Industry & Trade Summary

Wood Pulp and Waste Paper

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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 wood pulp and waste paper covers the period 1987 through 1991 and represents one of the approximately 250 to 300 individual reports produced in this series during the first half of the 1990s. Listed below are the individual summary reports published to date on the forest products sector.

USITC publication number	*Publication date*	*Title*
2551 (AG-9)	November, 1992	Newsprint
2612 (AG-10)	March, 1993	Wood Pulp and Waste Paper

[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.

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INTRODUCTION

This summary covers wood pulp and waste paper (classified in chapter 47 of the Harmonized Tariff Schedules (HTS) of the United States). Neither wood pulp nor waste paper is a final product; both are primarily used to make paper and paperboard. This summary gives information on the structure of the U.S. industry and certain foreign industries, domestic and foreign tariff and nontariff measures, and the competitiveness of U.S. producers in both domestic and foreign markets. The report covers the general period from 1987 through 1991. Appendix A contains an explanation of tariff and trade agreement terms.

Pulp is an intermediate chemically- or mechanically-processed fibrous material derived from wood or other plant fibers, whereas waste paper is a resource collected from previously discarded material. Both wood pulp and waste paper contain varying amounts of cellulose fibers. These fibers, along with other inputs, are subsequently employed in operations that eventually produce paper/paperboard (papermaking). Papermaking fibers continually and markedly degrade with each papermaking operation. Consequently, in many applications, fibers obtained from waste paper work best in the papermaking process when combined with virgin wood fibers. In recent years, wood pulp accounted for about three-quarters of the tonnage of material used in domestic papermaking, and waste paper accounted for most of the remainder. Nonwood fibers are estimated to account for about 1 percent.

U.S. imports of wood pulp in 1991 amounted to 4.5 million metric tons, valued at $2.1 billion, and represented 8 percent (by quantity) of total U.S. pulp consumption. In the same year, U.S. exports of wood pulp amounted to 5.8 million metric tons, valued at $2.9 billion and equivalent to about 10 percent of total U.S. pulp production. In 1991, U.S. imports of waste paper amounted to 110,616 metric tons, valued at $24.7 million, but they supplied less than 1 percent of U.S. consumption (by quantity). U.S. exports of waste paper were significantly greater, and in 1991 amounted to 6.0 million metric tons, valued at $715 million.

U.S. INDUSTRY PROFILE

Raw Materials and Processing

In temperate latitudes (e.g., the United States, Canada, Europe, etc.), the most economical and practical fibers for making paper and paperboard come from standing trees. However, in certain specialized applications, and where tree resources are scarce, other vegetable fibers such as bagasse (sugar cane residue), rice, straw, bamboo, kenaf, and others have occasionally served.

Slightly more than one-half of all U.S. virgin wood pulp is derived from pulpwood.[1] The remaining wood pulp is produced from wood residues (i.e., primarily edgings, slabs, scraps, etc.) from wood-milling operations. Both softwood trees (i.e., conifers) and hardwood trees (i.e., broad-leaved trees) are used to make paper and paperboard. Roughly one-third of all pulp produced is estimated to come from hardwood species while the other two-thirds comes from softwood species. Softwoods can often be grown on tree plantations and thus be intensively managed. Softwood fibers are longer than hardwood fibers, and they contribute strength to a finished grade of paper/paperboard. Generally hardwoods are more difficult to process from the point of harvesting the standing tree to pulping the wood fiber. However, the shorter hardwood fibers can contribute smoothness to a finished grade of paper/paperboard.

The extraction of useable papermaking fibers from waste paper entails removing inks, adhesives, latexes, and the myriad of other contaminants introduced to the paper/paperboard. The extraction of useable papermaking fibers from solid wood entails separating the cellulose from the lignin, hemicellulose, and other extractives. Nearly all fibers in solid wood are converted into pulp through a chemical or mechanical process or through both. The addition of heat can also facilitate the breakdown of the wood into fibers, especially for mechanically produced pulps. Chemical processes generally produce the higher quality pulps, but their yield per pound of wood is generally less than mechanically-produced pulps. One of the more dynamic areas in wood-pulping technology is occurring in the combination of chemical and mechanical processes in pursuit of combining the best characteristics of each process.

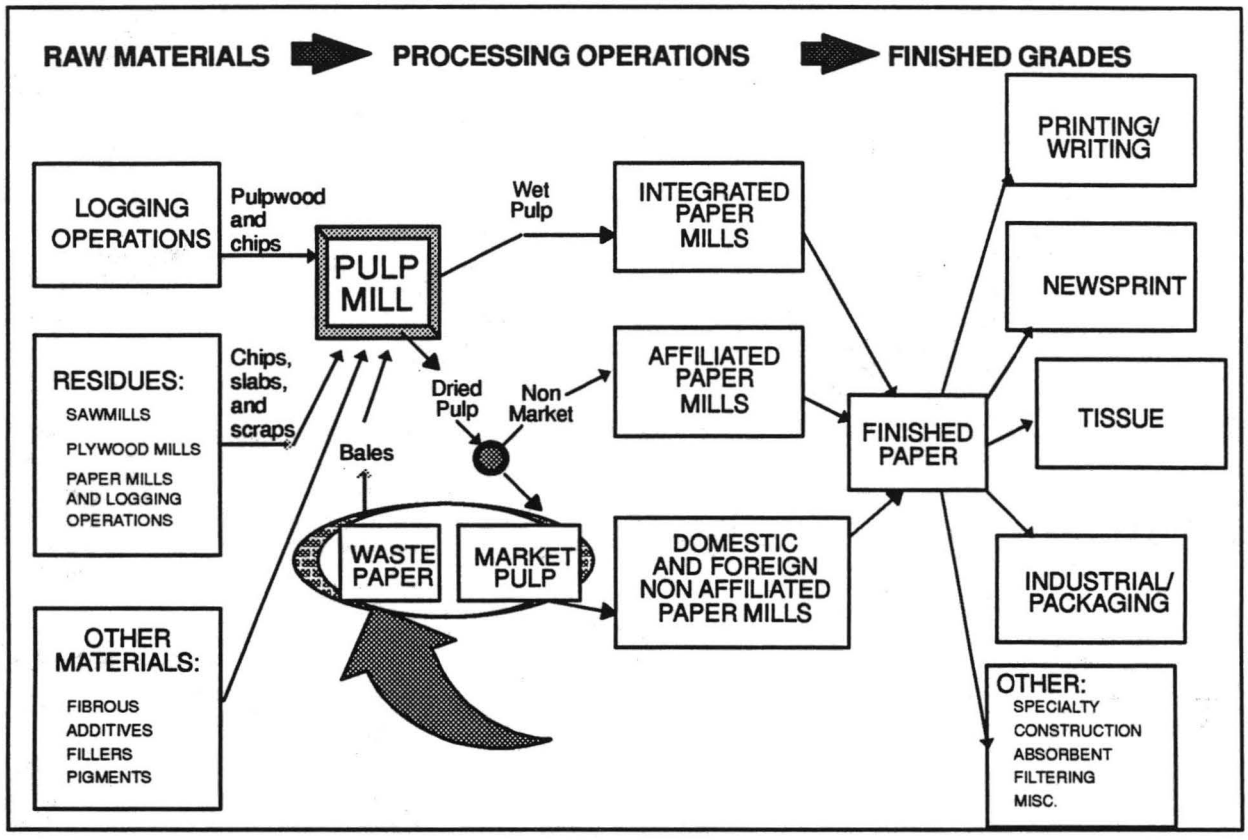
Industry Structure

The flow of raw and intermediate materials, processing operations, and finished grades of paper and/or paperboard are illustrated in figure 1. The Standard Industrial Classification (SIC) that pertains to the products in this summary is Pulp Mills (SIC 2611). Almost all domestic companies that produce pulp are vertically integrated with a downstream papermaking operation. These companies are part of the U.S. pulp and paper industry. Many of these companies also are horizontally integrated with other diverse forest product operations (e.g., land management, wood harvesting, road construction, sawmilling, plywood production, millwork production, paperboard container fabrication, and production of converted paper products, etc.). They are also in such diverse businesses as building materials, consumer nondurables (e.g., personal care products), and packaging. The top five pulp and paper companies that were engaged in sales of paper grade chemical pulps (the preeminent component of all market pulp sales) supplied 38 percent of the market in 1991, as compared with 28 percent in 1987. The top 10 companies captured 57 percent of the market in 1991, as compared with 46 percent in 1987.[2]

[1] Pulpwood is a generic term for wood coming directly from the forest. Pulpwood includes wood in the form of logs, roundwood cut into short lengths, chips produced from roundwood, and whole tree chips suitable for papermaking.

