

Industry & Trade Summary

**Ceramic Floor and
Wall Tiles**

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PREFACE

In 1991 the United States International Trade Commission initiated its current *Industry and Trade Summary* series of informational reports on the thousands of products imported into and exported from the United States. Each summary addresses a different commodity/industry area and contains information on product uses, U.S. and foreign producers, and customs treatment. Also included is an analysis of the basic factors affecting trends in consumption, production, and trade of the commodity, as well as those bearing on the competitiveness of U.S. industries in domestic and foreign markets.¹

This report on ceramic floor and wall tiles covers the period 1987 through 1991 and represents one of approximately 250-300 individual reports to be produced in this series during the first half of the 1990s. Listed below are the individual summary reports published to date on the minerals and metals sector.

<i>USITC publication number</i>	<i>Publication date</i>	<i>Title</i>
2475 (MM-1)	July 1992	Fluorspar and certain other mineral substances
2504 (MM-2)	October 1992	Ceramic floor and wall tiles

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

CONTENTS

	<i>Page</i>
Preface	i
Introduction	1
U.S. industry profile	3
Industry structure	3
Consumer characteristics and factors affecting demand	6
Foreign industry profile	7
Italy	7
Spain	11
Brazil	11
Japan	12
Germany	12
EC	12
U.S. trade measures	13
Foreign trade measures	13
U.S. market	13
Consumption	13
Production	17
Imports	18
Products imported	18
Import levels and trends	18
Principal import suppliers	19
U.S. importers	19
Foreign markets	25
Foreign market profile	25
Canada	25
Mexico	26
Japan	26
The Bahamas	26
U.S. exports	26
U.S. trade balance	27
Appendix	
A. Explanation of tariff and trade agreement terms	A-1
Figures	
1. Ceramic floor and wall tiles: Quantity of U.S. producers' shipments and imports for consumption, by types, 1991	2
2. U.S. ceramic floor and wall tile industry: Principal raw materials, producer types, major products, and principal consumers	4
3. Ceramic floor and wall tiles: Production, by selected countries, 1990	7
4. Ceramic floor and wall tiles: Quantity of production, imports, exports, and apparent consumption, by selected countries, 1987-90	9
5. Ceramic floor and wall tiles: Value of imports, exports, and trade balances, by selected countries, 1987-90	10
6. Ceramic floor and wall tiles: U.S. producers' shipments, imports for consumption, and apparent U.S. consumption, 1987-91	15

CONTENTS—Continued

	<i>Page</i>
Figures—Continued	
7. Ceramic floor and wall tiles: Indexes of the quantity of U.S. tile consumption and the number of housing starts, 1976–91	16
8. Ceramic floor and wall tiles: Indexes of the value (in current dollars) of U.S. tile consumption; new construction put in place, residential construction, new; expenditures for residential repairs and improvements; and new construction put in place, nonresidential, new; 1987–91	17
9. Ceramic floor and wall tiles: Average unit values for U.S. producers' shipments and imports for consumption, 1987–91	18
10. Ceramic floor and wall tiles: Quantity of U.S. imports for consumption, by principal sources, 1987 and 1991	24
11. Ceramic floor and wall tiles: Value of U.S. exports of domestic merchandise, by principal markets, 1987 and 1991	25
12. Ceramic floor and wall tiles: Value of U.S. exports of domestic merchandise, by types, 1991	26
Tables	
1. Ceramic floor and wall tiles: Industry profiles for selected countries, 1990	8
2. Ceramic floor and wall tiles: Harmonized Tariff Schedule subheading; description; U.S. col. 1 rates of duty as of Jan. 1, 1992; U.S. exports, 1991; and U.S. imports, 1991	14
3. Ceramic floor and wall tiles: U.S. shipments, exports of domestic merchandise, imports for consumption, and apparent U.S. consumption, 1987–91	15
4. Ceramic floor and wall tiles: U.S. shipments, exports of domestic merchandise, imports for consumption, and apparent U.S. consumption, 1987–91	16
5. Ceramic floor and wall tiles: U.S. production, by types, 1987–91	18
6. Ceramic floor and wall tiles: U.S. producers' shipments, by types, 1987–91	19
7. Ceramic floor and wall tiles: U.S. imports for consumption, by principal sources, 1987–91	20
8. Mosaic tiles: U.S. imports for consumption, by principal sources, 1987–91	21
9. Glazed nonmosaic tiles: U.S. imports for consumption, by principal sources, 1987–91	22
10. Unglazed nonmosaic tiles: U.S. imports for consumption, by principal sources, 1987–91	23
11. Ceramic floor and wall tiles: U.S. imports for consumption under special duty provisions, 1987–91	24
12. Ceramic floor and wall tiles: U.S. exports of domestic merchandise, by principal markets, 1987–91	27
13. Ceramic floor and wall tiles: U.S. exports of domestic merchandise, imports for consumption, and merchandise trade balance, by selected countries and country groups, 1987–91	28

INTRODUCTION

This summary covers ceramic floor and wall tiles (tiles), thin¹ surfacing units composed primarily of shaped and fired² mixtures of nonmetallic minerals. It reviews U.S. and foreign industry profiles, tariff and nontariff measures, and U.S. industry performance in domestic and foreign markets during 1987-91.

Tiles have been used for thousands of years as decorative veneers on floors and walls because of their beauty and durability. They enjoy widespread consumer acceptance and are produced throughout the world, largely because of abundant raw materials and readily available manufacturing technology.

Tiles are most commonly characterized by the presence or absence of glazes, with glazed tiles representing 93 percent of world tile trade in 1990.³ Glazes, which are carefully compounded mixtures that melt to form a glassy coating when fired, are applied to a tile face (the portion of a tile that is intended to remain exposed after installation). This layer of glassy material makes the tile face impervious to moisture and imparts a decorative appearance. Glazed tiles are available in a wide range of decorative variations because of the diversity of glazes available, including clear or opaque, monochrome or polychrome (e.g., mottled and speckled), plain or textured surface, light-reflective (bright glazes) or light-nonreflective (matt glazes), or some combination of these glaze types. Glazed tiles are installed on both floors and walls and in interior and exterior locations, but historically have not been recommended for floors subject to heavy traffic since even durable glazes are applied in relatively thin layers that can be worn away in heavily trafficked floor installations. Since glazes and tile bodies typically have very different physical characteristics (e.g., water absorption rates, color, and texture), glaze deterioration radically alters the overall physical characteristics of a glazed tile installation. Considerable improvement has been made in glaze hardness in recent years, but variations in glaze hardness occur in the marketplace.

Unglazed tiles, representing 7 percent of world tile trade in 1990,⁴ lack glassy coatings and derive their physical characteristics solely from tile body ingredients and method of manufacture. They are available in a more limited variety than glazed tiles because tile body characteristics alone cannot offer

the decorative diversity possible when the combinations of tile bodies and glazes are varied. Unglazed tiles are also installed on both floors and walls, indoors and outdoors, and are particularly well suited for use in heavily trafficked floor areas. Since unglazed tiles have uniform physical characteristics throughout the tile body, wear in heavily trafficked floor areas does not much change their overall appearance or performance.

In international trade nomenclature, a further distinction based on size often is employed; tiles are categorized by whether they can be enclosed by a square the side of which is less than 7 centimeters. Larger tiles (those that cannot be enclosed by a square with a side of less than 7 centimeters) appear to account for the most usage and generally require less maintenance and lower installation costs.⁵ United Nations (UN) data for world tile trade do not provide size information, but large tiles represented 85 percent of U.S. producers' shipments in 1991 and 97 percent of tile trade in 1990 in the European Community (EC), the world leader in tile trade.

The U.S. industry employs a slightly different size distinction along with the distinction between glazed and unglazed: tiles having facial areas of less than 6 square inches are known as mosaic,⁶ and tiles having facial areas of 6 square inches or more are considered nonmosaic. U.S. industry practice distinguishes three major types of tiles: mosaic (whether glazed or unglazed), glazed nonmosaic, and unglazed nonmosaic. Of the three types, glazed nonmosaic tiles offer the widest range of decorative variations and represent the bulk of U.S. producers' shipments and U.S. imports (figure 1). The other two categories are of roughly equal importance, but account for a considerably smaller share of U.S. producers' shipments and imports.

Glazed nonmosaic tiles are produced in an ever-expanding array of shapes, sizes, textures, colors, and glazes. In linear dimensions alone, such tiles are known to vary from 7 centimeters to more than a meter. Most of these tiles are installed individually, but some are fastened together in sheets (mounted) with preset spacing and alignment to reduce onsite installation time. Methods of tile mounting vary, with the most expensive methods (pregROUTED sheet systems) affording the shortest installation time. Due to the varieties of body density, water absorption rate, and glaze hardness, not all glazed nonmosaic tiles are suitable for particular installations, but acceptable variations exist for almost any application.

¹ The term tile does not include any article 3.2 cm or more in thickness, according to additional U.S. notes, chapter 69, *Harmonized Tariff Schedule of the United States (1991)*.

² Firing refers to, "The controlled heat treatment of ceramic ware in a kiln or furnace during the process of manufacture to develop desired properties." The American Ceramic Society, *Ceramic Glossary*, 1963, p. 15.

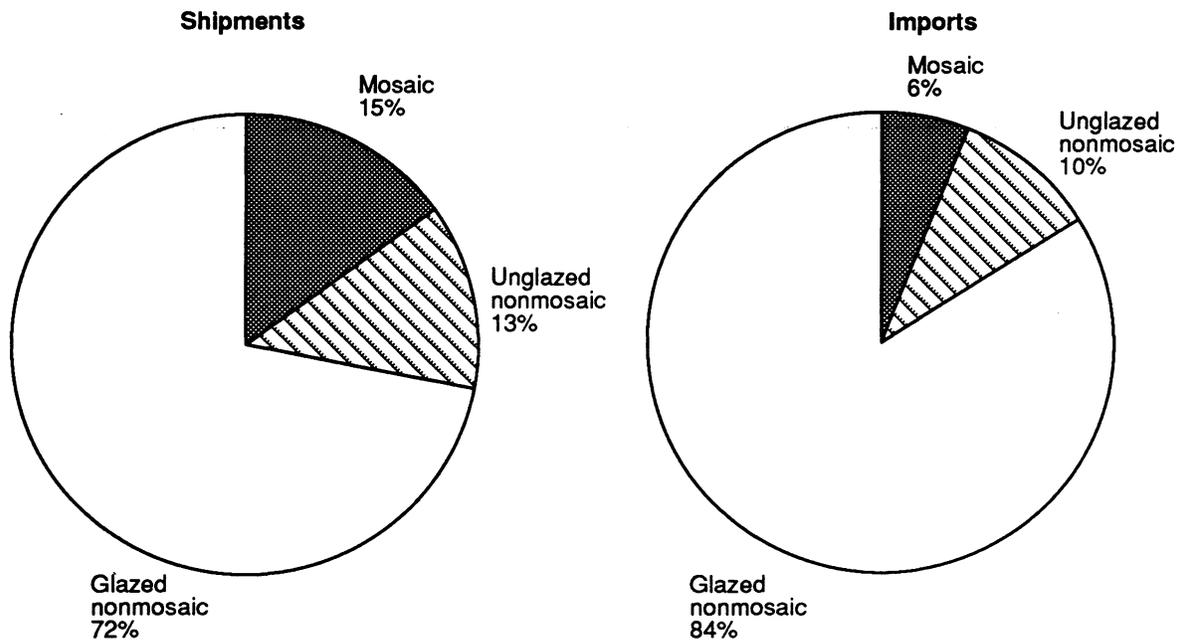
³ Calculated by Commission staff from United Nations trade data for tiles.

⁴Ibid.

⁵ "Managing Tile Marketing the Marazzi Way," *Ceramic Industry Magazine*, Feb. 1981, p. 28.

⁶ This definition of mosaic tile apparently is not universally accepted. The Japanese product definition for mosaic tiles includes all backmounted tiles, including sizes such as 3" x 3", 4" x 4", and 3-1/4" x 3-1/4" that would not be considered mosaic tiles according to the U.S. industry definition.

Figure 1
Ceramic floor and wall tiles: Quantity of U.S. producers' shipments and imports for consumption, by types, 1991



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

Mosaic tiles, in both glazed and unglazed form, offer moderate decorative variation. They can be arranged into geometric patterns or murals that would take up too much space and would not have the same visual impact if attempted with larger tiles. They are generally produced in the shape of small squares or rectangles, with individual tiles usually arranged in patterns and mounted in sheets. The small dimensions of mosaic tiles present problems. Of the three types of tiles, mosaic tiles are generally the most labor-intensive to produce, mount, and install. Small tiles also necessitate many grout lines between tiles, lines that are difficult to clean and repair. Glazed mosaic tiles are available in a wider range of colors and textures than unglazed mosaic tiles and are generally more expensive. Both glazed and unglazed mosaic tiles usually have low water-absorption rates and, therefore, are used primarily where moisture resistance is important.

Unglazed nonmosaic tiles offer the least variety of the three types of tiles. This type is generally installed individually. It is durable and is usually less expensive than the unglazed mosaic product. Unglazed nonmosaic tiles tend to be used more frequently on floors than on walls and are primarily used in areas subject to the heaviest floor traffic. Tile producers are promoting exterior applications of this product in uses such as prefabricated, exterior wall panels by

emphasizing its brick-like appearance, superior mechanical properties, and low cost.

The raw materials, equipment, and manufacturing procedures used by each tile manufacturer may vary, but the manufacturing process basically consists of three steps: forming, glazing (if applicable), and firing. Clays are the primary raw materials. World clay reserves are large and widespread geographically, as are other common tile ingredients such as feldspar, flint, talc, pyrophyllite, and wollastonite. Raw materials are proportioned to meet specific physical characteristics, mixed, and then shaped into tiles by various techniques. The typical forming techniques are dust-pressing and extrusion. The dust-pressing process consists of adding relatively dry mixtures of raw materials into a die cavity. The materials are then pressed into a desired shape and density with a friction or hydraulic press, the latter being more modern equipment. The extrusion process consists of mixing raw materials into a relatively wet consistency and forcing the resultant mixture through a die. The continuous band of extruded material leaving the die is then cut at set intervals to produce tiles of desired, uniform dimensions. After forming, tiles to be glazed are coated with special mixtures that fuse to form impervious facial finishes upon firing. The tiles are then fired at temperatures around 1,000 degrees Celsius for periods ranging from less than 1 hour to

over 20 hours; the length of time depends on the desired characteristics of the tiles and the type of kiln.⁷

U.S. INDUSTRY PROFILE

Industry Structure

The U.S. ceramic floor and wall tile industry⁸ is believed to be the world's sixth-largest producer of tiles, trailing only those in Italy, Spain, Brazil, Japan, and Germany. The U.S. industry consists of 95 companies, 150 establishments, and 10,000 employees, a 32-percent increase from the 114 manufacturing establishments in 1987 with virtually no change in the number of employees. California, Ohio, and Texas are the major producing areas.

