\$9.0 to \$21.6 million) and represented 70.9% of the four-year total. Almost all imports from North America were from Canada which grew from \$6.9 to \$16.2 million (76.9% of North America, 56.3% of all regions). While much smaller, imports from Mexico grew from \$2.1 to \$5.4 million (23.1% of North America, 17.0% of all regions). The the European Community was the second largest source accounting for 21.5% of the four-year total. However, imports declined from \$5.4 million to \$1.9 million. Central America, South America, the Caribbean and the Pacific Rim each supplied roughly 2% of the four-year total. Imported windows and frames were obtained from 32 different countries with 23-28 active in a given year. Only 13 were suppliers in all four years.

The Washington Customs District exports of windows and frames rose from \$3.6 to \$4.9 million and increased from 10.9% to 14.6% of the US total for these products. District imports grew from \$0.25 to \$0.55 million, varying from 1.6% to 3.3% of the US total.



## **Doors and Components (Tables 27-28; Figures 10, 11, 15)**

This has been the largest category of US millwork exports and has grown 240%, from \$38.8 to \$132.1 million, increasing its share of total millwork exports from 38.1% to 48.6%. North America took 52.7% of the four-year total and grew from \$15.2 to \$97.9 million (544%). Mexico has grown from \$7.2 to \$68.6 million and has taken over from Canada as the largest market. Mexico accounted for 34.8% of exports of doors and components to all countries over the four-year period (58.5% of exports to the North America region). During the same period 24.4% of all door exports (41.2% to North America) were to Canada which grew from \$8.0 to \$29.3 million. The European Community has been the second largest regional market, taking 20.1% of the four-year total and fluctuating between \$11.3 and \$15.2 million. The UK is the largest European market (79.1% of exports to that region and 13.2% of exports to all regions) and varied between \$10.0 and \$13.7 million. The Pacific Rim market is of slightly smaller than Europe (16.8% of the four-year total) grew from \$5.5 to \$14.0 million. Japan which grew from \$3.4 to \$9.0 million took 66.1% of exports to the Pacific Rim and 10.3% of all exports. Korea grew from \$0.8 to \$4.0 million (24.6% of exports to the Pacific Rim and 3.8% of total exports). The Caribbean countries were a market for 7% of the four-year total, varying between \$3.1 and \$5.1 million. Many Caribbean countries were recipients of door exports in all four years.

Doors and components are the most widely exported US millwork product. Over the four-year period, these products were exported to 102 different countries. The number of countries receiving these products in any given year has steadily increased from 69 to 80. Also, 51 countries received exports of these products in each of the four years.

Imports of doors and components ranged between \$59.9 and \$86.7 million, maintaining an overall average share of imported millwork of about 27%. The largest source is North America with 37.9% of the four-year total (\$22 to \$39.2 million). Canada supplied between \$10.4 and \$25.2 million (56.7% from the region and 21.8% of the total) and Mexico between \$10.3 and \$14.0 million (43.4% from the region and 16.6% of the total). The Pacific Rim is the second largest source (32.7% of the four-year total) and grew 26.1% from \$23.1 to \$29.2 million. Five countries accounted for 98.9% of the Pacific Rim four-year total. Taiwan was 34.7% of the supply from the region (11.2% of the world) but declined from \$12.0 to \$6.9 million. Malaysia was 28.19% of the region supply (9.4% of the world) and grew from \$3.0 to \$11.5 million. The Philippines was 18.6% of the region supply (6.0% of the world) and varied from \$3.7 to \$5.6 million. Indonesia was 12.0% of the region supply (3.9% of the world), growing from \$0.6 to \$2.9 million. Singapore was 9.7% of the region supply (1.5% of the world) and declined from \$2.2 to \$0.3 million.

South America supplied \$9.7-\$12.4 million (15.1%) with Brazil being the source of 92.3% (14.0% of the world). Central America supplied \$5.2-\$8.0 million (9.3% of the world). The European Community supplied 4.1% of the four-year total but declined from \$5.9 to \$1.0 million. The US imported doors and components from 64 different countries but in any single year imports were from 45-49 of them. Imports in all four years came from 35 countries.

The Washington Customs District increased exports of doors and components from \$5.6 million to \$16.6-18.7 million. The share of US door exports varied from 12.6 to 23.8% and averaged 16.8% for the four years. Imports fluctuated between \$8.6 and \$14.2 million. The import share of the US total varied from 13.8% to 17.0% with an average of 14.8%.

### **Wood Blinds, Shutters and Components (Tables 29-30; Figures 10, 11, 16)**

Exports of these products grew from \$2.9 to \$5.2 million (81%) but the overall share of millwork trade declined from 3% to 2%. Almost 47% of the four-year total was exported to North America which grew from \$1.4 to \$3.3 million. The European Community received 29.4% of the four-year total, the Pacific Rim 10.2%, and the Caribbean 8.9%. Over the four years, these products were exported to 59 different countries and in any single year 29-46 countries were recipients. Only 15 countries were recipients in each of the four years.

Imports grew from \$13.3 to \$15.1 million and represent about 5.2% of total millwork imports. About \$10 million (70%) of the imports are from Pacific Rim countries. North America, mainly Mexico, is the second largest supplier (26%) and has grown from \$2 to \$4 million. Other small sources are South America (2.3%) and the European Community (1.5%). Over the four years these products were imported from 42 countries with 24-26 being sources in a given year with 16 as sources in all four years.

The Washington Customs District is exported \$0.04 to \$0.15 million of these products, a 2% share of the US total. District imports are similar dollar amounts and represent only 0.5% of the US total imports of these products.

## **6. SUMMARY**

Tables 31-34 summarize trade in millwork products. Key findings are:

### **1. Moldings**

Total molding exports grew from \$27.1 to \$101.0 million between 1989 and 1992. As a percent of value of industry molding shipments, this has grown from 2.5% in 1989 to 7.4% in 1991. This is the highest level of the millwork product groups.

#### **a. softwood moldings:**

US exports grew 372.7% from \$18.1 to \$85.5 million with the share of total millwork exports (28.3% share of four-year total) rising from 17.8% to 31.4%.

Exports through the Washington Customs District grew 428.2% from \$7.3 to \$38.6 million. The share of District millwork exports (52.2% of the four-year total) rose from 41.4% to 61.9%. The District's share of US softwood molding exports rose (42.2% of the four-year total) from 40.3% to 45.1%.

US imports grew 35.0% from \$104.2 to \$140.6 million with the share of total millwork imports (41.4% for the four-year total) rising from 33.6% to 45.9%.

Imports through the Washington Customs District declined 30.1% from \$9.5 to \$6.6 million. The share of District millwork declined from 31.9% to 26.1% (30.0% of the four-year total). The District's share of US softwood molding imports (6.6% of the four-year total) declined from 9.1% to 4.7%.

The US is a net importer of softwood moldings but the deficit has declined from \$86 to \$55 million.

b. hardwood moldings:

US exports grew 72.9% from \$9.0 to \$15.5 million with the share of total millwork exports (7.0% share of four-year total) declining from 8.8% to 5.7%.

Exports through the Washington Customs District grew 115.8% from \$1.0 to \$2.2 million. The share of District millwork exports (4.0% of the four-year total) declined from 5.7% to 3.5%. The District's share of US hardwood molding exports rose (13.0% of the four-year total) from 11.2% to 14.0%.

US imports declined 52.5% from \$90.0 to \$42.7 million but the share of total millwork imports (41.4% for the four-year total) rose from 33.6% to 45.9%.

Imports through the Washington Customs District declined 50% from \$8.0 to \$4.0 million. The share of District millwork declined from 27.0% to 15.7% (22.8% of the four-year total). The District's share of US hardwood molding imports (10.6% of the four-year total) varied from 6.7% to 12.1%.

The US is a net importer of hardwood moldings but the deficit declined from \$81-86 in 1989/90 to \$17-27 million in 1991/92.

2. Windows and Frames

US exports were static at \$31.3 to \$33.6 million with the share of total millwork exports (18.1% share of four-year total) declining from 32.4% to 12.3%. As a percent of shipments of these products, exports were a constant 1.3%.

Exports through the Washington Customs District grew 35.5% from \$3.6 to \$4.9 million but the share of District millwork exports (10.8% of the four-year total) declined from 20.5% to 7.8%. The District's share of US window and frame exports rose (13.6% of the four-year total) from 10.9% to 14.6%.

US imports grew 57.5% from \$15.5 to \$24.4 million with the share of total millwork imports (6.7% for the four-year total) rising from 5.0% to 8.0%.

Imports through the Washington Customs District grew 120.0% from \$0.25 to \$0.55 million. The share of District millwork increased from 0.8% to 2.2% (1.9% of the four-year total). The District's share of US window and frame imports (2.5% of the four-year total) rose from 1.6% to 2.3%.

The US is a net exporter of windows and frames but the surplus has declined from \$17.5 to \$9.2 million.

### 3. Doors and Components

US exports grew 240.1% from \$38.3 to \$132.1 million with the share of total millwork exports (44.6% share of four-year total) rising from 38.1% to 48.6%. As a percent of value of shipments of these products, exports grew from 1.3% in 1989 to 3.6% in 1991.

Exports through the Washington Customs District grew 198.6% from \$5.6 to \$16.6 million. The share of District millwork exports (32.8% of the four-year total) declined from 31.6% to 26.7%. The District's share of US door and component exports varied (16.8% of the four-year total) from 12.6% to 23.8%.

US imports varied from \$59.9 to \$86.7 million with the share of total millwork imports (27.2% for the four-year total) varying from 26.6% to 28.0%.

Imports through the Washington Customs District varied from \$8.6 to \$14.9 million. The share of District millwork increased from 40.0% to 55.7% (45.0% of the four-year total). The District's share of US door and components imports (14.8% of the four-year total) rose from 13.8% to 17.0%.

The US changed from being a net importer of doors and components to a net exporter. The deficit of \$48 in 1989 shifted to a surplus of \$49 million in 1992.

### 4. Blinds, Shutters and Other Millwork

US exports grew 81% from \$2.9 to \$5.2 million with the share of total millwork exports (2.1% share of four-year total) declining from 2.8% to 1.9%. As a percent of value of shipments of these products, exports grew from 0.1% in 1989 to 0.2% in 1991.

Exports through the Washington Customs District declined 54% from \$0.15 to \$0.07 million. The share of District millwork exports (0.2% of the four-year total) declined from 0.8% to 0.1%. The District's share of US exports declined (2.2% of the four-year total) from 5.1% to 1.3%.

US imports grew 14.2% from \$13.3 to \$15.1 million with the share of total millwork imports (5.2% for the four-year total) varying from 4.3% to 6.3%.

Imports through the Washington Customs District varied from \$0.06 to \$0.10 million. The share of District millwork was about 0.3%. The District's share of US imports (0.5% of the four-year total) varied from 0.4% to 0.7%.

The US is a net importer of these products with the deficit about \$10 million per year

#### 5. All Millwork Products Combined.

US millwork exports grew 167.1% from \$101.8 million in 1989 to \$272.0 million in 1992. Compared to value of shipments, millwork exports rose from 1.1% in 1989 to 2.4% in 1991.

US millwork imports declined from \$310.0 million in 1989 to \$224.9 million in 1991 and then returned to \$306.0 million. The US had a declining trade deficit in millwork as follows:

	deficit, \$ million
1989	207.7
1990	112.2
1991	16.4
1992	34.1

Exports through the Washington Customs District grew 253.5% from \$17.6 to \$62.3 million. The District share of US millwork exports rose from 17.3% in 1989 to 23-25% in 1990-92 with a four-year average of 22.8%. Imports of millwork through the District varied between \$18.5 and \$29.9 million. The share of US imports declined from 9.6% to 8.3% with a four-year average of 9.0%.

### Needs for Future Research

This initial examination of trade in millwork products raises many questions that need to be resolved before sound interpretations can be made.

#### 1. Are the trade statistics any good?

Trade data compiled by the US Department of Commerce have been found to be very erroneous for hardwood lumber (Luppold, 1991). Are there problems with trade data for millwork that need to be understood and resolved?

#### 2. Need for examination of trade at more detailed product levels.

The summary presented here focuses on value of trade rather than quantities. Data on quantity of these items are available, but the units of measure are lineal feet (meters) for moldings and number of units traded for the other products. Given the heterogenous mix of products within some of these millwork categories, understanding quantities and unit values (prices) will require further research that must examine more detailed SIC codes. Examination of these 6 & 7 digit codes may also be revealing in terms of some of the trade flows with respect to degree of manufacture and species.

### 3. What economic factors influence the observed changes?

Exchange rates, changes in US softwood timber supply and costs, construction activity and other factors are involved in these trade flows yet very little has been done to gain understanding in specific countries. What will be the impacts of NAFTA? To what extent is Mexico already importing US, Canadian, Chilean and New Zealand softwood lumber and manufacturing millwork products that enter the US or compete with US millwork in other markets? Why are exports of doors to Mexico and the Caribbean so large? Is this due to growing affluence of certain segments of the population and associated new housing construction? Is construction for tourists an important factor? Are there tariff and transportation advantages with former colonial powers that influence trade flows?

To fully understand these trends in value of trade, further research will be needed to assess the influence of changes in cost structure due to the supply reductions in the Pacific Northwest and the influence of changes in exchange rates. The patterns of use of softwood moldings in major export markets, especially Canada, should be investigated. One important question is the degree to which exports to Canada are re-exported to other countries.

**Table 20. SIC Aggregations for Millwork Trade Summary**

<b>Product Category</b>	<b>SIC Classes</b>	<b>Import Classes</b>	<b>Export Classes</b>
1. Softwood molding	2431631	4409103000	4409104500
	2431731		4409105000
2. Hardwood molding	2431651	4409204500	4409204000
	2431751		4409205000
3. Windows and frames	24311	4418100000	4418100000
	24312		
	24313		
4. Doors and components	24314	4418200030	4418200030
		4418200060	4418200060
5. Blinds and shutters	2431833	4421904500	4421903000
			4421204000

Source: See Appendix A for further details.