[2] Market pulp: grade profile, *Pulp and Paper*, Oct. 1991 and Oct. 1987.

Figure 1
Pulp and papermaking: Principal raw materials, processing operation, and finished grades



Source: Derived by the staff of the USITC.

In 1991, there were 207 firms in the U.S. pulp, paper, and paperboard industry, compared with 223 in 1987. In 1991, only 66 of these firms produced pulp for papermaking, and of these, only 26 sold pulp.[3] Many of the corporations that produce wood pulp supplement their production with external pulp purchases. In 1991, at least 141 U.S. paper/paperboard firms had to purchase all of their fiber supply from external sources, compared with 147 firms in 1987. In 1991, approximately 87 percent (180 in number) of all pulp, paper, and paperboard corporations used some waste paper in their papermaking process compared with 83 percent (186 in number) in 1987.[4] In 1991, 84 percent of all papermaking grades of pulp was consumed on-site, 4 percent was shipped to an affiliated mill within the United States, and 12 percent was market pulp, of which 8 percent was exported and 4 percent was shipped and sold within the domestic market.[5]

In 1991, the U.S. Department of Commerce estimated that about 11,300 persons were employed in the production of all wood pulp compared with 11,000 persons in 1987. Pulp and paper mills are nearly always in small rural towns, and the mill is the preeminent employer for a typical "mill" town. Secondary employment directly associated with pulp and paper mill operations are in such areas as local trucking, logging, woodlands management, and logging equipment dealerships.

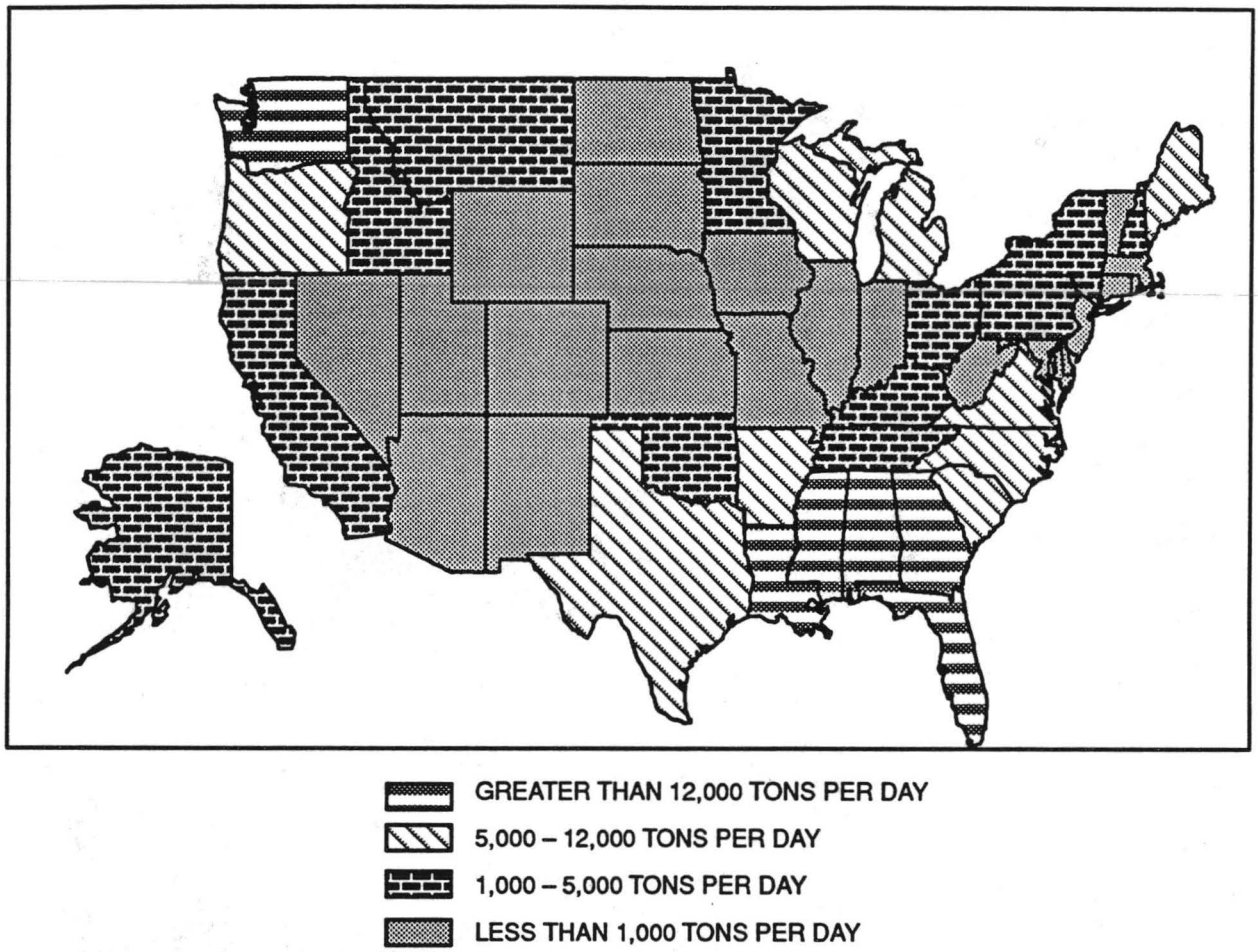
Domestic wood pulp production capacity is located near natural forests, and is most concentrated in the Southeastern States. Pulp mills require tremendous amounts of water which is principally used as the transport medium for the wood fibers throughout all of the pulping and papermaking processes. Consequently, pulp (and paper) mills are situated on rivers or lakes. Total pulping capacity, by State, is shown in figure 2. Figure 3 depicts domestic capacity, by State, devoted to waste paper utilization and the capacity devoted only to the production of market pulp. In general, waste paper processing facilities are usually near urban areas because of the higher concentration of recyclable material nearby.

Pulp and paper mills require an enormous amount of startup capital, unlike other forest product facilities such as sawmills. Recently planned greenfield[6] pulp

[3] American Paper Institute, *1991 Paper-Making Fiber Fact Sheet*, Mar. 9, 1992.
[4] Ibid.
[5] Ibid.

[6] Greenfield mills are those that are planned/constructed as completely new facilities, as opposed to capacity expansion projects that upgrade/expand existing facilities.

Figure 2
U.S. wood pulping capacity, by States



Source: Derived by the USITC staff from data in *Lockwood-Post's Paper Directory, 1991.*

and paper mills are estimated to have an initial startup cost approaching about $1 billion. Pulp mills are highly automated, although many skilled workers are also required. The major processes in pulping and papermaking must be meticulously monitored and regulated by various computer systems and this skilled labor. Accordingly, the ongoing maintenance costs associated with pulp and papermaking operations are high.