The basic structure of the U.S. industry is shown in figure 2. Many firms are vertically integrated upstream to the extent that they locate manufacturing facilities near raw material deposits that they own and operate as captive operations. A number of U.S. producers are vertically integrated downstream, marketing tiles through geographically dispersed warehouse/sales facilities in addition to factory warehouse/showrooms. Horizontal integration also exists, with some U.S. tile producers manufacturing competing floor and wall coverings such as vinyl flooring. Multinational tile producers are not predominant in the United States or other major tile-producing countries, but they are increasing in number as foreign producers build or purchase production facilities in other countries. Operations are highly automated in the United States and in many developed countries to maintain competitive labor costs and to improve product consistency. Production facilities for tiles are geographically dispersed throughout the United States and the world to minimize shipping costs of both raw materials and finished tiles. Shipping costs can be significant for relatively heavy, inexpensive products such as tiles, e.g., shipping costs associated with U.S. tile imports in 1991 equaled 17 percent of import value. The U.S. industry is relatively concentrated, with the 11 largest establishments representing 59 percent of U.S. shipments. Although the U.S. firms owning tile production facilities may produce other products at other establishments, U.S. tile-manufacturing facilities are dedicated almost solely to the production of tiles, as indicated by the industry specialization ratio of 99 percent.⁹ Firms in the

⁷ A kiln is "a furnace for the production of ceramic products." Lawrence H. Van Vlack, *Physical Ceramics for Engineers*, 1964, p. 290.

⁸ The coverage is identical to that of the industry included in Standard Industrial Classification No. 3253.

⁹ "Specialization ratio represents the ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for the establishments classified in the industry." U.S. Department of Commerce, Bureau of the Census, *1987 Census of Manufactures, Cement and Structural Clay Products*, p. A-4.

United States and in other market economy countries tend to be privately held operations rather than publicly held corporations.

As a percent of the value of shipments, material costs in the U.S. tile industry are below average for U.S. manufacturing establishments, and labor costs are above average. These facts reflect a production process that requires relatively abundant unprocessed raw materials and that is labor intensive. A comparison of 1990 data for U.S. tile-manufacturing and all U.S. manufacturing establishments reveals that material costs represented 54 percent of the value of shipments for all U.S. manufacturing industries, compared with 36 percent for the U.S. tile industry. In contrast, production worker costs represented 19 percent of the value of shipments for the U.S. tile industry in the same year, compared with 9 percent for all U.S. manufacturing establishments.

Production worker costs in the U.S. tile industry are relatively high compared with data for all U.S. manufacturing establishments because of low productivity rather than high wages. Tile production involves relatively unskilled workers; production workers in the U.S. tile industry are paid below-average hourly wages, e.g., \$9.57 per hour in 1990, compared with \$11.19 for production workers in all U.S. manufacturing establishments. Despite low hourly wage rates, productivity in the U.S. tile industry (as measured by the 1990 value added per production worker hour) remains below average for U.S. manufacturing establishments, e.g., \$33.94, compared with \$54.54 for all U.S. manufacturing establishments.

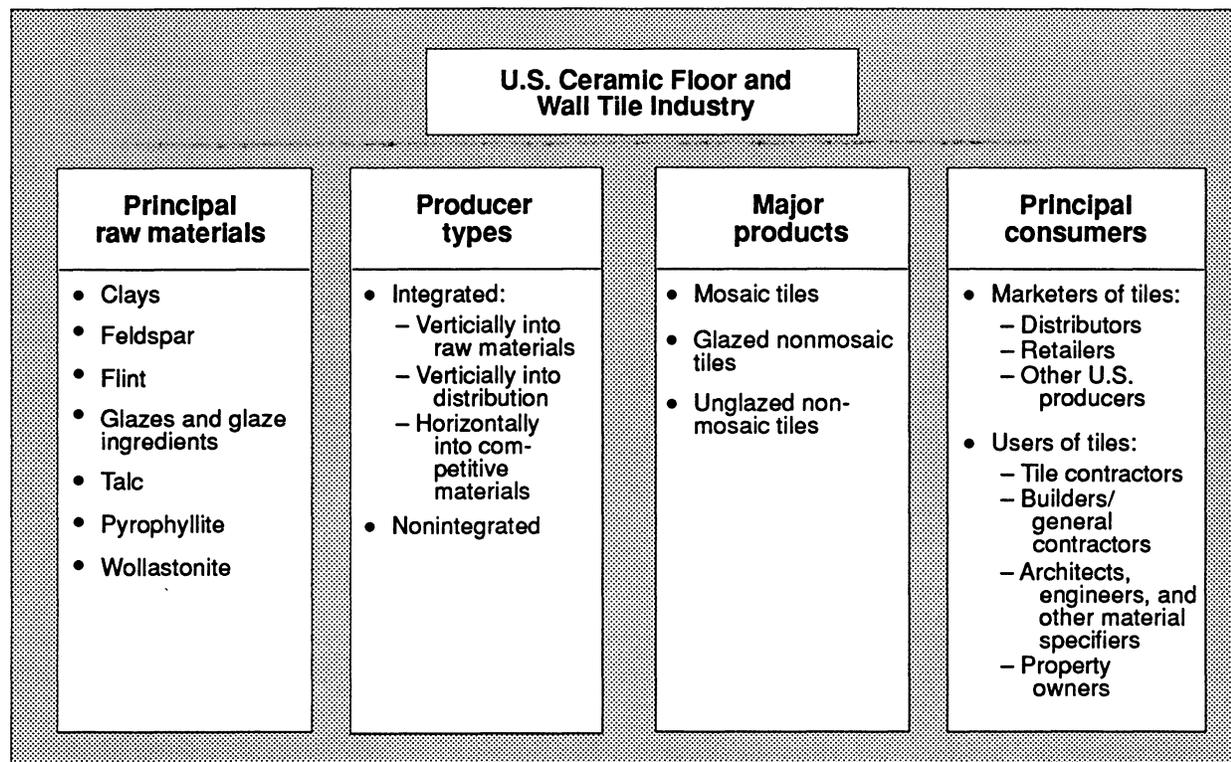
U.S. productivity also trails that of the two leading foreign tile producers, despite recent improvement in U.S. productivity. U.S. tile producers made new capital expenditures at a greater rate than total U.S. manufacturing establishments during 1987-90, spending 7 percent of the value of shipments on new capital expenditures during the period, compared with 3 percent for all U.S. manufacturing establishments. These expenditures are believed to be largely responsible for a 8-percent increase in U.S. productivity during the period. However, the average annual output per U.S. tile employee of about 5,000 square meters in 1990 remained less than 40 percent that of the world's leading two producing countries, Italy and Spain, which each produced about 14,000 square meters per employee per year.

The reasons for the continued low productivity of the U.S. industry are not clear. Foreign competitors claim that, "The U.S. industry has been slow to improve the efficiency of its technological processes,"¹⁰ but data are not available to assess such a claim. The level of use of roller-hearth kilns in the United States and foreign industries gives some insight in this regard. Roller-hearth kilns reportedly reduce employment levels by 60 percent and reduce fuel costs by lowering firing times from 20 hours to less than 1

¹⁰ Submission on behalf of Grupo Industrial Saltillo to the U.S. International Trade Commission in investigation No. TA-131(b)-14, Apr. 13, 1989, pp. 4-5.

Figure 2

U.S. ceramic floor and wall tile industry: Principal raw materials, producer types, major products, and principal consumers



Source: Compiled by the staff of the U.S. International Trade Commission.

hour.¹¹ Many of the new plants built in the United States use roller-hearth kilns, but information is not available on the extent that existing U.S. plants are converting to such kilns. On a worldwide basis, roller-hearth kilns are estimated to represent 70 percent of production.¹² The factor that could be limiting the U.S. industry's adoption of roller-hearth kilns relates to the predominant product size. Many of these new U.S. plants and foreign producers using roller-hearth kilns produce relatively large tiles, i.e., 6" x 6" or larger. However, most U.S.-produced tiles are believed to be smaller. All mosaic tiles are by definition smaller, and 4 1/4" x 4 1/4" tiles are believed to make up the majority of U.S. producers' shipments of glazed nonmosaic tiles.¹³ The smallest size associated with

such kilns is 4" x 4". A major domestic producer has indicated to Commission staff that it finds that roller-hearth kilns are most practical for tiles 6" x 6" or larger. Commission staff are aware of only one instance of U.S. tile production of a smaller size with a roller-hearth kiln by United States Ceramic Tile Co.¹⁴

The domestic industry uses two channels of distribution, selling from factory showrooms/warehouses and geographically dispersed warehouse/sales facilities to (1) marketers of tiles (primarily distributors but also retailers and other U.S. producers) and to (2) users of tiles (primarily tile contractors but also builders/general contractors, architects, engineers, other material specifiers, and property owners). A Commission study in 1983 on the U.S. ceramic tile industry found that the domestic industry sells 69 percent of its output from factory showrooms/warehouses and the remaining 31 percent from U.S.-producer-owned nonfactory warehouse/sales facilities.¹⁵ The same study found that the domestic

¹¹ Michael E. Porter, *The Competitive Advantage of Nations* (New York: Free Press, 1990), p. 217.

¹² Greg Geiger, "Developments in the Tile Industry," *Ceramic Bulletin*, Dec. 1991, p. 1880.

¹³ In 1982, 4 1/4" x 4 1/4" tiles made up 83 percent of U.S. producers' shipments of glazed nonmosaic tiles. U.S. International Trade Commission, *Competitive Assessment of the U.S. Ceramic Floor and Wall Tile Industry* (investigation No. 332-156), USITC publication 1442, Oct. 1983, pp. 29-30.

¹⁴ "U.S. Ceramic Tile Marks Founding," *Ceramic Industry*, Nov. 1988, p. 12.

¹⁵ USITC, *Competitive Assessment*, USITC publication 1442, Oct. 1983, p. 51.

industry sold 66 percent of its output to marketers of tiles and the remaining 33 percent to users of tiles.¹⁶ Larger tile producers tend to market their tiles on a nationwide basis, while smaller firms tend to market regionally. An increasing number of U.S. producers of all sizes are also importing and marketing tiles that complement their own product lines. Industry marketing efforts appear to be concentrated on intermediaries in the marketing process (architects, builders/general contractors, distributors, and tile contractors), but the industry does make some effort to reach the ultimate consumer: the property owner.

Industry pricing is characterized by a two-tier system, under which prices vary according to whether the customer is a distributor or contractor. Distributors maintain large inventories and generally pay lower prices than contractors. Contractors do not maintain such inventories and purchase tiles only for specific jobs. Tile prices vary along a product scale determined by the combination of a tile's technical (physical characteristics such as body density, glaze hardness, or water absorption rate) and aesthetic qualities (color, pattern, or glaze type). The magnitude of differences along this product scale make price comparisons difficult within the tile industry. The U.S. industry believes that the U.S. ceramic tile market is generally price-elastic.¹⁷

The period from 1987 to 1991 was notable for ownership changes within the U.S. industry, with major U.S. tile producers changing hands. Producers of multiple lines of floor and wall coverings continued to increase their share of U.S. production during the period with the acquisition of American Olean Tile Co., Inc., by Armstrong World Industries, Inc., a producer of vinyl flooring and carpets,¹⁸ and with the acquisition of Sikes Corp. by Premark International, Inc., a producer of bathroom and kitchen laminates and wood flooring.¹⁹ Foreign owners continued to increase their share of U.S. production during 1987-91, following the 1986 acquisition of International American Ceramics by Keramik Holding, a Swiss-based manufacturer of ceramic products that also has tile production facilities in Brazil,²⁰ and with the investment of a Taiwanese producer in the construction of a plant in Indiana, KPT (USA).²¹ Siam Cement Co., Ltd., of Thailand has announced plans to begin tile production at Clarksville, TN, in early

¹⁶ Ibid.

¹⁷ Memorandum of the Tile Council of America, Inc., to the U.S. International Trade Commission in investigation No. 332-156, p. 20.

¹⁸ "Armstrong Completes American Olean Buyout," *Tile & Decorative Surfaces*, Dec. 1988, pp. 18 and 20.

¹⁹ Bob Zielinski, "Premark International Acquires Sikes Corporation," *Tile & Decorative Surfaces*, Sept. 1990, pp. 57-66.

²⁰ "Keramik Acquires U.S. Tile Firm," *Ceramic Industry*, Jan. 1986, p. 12. and "IAC/Laufen Merger Brings Advantages to Their Distributors," *Tile & Decorative Surfaces*, Jan./Feb. 1986, pp. 26 and 28.

²¹ "KPT Breaks Ground for New Plant," *Tile & Decorative Surfaces*, Jan./Feb. 1986, pp. 14 and 16, and "KPT Opens," *Tile & Decorative Surfaces*, Dec. 1986, p. 44.

1992.²² Thai Ceramic Co., a subsidiary of Siam Cement Co., Ltd., is reportedly the largest Asian producer of ceramic tiles. Commission staff estimate that firms with some degree of foreign ownership, whether by individual foreign nationals or firms, currently have a combined capacity of 14 million square meters, equal to 34 percent of U.S. producers' shipments in 1991. Ownership changes at two additional firms did not fit either of the aforementioned trends. The Dal-Tile Group, with production facilities in Mexico and the United States, was acquired during the period by DTM Holdings, Inc., which was formed by AEA Investors, Inc., a private investment company in New York, NY.²³ The company management purchased Color Tile, Inc.²⁴

U.S. producers believe that they face the highest environmental costs in the world and that many of their foreign competitors have no such costs. "Tile Council estimates that the direct operating costs of compliance with U.S. environmental protection laws typically range from 0.5 percent to 1 percent of gross sales, and reduce pretax profits by 4-5 percent. U.S. manufacturers in recent years have spent as much as 5 percent of their capital budgets on pollution control equipment."²⁵ U.S. producers indicate that such costs force producers to avoid certain products, such as lead, with substitute products being more expensive and often not performing as well as the products that they replaced.²⁶ For example, conversion to lead-free glazes requires a total reevaluation of the entire production process, and yet lead-free glazes tend to show surface defects more readily than lead glazes.²⁷ U.S. producers indicate that the cost of compliance with environmental regulations continues to grow, with new materials steadily being added to the list of hazardous and toxic materials.²⁸ Lead and zinc restrictions appear to be the tile industry's primary concerns.

Federal requirements are eliminating settling ponds as an acceptable method of treating industry wastewater, forcing U.S. producers to install new wastewater treatment systems to eliminate metals used in glazes, such as lead and zinc.²⁹ Cost data associated with environmental regulation compliance are frequently not available, but U.S. Ceramic Tile Co. reported that its new wastewater system cost \$300,000, and Environmental Protection Agency regulations would require an additional \$1.7 million to close its settling pond.³⁰ U.S. Ceramic Tile Co. stated that it

²² "\$60 Million Initial Investment Launches Tilecera in the United States," *Tile & Decorative Surfaces*, June 1991, pp. 14 and 16.

²³ "Dal-Tile Acquired," *Tile & Decorative Surfaces*, Jan. 1990, p. 6.

²⁴ "1990 Mergers/Acquisitions," *Ceramic Industry*, Aug. 1991, p. 22.