Table 21. Aggregate US Softwood Molding Exports by Region, 1989-1992

Region	1989	1990	1991	1992	Four Year Composite	
					Total	Change (%) 1992 vs. 1989
<b>North America</b>						
\$, million	17.23	35.59	61.35	83.56	197.73	385.0
% of year total	95.2	95.8	95.5	97.7	96.1	
number of countries (4)	2	2	2	2	2	
<b>Central America</b>						
\$, million	0.00	0.00	0.03	0.01	0.04	NA <sup>1</sup>
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (7)	1	1	2	2	3	
<b>South America</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (14)	0	0	0	0	0	
<b>Caribbean</b>						
\$, million	0.39	0.53	0.45	0.40	1.77	2.6
% of year total	2.2	1.4	0.7	0.5	1.2	
number of countries (23)	10	9	10	9	15	
<b>Pacific Rim and Oceania</b>						
\$, million	0.32	1.00	2.30	1.24	4.86	287.5
% of year total	1.8	2.7	3.6	1.4	2.4	
number of countries (44)	6	5	6	6	10	
<b>European Community</b>						
\$, million	0.14	0.02	0.10	0.25	0.51	78.6
% of year total	0.8	0.1	0.2	0.3	0.3	
number of countries (12)	5	4	3	4	8	
<b>European Free Trade Assoc.</b>						
\$, million	0.01	0.00	0.00	0.00	0.01	-100.0
% of year total	0.1	0.0	0.0	0.0	0.0	
number of countries (7)	1	0	0	0	1	
<b>European Other</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (15)	0	0	0	0	0	
<b>Former Soviet Republics</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (16)	0	0	0	0	0	
<b>Asia Central</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (7)	0	0	0	0	0	
<b>Far East</b>						
\$, million	0.00	0.02	0.01	0.06	0.09	NA
% of year total	0.0	0.1	0.0	0.1	0.0	
number of countries (14)	0	1	1	2	3	
<b>Africa</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (57)	0	1	0	1	2	
<b>Total</b>						
\$, million	18.09	37.16	64.24	85.52	205.01	372.1
% of year total	100.0	100.0	100.0	100.0	100.0	
number of countries (220)	25	23	24	26	44	

<sup>1</sup>not applicable



Table 22. Aggregate US Softwood Molding Imports by Region, 1989-1992

Region	1989	1990	1991	1992	Four Year Composite	
					Total	Change (%) 1992 vs. 1989
<b>North America</b>						
\$, million	85.50	91.98	95.16	124.61	397.25	45.7
% of year total	82.1	86.3	92.5	88.7	87.4	
number of countries (4)	2	2	2	2	2	
<b>Central America</b>						
\$, million	0.08	0.01	0.08	0.00	0.17	-100.0
% of year total	0.1	0.0	0.1	0.0	0.0	
number of countries (7)	3	1	2	1	4	
<b>South America</b>						
\$, million	4.11	4.57	4.82	8.87	22.37	115.8
% of year total	3.9	4.3	4.7	6.3	4.8	
number of countries (14)	6	7	4	3	8	
<b>Caribbean</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA <sup>1</sup>
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (23)	0	1	1	0	1	
<b>Pacific Rim and Oceania</b>						
\$, million	5.41	3.66	1.58	6.46	17.11	19.4
% of year total	5.2	3.4	1.5	4.6	3.7	
number of countries (44)	9	7	9	9	9	
<b>European Community</b>						
\$, million	8.20	5.99	1.21	0.60	16.00	-92.7
% of year total	7.9	5.6	1.2	0.4	3.8	
number of countries (12)	6	8	6	5	9	
<b>European Free Trade Assoc.</b>						
\$, million	0.81	0.40	0.01	0.00	1.22	-100.0
% of year total	0.8	0.4	0.0	0.0	0.3	
number of countries (7)	4	4	2	1	5	
<b>European Other</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (15)	0	0	0	0	0	
<b>Former Soviet Republics</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (16)	0	0	0	0	0	
<b>Asia Central</b>						
\$, million	0.02	0.00	0.00	0.00	0.02	-100.0
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (7)	1	0	1	0	1	
<b>Far East</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (14)	0	0	0	0	0	
<b>Africa</b>						
\$, million	0.02	0.00	0.00	0.00	0.02	-100.0
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (57)	1	0	0	1	2	
<b>Total</b>						
\$, million	104.15	106.61	102.86	140.54	454.16	34.9
% of year total	100.0	100.0	100.0	100.0	100.0	
number of countries (220)	31	30	27	22	41	

<sup>1</sup>not applicable

Table 23. Aggregate US Hardwood Molding Exports by Region, 1989-1992

Region	1989	1990	1991	1992	Four Year Composite	
					Total	Change (%) 1992 vs. 1989
<b>North America</b>						
\$, million	5.74	12.06	11.66	14.49	43.95	152.4
% of year total	64.0	91.3	90.0	93.4	84.7	
number of countries (4)	2	2	2	2	2	
<b>Central America</b>						
\$, million	0.00	0.00	0.04	0.01	0.05	NA <sup>1</sup>
% of year total	0.0	0.0	0.3	0.1	0.1	
number of countries (7)	1	1	1	2	2	
<b>South America</b>						
\$, million	0.00	0.00	0.00	0.05	0.05	NA
% of year total	0.0	0.0	0.0	0.3	0.1	
number of countries (14)	0	0	0	1	1	
<b>Caribbean</b>						
\$, million	0.17	0.14	0.20	0.13	0.64	-23.5
% of year total	1.9	1.1	1.5	0.8	1.3	
number of countries (23)	2	9	5	5	12	
<b>Pacific Rim and Oceania</b>						
\$, million	1.67	0.69	0.60	0.44	3.40	-73.7
% of year total	18.6	5.2	4.6	2.8	7.8	
number of countries (44)	4	7	6	5	10	
<b>European Community</b>						
\$, million	1.37	0.26	0.41	0.38	2.42	-72.3
% of year total	15.3	2.0	3.2	2.4	5.7	
number of countries (12)	4	5	5	7	7	
<b>European Free Trade Assoc.</b>						
\$, million	0.00	0.04	0.00	0.00	0.04	NA
% of year total	0.0	0.3	0.0	0.0	0.1	
number of countries (7)	0	1	0	1	1	
<b>European Other</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (15)	0	0	0	0	0	
<b>Former Soviet Republics</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (16)	0	0	0	0	0	
<b>Asia Central</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (7)	0	0	0	0	0	
<b>Far East</b>						
\$, million	0.00	0.00	0.05	0.02	0.07	NA
% of year total	0.0	0.0	0.4	0.1	0.1	
number of countries (14)	1	0	1	1	2	
<b>Africa</b>						
\$, million	0.02	0.02	0.00	0.00	0.04	-100.0
% of year total	0.2	0.2	0.0	0.0	0.1	
number of countries (57)	1	1	0	0	1	
<b>Total</b>						
\$, million	8.97	13.21	12.96	15.52	50.66	73.0
% of year total	100.0	100.0	100.0	100.0	100.0	
number of countries (220)	15	26	20	24	38	

<sup>1</sup>not applicable

Table 24. Aggregate US Hardwood Molding Imports by Region, 1989-1992

Region	1989	1990	1991	1992	Four Year Composite	
					Total	Change (%) 1992 vs. 1989
<b>North America</b>						
\$, million	36.08	11.98	6.76	10.38	65.20	-71.2
% of year total	40.1	24.2	22.5	24.3	27.8	
number of countries (4)	2	2	2	2	2	
<b>Central America</b>						
\$, million	0.15	0.20	0.06	0.07	0.48	-53.3
% of year total	0.2	0.4	0.2	0.2	0.2	
number of countries (7)	3	3	1	1	3	
<b>South America</b>						
\$, million	2.37	4.15	4.03	2.24	12.79	-5.5
% of year total	2.6	8.4	13.4	5.2	7.4	
number of countries (14)	6	7	7	5	9	
<b>Caribbean</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA <sup>1</sup>
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (23)	1	1	0	0	2	
<b>Pacific Rim and Oceania</b>						
\$, million	41.54	27.68	16.49	26.57	112.28	-36.0
% of year total	46.2	55.9	54.9	62.2	54.8	
number of countries (44)	11	11	11	9	12	
<b>European Community</b>						
\$, million	9.03	4.46	1.85	2.93	18.27	-67.6
% of year total	10.0	9.0	6.2	6.9	8.0	
number of countries (12)	8	9	7	6	9	
<b>European Free Trade Assoc.</b>						
\$, million	0.27	0.31	0.60	0.42	1.60	55.6
% of year total	0.3	0.6	2.0	1.0	1.0	
number of countries (7)	4	2	2	2	4	
<b>European Other</b>						
\$, million	0.03	0.07	0.07	0.02	0.19	-33.3
% of year total	0.0	0.1	0.2	0.0	0.1	
number of countries (15)	1	2	1	1	2	
<b>Former Soviet Republics</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (16)	0	0	0	0	0	
<b>Asia Central</b>						
\$, million	0.00	0.10	0.15	0.02	0.27	NA
% of year total	0.0	0.2	0.5	0.0	0.2	
number of countries (7)	0	2	1	1	2	
<b>Far East</b>						
\$, million	0.00	0.00	0.02	0.00	0.02	NA
% of year total	0.0	0.0	0.1	0.0	0.0	
number of countries (14)	0	1	1	0	2	
<b>Africa</b>						
\$, million	0.47	0.58	0.03	0.04	1.12	-91.5
% of year total	0.5	1.2	0.1	0.1	0.5	
number of countries (57)	2	1	1	2	3	
<b>Total</b>						
\$, million	89.94	49.53	30.06	42.69	212.22	-52.5
% of year total	100.0	100.0	100.0	100.0	100.0	
number of countries (220)	38	41	34	29	50	

<sup>1</sup>not applicable

**Table 25. Aggregate US Window and Frame Exports by Region, 1989-1992**

Region	1989	1990	1991	1992	Four Year Composite	
					Total	Change (%) 1992 vs. 1989
<b>North America</b>						
\$, million	22.70	21.67	20.33	23.99	88.69	5.7
% of year total	68.8	65.3	65.0	71.5	67.6	
number of countries (4)	2	2	2	2	2	
<b>Central America</b>						
\$, million	0.03	0.15	0.05	0.03	0.26	0.0
% of year total	0.1	0.5	0.2	0.1	0.2	
number of countries (7)	1	4	4	2	5	
<b>South America</b>						
\$, million	0.03	0.03	0.09	0.17	0.32	466.7
% of year total	0.1	0.1	0.3	0.5	0.2	
number of countries (14)	5	1	4	4	7	
<b>Caribbean</b>						
\$, million	3.15	2.76	3.06	1.16	10.13	-63.2
% of year total	9.5	8.3	9.8	3.5	7.8	
number of countries (23)	7	4	8	6	5	
<b>Pacific Rim and Oceania</b>						
\$, million	5.99	7.83	6.16	7.18	27.16	19.9
% of year total	18.2	23.6	19.7	21.4	20.7	
number of countries (44)	6	6	7	6	9	
<b>European Community</b>						
\$, million	1.03	0.35	0.70	0.33	2.41	-68.0
% of year total	3.1	1.1	2.2	1.0	1.8	
number of countries (12)	5	4	5	6	7	
<b>European Free Trade Assoc.</b>						
\$, million	0.01	0.02	0.00	0.00	0.03	-100.0
% of year total	0.0	0.1	0.0	0.0	0.0	
number of countries (7)	1	1	0	0	2	
<b>European Other</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA <sup>1</sup>
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (15)	0	0	0	0	0	
<b>Former Soviet Republics</b>						
\$, million	0.00	0.12	0.82	0.62	1.56	NA
% of year total	0.0	0.4	2.6	1.8	1.2	
number of countries (16)	0	1	1	2	2	
<b>Asia Central</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (7)	0	1	0	0	1	
<b>Far East</b>						
\$, million	0.04	0.22	0.07	0.08	0.41	100.0
% of year total	0.1	0.7	0.2	0.2	0.3	
number of countries (14)	1	2	2	3	3	
<b>Africa</b>						
\$, million	0.02	0.03	0.00	0.00	0.05	-100.0
% of year total	0.1	0.1	0.0	0.0	0.0	
number of countries (57)	1	3	0	0	3	
<b>Total</b>						
\$, million	33.00	33.18	31.28	33.56	131.02	1.7
% of year total	100.0	100.0	100.0	100.0	100.0	
number of countries (220)	29	29	33	31	46	

<sup>1</sup>not applicable

Table 26. Aggregate US Window and Frame Imports by Region, 1989-1992

Region	1989	1990	1991	1992	Four Year Composite	
					Total	Change (%) 1992 vs. 1989
<b>North America</b>						
\$, million	9.01	9.23	14.19	21.9	54.02	139.6
% of year total	58.2	57.8	79.1	88.6	70.9	
number of countries (4)	2	2	2	2	2	
<b>Central America</b>						
\$, million	0.24	0.21	0.27	0.35	1.07	45.8
% of year total	1.6	1.3	1.5	1.4	1.5	
number of countries (7)	1	2	2	2	2	
<b>South America</b>						
\$, million	0.25	0.40	0.39	0.19	1.23	-24.0
% of year total	1.6	2.5	2.2	0.8	1.8	
number of countries (14)	2	3	6	3	6	
<b>Caribbean</b>						
\$, million	0.00	0.95	0.06	0.00	1.01	NA <sup>1</sup>
% of year total	0.0	6.0	0.3	0.0	1.6	
number of countries (23)	1	1	1	1	1	
<b>Pacific Rim and Oceania</b>						
\$, million	0.34	0.52	0.48	0.34	1.68	0.0
% of year total	2.2	3.3	2.7	1.4	2.4	
number of countries (44)	7	4	9	7	10	
<b>European Community</b>						
\$, million	5.45	4.63	2.50	1.89	14.47	-65.3
% of year total	35.2	29.0	13.9	7.8	21.5	
number of countries (12)	7	7	6	6	7	
<b>European Free Trade Assoc.</b>						
\$, million	0.15	0.00	0.00	0.00	0.15	-100.0
% of year total	1.0	0.0	0.0	0.0	0.2	
number of countries (7)	2	2	1	1	2	
<b>European Other</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (15)	0	0	0	0	0	
<b>Former Soviet Republics</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (16)	0	0	0	0	0	
<b>Asia Central</b>						
\$, million	0.02	0.02	0.06	0.00	0.10	-100.0
% of year total	0.1	0.1	0.3	0.0	0.1	
number of countries (7)	1	1	1	1	1	
<b>Far East</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (14)	0	0	0	0	0	
<b>Africa</b>						
\$, million	0.02	0.00	0.00	0.00	0.02	-100.0
% of year total	0.1	0.0	0.0	0.0	0.0	
number of countries (57)	1	1	0	0	1	
<b>Total</b>						
\$, million	15.48	15.96	17.95	24.36	73.75	57.4
% of year total	100.0	100.0	100.0	100.0	100.0	
number of countries (220)	24	23	28	23	32	