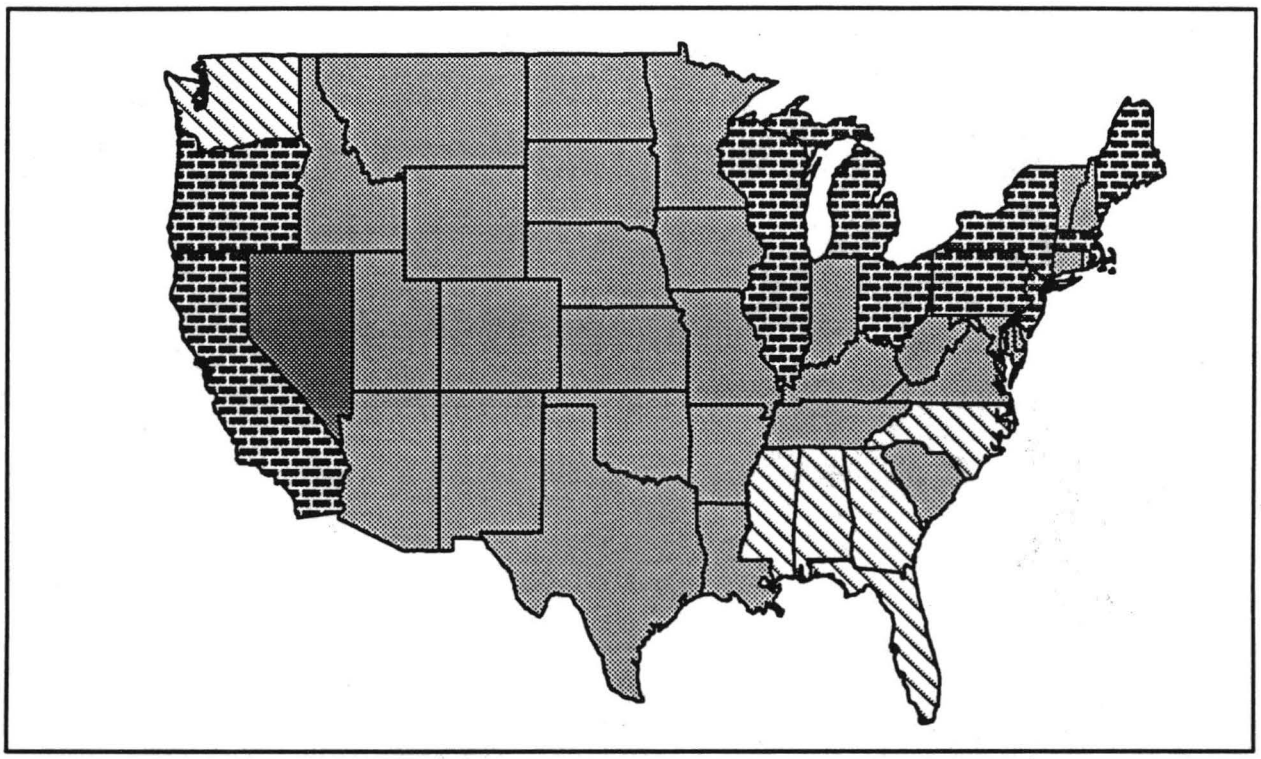
Environmental Considerations

The pulp and paper industry has responded to heightened concerns expressed by various environmental organizations. The industry is continually addressing and developing ongoing technology aimed at minimizing the air and water pollution inherently generated by pulping and papermaking processes. Furthermore, the industry is also increasing efforts to use more recycled material, thereby reducing the amount of waste (paper) entering landfills.

On an industry-wide level, waste paper's portion of total papermaking inputs has slightly increased in the past 10 years. Furthermore, the industry has been able to expand domestic waste paper's potential in export markets. Generally, the quality of paper made from a high-recycled-fiber content is notably inferior to the quality of a paper made from 100-percent virgin wood pulp. Recycled fibers have been found to make better paper when combined with virgin pulp fiber in applications where the need for strength and smoothness are secondary. These lower standards can occur in certain tissue grades, in corrugating medium, and occasionally in newsprint. The costs of many waste paper collection systems, in the past, have exceeded the revenues they generated.

Federal and State environmental legislation (e.g., the Clean Air Act, the Clean Water Act, and others) has also significantly affected the U.S. pulp and paper industry. During 1989-91, an industry source reported that the U.S. pulp and paper industry spent over $1 billion annually on capital improvements (not

Figure 3
Waste paper and market pulp: Capacities, by States



Source: Derived by the USITC staff from data in *Lockwood-Post's Paper Directory, 1991.*

including operating expenditures) in order to meet or exceed the allowable legal limits set forth in various legislation. U.S. industry sources believe that pulp and paper industries in major competing countries (e.g., Canada, the Nordic countries,[7] and Latin America) have yet to match the U.S. industry in addressing some of the pollution issues.

The industry has also been faced with pressure, from environmental groups as well as consumers, to suspend the use of chlorine to whiten or bleach pulps. Mixed evidence suggests that the chlorine bleaching process produces harmful traces of dioxin. The industry has explored alternative methods of pulp bleaching that do not produce dioxin.

[7] The Nordic country grouping, as it pertains to pulp and paper, includes the Northern European countries of Finland, Norway, and Sweden.

Industry Growth

During the 1980s, the industry witnessed many consolidations as some of the larger pulp and paper companies bought out other large and mid-size companies. This trend will likely continue throughout the 1990s, though more slowly. Domestically, the acquisition of existing industry assets (e.g., mill equipment and machines, other mill facilities, land, distribution channels, etc.) appears to be the preferred method of expansion (versus building greenfield mills, purchasing new equipment, etc.). In the rest of the world, the construction of greenfield mills appears more likely to occur in areas where climatic conditions are warmer, and consequently, the growing stock (trees) is more rapidly renewable. Furthermore, the availability of land suitable for plantations often coincides with warmer climates. Latin America,

Africa, Spain, Portugal, and New Zealand are likely candidates for potential greenfield pulp and paper expansion projects by larger U.S. and foreign-owned international companies.

Pricing and Distribution

The market pulp portion (i.e., market pulp sales) of the pulp and paper industry is more acutely affected by price fluctuations than any other large segment within the pulp and paper industry because, in the short term, pulp supply is relatively inflexible. A pulp and paper company's decision to expand or develop pulping capacity is part of that company's long-term strategic planning, and it requires large up-front capital outlays. Once planned, and capacity is constructed, the high level of fixed costs represents a strong incentive to maintain high production levels regardless of demand conditions. Consequently, when demand slackens, price competition is about the only means available for pulp sellers to move and reduce inventory.

Pulp may be sold directly from the pulp mill or through independent agents—pulp brokers. A major pulp seller (usually a large pulp and paper company) customarily announces a particular price (change) for a specific pulp grade just prior to each fiscal quarter. Other pulp sellers also price that particular grade of pulp comparably during the forthcoming quarter. A large portion of market pulp is purchased under renewable long-term contracts. However, a significant portion of market pulp is also purchased on the spot market. The largest pulp purchasers (i.e., large paper mills that must also meet sales contracts) usually purchase about two-thirds to four-fifths of their pulp requirement under renewable long-term contracts. These paper mills supplement the remainder of their pulp requirement with spot purchases anticipating to find pulp sellers offering pulp at a discounted prices. Some paper mills have been known to purchase nearly all of their pulp requirement through spot sales. These paper mills face greater uncertainty in the cost of their papermaking inputs. However, in periods of declining prices, this purchasing strategy has advantages.

Figure 4 depicts market pulp prices for major selected grades of pulp imports and exports, on a quarterly basis. In the past, market pulp prices have been cyclical, with ideal planned capacity expansions timed to occur during or just prior to periods of anticipated increasing prices. Eventually, new capacity expansions have created an oversupply situation, and prices have started to decline (e.g., 1990-91). Inevitably, worldwide demand for paper and paperboard grows, the gap between market pulp supply and demand decreases, and market pulp sales again become more profitable. Some forecasters in the industry are predicting that the current oversupply situation will continue until the mid-1990s, and that prices will not significantly increase much before then.