²⁵ Post-hearing submission by Tile Council of America, Inc., to the U.S. International Trade Commission in investigation No. TA-131(b)-14, Apr. 13, 1989, p. 6.

²⁶ Ibid.

²⁷ Geiger, p. 1883.

²⁸ Ibid, p. 7.

²⁹ Michael Tkach, "Wastewater Treatment at Mannington," *Ceramic Industry*, Oct. 1991, pp. 33-35.

³⁰ "U.S. Ceramic Tile Marks Founding," *Ceramic Industry*, Nov. 1988, pp. 12 and 14.

was also approaching this problem by attempting to eliminate lead and zinc from its glazes. Air quality requirements are also reportedly placing a financial burden on the U.S. industry,³¹ but financial data to provide a perspective on those requirements are not available.

Two U.S. manufacturers made significant steps during 1987-91 toward the production of ceramic tiles from recycled waste materials. GTE Engineered Ceramics produces ceramic tiles from bonding materials such as clays and waste glass generated during the production of GTE's Sylvania lightbulbs.³² "More than 50 percent of the weight of the tile is recycled glass."³³ Summitville Tiles, Inc., has developed a process to use tailings from the feldspar industry as its primary raw material; such tailings typically would be discharged into local rivers or put into landfills.³⁴

Consumer Characteristics and Factors Affecting Demand

Consumers of ceramic floor and wall tiles, whether marketers or users, are numerous, diverse in nature, and scattered throughout the country. Marketers may handle only ceramic tiles, including imported tiles, or a wide range of competitive floor and wall coverings. Although property owners are the ultimate tile consumers, the actual purchase decision may be made or strongly influenced by a diverse number of intermediate users. Users include builders/general contractors, tile contractors, architects, engineers, or officials empowered to set building specifications for construction projects.

Data on the relative importance of individual consumer groups are not readily available, although marketers of tiles represent the bulk of the domestic industry's sales. A limited amount of information is available for sales of imports from Italy, as shown in the following tabulation:³⁵

Type of Client	Percent
Tile contractor	30
Retailer	18
Consumer	16
Building contractor	15
Wholesaler	15
Architect/designer	10 ³⁶

The primary factor affecting demand for all floor and wall coverings is construction activity, both new

³¹ "Florida Tile Gives Wet Scrubbing a Whirl," *Ceramic Industry*, Apr. 1990, pp. 49-50.

³² "A New Slant on Tile," *Ceramic Bulletin*, Dec. 1991, p. 1882.

³³ "Prominence Tile from GTE Uses Recycled Glass Cullet," *Ceramic Bulletin*, Sept. 1991, p. 1447.

³⁴ "New Summitville Facility Addresses Ecological Problems," *Tile & Decorative Surfaces*, Sept. 1991, p. 14.

³⁵ "Italian Tile Imports: U.S. Sales Patterns," *Tile & Decorative Surfaces*, Apr. 1991, pp. 19-20.

³⁶ Rounding is believed to be the reason that figures do not add to 100 percent.

and repair/remodeling work. An industry source estimates U.S. tile consumption to be related to construction activity as follows:³⁷

Market	Percent
Residential construction, new	45
Nonresidential construction, new	30
Residential and nonresidential construction, repair and remodeling	25

Trends in U.S. construction activity in these areas can be helpful in understanding the U.S. tile market, but they are not definitive indicators of tile demand, since tiles represent a small, variable share of possible construction materials. Moreover, even reasonably established relationships can be altered by product improvements and shifts in consumer preferences.

A Commission study in 1983 indicated that U.S.-produced tiles were more important than imported tiles in nonresidential construction.³⁸ Data on U.S. sales patterns for Italian tiles published since that study indicate that imported tiles remain a relatively small factor in nonresidential markets, mostly for use in residential construction.³⁹ The Commission's 1983 study indicated a correlation between type of tile and construction market. Glazed nonmosaic tiles tended to be concentrated in residential construction, unglazed nonmosaic tiles in nonresidential construction, and mosaic tiles about equally divided between residential and nonresidential construction.⁴⁰ Technical advances, however, have enabled increased use of glazed nonmosaic tiles in nonresidential construction. "Modern glazes and manufacturing technologies have blurred the distinction between glazed and unglazed floor tile. While the products are distinctive in appearance, it is now possible to manufacture traffic tile that will stand up to heavy commercial traffic in applications once suited only to unglazed tile."⁴¹

Ceramic tiles are one of many floor and wall coverings such as carpet; paint; wood paneling and flooring; fabrics; vinyl tile and sheet goods; plastic tiles; metal tiles; concrete tiles; and plastic, fiberglass, or metal wall surrounds. Competition for consumer dollars is intense among all floor and wall coverings, and relative demand for a particular material depends on various competitive factors. Ceramic tiles generally hold a competitive advantage over other materials in terms of durability, ease of maintenance, and fire resistance, but perhaps their greatest advantage is their

³⁷ Duane R. Arment and Andy Uivary, "How to Forecast Your Ceramic Tile Markets," *Tile & Decorative Surfaces*, May 1989, pp. 150-158.

³⁸ USITC, *Competitive Assessment*, USITC publication 1442, Oct. 1983, p. 24.

³⁹ "Italian Tile Imports: U.S. Sales Patterns," *Tile & Decorative Surfaces*, Apr. 1991, pp. 19-20.

⁴⁰ USITC, *Competitive Assessment*, USITC publication 1442, Oct. 1983, p. 26.

⁴¹ Richard E. Baiter, Jr., President of Quarry Tile Co., Prehearing statement of Quarry Tile Co. to the U.S. International Trade Commission in Investigation No. TA-131(b)-14, Feb. 10, 1989, p. 4.

beauty. Ceramic tiles have aesthetic appeal. Manufacturers of certain competitive materials (such as vinyl floor coverings) specifically design their products to simulate ceramic tiles and emphasize this similarity in their advertising. However, price most frequently favors materials other than ceramic tiles. Installation costs add significantly to this price disadvantage, since few competing materials require as much skill and time for proper installation as ceramic tiles.

FOREIGN INDUSTRY PROFILE

Industry sources indicate that world tile production and consumption increased during 1987-90 to over 1 billion square meters in 1990, with annual tile trade in the range of \$2 to \$4 billion. Consumption data provided by the Association of Italian Tile and Refractories Manufacturers (Assopiastrelle), covering 12 European countries⁴² and totaling 734 million square meters in 1990, indicate growth of 26 percent during the period. World tile production and consumption are concentrated in the five major producing countries of Italy, Spain, Brazil, Germany, and Japan. Figure 3 and table 1 provide perspectives on the relative sizes of these foreign industries compared

⁴² Belgium, Finland, France, Germany, Greece, Italy, Luxembourg, Spain, Sweden, Switzerland, and the United Kingdom.

with that of the U.S. industry. With the exception of Germany, demand for tiles in each of these markets is fulfilled primarily by each country's domestic industry. With three of these five countries as members, the EC represents the largest tile market in the world, accounting for over half of world production and consumption. Tiles are especially suited for application over masonry bases, and the prevalence of masonry construction in Europe undoubtedly contributes to the popularity of tiles in that area of the world.

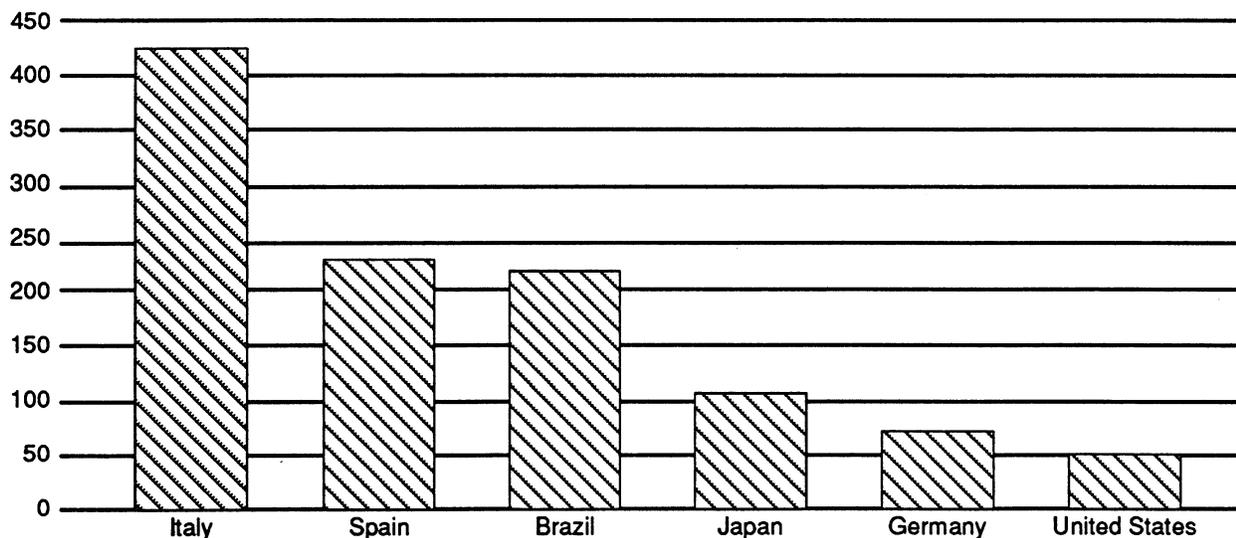
Italy

The Italian industry is the world's leading producer of tiles, reportedly representing about 30 percent of world output, with production of 426 million square meters in 1990. The Italian industry is widely considered the world leader in tile technology and is recognized as a leader in the creation of innovative designs and styling.⁴³ The industry consists of about 355 firms and 31,000 employees, with 86 percent of production centered in Emilia-Romagna. This concentration reportedly contributed to the development of the Italian industry and the formation of world-leading producers of glazes, enamels, and ceramic tile production equipment in the same area.⁴⁴

⁴³ W.A. Hubbard, "Tile Producers Profit from New Glaze Techniques," *Ceramic Industry*, Nov. 1983, p. 26.
⁴⁴ Porter, pp. 210-225.

Figure 3
Ceramic floor and wall tiles: Production, by selected countries, 1990¹

Million square meters



¹ Production figure for Brazil for 1989.

Source: Italy, Spain, and Germany from Association of Italian Tile and Refractories Manufacturers (Assopiastrelle); Brazil from Commission of the European Communities, *Panorama of EC Industry 1991-92*, p. 7-8; Japan estimated by the staff of the U.S. International Trade Commission; and United States from official statistics of the U.S. Department of Commerce.

Table 1
Ceramic floor and wall tiles: Industry profiles for selected countries, 1990

Item	Italy	Spain	Brazil	Japan	Germany	United States
Producers (number)	355	231	(¹)	² 231	(¹)	³ 95
Employees (thousands)	31	16	⁴ 52	(¹)	⁴ 8	⁵ 10
Production (million square meters)	426	231	⁴ 220	107	72	51
Exports (million dollars)	2,228	617	40	107	411	10
Imports (million dollars)	84	14	3	36	701	445
Trade balance (million dollars)	2,144	603	37	71	-290	-435

¹ Not available.

² Figure is for 1983.

³ Figure is for 1987.

⁴ Data are for 1989.

⁵ Figure is for 1990.

Source: Producers, employees, and production for Italy from the Association of Italian Tile and Refractories Manufacturers (Assopiastrelle); producers and employees for Spain from "Special Report: The Tiles of Spain," *Tile and Decorative Surfaces*, June 1991, p. 69, production for Spain from Assopiastrelle; employees and production for Brazil from Commission of the European Communities, *Panorama of EC Industry 1991-92*, p. 7-8; producers for Japan from submission to the U.S. International Trade Commission by The Japan Pottery Exporters' Association and The Japan Mosaic Tile Manufacturers' Association for *Competitive Assessment of the U.S. Ceramic Floor and Wall Tile Industry* (Investigation No. 332-156), July 1, 1983, p. 1; production for Japan estimated by the staff of the U.S. International Trade Commission; employees for Germany from Commission of the European Communities, *Panorama of EC Industry 1991-92*, p. 7-8, production for Germany from Assopiastrelle; producers, employees, and production for the United States compiled from official statistics of the U.S. Department of Commerce; and exports, imports, and trade balances for all countries compiled from official statistics of the United Nations.

There are reportedly three major groups of Italian producers: (1) firms that invest heavily in technology to improve productivity or product quality and aesthetics, (2) firms that compete on the basis of image and design in the design-sensitive end of the market and (3) firms that compete on the basis of price.⁴⁵ Italy exports roughly half of its output and is a net exporter of tiles. Accounts of mergers and acquisitions carried by trade publications indicate that the Italian industry is continuing a process of consolidation. The largest Italian producer (Gruppo Ceramiche Marazzi)⁴⁶ added to its facilities in Spain during the period.⁴⁷ Marazzi also has a production facility in the United States.

The Italian industry experienced growth in domestic and foreign markets during 1987-90, with export markets outperforming the Italian market in both absolute and relative terms. The majority of producers' shipments shifted slightly from the Italian market to export markets. Producers' shipments to export markets increased from 47 percent of production in 1987 to 51 percent in 1990 (figure 4). Italian consumption increased by 14 percent during 1987-90 to 217 million square meters, compared with an increase for exports of 32 percent to 217 million square meters. Italy's imports increased by 55 percent during

the period to almost 8 million square meters but remained relatively insignificant at less than 4 percent of apparent consumption.

UN data indicate that Italy's trade surplus in tiles increased by 48 percent during the period to over \$2 billion in 1990 (figure 5), an increase attributable to increased export volume and unit values. Italy shipped 10 percent of its exports to the United States in 1990, making the United States Italy's third-largest export market after Germany and France. The United States was a minor supplier of Italy's imports in 1990, providing less than 1 percent.