<sup>1</sup>not applicable

**Table 27. Aggregate US Door and Component Exports by Region, 1989-1992**

Region	1989	1990	1991	1992	Four Year Composite	
					Total	Change (%) 1992 vs. 1989
<b>North America</b>						
\$, million	15.21	21.69	56.90	97.91	191.71	543.7
% of year total	39.2	38.2	59.2	74.1	52.7	
number of countries (4)	2	2	2	2	2	
<b>Central America</b>						
\$, million	0.19	0.32	0.24	0.24	0.99	26.3
% of year total	0.5	0.6	0.2	0.2	0.4	
number of countries (7)	5	4	6	6	7	
<b>South America</b>						
\$, million	0.54	0.35	0.38	0.54	1.81	0.0
% of year total	1.4	0.6	0.4	0.4	0.7	
number of countries (14)	8	7	10	10	11	
<b>Caribbean</b>						
\$, million	5.07	4.88	3.67	3.10	16.72	-38.9
% of year total	13.1	8.6	3.8	2.3	7.0	
number of countries (23)	21	22	20	18	22	
<b>Pacific Rim and Oceania</b>						
\$, million	5.47	14.00	17.29	13.95	50.71	155.0
% of year total	14.1	24.7	18.0	10.6	16.8	
number of countries (44)	12	13	15	16	18	
<b>European Community</b>						
\$, million	11.29	14.52	15.24	13.18	54.23	16.7
% of year total	29.1	25.6	15.9	10.0	20.1	
number of countries (12)	7	9	9	10	10	
<b>European Free Trade Assoc.</b>						
\$, million	0.37	0.33	0.34	0.19	1.23	-48.6
% of year total	1.0	0.6	0.4	0.1	0.5	
number of countries (7)	4	4	4	4	5	
<b>European Other</b>						
\$, million	0.11	0.04	0.25	0.19	0.59	72.7
% of year total	0.3	0.1	0.3	0.1	0.2	
number of countries (15)	2	1	2	4	4	
<b>Former Soviet Republics</b>						
\$, million	0.00	0.00	0.02	0.81	0.83	NA <sup>1</sup>
% of year total	0.0	0.0	0.0	0.6	0.2	
number of countries (16)	0	0	2	1	2	
<b>Asia Central</b>						
\$, million	0.00	0.00	0.00	0.18	0.18	NA
% of year total	0.0	0.0	0.0	0.1	0.0	
number of countries (7)	0	0	0	1	1	
<b>Far East</b>						
\$, million	0.55	0.63	1.60	1.75	4.53	218.2
% of year total	1.4	1.1	1.7	1.3	1.4	
number of countries (14)	6	3	6	5	8	
<b>Africa</b>						
\$, million	0.04	0.02	0.16	0.09	0.31	125.0
% of year total	0.1	0.0	0.2	0.1	0.1	
number of countries (57)	2	2	8	3	12	
<b>Total</b>						
\$, million	38.84	56.78	96.09	132.13	323.84	240.2
% of year total	100.0	100.0	100.0	100.0	100.0	
number of countries (220)	69	67	84	80	102	

<sup>1</sup>not applicable

Table 28. Aggregate US Door and Component Imports by Region, 1989-1992

Region	1989	1990	1991	1992	Four Year Composite	
					Total	Change (%) 1992 vs. 1989
<b>North America</b>						
\$, million	39.15	20.70	21.95	33.11	114.91	-15.4
% of year total	45.2	30.1	36.7	39.8	37.9	
number of countries (4)	2	2	2	2	2	
<b>Central America</b>						
\$, million	6.80	7.51	5.23	8.05	27.59	18.4
% of year total	7.8	10.9	8.7	9.7	9.3	
number of countries (7)	4	5	5	4	6	
<b>South America</b>						
\$, million	10.64	12.40	9.74	11.53	44.31	8.4
% of year total	12.3	18.0	16.3	13.9	15.1	
number of countries (14)	7	9	8	7	9	
<b>Caribbean</b>						
\$, million	0.05	0.13	0.13	0.07	0.38	40.0
% of year total	0.1	0.2	0.2	0.1	0.1	
number of countries (23)	3	2	2	3	4	
<b>Pacific Rim and Oceania</b>						
\$, million	23.15	23.07	21.28	29.19	96.69	26.1
% of year total	26.7	33.5	35.6	35.1	32.7	
number of countries (44)	12	11	13	11	13	
<b>European Community</b>						
\$, million	5.86	4.58	1.07	0.98	12.49	-83.3
% of year total	6.8	6.7	1.8	1.2	4.1	
number of countries (12)	10	10	8	8	10	
<b>European Free Trade Assoc.</b>						
\$, million	0.07	0.13	0.08	0.02	0.30	-71.4
% of year total	0.1	0.2	0.1	0.0	0.1	
number of countries (7)	4	4	3	3	5	
<b>European Other</b>						
\$, million	0.30	0.00	0.00	0.00	0.30	-100.0
% of year total	0.3	0.0	0.0	0.0	0.1	
number of countries (15)	2	0	0	0	2	
<b>Former Soviet Republics</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA <sup>1</sup>
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (16)	0	0	0	0	0	
<b>Asia Central</b>						
\$, million	0.12	0.11	0.36	0.19	0.78	58.3
% of year total	0.1	0.2	0.6	0.2	0.3	
number of countries (7)	2	2	2	3	4	
<b>Far East</b>						
\$, million	0.47	0.00	0.00	0.01	0.48	-97.9
% of year total	0.5	0.0	0.0	0.0	0.1	
number of countries (14)	1	0	2	2	4	
<b>Africa</b>						
\$, million	0.09	0.19	0.01	0.08	0.37	-11.1
% of year total	0.1	0.3	0.0	0.1	0.1	
number of countries (57)	2	4	2	2	5	
<b>Total</b>						
\$, million	86.70	68.82	59.85	83.23	298.60	-4.0
% of year total	100.0	100.0	100.0	100.0	100.0	
number of countries (220)	49	49	47	45	64	

<sup>1</sup>not applicable

Table 29. Aggregate US Wood Blinds, Shutters and Components Exports by Region, 1989-1992

Region	1989	1990	1991	1992	Four Year Composite	
					Total	Change (%) 1992 vs. 1989
<b>North America</b>						
\$, million	1.41	1.27	1.32	3.27	7.27	131.9
% of year total	48.8	41.4	33.8	62.5	46.6	
number of countries (4)	2	2	2	2	2	
<b>Central America</b>						
\$, million	0.05	0.04	0.02	0.04	0.15	-20.0
% of year total	1.7	1.3	0.5	0.8	1.1	
number of countries (7)	4	3	2	3	5	
<b>South America</b>						
\$, million	0.05	0.00	0.02	0.04	0.11	-20.0
% of year total	1.7	0.0	0.5	0.8	0.8	
number of countries (14)	2	2	1	3	5	
<b>Caribbean</b>						
\$, million	0.22	0.64	0.16	0.16	1.18	-27.3
% of year total	7.6	20.8	4.1	3.1	8.9	
number of countries (23)	9	10	8	12	16	
<b>Pacific Rim and Oceania</b>						
\$, million	0.28	0.30	0.46	0.50	1.54	78.6
% of year total	9.7	9.8	11.8	9.6	10.2	
number of countries (44)	7	6	7	6	8	
<b>European Community</b>						
\$, million	0.73	0.73	1.81	1.15	4.42	57.5
% of year total	25.3	23.8	46.4	22.0	29.4	
number of countries (12)	7	4	5	9	9	
<b>European Free Trade Assoc.</b>						
\$, million	0.11	0.01	0.02	0.03	0.17	-72.7
% of year total	3.8	0.3	0.5	0.6	1.3	
number of countries (7)	3	2	2	3	5	
<b>European Other</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	
% of year total	0.0	0.0	0.0	0.0	0.0	NA <sup>1</sup>
number of countries (15)	0	0	0	2	2	
<b>Former Soviet Republics</b>						
\$, million	0.00	0.04	0.08	0.01	0.13	NA
% of year total	0.0	1.3	2.1	0.2	0.9	
number of countries (16)	0	1	1	1	1	
<b>Asia Central</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (7)	0	0	0	1	1	
<b>Far East</b>						
\$, million	0.04	0.04	0.01	0.03	0.12	-25.0
% of year total	1.4	1.3	0.3	0.6	0.9	
number of countries (14)	1	1	1	3	3	
<b>Africa</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (57)	0	1	0	1	2	
<b>Total</b>						
\$, million	2.89	3.07	3.90	5.23	15.09	81.0
% of year total	100.0	100.0	100.0	100.0	100.0	
number of countries (220)	35	32	29	46	59	

<sup>1</sup>not applicable



**Table 30. Aggregate US Wood Blinds, Shutters and Components Imports by Region, 1989-1992**

Region	1989	1990	1991	1992	Four Year Composite	
					Total	Change (%) 1992 vs. 1989
<b>North America</b>						
\$, million	2.65	3.28	3.81	5.23	14.97	97.4
% of year total	20.0	22.3	27.1	34.6	26.0	
number of countries (4)	2	2	2	2	2	
<b>Central America</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA <sup>1</sup>
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (7)	1	0	0	0	1	
<b>South America</b>						
\$, million	0.43	0.36	0.26	0.28	1.33	-34.6
% of year total	3.2	2.4	1.8	1.9	2.3	
number of countries (14)	3	2	3	2	4	
<b>Caribbean</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (23)	0	0	1	1	2	
<b>Pacific Rim and Oceania</b>						
\$, million	9.72	10.87	9.84	9.40	39.83	-3.3
% of year total	73.3	73.9	69.9	62.1	69.8	
number of countries (44)	11	11	11	9	13	
<b>European Community</b>						
\$, million	0.42	0.13	0.10	0.18	0.83	-57.1
% of year total	3.2	0.9	0.7	1.2	1.5	
number of countries (12)	7	5	5	5	9	
<b>European Free Trade Assoc.</b>						
\$, million	0.00	0.00	0.01	0.02	0.03	NA
% of year total	0.0	0.0	0.1	0.1	0.1	
number of countries (7)	0	0	1	2	2	
<b>European Other</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (15)	0	0	0	0	0	
<b>Former Soviet Republics</b>						
\$, million	0.01	0.00	0.00	0.00	0.01	-100.0
% of year total	0.1	0.0	0.0	0.0	0.0	
number of countries (16)	1	0	0	0	1	
<b>Asia Central</b>						
\$, million	0.03	0.04	0.05	0.02	0.14	-33.3
% of year total	0.2	0.3	0.4	0.1	0.2	
number of countries (7)	1	3	1	1	3	
<b>Far East</b>						
\$, million	0.00	0.00	0.00	0.00	0.00	NA
% of year total	0.0	0.0	0.0	0.0	0.0	
number of countries (14)	0	1	1	1	3	
<b>Africa</b>						
\$, million	0.00	0.03	0.00	0.00	0.03	NA
% of year total	0.0	0.2	0.0	0.0	0.1	
number of countries (57)	0	1	0	1	2	
<b>Total</b>						
\$, million	13.26	14.71	14.07	15.13	57.17	14.1
% of year total	100.0	100.0	100.0	100.0	100.0	
number of countries (220)	26	25	25	24	42	

<sup>1</sup>not applicable

Table 31. Aggregate US Millwork Trade, 1989-1992

Aggregate US Millwork Exports, 1989-1992					Four Year Composite	
Millwork	1989	1990	1991	1992	Total	Change (%) 1992 vs. 1989
<b>Softwood Molding</b>						
\$, million	18.10	37.16	64.24	85.53	205.03	372.5
% of year total	17.8	25.9	30.8	31.4	28.3	
<b>Hardwood Molding</b>						
\$, million	8.98	13.22	12.96	15.53	50.69	72.9
% of year total	8.8	9.2	6.2	5.7	7.0	
<b>Windows &amp; Frames</b>						
\$, million	33.02	33.19	31.29	33.55	131.05	1.6
% of year total	32.4	23.1	15.0	12.3	18.1	
<b>Doors &amp; Components</b>						
\$, million	38.84	56.77	96.10	132.11	323.82	240.1
% of year total	38.1	39.6	46.1	48.6	44.6	
<b>Blinds, Shutters &amp; Components</b>						
\$, million	2.90	3.10	3.90	5.25	15.15	81.0
% of year total	2.8	2.2	1.9	1.9	2.1	
<b>Total</b>						
\$, million	101.84	143.44	208.49	271.97	725.74	167.1
% of year total	100.0	100.0	100.0	100.0	100.0	