Figure 5 depicts waste paper prices for selected grades of U.S. waste paper exports. Waste paper use is somewhat affected by market pulp prices. Since there is limited substitutability between the higher priced market pulp and lower priced waste paper, waste paper consumption may sometimes increase when market pulp prices rise. Conversely, waste paper consumption may decrease when market pulp prices decline.

Pulp and waste paper are bulky commodities, and international trade is usually conveyed utilizing ocean-going cargo ships and inland river barges. Occasionally however, rail and truck traffic have been used, if practical. Recently, some U.S. exports of pulp have arrived in Mexico on rail cars.

Consumer Characteristics and Factors Affecting Demand

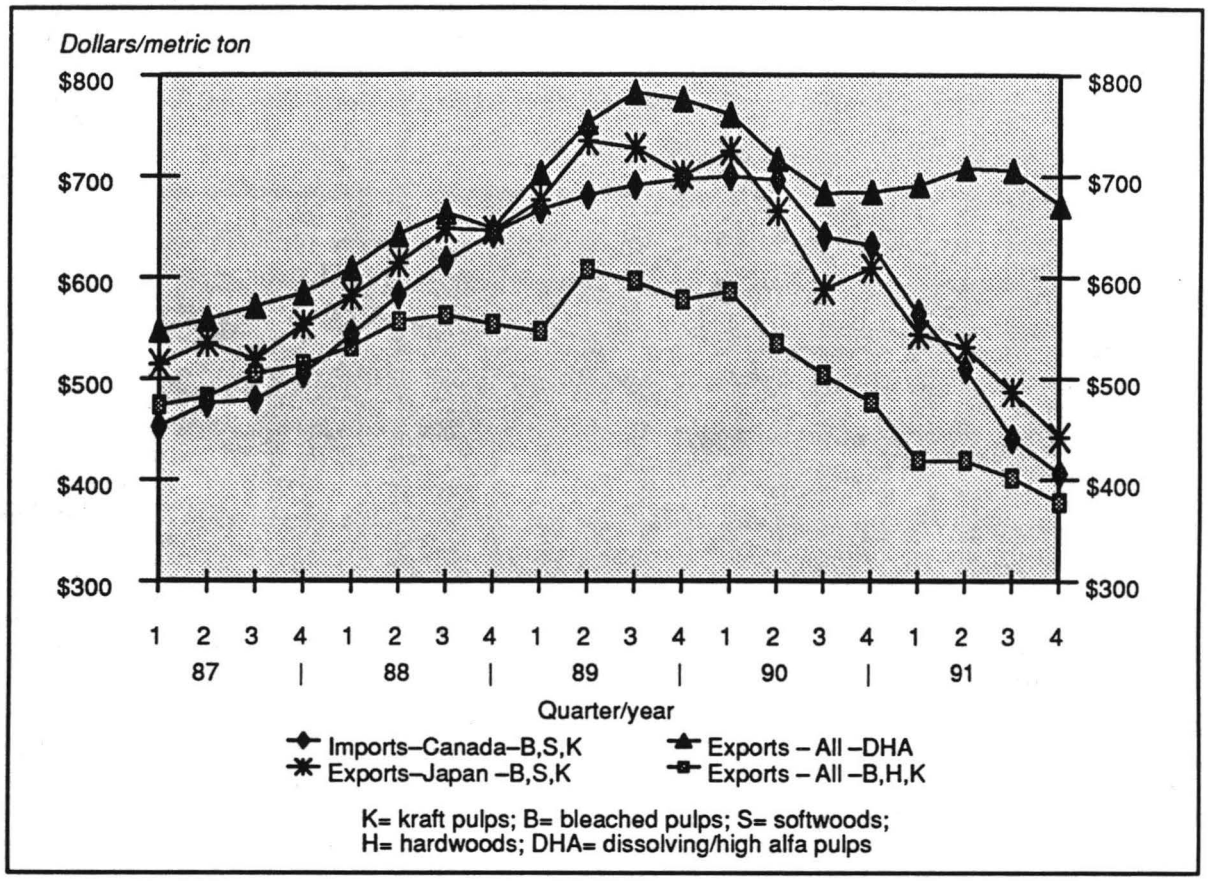
Paper and paperboard mills purchase and consume market pulp and waste paper as an input into the production of paper and/or paperboard. Generally the smaller, nonintegrated paper mills (i.e., those paper mills that do not have an accompanying pulp mill) are more dependent on market pulp than the integrated mills; however, large integrated mills often purchase market pulp to supplement or complement their existing pulp mix, usually with a higher quality pulp. The quality difference among pulp suppliers within a particular grade (e.g., northern bleached softwood kraft or bleached hardwood kraft, etc.) is usually negligible. Consequently, the purchasers' pricing arrangement is the most important variable.

Consumers and environmental groups are pushing for greater use of waste paper in papermaking operations, under the assumption that more waste paper used in papermaking reduces the amount of discarded paper entering landfills and that fewer standing trees need be harvested. Pulp and paper mills have generally been able to increase, somewhat, the use of waste paper in papermaking operations. Many in the pulp and paper industry believe that waste paper's contribution to the furnish (i.e., all of the input materials utilized in the papermaking process) will continue to slowly increase throughout the 1990s and perhaps surpass 30 percent of the total papermaking furnish, from its present 27-percent level. However, for premium paper grades, waste paper is not a suitable substitute for wood pulp, because papermaking fibers in waste paper are significantly inferior (i.e., contain fewer interlocking fibrils, more broken-up, and generally stubbier) than those fibers in virgin pulp. Some lower quality paper grades such as directory paper, certain tissues, newsprint, etc. can be made from a very high percentage of waste paper; however, other applications such as photographic papers, high-quality printing/writing papers, etc. cannot use waste paper. Certain States, including California, are also attempting to increase waste paper use by legislation.

FOREIGN INDUSTRY PROFILE

An abundant and accessible supply of raw material (trees in most cases) is the most important factor influencing the location of pulp mills throughout the world. Other significant variables influencing global development include the availability of capital, adequate infrastructure in mill localities, domestic

Figure 4
U.S. market pulp: Prices for selected major import and export grades, 1987-91



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

demand, and favorable prospects for a sustainable yield (i.e., the ability to renew depleted resources). Major world pulp producers in 1991 include the United States (with 36 percent of global production), Canada (14 percent), Japan (7 percent), China (7 percent), Sweden (6 percent), Finland (5 percent), and the former Soviet Union (5 percent) (table 1). Table 1 also presents per capita consumption of paper/paperboard, by country or area for 1991.