According to data of the U.S. Department of Commerce (Commerce), Italy was the largest supplier of U.S. tile imports in 1991 (41 percent of the U.S. total, on the basis of quantity), achieving a trade surplus of \$173 million in tile trade with the United States. U.S. imports from Italy are concentrated in the glazed nonmosaic tile category, which represented 89 percent of total imports of tiles from Italy in 1991 (on the basis of quantity). The quantity of U.S. imports from Italy decreased by 23 percent during 1987-91, as imports from Italy became increasingly expensive relative to other U.S. imports and the volume of less expensive imports from other countries expanded. Promotional information for Italian tiles emphasizes the color, style, and design aspects of Italian tiles, but there is some indication that less decorative Italian tiles also compete in the U.S. market on the basis of price.⁴⁸

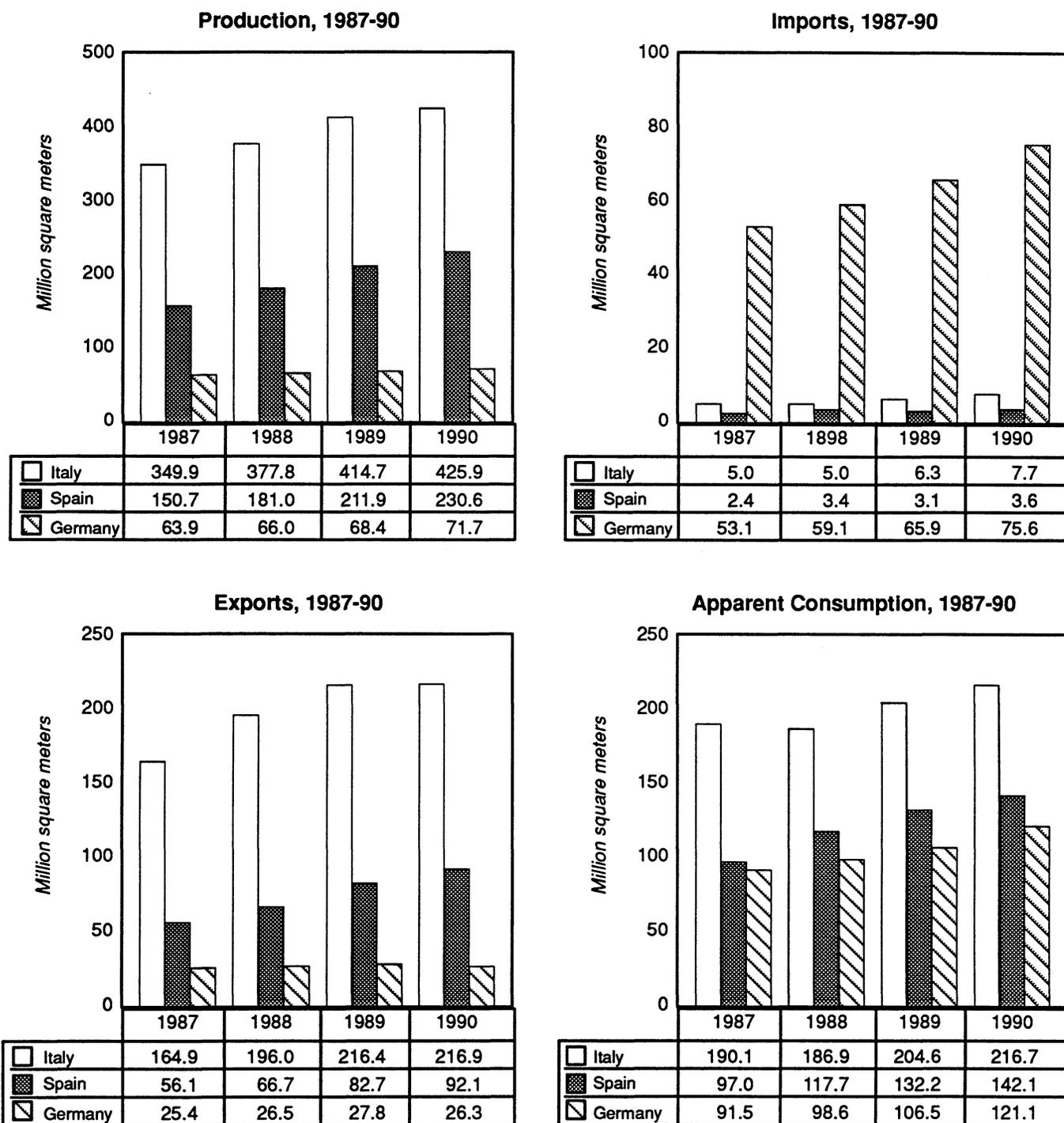
⁴⁵ *Ibid.*, p. 222.

⁴⁶ "Marazzi Acquires Ceramiche Ragno," *Tile & Decorative Surfaces*, Dec. 1989, pp. 84 and 86.

⁴⁷ "Marazzi Group Announces Acquisition in Spain," *Tile & Decorative Surfaces*, Feb. 1989, p. 115.

⁴⁸ Richard E. Baiter, Jr., President of Quarry Tile Co., Prehearing statement of Quarry Tile Co. to the U.S. International Trade Commission in investigation No. TA-131-(b)-14, Feb. 10, 1989, pp. 2-3.

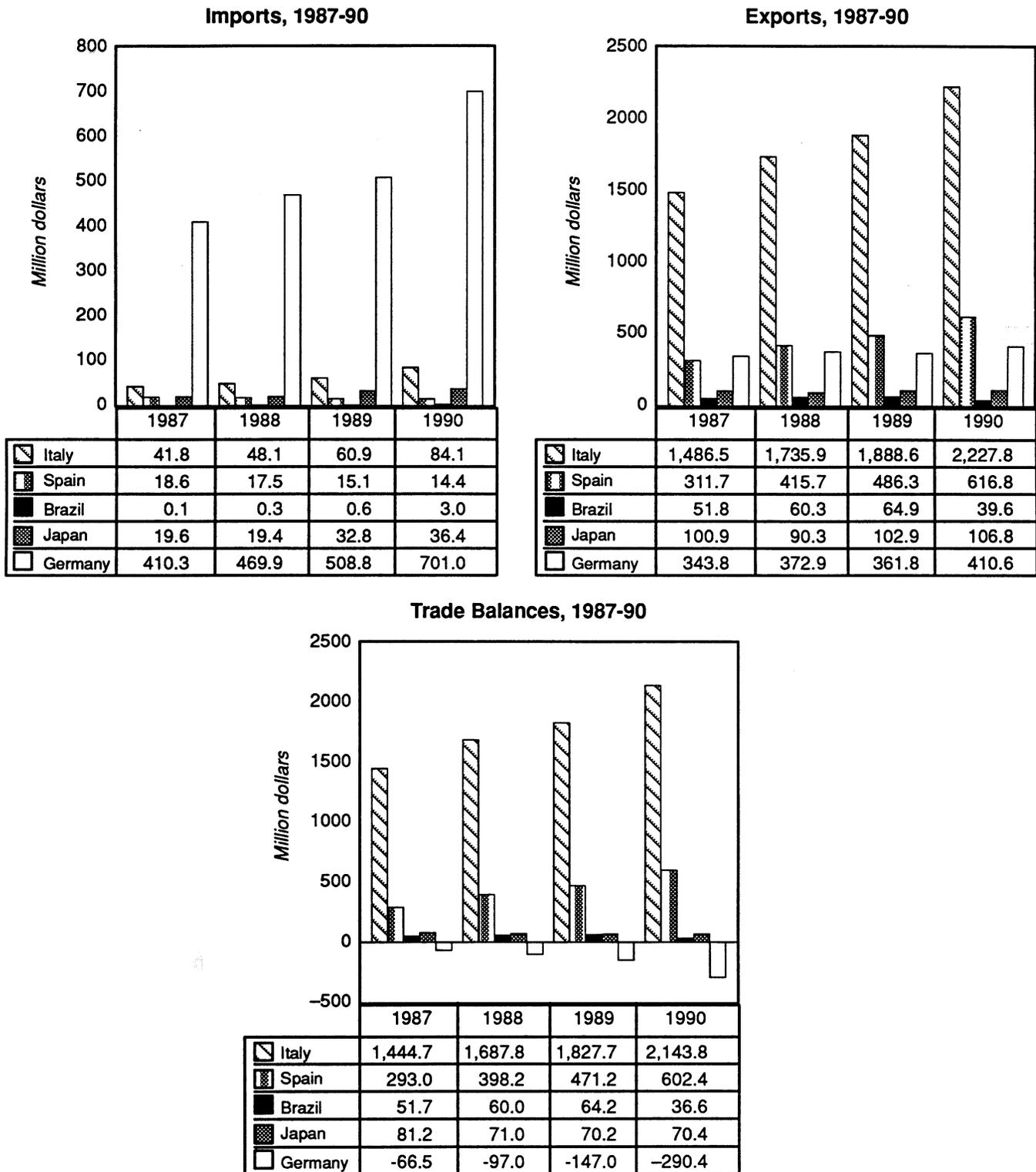
Figure 4
Ceramic floor and wall tiles: Quantity of production, imports, exports, and apparent consumption, by selected countries, 1987-90



Note.—Apparent consumption calculated from unrounded data.

Source: Association of Italian Tile and Refractories Manufacturers (Assopiastrelle).

Figure 5
Ceramic floor and wall tiles: Value of imports, exports, and trade balances, by selected countries, 1987-90



Note.—Trade balances calculated from unrounded data.

Source: Official statistics of the United Nations.

The Italian industry continued its extensive U.S. marketing efforts during the period. Many of these efforts were made collectively through the Italian Tile Center, a U.S. promotional organization for the Assopiastrelle. In 1990, Assopiastrelle was one of the founding sponsors of the International Tile Exposition, an annual event that combined the trade show efforts of several organizations into a single, premier U.S. trade show for tiles. Another development during the period was the establishment of a U.S. marketing and sales firm representing a number of Italian producers.

Spain

The Spanish industry is the world's second-largest producer of tiles, with an annual production of 231 million square meters in 1990. It consists of 231 firms and 16,000 employees. Approximately 90 percent of the industry is concentrated in northeastern Spain.⁴⁹ The Spanish industry invested heavily in the most advanced Italian technology in the 1980s.⁵⁰ Spain has clays that are ideally suited for the production of larger size tiles.⁵¹ Spain exports roughly half of its output and is a net exporter of tiles.

Like the Italian industry, Spain's tile industry experienced growth domestically and in foreign markets during 1987-90, with export markets outperforming the Spanish market in relative terms. Unlike the Italian industry, the Spanish industry's home market outperformed its export markets in absolute terms for the period and continued to consume the majority of producers' shipments. Spanish consumption increased by 47 percent during 1987-90 to 142 million square meters, compared with an increase of 64 percent to 92 million square meters for exports. Producers' shipments to export markets increased from 37 percent of producers' shipments in 1987 to 40 percent in 1990. Spain's imports increased by 52 percent during the period to almost 4 million square meters, but remained relatively insignificant at less than 3 percent of apparent consumption.

UN data indicate that Spain's trade surplus in tiles more than doubled during the period to \$617 million in 1990, an increase attributable to increased export volume and unit values. Spain shipped 4 percent of its exports to the United States in 1990, making the United States Spain's third-largest export market after France and the United Kingdom. The United States was a minor supplier of Spain's imports in 1990, supplying 2 percent.

Commerce data indicate that Spain was the third-largest supplier of U.S. tile imports in 1991 (15 percent of the U.S. total, on the basis of quantity), and achieved a trade surplus of \$54 million in tile trade with the United States. U.S. imports from Spain are concentrated in the glazed nonmosaic tile category, which represented 96 percent of total imports of tiles from Spain in 1991 (on the basis of quantity). The

⁴⁹ Guillam, "Ceramics and Pottery Industry in Spain," *Ceramic Bulletin*, Aug. 1989, p. 1459.

⁵⁰ Porter, p. 223.

⁵¹ "The Tile of Spain," *Tile & Decorative Surfaces*, Aug. 1990, p. 56.

quantity of U.S. imports from Spain increased by 19 percent during 1987-91, as the Spanish industry increased its marketing efforts in the United States. A key feature of the Spanish industry's marketing efforts was the increased presence of the Spanish industry at U.S. trade shows. The Association of Tile Manufacturers of Spain joined Italian producers in becoming one of the founding sponsors of the International Tile Exposition in 1990. As in the case of Italy, promotional information for Spanish tiles emphasizes the color, style, and design aspects of Spanish tiles. Less decorative Spanish tiles may also compete in the U.S. market on the basis of price.⁵²

Brazil

Brazil is the world's third-largest producer of tiles, with annual production of 220 million square meters in 1988. Brazil's industry reportedly uses Italian production equipment to manufacture low-priced, low-quality tiles.⁵³ Of the world's five leading tile-producing countries, Brazil is the least involved in international trade. Although the tile industry in Brazil is largely focused on the domestic market, Brazil is a net exporter of tiles, with a trade surplus of \$37 million in 1990. Brazil's imports were relatively small during the period, reaching a high of \$3 million in 1990. The United States was Brazil's largest foreign market in that year, representing 50 percent of Brazil's exports, and a minor supplier of Brazil's imports, providing less than 1 percent.

Brazil was the fourth-largest supplier of U.S. tile imports in 1991 (5 percent of the U.S. total, on the basis of quantity), and achieved a trade surplus of \$12 million in tile trade with the United States. U.S. imports from Brazil are concentrated in the glazed nonmosaic tile category, which represented 99 percent of total imports of tiles from Brazil in 1991 (on the basis of quantity). The quantity of U.S. imports from Brazil declined by 36 percent during 1987-91 as trade disagreements between the U.S. and Brazilian Governments began to involve U.S. tile imports from Brazil. In response to Brazil's alleged breach of certain trade agreements pertaining to computers and software, the U.S. Government considered the possible imposition of duties of 100 percent on tile imports from Brazil during 1987 and 1988. No such action was taken, but the threat of a duty increase of such magnitude and resultant uncertainty introduced into the marketplace is believed to be largely responsible for the decline of imports from Brazil. There are indications that Brazil's tile exports to the United States consist of tiles of relatively common colors that compete on the basis of price.⁵⁴

⁵² Richard E. Baiter, Jr., President of Quarry Tile Co., Prehearing statement of Quarry Tile Co. to the U.S. International Trade Commission in investigation No. TA-131(b)-14, Feb. 10, 1989, p. 2.

⁵³ Porter, p. 224.

⁵⁴ Richard E. Baiter, Jr., President of Quarry Tile Co., Prehearing statement of Quarry Tile Co. to the U.S. International Trade Commission in investigation No. TA-131(b)-14, Feb. 10, 1989, p. 2.

Japan

Japan is the world's fourth-largest producer of tiles, with an annual production estimated by Commission staff at 107 million square meters in 1990. The Japanese industry consisted of 231 producers in 1983. Japan is a net exporter of tiles, but its trade surplus in tiles is declining as a result of declining exports and increasing imports. According to UN data, Japan's trade surplus in 1990 was \$70 million. The United States was Japan's largest-foreign-market in that year, receiving 42 percent of Japan's exports, and was a minor supplier of Japan's imports, supplying 4 percent.

Japan was the fifth-largest supplier of U.S. tile imports in 1991 (4 percent of the U.S. total, on the basis of quantity), and achieved a trade surplus of \$25 million in tile trade with the United States. U.S. imports from Japan are concentrated in the glazed nonmosaic tile category, which represented 65 percent of total imports of tiles from Japan in 1991 (on the basis of quantity). The quantity of U.S. imports from Japan declined by 57 percent during 1987-91 as U.S. imports of less expensive tiles from other countries increased. Japanese tiles are among the most expensive in the U.S. market, and the Japanese industry has not participated as actively in the U.S. promotion of its products as have manufacturers from countries such as Italy and Spain.

In 1983, a statement to the Commission on behalf of The Japan Pottery Exporters' Association and The Japan Mosaic Tile Manufacturers' Association attributed the decline of Japan's importance in the U.S. tile market to substantially higher costs for the Japanese industry and increased competition from other tile producers.⁵⁵ The cost factors cited at that time were exchange rates for the Japanese yen, fuel, and labor. The increased competition cited was from countries such as Korea in middle and low-end mosaic tiles, U.S. producers in middle and low-end (plain color) glazed nonmosaic tiles for wall applications, and European producers such as Italy in the high-end segment of nonmosaic tiles for floor applications.