## Aggregate US Millwork Imports, 1989-1992

Aggregate US Millwork Imports, 1989-1992					Four Year Composite	
Millwork	1989	1990	1991	1992	Total	Change (%) 1992 vs. 1989
<b>Softwood Molding</b>						
\$, million	104.13	106.60	102.93	140.56	454.22	35.0
% of year total	33.6	41.7	45.8	45.9	41.4	
<b>Hardwood Molding</b>						
\$, million	89.95	99.54	30.05	42.69	212.23	-52.5
% of year total	29.1	19.4	13.4	14.0	19.4	
<b>Windows &amp; Frames</b>						
\$, million	15.49	15.98	17.96	24.39	73.82	57.5
% of year total	5.0	6.3	8.0	8.0	6.7	
<b>Doors &amp; Components</b>						
\$, million	86.69	68.83	59.85	83.23	298.60	-4.0
% of year total	28.0	26.9	26.6	27.2	27.2	
<b>Blinds, Shutters &amp; Components</b>						
\$, million	13.26	14.71	14.07	15.14	57.18	14.2
% of year total	4.3	5.8	6.3	4.9	5.2	
<b>Total</b>						
\$, million	309.52	255.66	224.86	306.01	1096.05	1.0
% of year total	100.0	100.0	100.0	100.0	100.0	

Table 32. Aggregate Washington Customs District Millwork Trade, 1989-1992

<b>Aggregate Washington Customs District Millwork Exports, 1989-1992</b>						
<b>Millwork</b>	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>Four Year Composite</b>	
					<b>Total</b>	<b>Change (%) 1992 vs. 1989</b>
<b>Softwood Molding</b>						
\$, million	7.30	14.54	26.05	38.56	86.45	428.2
% of year total	41.4	42.2	50.8	61.9	52.2	
<b>Hardwood Molding</b>						
\$, million	1.01	1.62	1.77	2.18	6.58	115.8
% of year total	5.7	4.7	3.5	3.5	4.0	
<b>Windows &amp; Frames</b>						
\$, million	3.61	4.75	4.64	4.89	17.88	35.5
% of year total	20.5	13.8	9.1	7.8	10.8	
<b>Doors &amp; Components</b>						
\$, million	5.56	13.51	18.72	16.61	54.40	198.6
% of year total	31.6	39.2	36.5	26.7	32.8	
<b>Blinds, Shutters &amp; Components</b>						
\$, million	0.15	0.04	0.08	0.07	0.33	-53.9
% of year total	0.8	0.1	0.2	0.1	0.2	
<b>Total</b>						
\$, million	17.62	34.47	51.26	62.30	165.65	253.5
% of year total	100.0	100.0	100.0	100.0	100.0	

<b>Aggregate Washington Customs District Millwork Imports, 1989-1992</b>						
<b>Millwork</b>	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>Four Year Composite</b>	
					<b>Total</b>	<b>Change (%) 1992 vs. 1989</b>
<b>Softwood Molding</b>						
\$, million	9.52	7.87	5.53	6.65	29.57	-30.1
% of year total	31.9	31.9	29.9	26.1	30.0	
<b>Hardwood Molding</b>						
\$, million	8.05	6.68	3.70	3.99	22.42	-50.4
% of year total	27.0	27.1	20.0	15.7	22.8	
<b>Windows &amp; Frames</b>						
\$, million	0.25	0.45	0.59	0.55	1.84	120.0
% of year total	0.8	1.8	3.2	2.2	1.9	
<b>Doors &amp; Components</b>						
\$, million	11.95	9.61	8.60	14.19	44.35	18.7
% of year total	40.0	38.9	46.5	55.7	45.0	
<b>Blinds, Shutters &amp; Components</b>						
\$, million	0.08	0.07	0.06	0.10	0.31	25.0
% of year total	0.3	0.3	0.3	0.4	0.3	
<b>Total</b>						
\$, million	29.85	24.68	18.48	25.48	98.49	-14.6
% of year total	100.0	100.0	100.0	100.0	100.0	

Table 33. Washington Customs District as Percent of Total US Trade in Millwork Products

Year	Softwood Molding		Hardwood Molding		Windows		Door		Blinds/Shutters/Other		All Products	
	% of US Exports	% of US Imports	% of US Exports	% of US Imports	% of US Exports	% of US Imports	% of US Exports	% of US Imports	% of US Exports	% of US Imports	% of US Exports	% of US Imports
1989	40.3	9.1	11.2	8.9	10.9	1.6	14.3	13.8	5.1	0.6	17.3	9.6
1990	39.1	7.4	12.2	6.7	14.3	2.8	23.8	14.0	1.2	0.5	24.0	9.7
1991	40.6	5.4	13.6	12.1	14.8	3.3	19.5	14.3	2.0	0.7	24.6	8.2
1992	45.1	4.7	14.0	9.3	14.6	2.3	12.6	17.0	1.3	0.5	22.9	8.3
Four-year Total	42.2	6.6	13.0	10.6	13.6	2.5	16.8	14.8	2.2	0.5	22.8	9.0

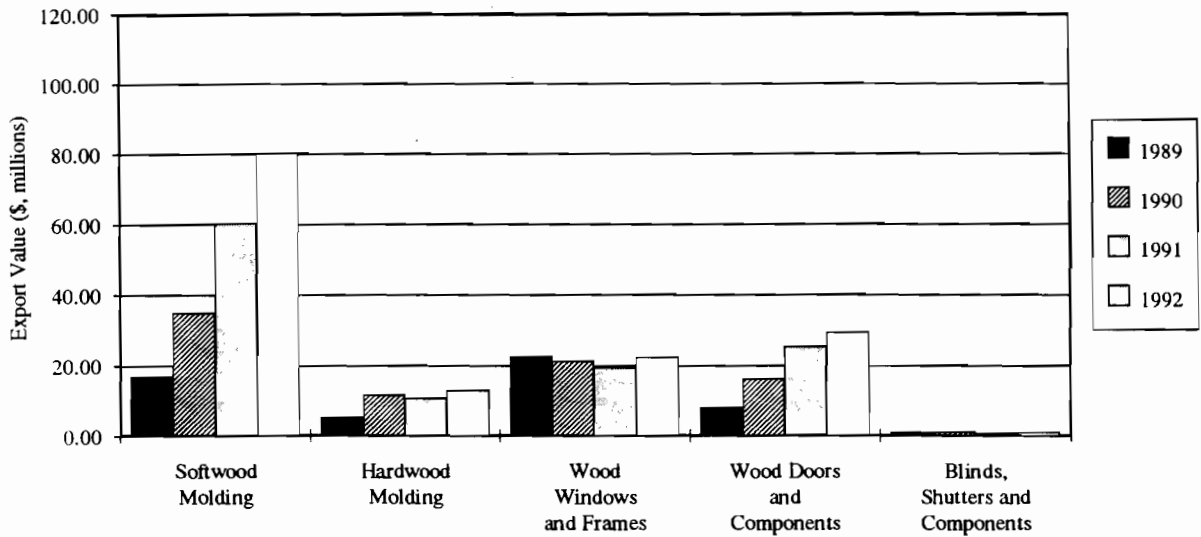
Table 34. US Millwork Exports Compared to Value of Shipments

Year	Doors		Windows		Moldings		Other		Total <sup>1</sup>	
	Value of Shipments (mil \$)	Exports (mil \$)	Value of Shipments (mil \$)	Exports (mil \$)	Value of Shipments (mil \$)	Exports (mil \$)	Value of Shipments (mil \$)	Exports (mil \$)	Value of Shipments (mil \$)	Exports (mil \$)
1989	2937.6	38.8	2490.8	33.0	1091.3	27.1	2703.4	2.9	9223.1	101.8
		1.3		1.3		2.5		0.1		1.1
1990	2930.5	56.8	2507.4	33.2	1067.2	50.4	2547.1	3.1	9052.2	143.4
		1.9		1.3		4.7		0.1		1.6
1991	2717.4	96.1	2388.8	31.3	1050.1	77.2	2307.5	3.9	8563.8	208.5
		3.5		1.3		7.4		0.2		2.4
1992	NA	132.1	NA	33.6	NA	101.0	NA	5.3	NA	272.0
		NA		NA		NA		NA		NA

Source: Table 7, Table 31

<sup>1</sup>The rate of exports to shipments would be slightly lower if the total value of all shipments was used, compare Tables 6 and 7.

US Exports of Millwork Products to Canada, 1989-1992



US Imports of Millwork Products From Canada, 1989-1992

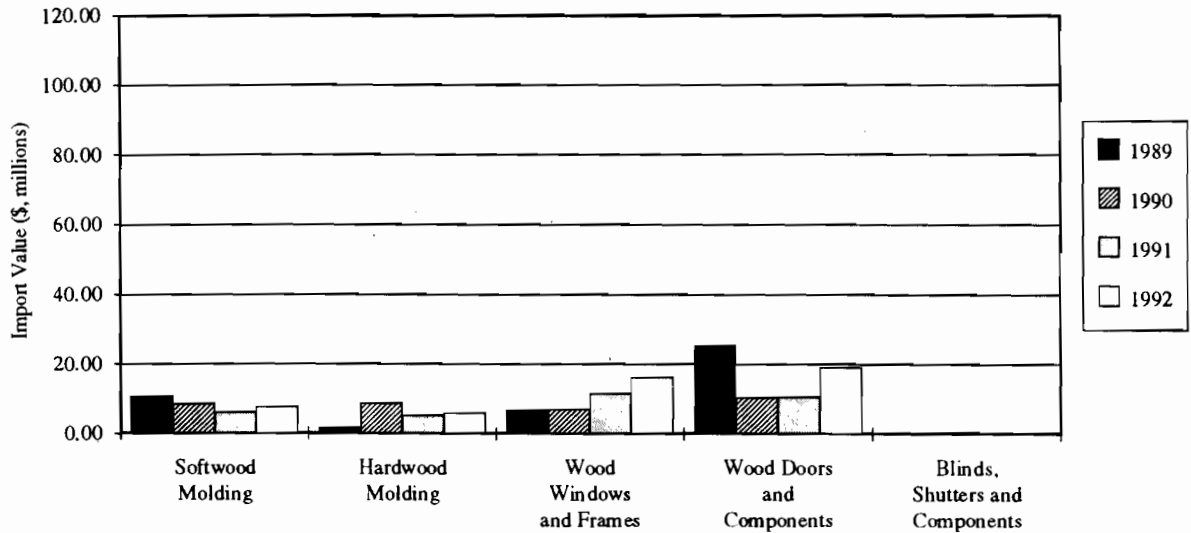
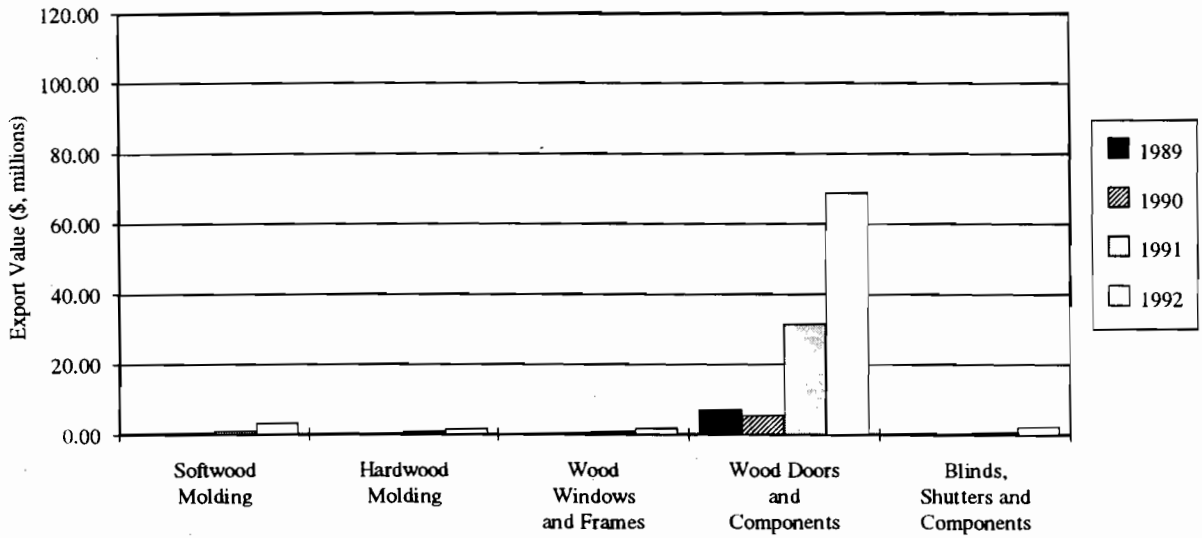