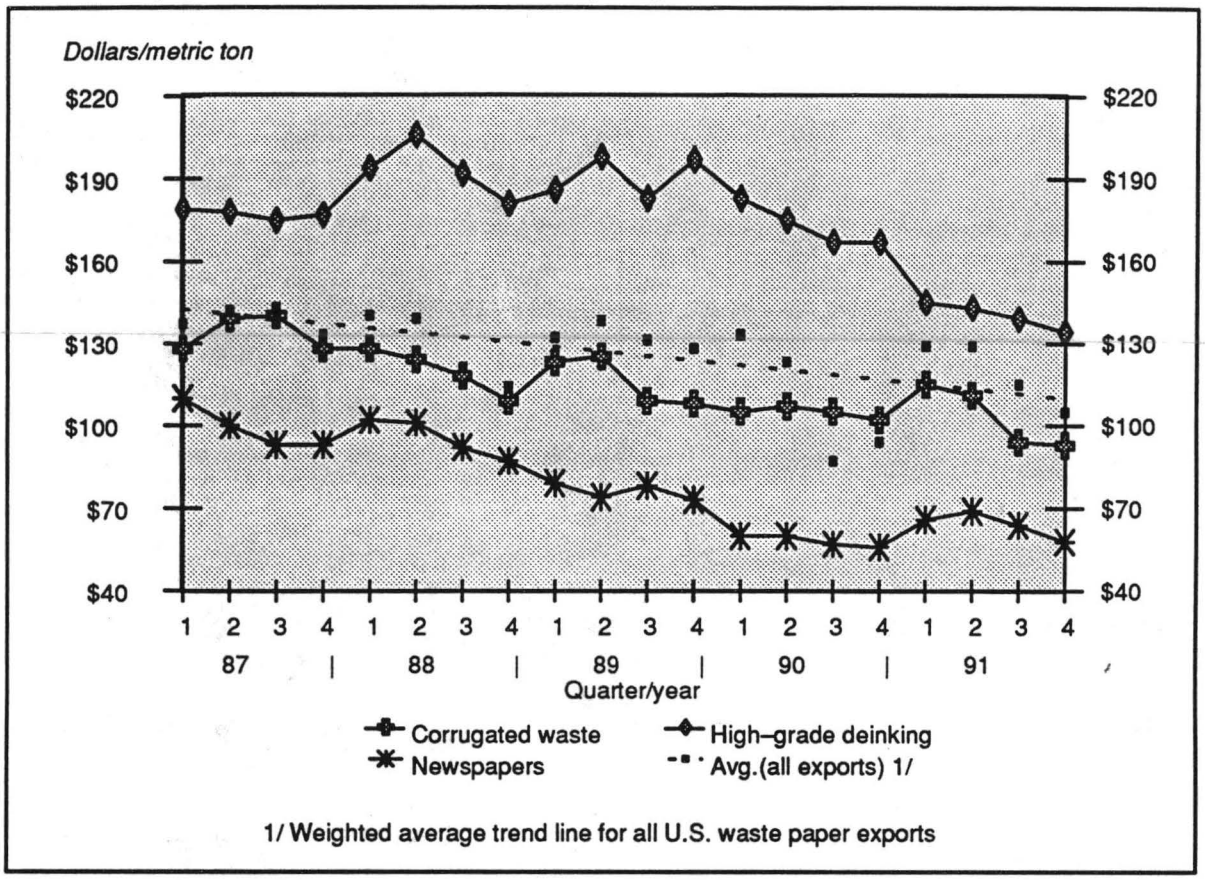
The ranking of major market-pulp-producing countries differs somewhat from the total-wood-pulp-producing countries. These countries are those that primarily produce a greater portion of their pulp for export markets and consume a lesser portion of their pulp at integrated paper/paperboard mills. Canada leads the world in market pulp capacity with around 25 percent of global capacity in 1991. Following Canada were the United States and Sweden with 21 percent and 10 percent, respectively, of global market pulp capacity (table 2). The major global market pulp exporters, based on United Nations trade data, on a value basis between 1986 and 1990, parallel the market pulp capacity countries. Canada supplied slightly over one-third of all global market pulp exports. Following Canada, the United States supplied slightly more than one-fifth of all global exports. Sweden ranked third, and it supplied slightly over one-eighth of these exports.

Most of the significant world producers are internationally oriented, reflecting in part the importance of export earnings and international investments. Some of the largest non-U.S.-owned pulp companies are Swedish, Canadian, Japanese, New Zealand, and Brazilian.

Canada

Canada is the second-largest wood pulp producer in the world and the largest market pulp supplier and exporter. Canada's market pulp industry accounts for about 1 percent of Canada's gross domestic product (GDP) and over 3 percent of all of Canada's exports. Production of all Canadian wood pulp increased from 21.7 million metric tons in 1986 to 23.3 million metric tons in 1991. In 1991, total Canadian wood pulp production was equivalent to about 40 percent of total U.S. wood pulp production. However, Canadian market pulp production was estimated to be about 20-percent greater than U.S. market pulp production in

Figure 5
U.S. waste paper: Prices for selected U.S. export grades, 1987-91



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

1991. Canada's supply of high-quality trees and water resources, as well as its progressive business climate, assure its globally competitive pulp and paper industry.

In 1990, the Canadian market pulp industry consisted of 39 companies operating mills at 54 locations.[8] Canada has most of its pulping capacity concentrated in three Provinces—British Columbia, Ontario, and Quebec. In 1991, the largest markets for Canadian pulp shipments were Western Europe and the United States, with each receiving just under one-third of all Canadian shipments. Market pulp shipments to Japan and within Canada represented about 12 percent and 9 percent, respectively, of all Canadian market pulp shipments in 1991.[9] Canada's market pulp shipments are dominated by NBSK;[10] this premium pulp grade comprises about three-quarters of all of Canada's market pulp shipments. Shipments to all of Canada's major export markets dropped during 1990 and 1991, reflecting the current world economic situation.

Europe

The Nordic countries dominate pulp production in Western Europe. Sweden and Finland account for nearly 60 percent of all Western European pulp production. Norway accounts for about 7 percent. Sweden is the fifth-largest pulp producer, behind the United States, Canada, Japan, and China. Finland is the sixth-largest producer. Pulp production of both Sweden and Finland is about one-sixth the size of that of the United States. However, Sweden's market pulp production capacity is about one-half the size of that in the United States. Furthermore, Sweden is the third-largest exporter of pulp, behind Canada and the United States. Finland's market pulp capacity is about one-quarter the size of that in the United States. It is estimated these Nordic countries export about three-quarters of their market pulp shipments to the European Community (EC).

[8] *Canadian Market Pulp Statistics*, Mar. 1992 published by the Canadian Pulp and Paper Association.

[9] Derived from *Canadian Market Pulp Statistics*, Mar. 1992 published by the Canadian Pulp and Paper Association.

[10] NBSK (northern bleached softwood kraft) is a high-quality pulp, and exports of such are an industry mainstay for Canada and the Nordic countries.

Table 1
Wood pulp: Total pulp production, pulp mills, total pulp consumption, and per capita consumption of paper/paperboard, by selected country or area, 1991

Country or area	Total pulp production			Pulp consumption		Per capita consumption of paper/ paperboard
	1,000 metric tons	Percent of total	Number of pulp mills	1,000 metric tons	Percent of total	
						(kg/year)
Country						
United States	57,896	36	210	56,680	35	302
Canada	23,329	14	35	14,907	9	211
Japan	11,729	7	57	14,648	9	235
China	10,750	7	(1)	11,421	7	14
Sweden	9,769	6	53	7,114	4	219
Finland	8,483	5	46	7,240	4	252
CIS[2]	7,580	5	50	7,420	5	27
Norway	2,108	1	22	1,587	1	153
Area						
Europe:						
EC-12	9,829	6	129	18,853	12	156
Western Europe[3]	1,807	1	17	2,354	1	187
Eastern Europe[4]	2,651	2	89	2,857	2	31
Latin America	7,838	5	113	6,487	4	27
Asia[5]	3,907	2	302	6,733	4	11
Africa	2,383	1	31	1,887	1	5
Pacific[6]	2,338	1	17	1,834	1	126
World	162,397	100	1,347	162,022	100	[7]44

[1] The Peoples Republic of China has approximately 9,000 pulp mills, but only about 2 percent are considered internationally comparable.
[2] For this analysis, the CIS include all of the republics of the former Soviet Union except Estonia, Latvia, and Lithuania.
[3] Does not include the EC-12, Sweden, Finland and Norway.
[4] Does not include the former Soviet Union.
[5] Does not include Japan and China.
[6] Includes Australia, New Zealand, Papua New Guinea, and the Pacific islands to the east.
[7] World average.

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

Source: Compiled from *Pulp and Paper International, Annual Review*, July 1992.

Table 2
Market pulp: Production capacities, by selected country or area, and major grades, 1991

Country or Area	Chemical paper grade pulps	Mechanical market pulps	Total market pulps	Percent of total
	Quantity *(1,000 metric tons)*			
Canada	7,808	1,360	9,168	25
United States	7,883	0	7,883	21
Sweden	2,980	640	3,620	10
Finland	1,885	90	1,975	5
Norway	350	260	610	2
Western Europe[1]	4,160	55	4,215	11
Eastern Europe	3,420	105	3,525	9
Latin America	3,105	120	3,225	9
Japan	886	5	891	2
Other	1,775	370	2,145	6
Total	34,252	3,005	37,257	100

[1] Does not include the Sweden, Finland, or Norway.