Germany

Germany is the world's fifth-largest producer of tiles, with annual production of 72 million square meters in 1990. The number of firms in the German industry is unknown, but employment within the industry is approximately 9,000. German producers reportedly tend to manufacture high-priced tiles with excellent mechanical qualities, i.e., resistance to scratching, wear, and freezing.⁵⁶ The German industry is believed to offer the world's largest selection of large-size tiles, with tiles as large as 4' x 5'. Germany is a net importer of tiles. At least two German

⁵⁵ See statement on behalf of The Japan Pottery Exporters' Association and The Japan Mosaic Tile Manufacturers' Association to the U.S. International Trade Commission in investigation No. 332-156, July 1, 1983, pp. 4-5, and errata, July 14, 1983, p. 5.

⁵⁶ Porter, p. 223.

producers are known to have foreign production facilities: Villeroy & Boch in France and Pegulan-Werke AG in Italy. The latter firm was purchased by Swedish Match during the period and has a flooring division for resilient flooring, carpeting, and ceramic floor and wall tile.⁵⁷

Like the Spanish industry, Germany's tile industry experienced growth domestically and in foreign markets during 1987-90, with emphasis on the domestic market. Producers' shipments to export markets declined from 40 percent of production in 1987 to 37 percent in 1990. German consumption increased by 32 percent during 1987-90 to 121 million square meters, compared with an increase of 4 percent to 26 million square meters for exports. Germany's imports increased by 43 percent during the period to almost 76 million square meters, representing 62 percent of apparent consumption.

UN data indicate that Germany's trade deficit in tiles increased from \$66 million in 1987 to \$290 million in 1990, an increase attributable to increased import volume and unit values. German import volume of \$701 million in 1990 was larger than that of the United States. The United States was a minor foreign market for Germany in 1990, representing 2 percent of Germany's exports, and a minor supplier of Germany's imports, providing less than 1 percent.

Commerce data indicate that Germany was the ninth-largest supplier of U.S. tile imports in 1991 (1 percent of the U.S. total, on the basis of quantity), and achieved a trade surplus of \$8 million in tile trade with the United States. U.S. imports from Germany are concentrated in the glazed nonmosaic tile category, which represented 55 percent of total imports of tiles from Germany in 1991 (on the basis of quantity). The quantity of U.S. imports from Germany declined by 15 percent during 1987-91 as the already-above-average unit values of German tiles became even less competitive with imports from other countries. German producers have long promoted tiles suitable for exterior applications in the U.S. market.

EC

The EC represents the bulk of world trade in tiles. According to UN data in 1990, EC exports were valued at over \$3 billion in 1990 and imports at over \$1 billion. Aesthetically pleasing products and strong foreign marketing efforts are most likely responsible for the EC trade surplus in tiles. The EC is the world's largest market for tiles, but it is a market unreceptive to imports from nonmember countries. EC data for tile imports in 1990 indicate that nonmember countries provided 9 percent of the total. There is currently no indication that implementation of EC92 is likely to significantly affect the accessibility of the EC market to nonmember countries.

⁵⁷ "Swedish Match Acquires Pegulan," *Tile & Decorative Surfaces*, Jan./Feb. 1987, p. 26, and "An Interview with Tarkett," *Tile & Decorative Surfaces*, Oct./Nov. 1987, pp. 84-90.

U.S. TRADE MEASURES

Table 2 shows, for products entered under *Harmonized Tariff Schedule of the United States* (HTS) subheadings 6907.10.00 to 6908.90.00, the column 1 rates of duty as of January 1, 1992. The aggregate trade-weighted, average rate of duty for imports from column 1 countries in 1991 was 19.2 percent ad valorem, exclusive of imports entering under special duty provisions.

Customs classification of tiles is based on readily apparent physical characteristics, i.e., glazing, size, and shape. The conversion from the *Tariff Schedules of the United States* (TSUS) to the HTS reduced the comparability of U.S. trade categories to U.S. industry production categories. It replaced the facial-area criterion of 6 square inches used by the U.S. industry with the surface-area criterion employed in international trade nomenclature. The international standard is similar but not identical to the U.S. facial-area criterion. Although there are exceptions, import HTS subheadings generally can be reconciled to U.S. industry practice as follows:

6907.10.00	.....	Unglazed mosaic tiles
6907.90.00	.....	Unglazed nonmosaic tiles
6908.10.10	.....	Glazed mosaic tiles
6908.10.20	.....	Glazed mosaic tiles
6908.10.50	.....	Glazed nonmosaic tiles
6908.90.00	.....	Glazed nonmosaic tiles

Imports of glazed and unglazed nonmosaic tiles from Mexico have been subject to a countervailing duty order since May 10, 1982, resulting from a petition filed with Commerce by the Tile Council of America, Inc. (a trade association of U.S. ceramic tile manufacturers). The magnitude of the subsidies and resultant countervailing duties involved have declined over time, as has their apparent effect on trade. In its latest administrative review of the matter, covering 1989, Commerce found the subsidies involved to be de minimis, i.e., less than 0.5 percent ad valorem. As a result of this finding, no countervailing duties were assessed for 1989, and estimated cash deposits on imports of such merchandise from Mexico were waived until further notice.

FOREIGN TRADE MEASURES

Foreign tariffs applicable to U.S. exports tend to be at the same level or lower than those of the United States for the four leading U.S. export markets and the EC: Mexico has duties roughly equivalent to the United States (20 percent); Canada (8-10 percent), Japan (10 percent), and the EC (8-9 percent) have lower duties; and only The Bahamas (35 percent) have higher duties.

Nontariff measures are not known to have a significant effect on trade in these products.

U.S. MARKET

Consumption

U.S. consumption of ceramic floor and wall tiles moved erratically during 1987-91, with producers' shipments recording a slightly greater overall decline than imports (figure 6). The share of U.S. consumption represented by imports finished the period up by almost 1 percentage point at 53 percent. Relative importance of the three types of tiles remained largely unchanged during the period, with glazed nonmosaic tiles representing an estimated 78 percent of U.S. consumption in 1991, unglazed nonmosaic 12 percent, and mosaic 10 percent. The 8-percent growth in U.S. consumption recorded during the 1987-90 portion of the period significantly trailed the 26-percent increase recorded by European countries, and the U.S. per capita consumption rate of 0.4 square meters in 1990 remained far below the 3.8-square-meter figure for Italy and 3.6-square-meter figure for Spain. Apparent U.S. consumption decreased by 10 percent during the overall 1987-91 period (table 3) and decreased in value by 5 percent (table 4). This decline occurred during a sustained period of weakness in the residential construction market, historically the most significant U.S. tile market (figure 7).

The number of new housing starts in the United States declined each year during 1987-91, posting an overall decline for the period of 38 percent to 1 million units in 1991. The decline in housing-unit volume was offset somewhat by the increasing size of units started during the period and number of bathrooms per unit, factors that favor tile consumption. In themselves, these two factors were unlikely to buoy consumption, given the severity of the decline in housing starts. It appears likely that displacement of other floor and wall coverings by tiles in the residential construction market, more emphasis on the nonresidential construction market, and more emphasis on the repair/remodeling market played parts in moderating the decline of U.S. tile consumption during the period (figure 8).

Competition is intense both among various domestic ceramic tile products and between domestic and imported products. Quality (i.e., the technical quality of tiles based on physical characteristics) is increasingly being considered equal for tiles,⁵⁸ with the worldwide spread of similar production machinery of European origin. Competition is largely based on factors of aesthetic appeal, availability of technical assistance, price, short lead times for noninventoried items, and variety. Various domestic products may differ by degree in these areas, but domestic and imported tiles each appear to have definite advantages

⁵⁸ Eddie M. Lesok, Chairman of the Board and Chief Executive Officer of Color Tile, Inc., Posthearing statement of Color Tile, Inc. to the U.S. International Trade Commission in investigation No. TA-131(b)-14, Apr. 13, 1989, pp. 4-5.

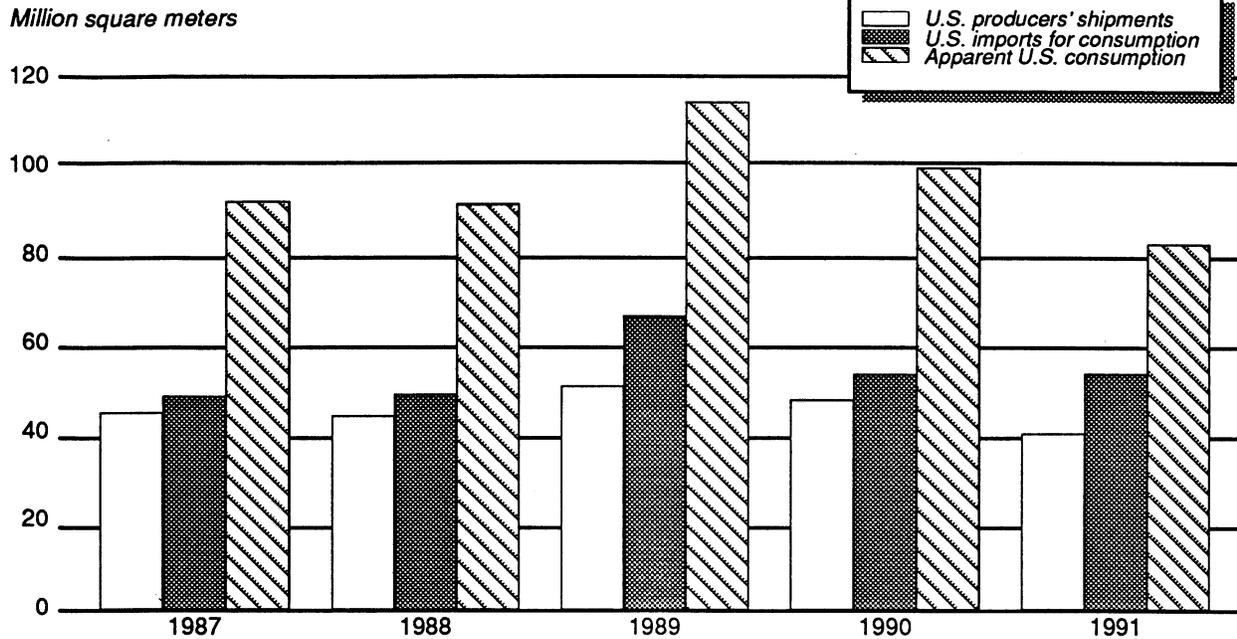
Table 2
Ceramic floor and wall tiles: Harmonized Tariff Schedule subheading; description; U.S. col. 1 rates of duty as of Jan. 1, 1992; U.S. exports, 1991; and U.S. imports, 1991

HTS subheading	Description	Col. 1 rate of duty As of Jan. 1, 1992		U.S. exports, 1991	U.S. imports, 1991
		General	Special ¹		
6907.10.00	Unglazed ceramic flags and paving, hearth or wall tiles; unglazed ceramic mosaic cubes and the like, whether or not on a backing; Tiles, cubes and similar articles, whether or not rectangular, the largest surface area of which is capable of being enclosed in a square the side of which is less than 7 cm	20.0%	Free (E,IL) 12.0% (CA)	2	3
6907.90.00	Other Glazed ceramic flags and paving, hearth or wall tiles; glazed ceramic mosaic cubes and the like, whether or not on a backing; Tiles, cubes and similar articles, whether or not rectangular, the largest surface area of which is capable of being enclosed in a square the side of which is less than 7 cm	20.0%	Free (E,IL) 12.0% (CA)	8	33
6908.10.10	Having not over 3229 tiles per square meter, most of which have faces bounded entirely by straight lines	20.0%	Free (E,IL) 12.0% (CA)	23	7
6908.10.20	Other: The largest surface area of which is less than 38.7 cm ²	20.0%	Free (A*,E,IL) 12.0% (CA)	20	15
6908.10.50	Other	19.0%	Free (E,IL) 11.4% (CA)	20	91
6908.90.00	Other	19.0%	Free (E,IL) 11.4% (CA)	8	217

¹ Programs under which special tariff treatment may be provided, and the corresponding symbols for such programs as they are indicated in the "Special" subcolumn, are as follows: Generalized System of Preferences (A); Automotive Products Trade Act (B); Agreement on Trade in Civil Aircraft (C); United States-Canada Free-Trade Agreement (CA); Caribbean Basin Economic Recovery Act (E); and United States-Israel Free Trade Area (IL).
² Estimated.

Source: U.S. exports and imports compiled from data of the U.S. Department of Commerce.

Figure 6
Ceramic floor and wall tiles: U.S. producers' shipments, imports for consumption, and apparent U.S. consumption, 1987-91



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

Table 3
Ceramic floor and wall tiles: U.S. shipments, exports of domestic merchandise, imports for consumption, and apparent U.S. consumption, 1987-91

Year	U.S. shipments	U.S. exports	U.S. imports	Apparent U.S. consumption	Ratio of imports to consumption
	1,000 square meters				Percent
1987	44,493	637	48,192	92,048	52.4
1988	43,729	912	48,599	91,416	53.2
1989	50,454	¹ 2,275	66,183	² 114,362	² 57.9
1990	47,309	¹ 819	53,179	² 99,669	² 53.4
1991	39,757	¹ 1,118	43,838	² 82,477	² 53.2

¹ Data are understated to the extent that export quantity data are not available for subheadings 6907.90.00 and 6908.90.00 of *Schedule B: Statistical Classification of Domestic and Foreign Commodities Exported from the United States*.

² Data are overstated to the extent that export quantity data are not available for subheadings 6907.90.00 and 6908.90.00 of *Schedule B: Statistical Classification of Domestic and Foreign Commodities Exported from the United States*.