Figure 10. US Trade in Millwork Products with Canada, 1989-1992

US Exports of Millwork Products to Mexico, 1989-1992



US Imports of Millwork Products From Mexico, 1989-1992

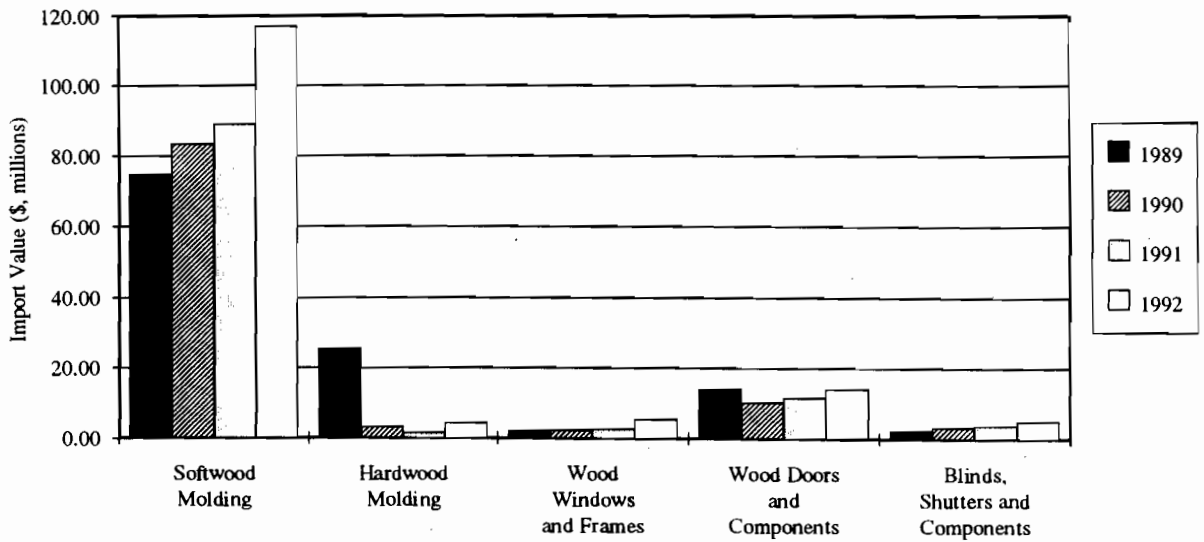
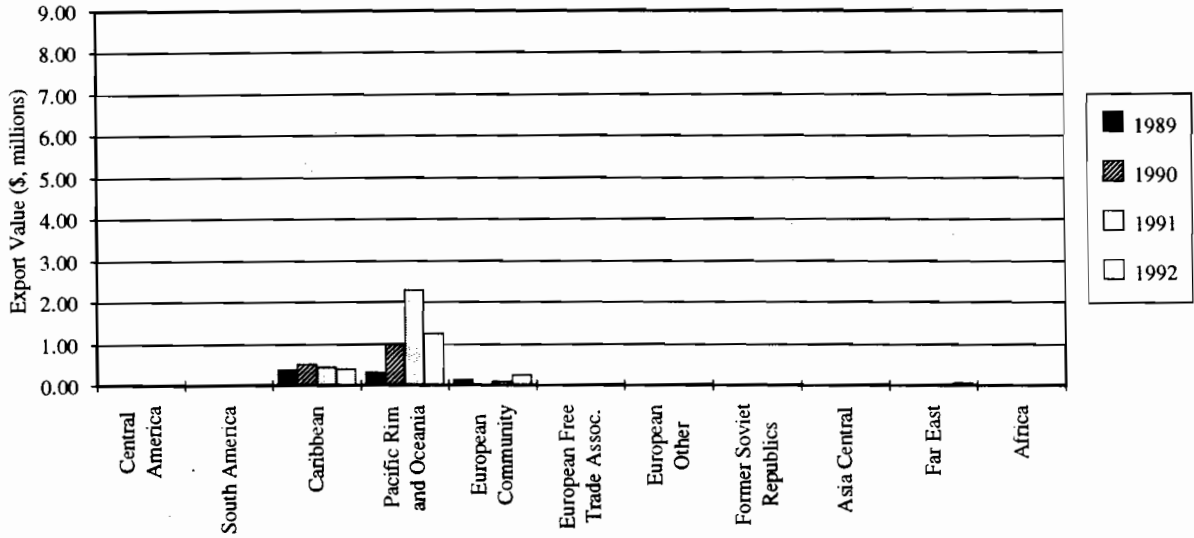


Figure 11. US Trade in Millwork Products with Mexico, 1989-1992

Softwood Molding Exports From US, 1989-1992



Softwood Molding Imports to US, 1989-1992

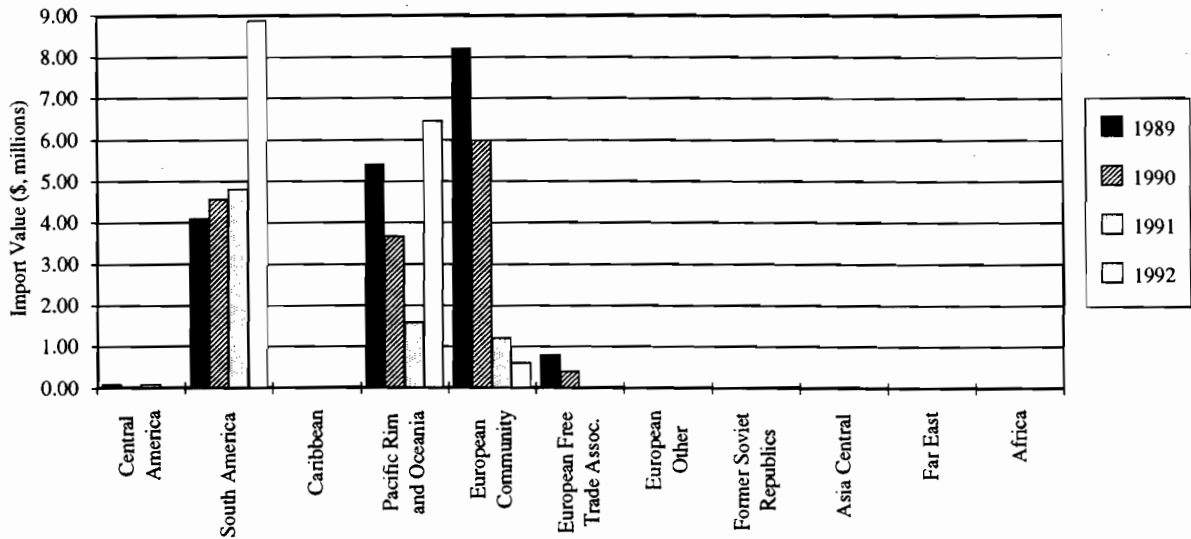
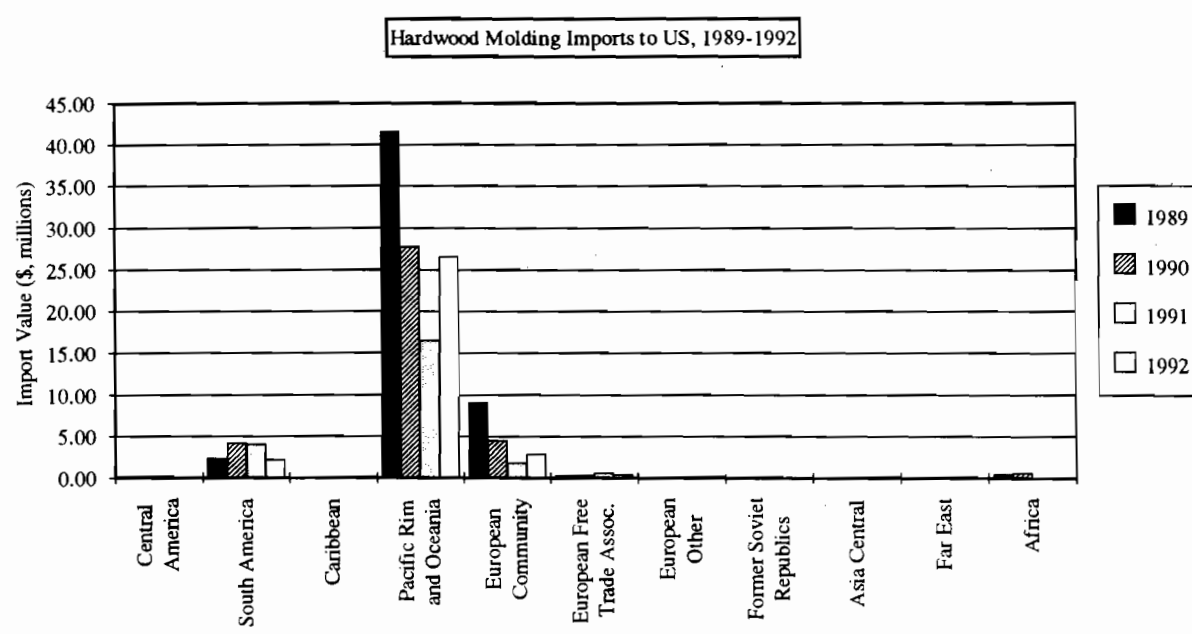
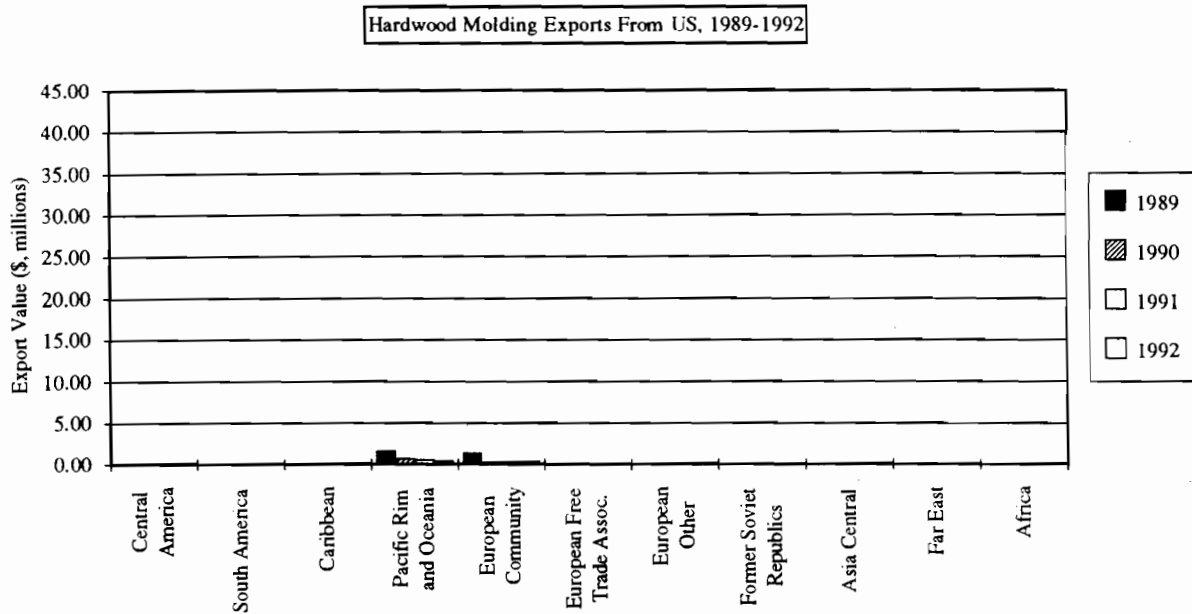


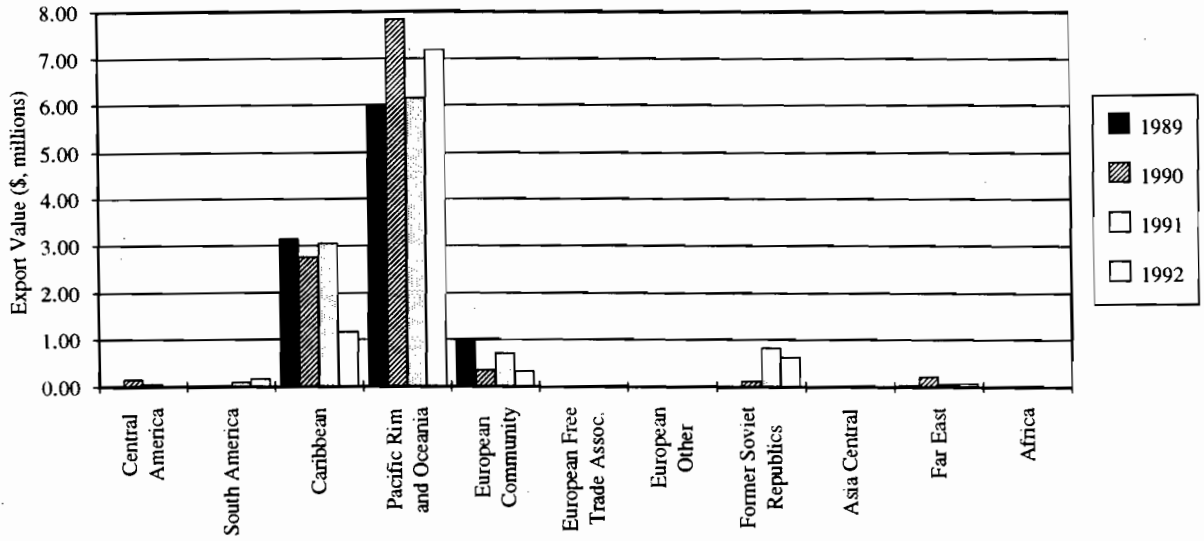
Figure 12. US Trade in Softwood Moldings Outside North America, 1989-1992