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

Source:Compiled from *API Paper-making Fiber Fact Sheet*, March 9, 1992

In 1991, West Germany and France each accounted for 7 percent of total Western European total pulp production. Portugal, Spain, and Austria each accounted for about another 5 percent of Western European pulp production in 1991. Furthermore, it is estimated that about 90 percent of pulp exports from West Germany, France, and Spain remains within EC markets.

Western European pulp producers are well-positioned to take advantage of an increase in demand for pulp in the emerging markets in Eastern Europe. Eastern European countries currently have a very low per capita consumption of paper/paperboard at 31 kilograms per year (compared with 160 kilograms per year for all of the Western European countries). Finland has already arranged a number of joint ventures (pulp and paper projects) with the Commonwealth of Independent States (C.I.S.). Certain of the member states, especially Russia, are endowed with large areas of untapped forest resources, while Finland extends the latest in technology and business skills to these joint ventures. Like the United States and Canada, the EC also has a very well-organized industry.

Japan

Japan, the world's second-leading paper/paperboard producer and consumer, is the third-leading pulp producer behind the United States and Canada. Japan also ranks third in per capita consumption of paper/paperboard at 235 kilograms per year. Japan's total pulp production capacity is about one-fifth the size of that in the United States, and its market pulp capacity is about one-tenth the size of that in the United States.

Since natural resources in Japan are limited, Japan must import a very significant portion of its papermaking as well as its "pulp-making" requirements. Although Japan produces about 45 percent of all the wood pulp produced in Asia, it is a major importer of such pulp-making ingredients as pulpwood, wood chips, and waste paper. In the past, about 80 percent of Japan's pulp and waste paper requirement has been sourced from the United States and Canada. Japan's participation in global market pulp exports is nominal.

Latin America

The four most significant pulp-producing countries in Latin America are Brazil, Chile, Argentina, and Mexico. Brazil produces over 60 percent of Latin America's pulp output. Collectively, Chile, Argentina, and Mexico produce over 30 percent of Latin America's total pulp output. Brazil, Chile, and Argentina are significant net exporters of pulp. In 1990, Brazil's major export markets were the EC (about 40 percent of Brazil's exports), the United States (about 30 percent), and Japan (about 20 percent). In 1990, Chile's major export markets were the EC (about one-half of Chile's exports), Asian markets (about a quarter of Chile's exports) and other markets within Latin America (about a fifth). Argentina's pulp exports are much smaller than Chile's exports, although Argentina's paper/paperboard production is twice as large as Chile's. Mexico, the second-leading paper/paperboard producer in Latin America (behind only Brazil), exports only about one-tenth as much pulp as it must import.

Per capita consumption of paper/paperboard in Latin America is relatively low at about 27 kilograms per year. However, future growth prospects appear promising. Brazil, Chile, and Argentina benefit from certain competitive advantages including an abundant supply of fiber (e.g., fast- growing eucalyptus trees in Brazil and intensively managed plantations of radiata pine trees in Chile), favorable climates and soil for sustaining tree plantations, and relatively low labor and port costs. However, industries in Latin America are currently unable to fully exploit their competitive advantages because of a lack of sufficient capital and often less-than-globally-competitive infrastructure conditions.

TRADE MEASURES

U.S. Tariff Measures

All wood pulp and waste paper imports are free of duty. This duty-free status has existed since the Tariff Act of 1922. It was also granted in a concession by the United States in the General Agreement on Tariffs and Trade (GATT), effective January 1, 1948. Furthermore, the duty-free status for chemical wood pulps was reconfirmed in another GATT concession granted by the United States in 1950. U.S. imports of wood pulp and waste paper are not subject to quotas, embargoes, or other nontariff measures. Table 3 provides the import descriptions that would categorize imports of pulp and/or waste paper in the HTS of the United States. Table 3 also depicts 1991 U.S. exports and imports of pulp and waste paper, by these tariff subheadings.

Foreign Tariff Measures

The duty rates on wood pulp and waste paper are often "free" in the more developed countries, including Canada, Japan, and the EC. Certain less developed countries sometimes impose duties on imports of pulp and waste paper. However, it should be noted that many countries may impose significant tariffs on articles made from wood pulp and waste paper (i.e., paper, paperboard, and converted paper/paperboard products). Foreign nontariff trade restrictions on wood pulp and waste paper are believed to be minimal.

Table 3
Wood pulp and waste paper: Harmonized Tariff Schedule subheading; description; U.S. column 1 rate of duty as of Jan. 1, 1992; U.S. exports, 1991; and U.S. imports, 1991

HTS subheading	Brief description	Col. 1 rate of duty as of Jan. 1, 1992		U.S. exports, 1991	U.S. imports, 1991
		General	Special[1]		
				Thousand dollars	
4701.00.00	Mechanical woodpulp	Free		10	58
4702.00.00	Chemical woodpulp, dissolving grades	Free		486	89
	Chemical woodpulp, soda or sulfate, other than dissolving grades:				
	Unbleached:				
4703.11.00	Coniferous	Free		60	34
4703.19.00	Nonconiferous	Free		1	9
	Semibleached or bleached:				
4703.21.00	Coniferous	Free		1,383	1,420
4703.29.00	Nonconiferous	Free		681	311
	Chemical woodpulp, sulfite, other than dissolving grades:				
	Unbleached:				
4704.11.00	Coniferous	Free		5	8
4704.19.00	Nonconiferous	Free		([2])	2
	Semibleached or bleached:				
4704.21.00	Coniferous	Free		95	122
4704.29.00	Nonconiferous	Free		74	21
4705.00.00	Semichemical woodpulp	Free		5	57
	Pulps of other fibrous cellulosic material:				
4706.10.00	Cotton linters pulp	Free		77	([2])
	Other:				
4706.91.00	Mechanical	Free		1	6
4706.92.00	Chemical	Free		7	1
4706.93.00	Semichemical	Free		4	1
	Waste and scrap of paper or paperboard:				
4707.10.00	Of unbleached kraft paper or paperboard or of corrugated paper or paperboard	Free		258	3
4707.20.00	Of other paper or paperboard, made mainly of bleached chemical pulp, not colored in the mass	Free		214	10
4707.30.00	Of paper of paperboard made mainly of mechanical pulp (for example, newspapers, journals and similar printed matter)	Free		124	3
4707.90.00	Other, including unsorted waste and scrap	Free		120	9

[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 of Trade in Civil Aircraft (C); United States-Canada Free-Trade Agreement (CA); Caribbean Basin Economic Recovery Act (E); and United State-Israel Free-Trade Agreement (IL).
[2] Less than $500,000.

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

U.S. MARKET

Consumption

Wood Pulp

Since wood pulp is an intermediate material, consumption of pulp is a direct function of paper/paperboard consumption. Consumption of paper/paperboard generally tracks economic growth and activity. U.S. consumption of paper/paperboard increased irregularly by 2 percent from 74.1 million metric tons in 1987 to 75.4 million metric tons in 1991. During this same period, U.S. consumption of pulp increased steadily by 5 percent from 53.9 million metric tons to 56.6 million metric tons. Table 4 depicts total wood pulp production and apparent U.S. consumption, on a quantity basis, between 1987 and 1991. Imports have represented about 8 percent of total pulp consumption throughout this period. Figure 6 depicts domestic consumption of all wood pulp as well as the representative share supplied by imports, on a quantity basis.