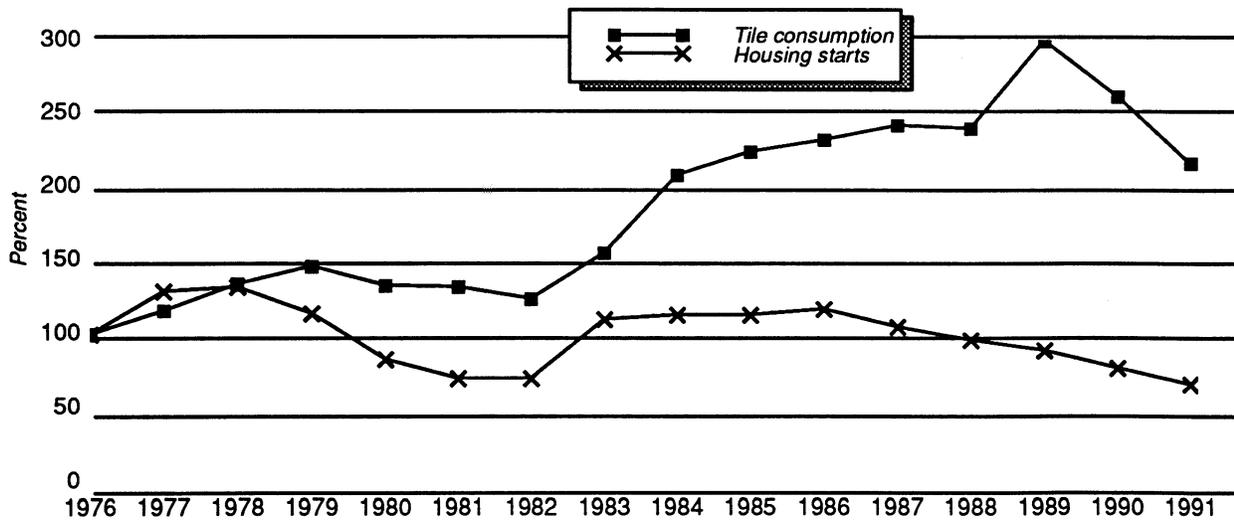
Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 4
Ceramic floor and wall tiles: U.S. shipments, exports of domestic merchandise, imports for consumption, and apparent U.S. consumption, 1987-91

Year	U.S. shipments	U.S. exports	U.S. imports	Apparent U.S. consumption	Ratio of imports to consumption
	1,000 dollars				Percent
1987	607,521	7,960	378,017	977,578	38.7
1988	624,397	12,396	410,913	1,022,914	40.2
1989	697,744	17,893	431,148	1,110,999	38.8
1990	686,524	20,504	421,007	1,087,027	38.7
1991	581,806	20,973	365,060	925,893	39.4

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

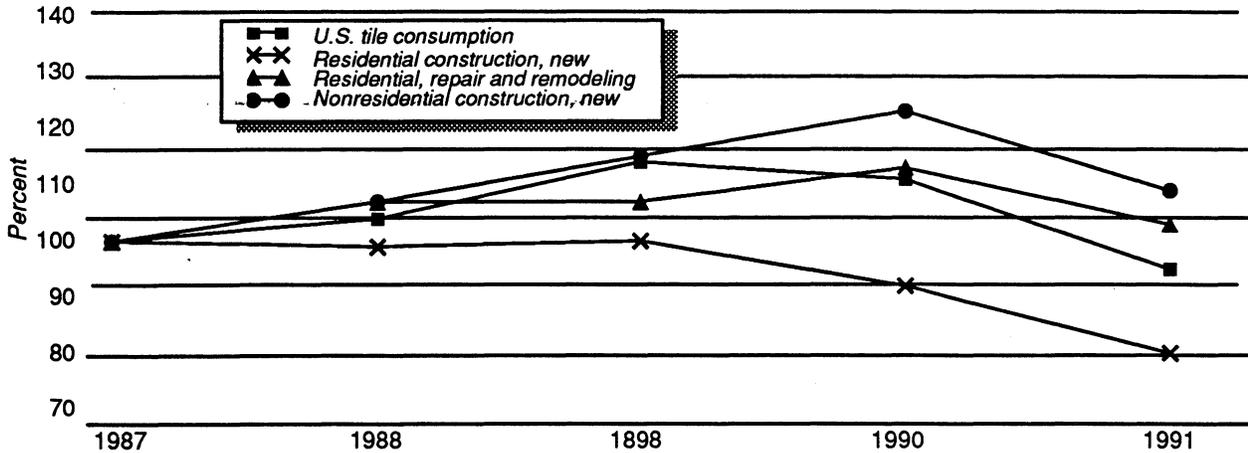
Figure 7
Ceramic floor and wall tiles: Indexes of the quantity of U.S. tile consumption and number of housing starts, 1976-91



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

Figure 8

Ceramic floor and wall tiles: Indexes of the value (in current dollars) of U.S. tile consumption; new construction put in place, residential construction, new;¹ expenditures for residential repairs and improvements;² and new construction put in place, nonresidential, new;³ 1987-91⁴



¹ Data include private construction, residential buildings, new housing units and public construction, public buildings, housing and redevelopment. Data exclude private construction, residential buildings, improvements that are covered under the repair and remodeling category.

² Similar data are not available for expenditures for nonresidential repairs and improvements.

³ Data include private construction, nonresidential buildings and public construction, public buildings, exclusive of buildings for housing and redevelopment.

⁴ Data for expenditures for residential repairs and improvements in 1991 were estimated by the staff of the U.S. International Trade Commission.

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

over the other in certain criteria based on a correlation of U.S. producers' and importers' assessments of product-related factors of competition.⁵⁹

Domestic tiles hold competitive advantages in the availability of technical assistance and short lead times for noninventoried items. Imported tiles hold an advantage in variety (e.g., tile sizes offered), price, and aesthetic appeal (e.g., colors, designs, textures).⁶⁰ Domestic producers have made efforts to minimize import advantages in variety and aesthetic appeal by offering a more competitive range of sizes, shapes, colors, and surface decorations. They have been unsuccessful in minimizing the price advantage of imports by improving productivity (figure 9). For their part, foreign producers have tried to reduce the domestic advantage in short lead times for noninventoried items by shortening shipping times and expanding U.S. warehousing facilities.

⁵⁹ USITC, *Competitive Assessment*, USITC publication 1442, Oct. 1983, pp. 87-89.

⁶⁰ "Tile makers in western Europe and Japan have dominated the market in design, texture and coloring of ceramic tile." "Ferro Installs Pilot Line for Glazing Tile," *Ceramic Industry*, May 1983, p. 15.

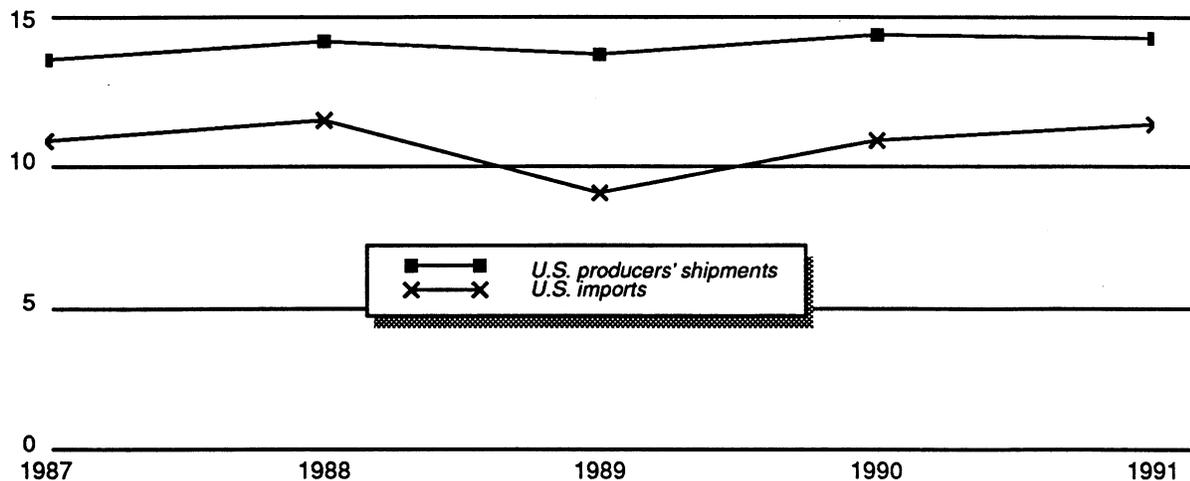
Production

The U.S. production decline roughly matched import decline during the period. U.S. production posted an overall decrease of 10 percent during 1987-91 to 41 million square meters in 1991 (table 5). Production of two of the three tile categories decreased for the period. Glazed nonmosaic tiles decreased by 15 percent and unglazed nonmosaic tiles by 13 percent. The only increase was posted by mosaic tiles. U.S. mosaic producers were apparently able to capitalize on the removal of a number of countries from eligibility for mosaic tiles under the Generalized System of Preferences (GSP) that occurred during the period.

U.S. producers' shipments showed a pattern largely consistent with production data, with an overall decrease of 5 million square meters (11 percent) during 1987-91 (table 6), reaching 40 million square meters, valued at \$582 million. Mosaic tiles posted the only overall gain in terms of quantity, about 1 million square meters, or 19 percent.

Figure 9
Ceramic floor and wall tiles: Average unit values for U.S. producers' shipments¹ and imports for consumption,² 1987-91

Dollars per square meter



¹ F.o.b. plant.

² C.i.f. (cost, insurance, and freight), duty paid.

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

Table 5
Ceramic floor and wall tiles: U.S. production, by types, 1987-91
(Thousands of square meters)

Type	1987	1988	1989	1990	1991
Mosaic	4,503	4,958	8,191	7,444	6,104
Glazed nonmosaic	34,854	34,459	38,716	36,041	29,686
Unglazed nonmosaic ...	6,187	6,133	8,406	7,467	5,365
Total	45,543	45,549	55,314	50,951	41,155

Note.—Because of rounding, figures may not add to the totals shown.

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

Imports

Products Imported

All three tile categories are imported. During the 1987-91 period, glazed nonmosaic tiles increased their share of total imports by 3 percentage points to 84 percent at the expense of mosaic tile, whose share of total imports declined to 6 percent. The share represented by unglazed nonmosaic tiles finished the period unchanged at 10 percent.

Import Levels and Trends

Imports slightly outperformed U.S. producers' shipments during the period. Imports posted an overall

decrease of 9 percent during 1987-91, totaling 44 million square meters, valued at \$365 million, in 1991 (table 7). Imports of mosaic tiles decreased by about 45 percent during the period to 2 million square meters in 1991, valued at \$24 million (table 8), with the loss of eligibility for certain GSP imports believed to be responsible for the decline. Imports of glazed nonmosaic tiles decreased by 6 percent during the period to 37 million square meters in 1991, valued at \$308 million (table 9). Imports of unglazed nonmosaic expanded 2 percent to 5 million square meters in 1991, valued at \$33 million (table 10).

Imports entered under special duty provisions were largely insignificant during the period, representing 1 percent of total U.S. imports in 1991 in terms of

quantity and value. Tiles entered under GSP provisions were the most prevalent imports in this category, totaling 159,000 square meters in 1991, valued at \$1 million (table 11). Duty-free imports under the sole GSP-eligible category, HTS subheading 6908.10.20, totaled almost 1 million square meters in

1987 but declined by 77 percent during the period with the graduation of Hong Kong, Singapore, and Taiwan from the GSP program⁶¹ and the loss of GSP eligibility for tiles from Thailand.

Principal Import Suppliers

Italy, Spain, Mexico, and Japan were the four principal sources of U.S. imports during 1987-91 in terms of quantity and value, and increased their share of the U.S. market during the period. Together, they accounted for 79 percent of total imports in 1991 in terms of quantity (figure 10) and 81 percent in terms of value, up from the 1987 figure of 76 percent for quantity and with no change in terms of value. Of the four countries, only Spain and Mexico posted gains. Imports from Mexico showed the largest growth during the period, increasing by 4 million square meters

⁶¹ Korea was already ineligible for GSP treatment on these items.

(83 percent) largely because of the low unit values of the Mexican products and expansion of Mexican production capacity to service the U.S. market. Imports from Spain increased by 1 million square meters (19 percent) during the period, largely on the strength of below average unit values and increased promotional efforts in the United States by the Spanish industry. Unit values of imports from Italy and Japan became more expensive during the period, and the volume of imports from these countries finished the period down by 23 and 57 percent respectively.

Of the three individual tile categories, Japan was the leading supplier of mosaic tiles in 1991 (23 percent); Italy, Spain, Mexico, and Japan the leading suppliers of glazed nonmosaic tiles (78 percent); and Italy and Mexico the leading suppliers of unglazed nonmosaic tiles (70 percent).

U.S. Importers

Domestic importers typically consist of U.S. marketing subsidiaries of foreign producers, distributors, and U.S. producers. Importers in the latter category typically explain that they must import because of import competition.⁶²

⁶² USITC, *Competitive Assessment*, USITC publication 1442, Oct. 1983, p. 10.

Table 6
Ceramic floor and wall tiles: U.S. producers' shipments, by types, 1987-91

Source	1987	1988	1989	1990	1991
<i>Quantity (1,000 square meters)</i>					
Mosaic	4,865	5,797	7,395	6,880	6,104
Glazed nonmosaic	33,457	31,826	35,075	33,369	29,686
Unglazed nonmosaic ...	6,171	6,106	7,984	7,060	5,365
Total	44,493	43,729	50,454	47,309	41,155
<i>Value (1,000 dollars)</i>					
Mosaic	83,327	100,356	119,174	114,627	93,932
Glazed nonmosaic	435,804	438,829	459,932	467,184	397,372
Unglazed nonmosaic ...	88,390	85,212	118,638	104,713	90,502
Total	607,521	624,397	697,744	686,524	581,806
<i>Unit value (dollars per square meter)</i>					
Mosaic	17.13	17.31	16.12	16.66	15.39
Glazed nonmosaic	13.03	13.79	13.11	14.00	13.39
Unglazed nonmosaic ...	14.32	13.96	14.86	14.83	16.87
Average	13.65	14.28	13.83	14.51	14.14

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

Table 7
Ceramic floor and wall tiles: U.S. imports for consumption, by principal sources, 1987-91

<i>Source</i>	<i>1987</i>	<i>1988</i>	<i>1989</i>	<i>1990</i>	<i>1991</i>
<i>Quantity (1,000 square meters)</i>					
Italy	23,076	22,931	30,667	22,678	17,756
Spain	5,460	5,461	7,298	7,396	6,503
Mexico	4,480	5,754	8,286	8,308	8,181
Japan	3,900	3,400	5,355	3,257	1,684
Brazil	3,360	3,270	3,709	2,867	2,139
Thailand	879	1,245	2,142	2,030	1,459
Germany	701	479	802	535	455
Venezuela	333	364	776	1,157	1,682
Argentina	490	732	803	775	725
Taiwan	1,354	743	578	596	417
All other	4,159	4,220	5,767	3,580	2,837
Total	48,192	48,599	66,183	53,179	43,838
<i>Value (1,000 dollars)</i>					
Italy	193,272	210,040	207,453	199,942	172,911
Spain	36,737	43,279	50,043	55,660	53,947
Mexico	22,589	30,416	40,247	43,308	45,388
Japan	54,713	55,827	50,896	43,423	26,368
Brazil	16,845	15,565	18,046	16,059	11,822
Thailand	4,916	7,508	12,625	13,927	9,544
Germany	9,882	7,086	8,335	8,608	8,302
Venezuela	1,277	1,666	3,577	5,786	7,725
Argentina	2,885	3,778	3,976	3,790	3,730
Taiwan	8,081	5,343	3,686	3,343	3,264
All other	26,820	30,405	32,264	27,161	22,059
Total	378,017	410,913	431,148	421,007	365,060
<i>Unit value (dollars per square meter)</i>					
Italy	8.38	9.16	6.76	8.82	9.74
Spain	6.73	7.93	6.86	7.53	8.30
Mexico	5.04	5.29	4.86	5.21	5.55
Japan	14.03	16.42	9.50	13.33	15.66
Brazil	5.01	4.76	4.87	5.60	5.53
Thailand	5.59	6.03	5.89	6.86	6.54
Germany	14.10	14.79	10.39	16.09	18.25
Venezuela	3.83	4.58	4.61	5.00	4.59
Argentina	5.89	5.16	4.95	4.89	5.14
Taiwan	5.97	7.19	6.38	5.61	7.83
All other	6.45	7.20	5.59	7.59	7.78
Average	7.84	8.46	6.51	7.92	8.33