**Figure 13. US Trade in Hardwood Moldings Outside North America, 1989-1992**

Wood Window and Frame Exports From US, 1989-1992



Wood Window and Frame Imports to US, 1989-1992

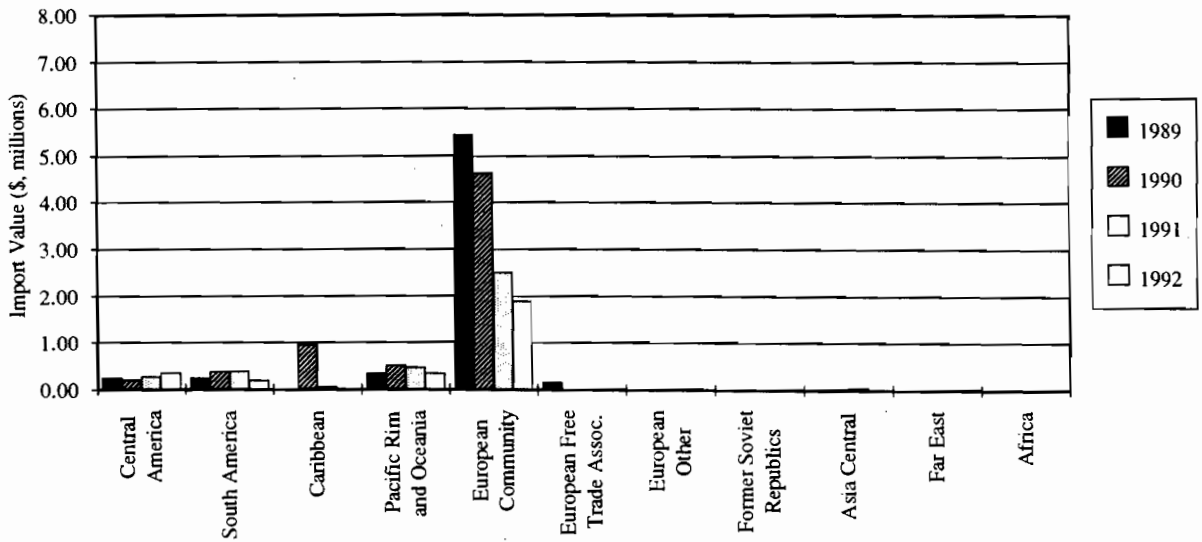
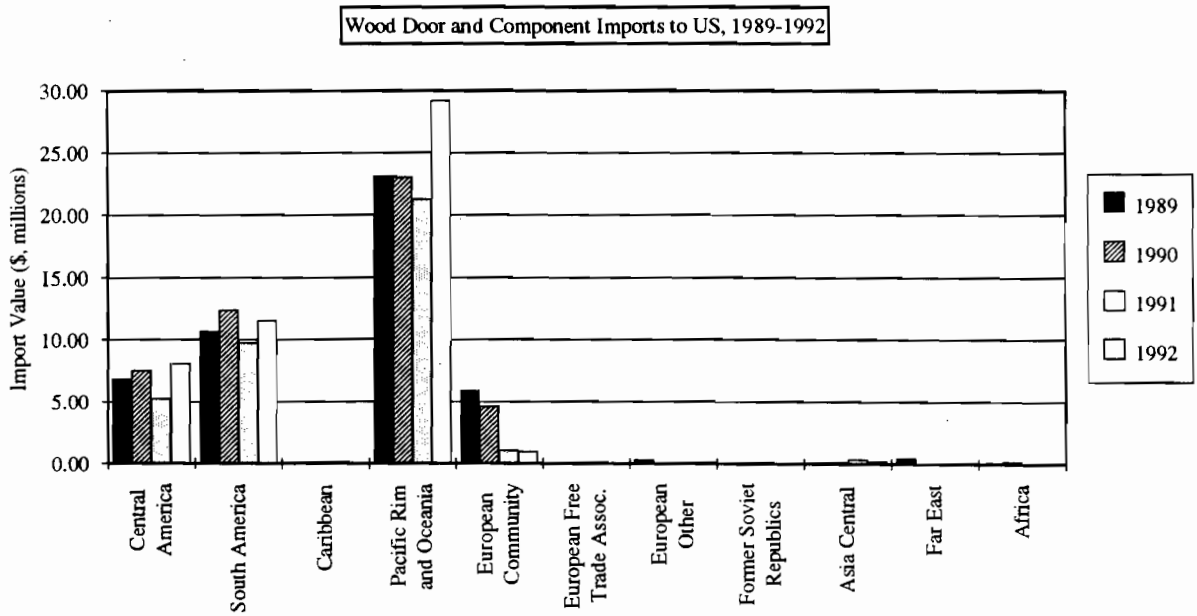
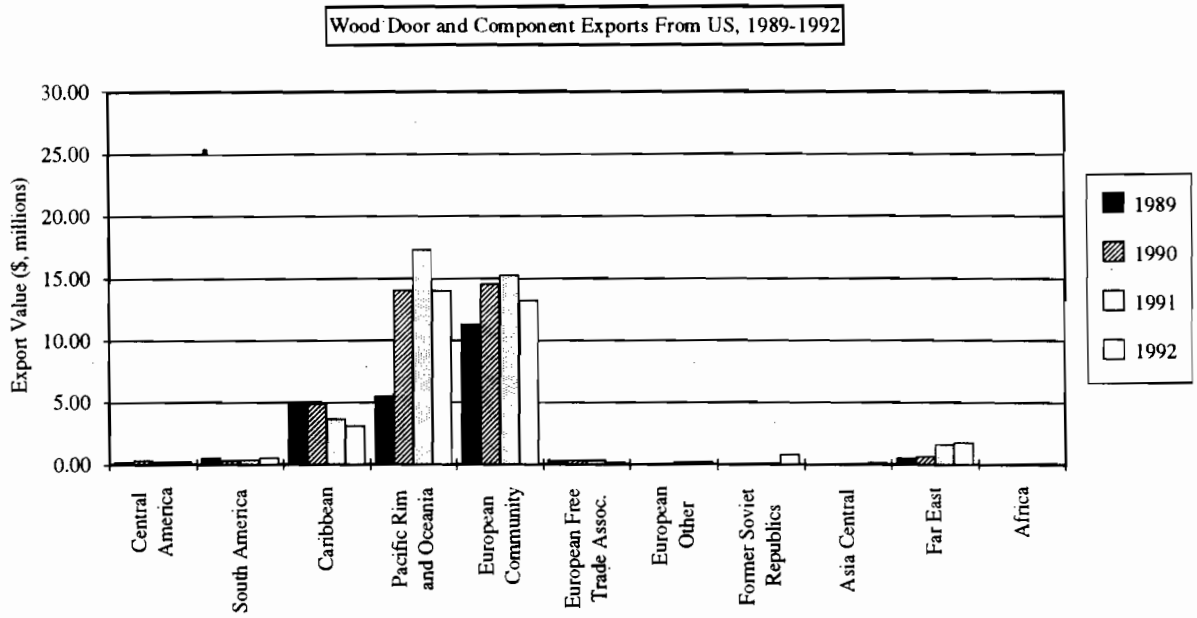
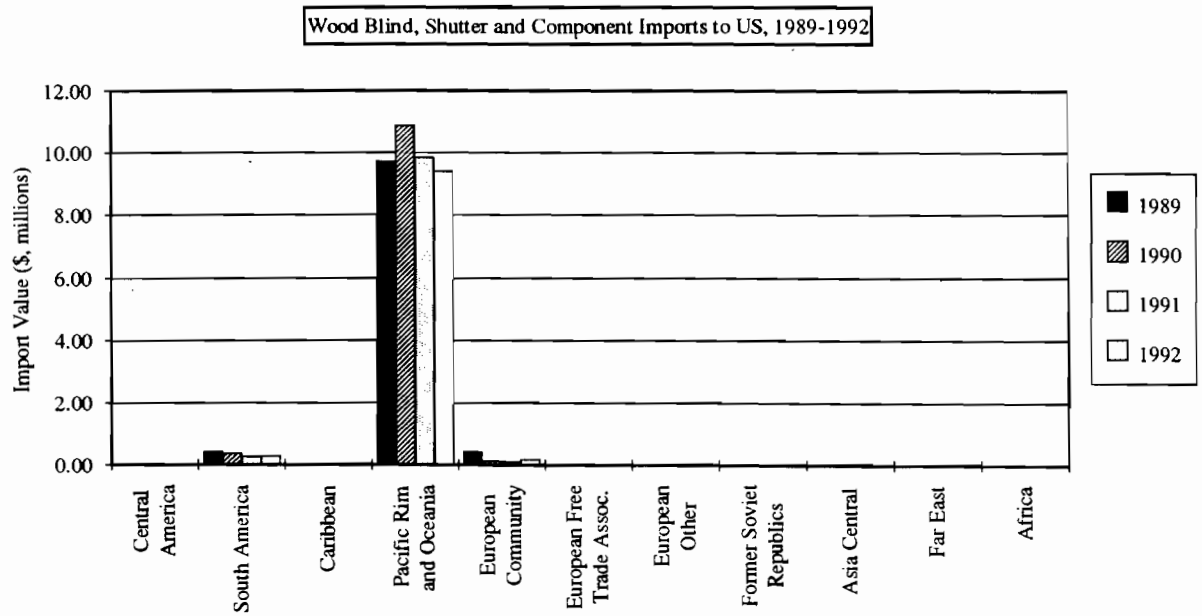
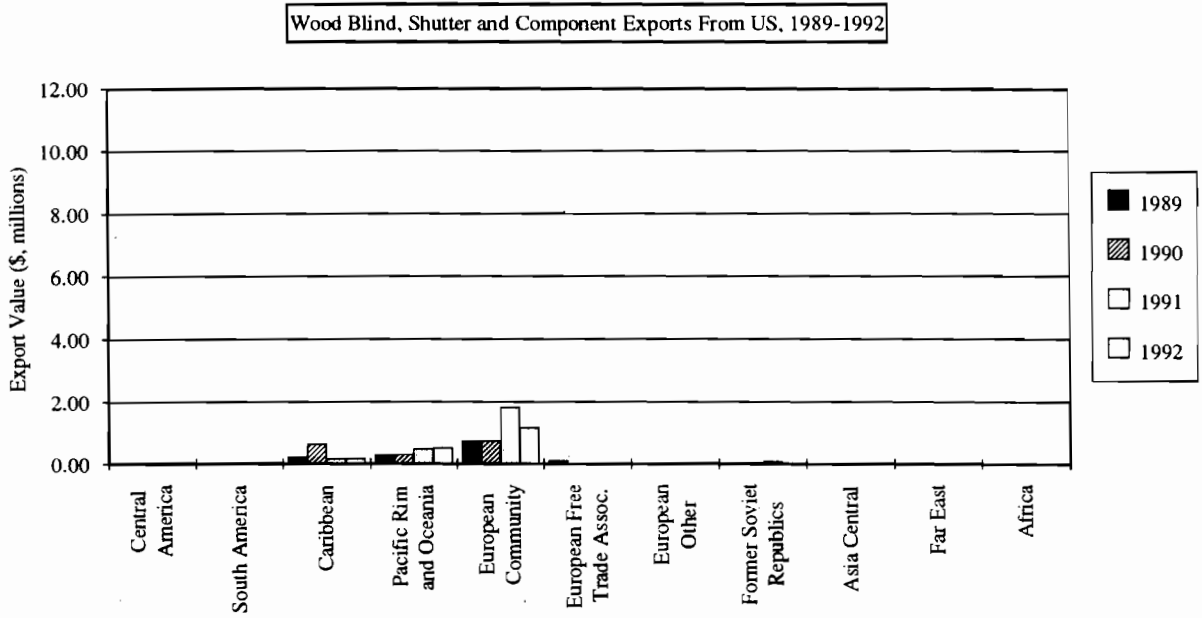


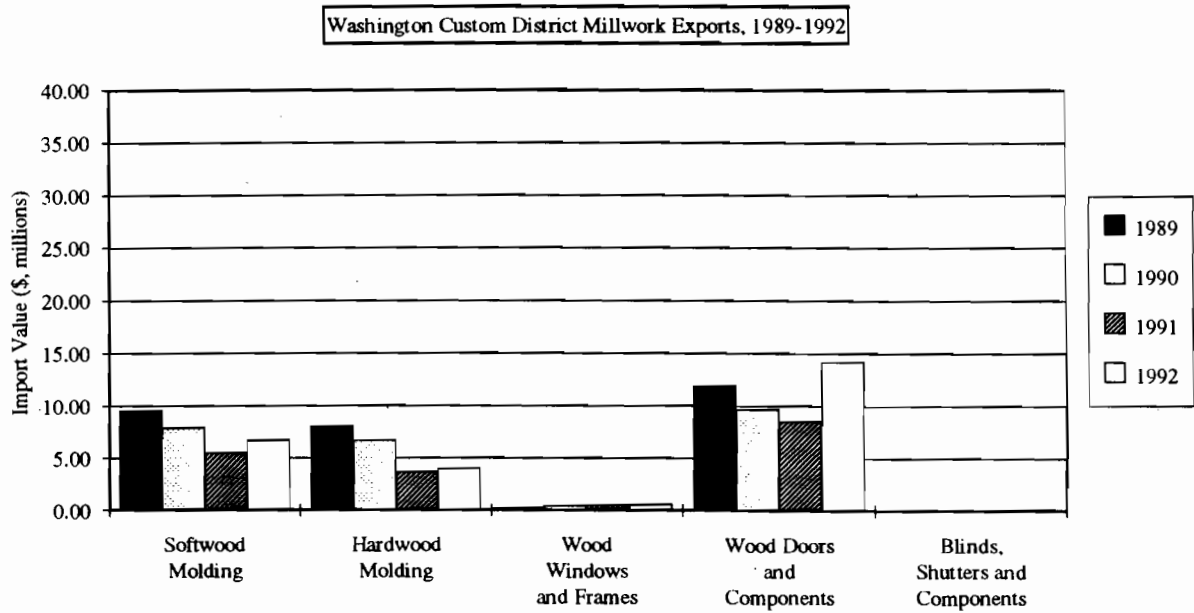
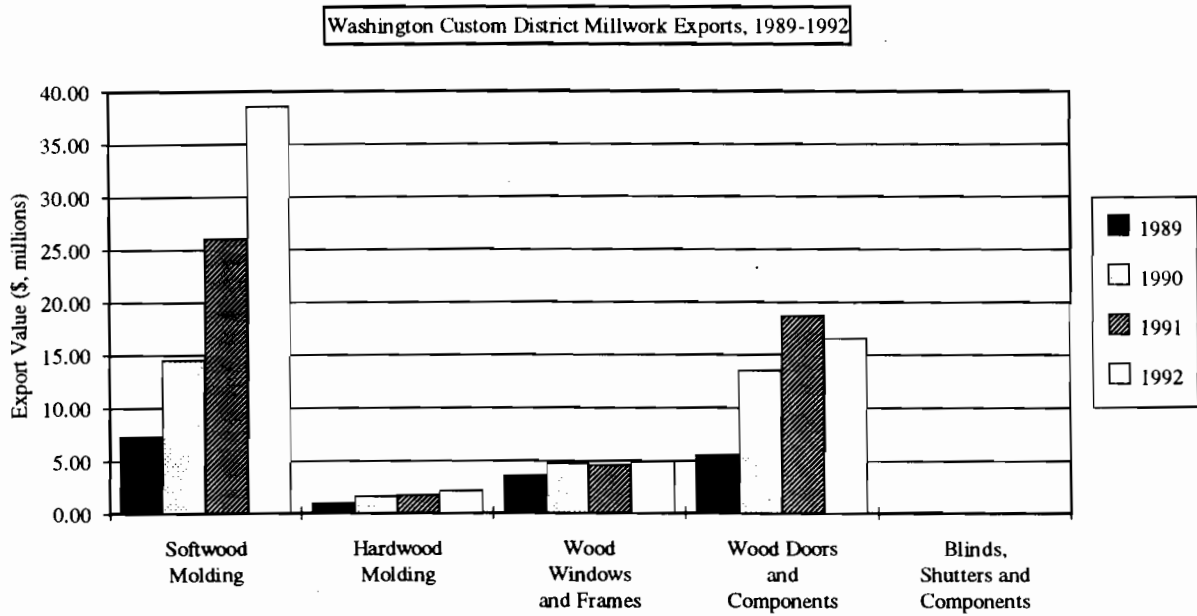
Figure 14. US Trade in Windows and Frames Outside North America, 1989-1992