U.S. shipments of the market pulp portion of the pulp industry increased by 11 percent, from 7.4 million metric tons in 1987 to 8.2 million metric tons in 1991. Table 5 depicts market pulp shipments, trade, and market pulp available for consumption between 1987 and 1991. The differential between the growth rates for paper/paperboard consumption and market pulp shipments contributed to oversupply and weak price conditions during 1990-91. Figure 7 depicts the value of market pulp shipments, imports, and pulp available for consumption. In recent years, about 85 percent of all domestic market pulp shipments consisted of paper grade chemical pulps (table 6), and nearly 95 percent of these chemical pulps consisted of bleached kraft pulps.[11] These bleached kraft pulps can be further subdivided into pulps made from softwood species (nearly two-thirds) and pulps made from hardwood species (slightly over one-third). Currently, nearly all of the dissolving grade pulps produced domestically are sold as market pulps. About 10 percent of all domestic pulp production has been mechanically produced (e.g., groundwood and thermomechanical pulps). However, in recent years, groundwood and thermomechanical pulps have accounted for an even smaller share of the market pulp stream.

Waste Paper

Waste paper is a resource collected from previously discarded material (i.e., used paper/paperboard). Typically, waste paper consumption, like wood pulp consumption, is a function of domestic paper/paperboard demand. However, increased pressure from conservation interests have also had an effect in increasing waste paper consumption. During 1987-91, waste paper consumption increased steadily from 16.3 million metric tons to 20.6 million metric tons or by 26 percent (table 7). In 1991, waste paper accounted for about 27 percent, on a tonnage basis, of all fiber used in papermaking, compared with 23 percent in 1987. Imports of waste paper were insignificant and represented less than 1 percent of the waste paper collected for subsequent domestic papermaking.

[11] The terms 'kraft' pulp and 'sulfate' pulp are generally interchangeable. More precisely, sulfate refers to an alkaline cooking process and kraft refers to the product resulting from such a cooking process.

Production

Total domestic pulp production increased by 7 percent from 54.0 million metric tons in 1987 to 57.9 million metric tons in 1991. Market pulp shipments increased by 11 percent from 7.4 million metric tons in 1987 to 8.2 million metric tons in 1991. Table 8 depicts U.S. "captive" and market pulp production for 1987-1991.

As noted before, a firm's decision to launch into or increase pulp production is a part of its long-term strategy and requires an extensive amount of capital and a significant lead time. Domestically, pulp production anticipates paper/paperboard demand. If actual paper/paperboard demand falls short of the previously projected expectations, then there will be excess pulp on the market and weak pulp prices (e.g., 1990 and 1991).

In 1991, about 84 percent of the domestic paper grade pulp produced was consumed on-site and another 4 percent was shipped to affiliated mills and never entered the market pulp stream. The production processes and flow of materials through a typical papermaking operation can be reviewed in figure 1. In the United States, more softwood than hardwood was used for papermaking as attested by the greatest pulping capacity in the Southeastern United States (review figure 2) where native "southern pine" species dominate.

Imports

In recent years, it is estimated that the value of U.S imports of wood pulp accounted for about one-fifth of global trade in pulp. U.S. wood pulp imports increased irregularly from 4.5 million metric tons ($2.1 billion) in 1987 to 4.6 million metric tons ($3.0 billion) in 1989. Thereafter, imports declined irregularly, reaching 4.5 million metric tons ($2.1 billion) in 1991. In 1991, Canada supplied 86 percent, on a quantity basis, of all U.S. pulp imports (table 9). Brazil was a distant second, providing 9 percent of U.S. pulp imports. Generally, imports from Canada consist of NBSK pulp. This is the primary component within the "paper grade chemical pulp" grouping shown in table 10, and is generally used to produce premium printing/writing papers.

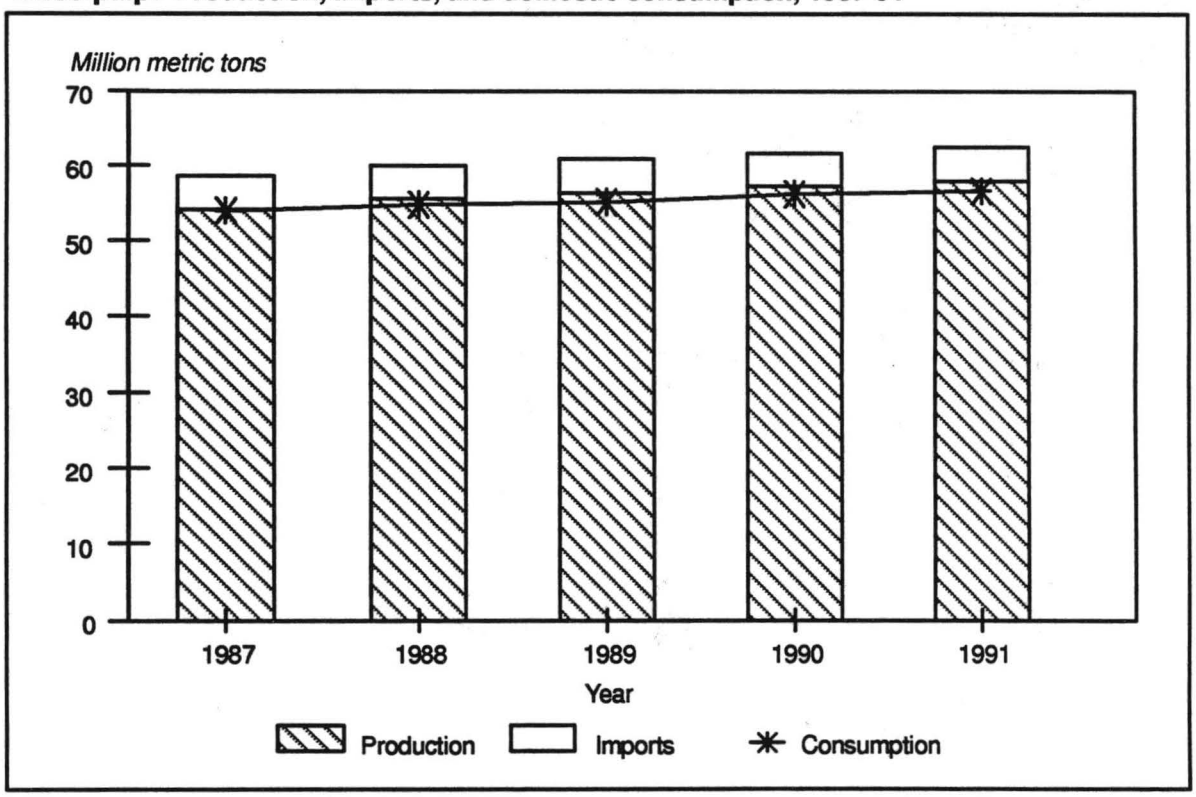
U.S. imports of waste paper are relatively minor ($25 million in 1991). Border trade with Canada and Mexico accounted for 98 percent of all waste paper imports. Since there is a bountiful supply of low-value (in relation to shipping costs) domestic waste paper, U.S. imports of waste paper are likely to remain minor.

Table 4
Wood pulp: U.S. production, exports of domestic merchandise, imports for consumption, apparent U.S. consumption, 1987-91

Year	U.S. production	U.S. exports	U.S. imports	Apparent U.S. consumption	Ratio of imports to consumption
	Quantity *(1,000 metric tons)*				Percent
1987	54,023	4,581	4,502	53,944	8.3
1988	55,484	5,198	4,480	54,766	8.2
1989	56,244	5,764	4,642	55,122	8.4
1990	57,199	5,480	4,452	56,171	7.9
1991	57,895	5,848	4,544	56,591	8.0

Source: Production data is derived from the American Paper Institute. Trade data is compiled from official statistics of the U.S. Department of Commerce.

Figure 6
Wood pulp: Production, imports, and domestic consumption, 1987-91



Source: Production data are derived from American Paper Institute , and import data are compiled from official statistics of the U.S. Department of Commerce.