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

Table 8
Mosaic tiles: U.S. imports for consumption, by principal sources, 1987-91

<i>Source</i>	<i>1987</i>	<i>1988</i>	<i>1989</i>	<i>1990</i>	<i>1991</i>
<i>Quantity (1,000 square meters)</i>					
Japan	1,271	1,129	1,738	933	555
Thailand	574	712	1,242	722	534
Mexico	3	10	309	239	351
Italy	479	748	541	472	316
Taiwan	812	207	255	384	141
Malaysia	0	5	82	32	129
Spain	101	248	304	227	107
France	3	2	7	10	39
Korea	771	890	580	151	51
Germany	4	15	142	27	15
All other	394	564	621	425	207
Total	4,412	4,530	5,821	3,622	2,445
<i>Value (1,000 dollars)</i>					
Japan	15,476	16,980	13,369	12,101	7,592
Thailand	3,539	4,553	7,854	5,345	3,629
Mexico	12	77	1,007	1,016	3,505
Italy	2,013	2,117	4,074	4,897	3,388
Taiwan	4,401	1,639	1,513	1,800	1,142
Malaysia	0	31	612	255	1,066
Spain	724	851	1,386	1,491	1,038
France	27	35	78	192	642
Korea	4,407	6,037	3,487	1,239	417
Germany	75	109	773	470	358
All other	2,710	3,238	3,978	2,611	1,661
Total	33,384	35,667	38,131	31,417	24,438
<i>Unit value (dollars per square meter)</i>					
Japan	12.18	15.04	7.69	12.97	13.68
Thailand	6.17	6.39	6.32	7.40	6.80
Mexico	4.00	7.70	3.26	4.25	9.99
Italy	4.20	2.83	7.53	10.38	10.72
Taiwan	5.42	7.92	5.93	4.69	8.10
Malaysia	0	6.20	7.46	7.97	8.26
Spain	7.17	3.43	4.56	6.57	9.70
France	9.00	17.50	11.14	19.20	16.46
Korea	5.72	6.78	6.01	8.21	8.18
Germany	18.75	7.27	5.44	17.41	23.87
All other	6.88	5.74	6.41	6.14	8.02
Average	7.57	7.87	6.55	8.67	10.00

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

Table 9
Glazed nonmosaic tiles: U.S. imports for consumption, by principal sources, 1987-91

<i>Source</i>	<i>1987</i>	<i>1988</i>	<i>1989</i>	<i>1990</i>	<i>1991</i>
<i>Quantity (1,000 square meters)</i>					
Italy	20,846	20,875	28,173	20,117	15,819
Spain	4,985	4,882	6,607	6,936	6,262
Mexico	3,073	3,871	5,228	5,494	5,466
Japan	2,447	2,168	3,495	2,273	1,103
Brazil	3,245	2,989	-3,517	2,811	2,125
Venezuela	279	344	743	1,087	1,625
Thailand	264	526	893	1,306	925
Germany	413	325	426	289	251
Argentina	479	718	780	744	688
Korea	489	715	1,262	614	224
All other	2,717	2,326	3,217	2,182	2,279
Total	39,237	39,739	54,341	43,853	36,767
<i>Value (1,000 dollars)</i>					
Italy	178,514	196,193	189,571	173,068	150,823
Spain	34,185	40,054	46,741	52,489	51,911
Mexico	18,039	24,390	32,908	35,568	35,175
Japan	36,301	37,016	35,971	30,446	18,238
Brazil	16,211	14,663	16,914	15,660	11,756
Venezuela	1,132	1,611	3,406	5,310	7,378
Thailand	1,178	2,897	4,720	8,528	5,914
Germany	6,009	5,130	4,860	4,883	4,543
Argentina	2,780	3,745	3,866	3,638	3,548
Korea	2,959	4,797	6,461	5,275	2,025
All other	17,414	16,390	17,159	15,583	16,328
Total	314,722	346,886	362,577	350,448	307,639
<i>Unit value (dollars per square meter)</i>					
Italy	8.56	9.40	6.73	8.60	9.53
Spain	6.86	8.20	7.07	7.57	8.29
Mexico	5.87	6.30	6.29	6.47	6.44
Japan	14.83	17.07	10.29	13.39	16.53
Brazil	5.00	4.91	4.81	5.57	5.53
Venezuela	4.06	4.68	4.58	4.89	4.54
Thailand	4.46	5.51	5.29	6.53	6.39
Germany	14.55	15.78	11.41	16.90	18.10
Argentina	5.80	5.22	4.96	4.89	5.16
Korea	6.05	6.71	5.12	8.59	9.04
All other	6.41	7.05	5.33	7.14	7.16
Average	8.02	8.73	6.67	7.99	8.37

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

Table 10
Unglazed nonmosaic tiles: U.S. imports for consumption, by principal sources, 1987-91

<i>Source</i>	<i>1987</i>	<i>1988</i>	<i>1989</i>	<i>1990</i>	<i>1991</i>
<i>Quantity (1,000 square meters)</i>					
Italy	1,751	1,309	1,953	2,089	1,621
Mexico	1,404	1,872	2,749	2,575	2,364
Germany	284	139	234	218	189
Spain	374	332	386	233	134
United Kingdom	52	59	40	38	55
France	45	31	117	114	30
Japan	183	103	122	50	26
Portugal	88	100	86	42	32
Netherlands	4	20	36	20	13
Switzerland	48	17	106	130	19
All other	310	348	192	195	142
Total	4,543	4,330	6,021	5,704	4,625
<i>Value (1,000 dollars)</i>					
Italy	12,745	11,731	13,809	21,978	18,700
Mexico	4,539	5,949	6,331	6,724	6,707
Germany	3,799	1,847	2,702	3,255	3,401
Spain	1,829	2,373	1,917	1,680	999
United Kingdom	520	909	443	430	608
France	631	587	631	1,123	541
Japan	2,936	1,832	1,556	876	539
Portugal	661	892	840	404	336
Netherlands	40	301	437	341	226
Switzerland	567	250	853	1,158	185
All other	1,645	1,689	921	1,173	740
Total	29,912	28,360	30,440	39,142	32,982
<i>Unit value (dollars per square meter)</i>					
Italy	7.28	8.96	7.07	10.52	11.54
Mexico	3.23	3.18	2.30	2.61	2.84
Germany	13.38	13.29	11.55	14.93	17.99
Spain	4.89	7.15	4.97	7.21	7.46
United Kingdom	10.00	15.41	11.08	11.32	11.05
France	14.02	18.94	5.39	9.85	18.03
Japan	16.04	17.79	12.75	17.52	20.73
Portugal	7.51	8.92	9.77	9.62	10.50
Netherlands	10.00	15.05	12.14	17.05	17.38
Switzerland	11.81	14.71	8.05	8.91	9.74
All other	5.31	4.85	4.80	6.02	5.21
Average	6.58	6.55	5.06	6.86	7.13

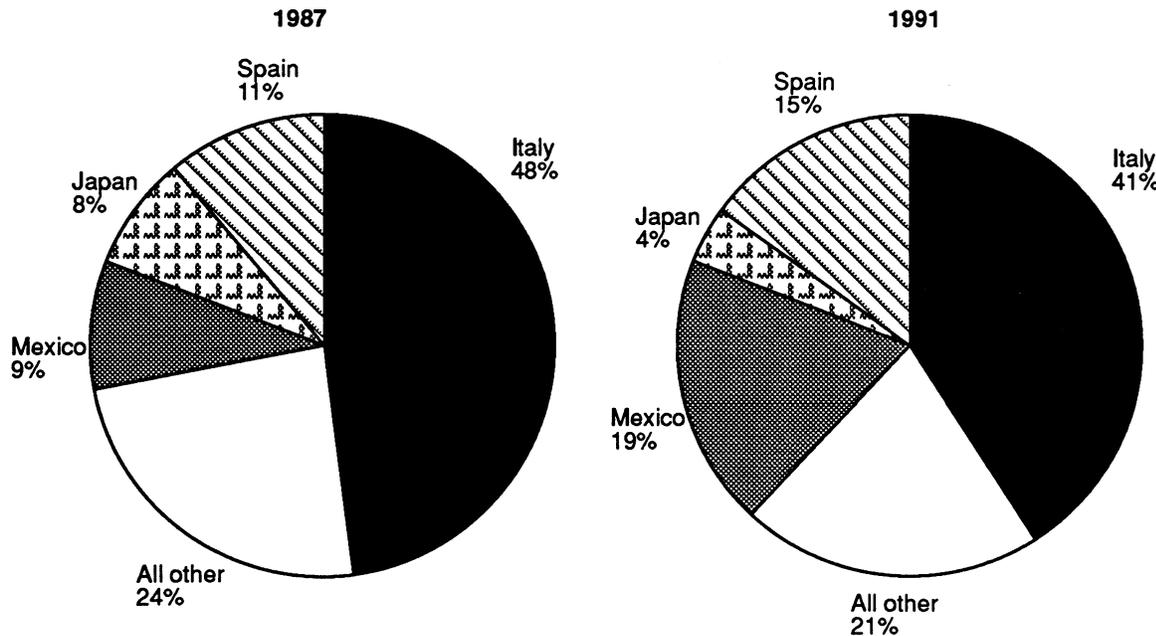
Source: Compiled from official statistics of the U.S. Department of Commerce.

Table 11
Ceramic floor and wall tiles: U.S. Imports for consumption under special duty provisions, 1987-91

Type	1987	1988	1989	1990	1991
<i>Quantity (1,000 square meters)</i>					
Generalized System of Preferences	1,234	705	836	80	159
United States-Israel Free-Trade-Agreement	1	2	33	95	163
Caribbean Basin Economic Recovery Act	4	3	33	39	162
United States-Canada Free-Trade-Agreement	0	0	268	218	23
Total	1,239	710	1,170	432	507
<i>Value (1,000 dollars)</i>					
Generalized System of Preferences	6,469	4,564	4,780	718	1,479
United States-Israel Free-Trade-Agreement	60	217	240	697	1,039
Caribbean Basin Economic Recovery Act	196	43	62	223	855
United States-Canada Free-Trade-Agreement	0	0	2,181	1,405	544
Total	6,725	4,824	7,263	3,043	3,917

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

Figure 10
Ceramic floor and wall tiles: Quantity of U.S. imports for consumption, by principal sources, 1987 and 1991



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

FOREIGN MARKETS

Foreign Market Profile

U.S. tile producers are not export oriented because their tiles are generally more expensive and less aesthetically varied than many foreign tiles. Even within the United States, domestic tiles are generally at a price disadvantage. In foreign markets, this basic disadvantage is compounded by the addition of tariff and transportation costs.

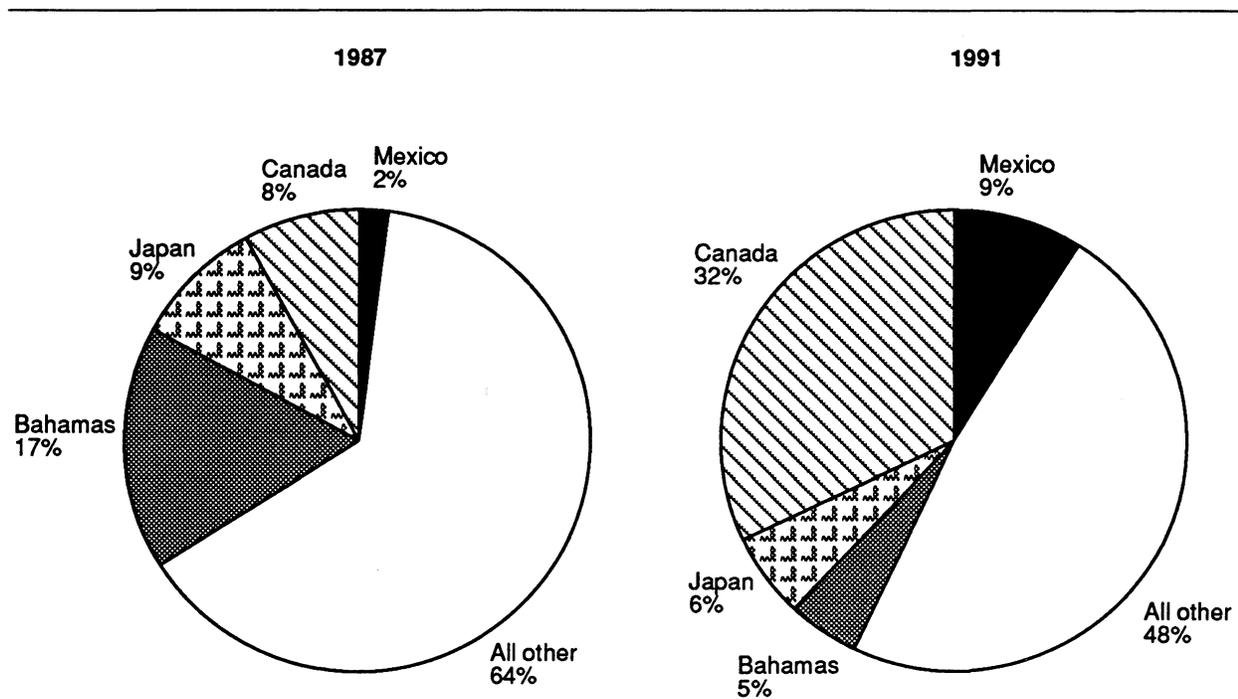
U.S. exports largely can be characterized as small-volume, spot sales to minor markets. The major producing countries of Italy, Spain, Brazil, Japan, and Germany are the major markets for ceramic floor and wall tiles, but the U.S. industry is not a significant factor in any of these markets, and the United States has significant trade deficits in tiles with each of these countries. The United States exported tiles to 84 countries in 1991, but only shipments to Canada, Mexico, Japan, and The Bahamas exceeded \$1 million. These four countries represented 52 percent of the

value of U.S. exports in 1991 up from 36 percent in 1987 (figure 11).

Canada

The United States-Canada Free-Trade Agreement (CFTA) appears to have made Canada the leading U.S. foreign market in 1991, accounting for 32 percent of the value of U.S. exports. U.S. exports to Canada increased significantly during the latter 3 years of the 1987-91 period to almost \$7 million in 1991, concurrent with the implementation of the CFTA. During 1987-91, the U.S. trade balance with Canada in tiles changed from a deficit of \$1 million in 1987 to a surplus of \$6 million in 1991. Canada has a relatively small tile industry and is believed to be largely dependent on imports for consumption. It is a net importer of tiles, with imports of \$84 million and exports of \$4 million in 1990, according to UN data. Canadian imports and exports both increased in value during 1986-90. According to UN data for 1990, the United States was Canada's only significant export market (97 percent) and fourth-leading supplier (4 percent) of imports, behind Italy, Spain, and Brazil.