**Figure 15. US Trade in Wood Doors and Components Outside North America, 1989-1992**



**Figure 16. US Trade in Wood Blinds, Shutters and Components Outside North America, 1989-1992**



**Figure 17. Trade in Millwork Products Through the Washington Customs District, 1989-1992**

## LITERATURE CITED

- Anderson, R. A., and D. B. McKeever. 1988. Wood Used In New Residential Construction in the United States. USDA Forest Service, American Plywood Association, American Wood Council, National Forest Products Association, Southern Forest Products Association, Western Wood Products Association. 73pp.
- Byalozynski, L. F., and D. G. Briggs. 1994. Results of a 1990 Survey of the US Millwork Industry: Characteristics and Attitudes. Center for International Trade in Forest Products (CINTRAFOR) Working Paper 49, College of Forest Resources, University of Washington, Seattle WA.
- Bratkovich, S. M., and G. R. Passewitz. 1991. Estimating the Size of Hardwood Industries: An Ohio Case Study. *For. Prod. J.* 43(10):69-72.
- Business Trend Analysts, Inc. 1986. The US Millwork Industry.
- Floyd, D. W., B. D. McCoy, and S. M. Bratkovich. 1993. Ohio's Pallet Industry. *For. Prod. J.* 43(3):59-63.
- Kingslien, H., and B. J. Greber. 1993. Wood Remanufacturing: Growth Trends and Selected Characteristics Identify Opportunities. *For. Prod. J.* 43(6):29-34.
- Luppold, W. G., and R. E. Thomas. 1991. New Estimates of Hardwood Lumber Exports to Europe and Asia. USDA Forest Service, Northeastern Forest Experiment Station Research Paper NE-652, Radner PA.
- Phelps, J. E., and D. R. McCurdy. 1992. Sawmill Production in the United States. *For. Prod. J.* 43(3):19-21.
- Sherrill, S. 1987. A Perspective on: Western Factory Lumber. *Crow Digest* 2(4):2-7.
- US Department of Commerce. 1947. Millwork, Plywood, and Prefabricated Wood Products. Bureau of the Census, Washington, DC
- US Department of Commerce. 1954. Millwork, Plywood, and Prefabricated Wood Products. Bureau of the Census, Washington, DC
- US Department of Commerce. 1958. Millwork, Veneer, Plywood, and Prefabricated Structural Wood Products. Bureau of the Census, Washington, DC
- US Department of Commerce. 1963. Millwork, Plywood, and Prefabricated Structural Wood Products. Bureau of the Census, Washington, DC
- US Department of Commerce. 1967. Millwork, Plywood, and Prefabricated Structural Wood Products. Bureau of the Census, Washington, DC

- US Department of Commerce. 1972. Millwork, Plywood, and Structural Wood Members, Not Elsewhere Classified. Bureau of the Census, Washington, DC
- US Department of Commerce. 1977. Millwork, Plywood, and Structural Wood Members, Not Elsewhere Classified. Bureau of the Census, Washington, DC
- US Department of Commerce. 1982. Millwork, Plywood, and Structural Wood Members, Not Elsewhere Classified. Bureau of the Census, Washington, DC
- US Department of Commerce, 1987. Millwork, Plywood, and Structural Wood Members, Not Elsewhere Classified. Bureau of the Census, Washington, DC
- US Department of Commerce. 1992. Statistical Abstract of the United States: 1992, 112th Edition. Bureau of the Census, Washington DC
- US Department of Commerce. 1991. Annual Survey of Manufacturers: Value of Product Shipments. Bureau of the Census, Washington DC (Annual).
- US Department of Commerce. 1991. Annual Study of Manufacturers: Statistics for Industry Groups and Industries. Bureau of the Census, Washington DC (Annual).

## APPENDIX A

### DEPARTMENT OF COMMERCE MILLWORK INDUSTRY DEFINITION

The following definition and product list is a verbatim reproduction of the Department of Commerce description of the millwork industry and the products which are considered millwork products. The millwork industry belong to the industry group "Millwork, Veneer, Plywood, and Structural Wood Members," its three-digit, SIC industry group number is 243. Millwork is the first industry listed in the industry group and is therefore identified with the four-digit code SIC 2431.

#### **2431 Millwork**

Establishments primarily engaged in manufacturing fabricated wood millwork, including wood millwork covered with materials such as metal and plastics. Planing mills primarily engaged in producing millwork are included in this industry, but planing mills primarily producing standard workings or patterns of lumber are classified in Industry 2421. Establishments primarily manufacturing wood kitchen cabinets and bathroom vanities for permanent installation are classified in Industry 2434. Table A-1 presents SIC classification of the millwork industry and its products up to 7 digit codes. Table A-2 presents classification codes for millwork imports and exports.



**Table A-1. SIC Classification of Millwork**  
(The lettered groups are aggregates used in this report.)

SIC	Description
<b>A. Wood Windows and Frames</b>	
24311	Wood window units <ul style="list-style-type: none"> <li>• Double hung: cladded 2431131; other 2431132; awning 2431134</li> <li>• Casement: cladded 2431135; other 2431136</li> <li>• Horizontal sliding: 2431141</li> <li>• All other, including single hung: 2431145</li> <li>• Wood window units, not specified in kind: 2431100</li> </ul>
24312	Wood window sash <ul style="list-style-type: none"> <li>• Knockdown and open: 2431209</li> <li>• Glazed: 2431215</li> <li>• Wood window sash, including combination screen and storm sash, and window screens, excluding window units not specified in kind: 2431200</li> </ul>
24313	Wood window and door frames, and door frames shipped in door units, excluding window frames shipped in window units <ul style="list-style-type: none"> <li>• Window frames, wood: 2431313</li> <li>• Door frames, wood: 2431315</li> <li>• Wood windows &amp; door frames, not specified in kind: 2431300</li> </ul>
<b>B. Doors and Components</b>	
24314	Wood doors, interior and exterior, including those with glazed sections and doors shipped in door units <ul style="list-style-type: none"> <li>• Panel type (including French doors): Douglas-fir 2431411; western pines 2431413; other species 2431419</li> <li>• Flush type, hollow core: softwood faces 2431431; hardwood faces 2431433; hardboard faces 2431435; other faces 2431437</li> <li>• Flush type, solid core: hardwood faces and solid wood core 2431441; hardwood faces and solid composition core 2431445; hardboard faces 2431446; softwood and other faces 2431448; wood doors, interior and exterior, not specified in kind 2431400</li> </ul>
<b>C. Moldings</b>	
24316	Wood moldings except prefinished moldings made from purchased moldings <ul style="list-style-type: none"> <li>• Softwood (including softwood covered with metal, plastics, etc.): pine 2431621; other softwood species 2431631</li> <li>• Hardwoods (including luan and hardwood covered with metal, plastics, etc.): 2431651</li> <li>• Wood moldings (except prefinished moldings made from purchased moldings) not specified in kind: 2431600</li> </ul>
24317	Prefinished wood moldings made from purchased moldings <ul style="list-style-type: none"> <li>• Softwood (including softwood covered with metal, plastics, etc.): pine 2431721; other softwood species 2431731</li> <li>• Hardwood (including luan and hardwood covered with metal, plastics, etc.): 2431751</li> <li>• Prefinished wood moldings made from purchased moldings, not specified in kind 2431700</li> </ul>
<b>D. Other millwork products, including stair work and exterior millwork</b>	
24318	<ul style="list-style-type: none"> <li>• Stair work including treads, risers, balusters, brackets, newels, rails, etc.): Softwood 2431821; hardwood 2431825</li> <li>• Exterior wood blinds and shutters with or without hardware 2431833</li> <li>• Exterior millwork, including porch columns, porch rails, newels, trellises and entrances 2431835</li> <li>• Nonstandard specialty wood moldings, carvings and ornaments suitable for architectural or furniture decorations: softwood 2431873; hardwood 2431877</li> <li>• Other millwork products, nsk: 2431800</li> </ul>
24310	Millwork products, nsk

**Table A-2. Import and Export Classification of Millwork Products**

4-Digit SIC	Commerce Descriptor	Harmonized System	
		Export Commodity	Import Commodity <sup>1</sup> (if different)
A. Wood Windows and Frames			
2431	Windows, French windows and their frames, of wood	4418100000	
B. Doors and Components			
2431	Flush doors, of wood	4418200030	
2431	Doors and their frames, thresholds, of wood, nesoi	4418200060	
C. Moldings			
2431	Wood moldings, coniferous	4409103000	4409104500/ 4409105000
2431	Wood moldings, nonconiferous	4409204500	4409204000/ 4409205000
D. Other millwork products, including stair work and exterior millwork			
2431	Wood continuously shaped, coniferous, nesoi	4409109000	4409109000/ 4409109040
2431	Wood continuously shaped, nonconiferous, nesoi	4409209000	
2431	Wood blinds, shutters, screens and shades	4421904500	4421903000/ 4421904000
2431	Wood dowel rods, nonconiferous	4409207000	4409206000/ 4409206500
2431	Wood dowel pins	4421902500	

<sup>1</sup>Slashes: either represent a change in classification code or two categories that are combined in the statistical summary presented in this report.



## APPENDIX B

### DEPARTMENT OF COMMERCE ABBREVIATIONS AND DEFINITIONS

Due to the high frequency of Department of Commerce data utilized in this report, the following list of abbreviations and symbols utilized in the tables sourced by Department of Commerce data is presented for reader convenience.

- Represents zero.
- (D) Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
- do Ditto.
- emp employees.
- mfgr manufacture.
- (NA) Not available.
- (NC) Not comparable.
- n.e.c. Not elsewhere classified.
- NSK Not specified by kind.
- pt. Part.
- r Revised.
- (S) Withheld because estimate did not meet publication standards.
- SIC Standard Industrial Classification.
- (X) Not applicable.
- (Z) Less than half the unit shown.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

The following is an explanation of Department of Commerce terminology utilized in this report. It is a verbatim reproduction of the terms as they are presented in the Census of Manufactures report.

**Number of establishments and companies:** An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

If the company operated at different physical location, even if the individual locations were producing the same line of goods, a separate report was requested for each location. if the

company operated in two or more distinct lines of manufacturing at the same location, a separate report was requested for each activity.

An establishment not in operation for any portion of the year was requested to return the report form with the proper notation in the "Operational Status" section of the form. In addition, the establishment was requested to report data on any employees, capital expenditures, inventories, or shipments from inventories during the year.

In this report, data are shown for establishments in operation at any time during the year. A comparison with the number of establishments in operation at the end of the year will be provided in the Introduction of the General Summary subject report.

**All employees:** This item includes all full-time and part-time employees on the payrolls of operating manufacturing establishments during any part of the pay period which included the 12th of the months specified on the report form. Included are all persons on paid sick leave, paid holidays, and paid vacations during these pay periods. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average for the payroll periods including the 12th of March, May, August, and November.

**Production workers:** This item includes workers (up through the line-supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial and guard services, product development, auxiliary production for plant's own use (e.g., power plant), recordkeeping, and other services closely associated with these production operations at the establishment covered by the report. Employees above the working-supervisor level are excluded from this item.

**All other employees:** This item covers nonproduction employees of the manufacturing establishment including those engaged in factory supervision above the line-supervisor level. It includes sales (including driver sales persons), sales delivery (highway truck drivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office function, executive, purchasing, financing, legal, personnel (including cafeteria, medical, etc.), professional, and technical employees. Also included are employees on the payroll of the manufacturing establishment engaged in the construction of major additions or alterations to the plant and utilized as a separate work force.

In addition to reports sent to operating manufacturing establishments, information on employment during the payroll period which included March 12 and annual payrolls also was requested of auxiliary units (e.g., administrative offices, warehouses, and research and development laboratories) of multiestablishment companies. However, these figures are not included in the totals for individual industries shown in this report. They are included in the general summary and geographic area reports as a separate category.

**Payroll:** This item includes the gross earnings of all employees on the payroll of operating manufacturing establishments paid in the calendar year 1987. Respondents were told they could follow the definition of payrolls used for calculating the Federal withholding tax. It includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers of corporations; it excludes payments to proprietors or partners of unincorporated concerns. Also excluded are payments to members of Armed Forces and pensioners carried on the active payroll of manufacturing establishments.

The census definition of payrolls is identical to that recommended to all Federal statistical agencies by the Office of Management and Budget. It should be noted that this definition does not include employers' Social Security contributions or other nonpayroll labor costs, such as employees' pension plan, group insurance premiums, and workers' compensation.

The ASM provides estimates of employers' supplemental labor costs, both those required by Federal and State laws and those incurred voluntarily or as part of collective bargaining agreements. (Supplemental labor costs are explained later in this appendix.)

As is the case of employment figures, the payrolls of separate auxiliary units of multiestablishment companies are not included in the totals for individual industries or industry groups.

**Cost of materials:** This term refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed, whether purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (1) all raw materials, semifinished goods, parts, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year, (2) electric energy purchased, (3) fuels consumed for heat, power, or the generation of electricity, (4) work done by others on materials or parts furnished by manufacturing establishments (contract work), and (5) products bought and resold in the same condition. (See discussion of duplication of data below.)

**Value of Shipments:** This item covers the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts, such as receipts for contract work performed for others, installation and repair, sales of scrap, and sales of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it, whether sold, transferred to other plants of the same company, or shipped on consignment. The net

selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multi-unit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, including not only the direct cost of production but also a reasonable proportion of "all other costs" (including company overhead) and profit. (See discussion of duplication of data below.)

**Value added by manufacture:** This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments (products manufactured plus receipts for services rendered). The result of this calculation is adjusted by the addition of value added by merchandising operations (i.e., the difference between the sales value and the cost of merchandise sold without manufacture, processing, or assembly) plus the net change in finished goods and work-in-process between the beginning- and end-of-year inventories.