Figure 11
Ceramic floor and wall tiles: Value of U.S. exports of domestic merchandise, by principal markets, 1987 and 1991



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

Mexico

Mexico was the second-leading U.S. foreign market in 1991, accounting for 9 percent of the value of U.S. exports. Mexico is a net exporter of tiles, with exports of \$42 million⁶³ and imports of \$28 million in 1990 according to UN data. Mexican imports and exports both increased in value during 1987-90. Growth of U.S. exports to Mexico during 1987-91 was overshadowed by growth of U.S. imports from Mexico, increasing the U.S. trade deficit with Mexico in tiles to \$43 million in 1991. According to UN data for 1990, the United States was Mexico's only significant export market (94 percent) and third-leading supplier (3 percent) of imports behind Spain and Italy. The Mexican industry has expanded capacity during the period, adding state-of-the-art production equipment. This new capacity is likely to offer resistance to the further growth of imports from the United States, as well as to facilitate added export growth to the U.S. market. One U.S. producer (Dal-Tile) owns production facilities in Mexico⁶⁴ and another (American Olean) has recently entered into an agreement to market Mexican-produced tiles in the United States.⁶⁵

⁶³ UN trade data for Mexico do not correspond with official statistics of the U.S. Department of Commerce, but they provide the best available means for comparison of foreign trade balance information on a timely, uniform basis.

⁶⁴ "Dal-Tile Acquired," *Tile & Decorative Surfaces*, Jan. 1990, p. 6.

⁶⁵ "American Olean Enters Joint Venture." *Ceramic Industry*, Dec. 1990, pp. 11-12.

Japan

Japan is the only major supplier of U.S. tile imports with a noticeable two-way tile trade with the United States, although trade volume is considerably in Japan's favor. Japan was the third-largest U.S. foreign market in 1991, accounting for 6 percent of the value of U.S. exports. Although expanded U.S. exports to Japan occurred during 1987-91, the improvement in the U.S. trade deficit in tiles with Japan during the period was based largely on declining Japanese shipments to the United States.

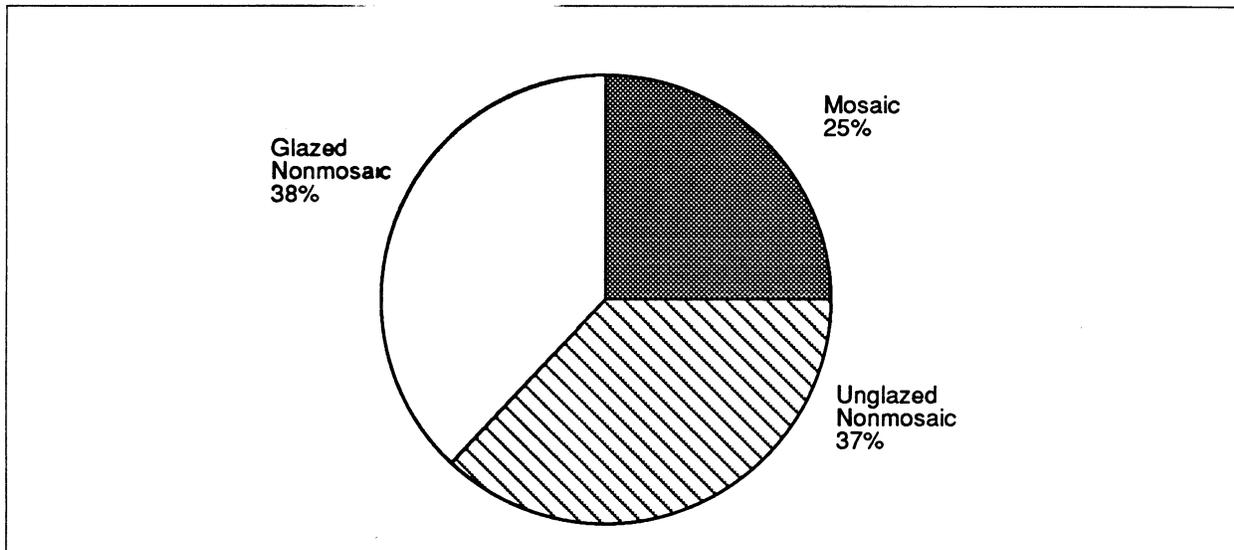
The Bahamas

The Bahamas are believed to be dependent on imports for their tile needs, having no known commercial production of ceramic floor and wall tiles. They were the fourth-leading U.S. foreign market in 1991, accounting for almost 5 percent of the value of U.S. exports. The Bahamas have been a relatively consistent market for U.S. exports during 1987-91, and the United States was the largest supplier to The Bahamas in 1990 (47 percent) on the basis of UN data.

U.S. Exports

All three tile categories are exported, and the product mix exported is more balanced than the over two-thirds of total U.S. producers' shipments accounted for by glazed nonmosaic tiles (figure 12).

Figure 12
Ceramic floor and wall tiles: Value of U.S. exports of domestic merchandise, by types, 1991



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

Glazed nomosaic tiles represented the largest export category in 1991, but the relative importance of the three categories fluctuated during the 3-year period, 1989-91, that data have been compiled for the individual categories.

The value of U.S. exports almost tripled during 1987-91, but remained at an insignificant level. Exports totaled nearly \$21 million in 1991, but constituted only 3 percent of U.S. producers' shipments. The Bahamas were the only significant market throughout the period, with Canada, Japan, and

Mexico accounting for much of the growth during the period (table 12).

U.S. TRADE BALANCE

The U.S. trade deficit in ceramic floor and wall tiles declined by \$26 million during 1987-91 to \$344 million in 1991, as imports decreased and exports increased (table 13). Expanded exports to Canada and Mexico and decreased imports from Italy and Japan were largely responsible for the decline.

Table 12
Ceramic floor and wall tiles: U.S. exports of domestic merchandise, by principal markets, 1987-91

Market	1987	1988	1989	1990 ¹	1991 ¹
<i>Quantity (1,000 square meters)</i>					
Canada	85	81	1,343	37	71
Mexico	12	28	201	67	95
Japan	28	22	31	35	60
Bahamas	110	86	162	56	118
Saudi Arabia	7	24	29	17	32
United Kingdom	8	25	78	99	13
Jamaica	15	34	12	25	4
Korea	40	86	42	19	88
Netherlands	0	1	0	0	1
Hong Kong	29	48	22	3	53
All other	303	477	355	461	583
Total	637	912	2,275	819	1,118
<i>Value (1,000 dollars)</i>					
Canada	671	859	3,439	5,558	6,747
Mexico	142	300	1,253	1,114	1,825
Japan	686	595	1,912	2,392	1,217
Bahamas	1,355	1,932	1,961	1,186	1,014
Saudi Arabia	250	367	611	565	814
United Kingdom	183	304	440	870	586
Jamaica	192	453	1,073	679	533
Korea	819	1,247	828	608	492
Netherlands	0	17	3	32	451
Hong Kong	487	584	802	946	435
All other	3,175	5,738	5,571	6,554	6,859
Total	7,960	12,396	17,893	20,504	20,973
<i>Unit value (dollars per square meter)</i>					
Canada	7.89	10.60	(²)	(²)	(²)
Mexico	11.83	10.71	(²)	(²)	(²)
Japan	24.50	27.05	(²)	(²)	(²)
Bahamas	12.32	22.47	(²)	(²)	(²)
Saudi Arabia	35.71	15.29	(²)	(²)	(²)
United Kingdom	22.88	12.16	(²)	(²)	(²)
Jamaica	12.80	13.32	(²)	(²)	(²)
Korea	20.48	14.50	(²)	(²)	(²)
Netherlands	0	17.00	(²)	(²)	(²)
Hong Kong	16.79	12.17	(²)	(²)	(²)
All other	10.48	12.03	(²)	(²)	(²)
Average	12.50	13.59	(²)	(²)	(²)

¹ Quantity data are understated to the extent that quantity data are not reported under subheadings 6907.90.00 and 6908.90.00 of the *Schedule B: Statistical Classification of Domestic and Foreign Commodities Exported from the United States*.

² Not available.

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

Table 13
Ceramic floor and wall tiles: U.S. exports of domestic merchandise, imports for consumption,
and merchandise trade balance, by selected countries and country groups, 1987-91¹
(Million dollars)

<i>Item</i>	<i>1987</i>	<i>1988</i>	<i>1989</i>	<i>1990</i>	<i>1991</i>
U.S. exports of domestic merchandise:					
Italy	0	0	0	0	0
Spain	0	0	0	0	0
Mexico	0	0	1	1	2
Japan	1	1	2	2	1
Brazil	0	0	0	0	0
Thailand	0	0	0	0	0
Germany	0	0	0	0	0
Venezuela	0	0	0	0	0
Canada	1	1	3	6	7
Argentina	0	0	0	0	0
All other	6	10	11	11	10
Total	8	12	18	21	21
EC-12	0	1	1	1	1
OPEC	0	1	1	1	2
ASEAN	0	0	0	0	1
CBERA	3	5	5	4	4
U.S. imports for consumption:					
Italy	193	210	207	200	173
Spain	37	43	50	56	54
Mexico	23	30	40	43	45
Japan	55	56	51	43	26
Brazil	17	16	18	16	12
Thailand	5	8	13	14	10
Germany	10	7	8	9	8
Venezuela	1	2	4	6	8
Canada	2	2	3	2	1
Argentina	3	4	4	4	4
All other	33	33	33	29	25
Total	378	411	431	421	365
EC-12	249	268	274	273	243
OPEC	1	2	4	6	8
ASEAN	5	8	14	15	12
CBERA	0	0	0	0	1
U.S. merchandise trade balance:					
Italy	-193	-210	-207	-200	-173
Spain	-37	-43	-50	-56	-54
Mexico	-23	-30	-39	-42	-43
Japan	-54	-55	-49	-41	-25
Brazil	-17	-16	-18	-16	-12
Thailand	-5	-8	-13	-14	-10
Germany	-10	-7	-8	-9	-8
Venezuela	-1	-2	-4	-6	-8
Canada	-1	-1	0	4	6
Argentina	-3	-4	-4	-4	-4
All other	-27	-23	-22	-18	-15
Total	-370	-399	-413	-400	-344
EC-12	-249	-267	-273	-272	-242
OPEC	-1	-1	-3	-5	-6
ASEAN	-5	-8	-14	-15	-11
CBERA	3	5	5	4	3

¹ Import values are based on customs value; export values are based on f.a.s. value, U.S. port of export. U.S. trade with East Germany is included in "Germany."

Note.—Because of rounding, figures may not add to the totals shown.

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

APPENDIX A
EXPLANATION OF TARIFF AND TRADE AGREEMENT TERMS

TARIFF AND TRADE AGREEMENT TERMS

The *Harmonized Tariff Schedule of the United States* (HTS) replaced the *Tariff Schedules of the United States* (TSUS) effective January 1, 1989. Chapters 1 through 97 are based on the internationally adopted Harmonized Commodity Description and Coding System through the 6-digit level of product description, with additional U.S. product subdivisions at the 8-digit level. Chapters 98 and 99 contain special U.S. classification provisions and temporary rate provisions, respectively.

Rates of duty in the *general* subcolumn of HTS column 1 are most-favored-nation (MFN) rates; for the most part, they represent the final concession rate from the Tokyo Round of Multilateral Trade Negotiations. Column 1-general duty rates are applicable to imported goods from all countries except those enumerated in general note 3(b) to the HTS, whose products are dutied at the rates set forth in *column 2*. Goods from the People's Republic of China, Czechoslovakia, Hungary, Poland, and Yugoslavia are among those eligible for MFN treatment. Among articles dutiable at column 1-general rates, particular products of enumerated countries may be eligible for reduced rates of duty or for duty-free entry under one or more preferential tariff programs. Such tariff treatment is set forth in the *special* subcolumn of HTS column 1.

The *Generalized System of Preferences* (GSP) affords nonreciprocal tariff preferences to developing countries to aid their economic development and to diversify and expand their production and exports. The U.S. GSP, enacted in title V of the Trade Act of 1974 and renewed in the Trade and Tariff Act of 1984, applies to merchandise imported on or after January 1, 1976, and before July 4, 1993. Indicated by the symbol "A" or "A*" in the special subcolumn of column 1, the GSP provides duty-free entry to eligible articles the product of and imported directly from designated beneficiary developing countries, as set forth in general note 3(c)(ii) to the HTS.

The *Caribbean Basin Economic Recovery Act* (CBERA) affords nonreciprocal tariff preferences to developing countries in the Caribbean Basin

area to aid their economic development and to diversify and expand their production and exports. The CBERA, enacted in title II of Public Law 98-67, implemented by Presidential Proclamation 5133 of November 30, 1983, and amended by the Customs and Trade Act of 1990, applies to merchandise entered, or withdrawn from warehouse for consumption, on or after January 1, 1984; this tariff preference program has no expiration date. Indicated by the symbol "E" or "E*" in the special subcolumn of column 1, the CBERA provides duty-free entry to eligible articles the product of and imported directly from designated countries, as set forth in general note 3(c)(v) to the HTS.

Preferential rates of duty in the special subcolumn of column 1 followed by the symbol "IL" are applicable to products of Israel under the *United States-Israel Free-Trade Area Implementation Act* of 1985, as provided in general note 3(c)(vi) of the HTS. When no rate of duty is provided for products of Israel in the special subcolumn for a particular provision, the rate of duty in the general subcolumn of column 1 applies.

Preferential rates of duty in the special duty rates subcolumn of column 1 followed by the symbol "CA" are applicable to eligible goods originating in the territory of Canada under the *United States-Canada Free-Trade Agreement*, as provided in general note 3(c)(vii) to the HTS.

Other special tariff treatment applies to particular *products of insular possessions* (general note 3(a)(iv)), goods covered by the *Automotive Products Trade Act* (general note 3(c)(iii)) and the *Agreement on Trade in Civil Aircraft* (general note 3(c)(iv)), and *articles imported from freely associated states* (general note 3(c)(viii)).

The *General Agreement on Tariffs and Trade* (GATT) (61 Stat. (pt. 5) A58; 8 UST (pt. 2) 1786) is the multilateral agreement setting forth basic principles governing international trade among its more than 90 signatories. The GATT's main obligations relate to most-favored-nation treatment, the maintenance of scheduled concession rates of duty, and national (nondiscriminatory) treatment for imported products. The GATT also provides the legal framework for customs valuation standards, "escape clause" (emergency) actions, anti-dumping and countervailing duties, and other measures. Results of GATT-sponsored multilateral tariff negotiations are set forth by way of separate schedules of concessions for each participat-

ing contracting party, with the U.S. schedule designated as schedule XX.

Officially known as "The Arrangement Regarding International Trade in Textiles," the *Multifiber Arrangement* (MFA) provides a framework for the negotiation of bilateral agreements between importing and producing countries, or for unilateral action by importing countries in the absence of an agreement. These bilateral agreements es-

tablish quantitative limits on imports of textiles and apparel, of cotton and other vegetable fibers, wool, manmade fibers, and silk blends, in order to prevent market disruption in the importing countries—restrictions that would otherwise be a departure from GATT provisions. The United States has bilateral agreements with more than 30 supplying countries, including the four largest suppliers: China, Hong Kong, the Republic of Korea, and Taiwan.