For those industries where value of production is collected instead of value of shipments (see footnote in table 1a), value added is adjusted only for the change in work-in-process inventories between the beginning and end of year. For those industries where value of work done is collected, the value added does not include an adjustment for the change in finished goods or work-in-process inventories.

**New and used capital expenditures:** For establishments in operation and any known plants under construction, manufacturers were asked to report their new expenditures for (1) permanent additions and major alterations to manufacturing establishments, and (2) machinery and equipment used for replacement and addition to plant capacity if they were of the type for which depreciation accounts were ordinarily maintained.

The totals for new expenditures include expenditures leased from nonmanufacturing concerns through capital leases, new facilities owned by the Federal Government but operated under contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations. Also excluded are expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses.

Manufacturers also were requested to report the value of all used buildings and equipment purchased during the year at the purchase price. For any equipment or structure transferred for the use of the reporting establishment by the parent company or one of its subsidiaries, the value at which it was transferred to the establishment was to be reported. Furthermore, if the establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported under used capital expenditures.

Total expenditures for used plant and equipment is a universe figure; it is collected on all census forms. However, the breakdown of this figure between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. The data for total new capital expenditures, new building expenditures, and new machinery expenditures, as well as the data for total used expenditures, are shown in table 3b (not included).

**End-of-year inventories:** Respondents were asked to report their 1986 and 1987 end-of-year inventories at cost or market. Effective with the 1982 Economic Censuses, this change to a uniform instruction for reporting inventories was introduced for all sector reports. Prior to 1982, respondents were permitted to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). (in 1983, LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

Because of this change in reporting instructions, the 1982 through 1987 data for inventories and value added by manufacture included in the tables of this report are not comparable to the prior-year data shown in table 1a of this [1987 Census of Manufactures] report (not included) and in historical census of manufactures and annual survey of manufactures publications.

In using inventory data by stage of fabrication for "all industries" and at the two-digit industry level, it should be noted that an item treated as a finished product by an establishment in one industry may be reported as a raw material by another establishment in a different industry. For example, the finished-product inventories of a steel mill would be reported as raw materials by a stamping plant. Such differences are present in the inventory figures by stage of fabrication shown for individual industries, industry groups, and "all manufacturing," which are aggregates of figures reported by establishments in specified industries.

### **Items Collected Only On ASM Report Forms**

The following items were collect only from establishments included in the ASM sample:

**Retirements of depreciable assets:** Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during 1987. When a complete operation or establishment changed ownership, the respondent was instructed to report the value of the assets sold at the original cost as recorded in the books of the seller. The respondent also was requested to report retirements of equipment or structures owned by a parent company that the establishment was using as if it were a tenant.

**Depreciation charges for fixed assets:** This item includes depreciation and amortization charged during the year against assets. Depreciation charged against fixed assets acquired since the beginning of the year and against assets sold or retired during the year are components of this category. Respondents were requested to make certain that they did not report accumulated depreciation.



**Breakdown of new capital expenditures for machinery and equipment:** ASM establishments were requested to separate their capital expenditures for new machinery and equipment into (1) automobiles, trucks, etc., for highway use, (2) computers and peripheral data processing equipment, and (3) all other.

The category "automobiles, trucks, etc., for highway use" is intended to measure expenditures for vehicles designed for highway use that were acquired through a purchase or lease-purchase agreement.

Vehicles normally operating off public highways (vehicles specifically designed to transport materials, property, or equipment on mining, construction, logging, and petroleum development projects) are excluded from this item.

**APPENDIX C**

**ORGANIZATION OF COUNTRIES BY REGION**

Schedule C Code	Country Abbreviation	Macro Territory Designation	Micro Territory Designation
7140	Moroc	Africa	Africa
7210	Algeria	Africa	Africa
7230	Tunisia	Africa	Africa
7250	Libya	Africa	Africa
7290	Egypt	Africa	Africa
7320	Sudan	Africa	Africa
7370	W Sahar	Africa	Africa
7380	Eq Guin	Africa	Africa
7410	Mauritn	Africa	Africa
7420	Camroon	Africa	Africa
7440	Senegal	Africa	Africa
7450	Mali	Africa	Africa
7460	Guinea	Africa	Africa
7470	Sier Ln	Africa	Africa
7480	Ivy Cst	Africa	Africa
7490	Ghana	Africa	Africa
7500	Gambia	Africa	Africa
7510	Niger	Africa	Africa
7520	Togo	Africa	Africa
7530	Nigeria	Africa	Africa
7540	C Af Rp	Africa	Africa
7550	Gabon	Africa	Africa
7560	Chad	Africa	Africa
7580	S Helna	Africa	Africa
7600	U Volta	Africa	Africa
7610	Benin	Africa	Africa
7620	Angola	Africa	Africa
7630	Co Braz	Africa	Africa
7642	G Bisau	Africa	Africa
7643	C Verde	Africa	Africa
7644	Sao T P	Africa	Africa
7650	Liberia	Africa	Africa
7660	Zaire	Africa	Africa
7670	Burundi	Africa	Africa
7690	Rwanda	Africa	Africa
7700	Somalia	Africa	Africa
7740	Ethiop	Africa	Africa
7770	Djibuti	Africa	Africa
7780	Uganda	Africa	Africa
7790	Kenya	Africa	Africa
7800	Seychel	Africa	Africa
7810	B Ind O	Africa	Africa
7830	Tnzania	Africa	Africa
7850	Maurit	Africa	Africa
7870	Mozambq	Africa	Africa
7880	Malagas	Africa	Africa
7890	Comoros	Africa	Africa

Schedule C Code	Country Abbreviation	Macro Territory Designation	Micro Territory Designation
7904	Reunion	Africa	Africa
7905	F So Ant	Africa	Africa
7910	Rep SAf	Africa	Africa
7920	Nambia	Africa	Africa
7930	Botswan	Africa	Africa
7940	Zambia	Africa	Africa
7950	Swazlnd	Africa	Africa
7960	Zmbabwe	Africa	Africa
7970	Malawi	Africa	Africa
7990	Lesotho	Africa	Africa
5310	Afghan	Asia	Asia Central
5330	India	Asia	Asia Central
5350	Pakistn	Asia	Asia Central
5360	Nepal	Asia	Asia Central
5380	Bngldsh	Asia	Asia Central
5420	Sri Lka	Asia	Asia Central
5460	Burma	Asia	Asia Central
2320	Bermuda	North America	Caribbean
2360	Bahamas	North America	Caribbean
2390	Cuba	North America	Caribbean
2410	Jamaica	North America	Caribbean
2430	Turk Is	North America	Caribbean
2440	Cayman	North America	Caribbean
2450	Haiti	North America	Caribbean
2470	Dom Rep	North America	Caribbean
2481	Anglla	North America	Caribbean
2482	B Virgn	North America	Caribbean
2483	ST C N	North America	Caribbean
2484	Antigua	North America	Caribbean
2485	Monsrat	North America	Caribbean
2486	Dominca	North America	Caribbean
2487	S Lucia	North America	Caribbean
2488	S Vinct	North America	Caribbean
2489	Grenada	North America	Caribbean
2720	Barbado	North America	Caribbean
2740	Trinid	North America	Caribbean
2771	N Antil	North America	Caribbean
2779	Aruba	North America	Caribbean
2831	Guadlpe	North America	Caribbean
2839	Martinq	North America	Caribbean
2050	Guatmal	North America	Central America
2080	Belize	North America	Central America
2110	Salvadr	North America	Central America
2150	Hondura	North America	Central America
2190	Nicarag	North America	Central America
2230	C Rica	North America	Central America
2250	Panama	North America	Central America
4000	Iceland	Europe	Euro. Free Trade Assoc.
4010	Sweden	Europe	Euro. Free Trade Assoc.
4039	Norway	Europe	Euro. Free Trade Assoc.

Schedule C Code	Country Abbreviation	Macro Territory Designation	Micro Territory Designation
4050	Finland	Europe	Euro. Free Trade Assoc.
4330	Austria	Europe	Euro. Free Trade Assoc.
4411	Lichten	Europe	Euro. Free Trade Assoc.
4419	Switzld	Europe	Euro. Free Trade Assoc.
4099	Denmark	Europe	European Community
4120	U King	Europe	European Community
4190	Ireland	Europe	European Community
4210	Nethlds	Europe	European Community
4231	Belgium	Europe	European Community
4239	Luxmbrg	Europe	European Community
4279	France	Europe	European Community
4280	FR Germ	Europe	European Community
4700	Spain	Europe	European Community
4710	Portugl	Europe	European Community
4759	Italy	Europe	European Community
4840	Greece	Europe	European Community
4031	Sv Jm Is	Europe	European Other
4271	Andorra	Europe	European Other
4272	Monaco	Europe	European Other
4350	Czecho	Europe	European Other
4370	Hungary	Europe	European Other
4720	Gibralt	Europe	European Other
4730	Malta	Europe	European Other
4751	San Mar	Europe	European Other
4752	Vat Cty	Europe	European Other
4790	Yugosl	Europe	European Other
4810	Albania	Europe	European Other
4850	Romania	Europe	European Other
4870	Bulgar	Europe	European Other
4890	Turkey	Europe	European Other
4910	Cyprus	Europe	European Other
5020	Syria	Asia	Far East
5040	Lebanon	Asia	Far East
5050	Iraq	Asia	Far East
5070	Iran	Asia	Far East
5080	Isreal	Asia	Far East
5110	Jordan	Asia	Far East
5130	Kuwait	Asia	Far East
5160	Sa Nz	Asia	Far East
5170	S Arab	Asia	Far East
5180	Qatar	Asia	Far East
5200	Arab Em	Asia	Far East
5210	Yemen	Asia	Far East
5230	Oman	Asia	Far East
5250	Bahrain	Asia	Far East
4470	Estonia	Europe	Former Soviet Republics
4490	Latvia	Europe	Former Soviet Republics
4510	Lithuan	Europe	Former Soviet Republics
4550	Poland	Europe	Former Soviet Republics
4621	Russia	Europe	Former Soviet Republics

Schedule C Code	Country Abbreviation	Macro Territory Designation	Micro Territory Designation
4622	Byelar	Europe	Former Soviet Republics
4623	Ukraine	Europe	Former Soviet Republics
4631	Armenia	Europe	Former Soviet Republics
4632	Azerbjn	Europe	Former Soviet Republics
4633	Georgia	Europe	Former Soviet Republics
4634	Kazakhs	Europe	Former Soviet Republics
4635	Kyrgyzs	Europe	Former Soviet Republics
4641	Moldova	Europe	Former Soviet Republics
4642	Tajikis	Europe	Former Soviet Republics
4643	Turkmen	Europe	Former Soviet Republics
4644	Uzbekis	Europe	Former Soviet Republics
1010	Greenld	North America	North America
1220	Canada	North America	North America
1610	SP Mqel	North America	North America
2010	Mexico	North America	North America
5490	Thailnd	Asia	Pacific Rim
5520	Vietnam	Asia	Pacific Rim
5530	Laos	Asia	Pacific Rim
5550	Kampuch	Asia	Pacific Rim
5570	Malaysa	Asia	Pacific Rim
5590	Singarp	Asia	Pacific Rim
5600	Indnsia	Asia	Pacific Rim
5610	Brunei	Asia	Pacific Rim
5650	Phil R	Asia	Pacific Rim
5660	Macao	Asia	Pacific Rim
5682	Bhutan	Asia	Pacific Rim
5683	Maldiv	Asia	Pacific Rim
5700	China M	Asia	Pacific Rim
5740	Mongola	Asia	Pacific Rim
5790	No Kor	Asia	Pacific Rim
5800	Kor Rep	Asia	Pacific Rim
5820	Hg Kong	Asia	Pacific Rim
5830	China T	Asia	Pacific Rim
5880	Japan	Asia	Pacific Rim
6021	Austral	Australia and Oceania	Pacific Rim
6022	Norfolk	Australia and Oceania	Pacific Rim
6023	Cocos I	Australia and Oceania	Pacific Rim
6024	Crist I	Australia and Oceania	Pacific Rim
6029	Heard I	Australia and Oceania	Pacific Rim
6040	New Gui	Australia and Oceania	Pacific Rim
6141	N Zeal	Australia and Oceania	Pacific Rim
6142	Cook Is	Australia and Oceania	Pacific Rim
6143	Tokelau	Australia and Oceania	Pacific Rim
6144	Niue	Australia and Oceania	Pacific Rim
6150	W Samoa	Australia and Oceania	Pacific Rim
6223	Solmn I	Australia and Oceania	Pacific Rim
6224	Vanuatu	Australia and Oceania	Pacific Rim
6225	Pitcarn	Australia and Oceania	Pacific Rim
6226	Kiribat	Australia and Oceania	Pacific Rim
6227	Tuvalu	Australia and Oceania	Pacific Rim

Schedule C Code	Country Abbreviation	Macro Territory Designation	Micro Territory Designation
6412	N Cald'n	Australia and Oceania	Pacific Rim
6413	Wallis	Australia and Oceania	Pacific Rim
6414	FR Poly	Australia and Oceania	Pacific Rim
6810	Marshal	Australia and Oceania	Pacific Rim
6820	Fed Mic	Australia and Oceania	Pacific Rim
6830	Palau	Australia and Oceania	Pacific Rim
6862	Nauru	Australia and Oceania	Pacific Rim
6863	Fiji	Australia and Oceania	Pacific Rim
6864	Tonga	Australia and Oceania	Pacific Rim
3010	Colomb	South America	South America
3070	Venez	South America	South America
3120	Guyana	South America	South America
3150	Surinam	South America	South America
3170	F Guian	South America	South America
3310	Ecuador	South America	South America
3330	Peru	South America	South America
3350	Bolivia	South America	South America
3370	Chile	South America	South America
3510	Brazil	South America	South America
3530	Paragua	South America	South America
3550	Uruguay	South America	South America
3570	Argent	South America	South America
3720	Falk Is	South America	South America