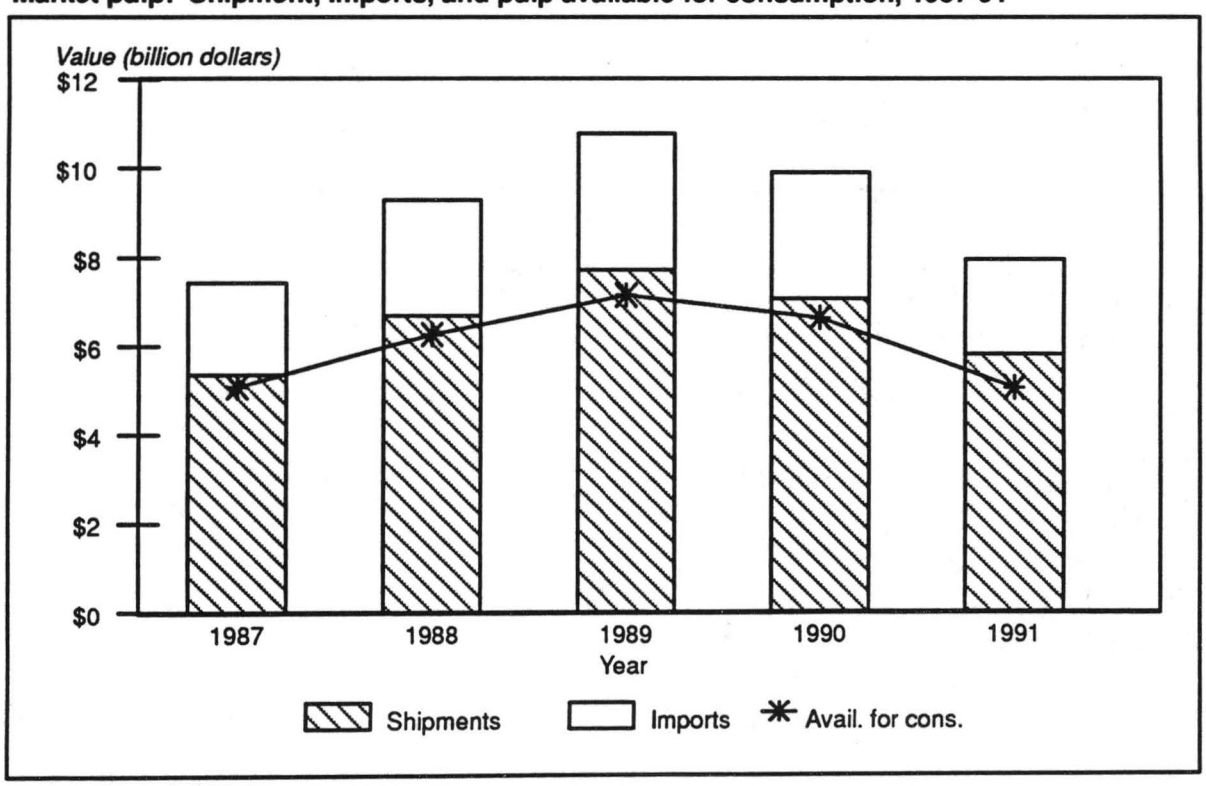
Table 5
Market pulp: Domestic shipments, exports of domestic merchandise, imports for consumption, and available for non integrated consumption, 1987-91

Year	U.S. shipments[1]	U.S. exports	U.S. imports	Market pulp consumption
		Quantity *(1,000 metric tons)*		
1987	7,359	4,581	4,502	7,280
1988	7,770	5,198	4,480	7,052
1989	7,860	5,764	4,642	6,738
1990	7,981	5,480	4,452	6,953
1991	8,202	5,848	4,544	6,898
		Value *(million dollars)*		
1987	5,357	2,342	2,069	5,084
1988	6,686	3,026	2,608	6,268
1989	7,719	3,613	3,045	7,151
1990	7,062	3,260	2,841	6,643
1991	5,808	2,889	2,139	5,058

[1] In 1991, total wood pulp production was near 58 million metric tons. However, most of this pulp is captive production and made directly into paper/paperboard and did not become market pulp. Market pulp shipments are those pulp shipments that are available for export or domestic sale.

Source: Shipment quantity data is derived from the American Paper Institute. Shipment value data and trade data is compiled from official statistics of the U.S. Department of Commerce.

Figure 7
Market pulp: Shipment, imports, and pulp available for consumption, 1987-91



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

Table 6
Market pulp: U.S. shipments by domestic grades, 1987-91

Grade	1987	1988	1989	1990	1991
	Quantity (*1,000 metric tons*)				
Dissolving pulps	1,186	1,238	1,290	1,172	1,242
Paper grade, chemical pulp	6,173	6,532	6,570	6,809	6,960
Groundwood and other pulps	0	0	0	0	0
Total	7,359	7,770	7,860	7,981	8,202

Source: Derived from *Paper, Paperboard, and Wood Pulp, Monthly Statistical Summary*, American Paper Institute.

Table 7
Waste paper: U.S. industry collections, exports of domestic merchandise, imports for consumption, and apparent U.S. consumption, 1987-91

Year	U.S. industry collections[1]	U.S. exports	U.S. imports	Apparent U.S. consumption[2]	Ratio of imports to consumption
	Quantity (*1,000 metric tons*)				Percent
1987	20,200	4,008	116	16,323	0.7
1988	24,600	7,528	146	17,256	0.8
1989	23,000	5,513	157	17,681	0.9
1990	26,300	7,336	111	19,033	0.6
1991	26,500	5,985	111	20,623	0.5
	Value (*million dollars*)				Percent
1987	[3]	553	19	[3]	[3]
1988	[3]	688	27	[3]	[3]
1989	[3]	730	33	[3]	[3]
1990	[3]	780	26	[3]	[3]
1991	[3]	715	25	[3]	[3]

[1] Waste paper industry collection data was derived from two sources: (1) waste paper consumption data provided by the American Paper Institute, and (2) waste paper trade data provided from official trade statistics.
[2] Provided by the American Paper Institute.
[3] Not available.

Source: Compiled from official statistics of the U.S. Department of Commerce, except as noted.

Table 8
Wood pulp: Captive pulp production and market pulp shipments, 1987-91

Captive or market	1987	1988	1989	1990	1991
	Quantity (*1,000 metric tons*)				
Captive pulp production	46,662	47,714	48,384	49,218	49,693
Market pulp shipments to:					
Domestic markets	2,780	2,572	2,096	2,501	2,354
Exports markets	4,581	5,198	5,764	5,480	5,848
Total market pulp shipments	7,361	7,770	7,860	7,981	8,202
Grand total	54,023	55,484	56,244	57,199	57,895

Source: Derived by the staff of the USITC from official statistics of the U.S. Department of Commerce and statistics provided by the American Paper Institute.

Table 9
Wood pulp: U.S. imports for consumption, by principal source, 1987-91

Source	1987	1988	1989	1990	1991
	Quantity *(1,000 metric tons)*				
Canada	3,919	3,847	4,043	3,931	3,917
Brazil	252	325	363	324	426
South Africa	66	95	86	84	84
Chile	17	24	17	18	47
Portugal	27	31	24	35	26
Sweden	45	80	46	31	18
Spain	45	35	30	5	10
West Germany	2	1	1	2	5
Swaziland	3	4	4	2	3
Finland	18	28	16	10	2
All other	108	0	12	10	4
Total	4,502	4,480	4,642	4,452	4,544
	Value *(million dollars)*				
Canada	1,842	2,226	2,657	2,521	1,847
Brazil	115	190	220	198	182
South Africa	30	56	64	54	51
Chile	7	13	9	7	18
Portugal	14	20	17	22	14
Sweden	24	53	33	19	9
Spain	24	22	22	3	6
West Germany	1	1	1	2	6
Swaziland	1	2	2	1	2
Finland	9	18	12	6	1
All other	3	6	10	7	3
Total	2,069	2,608	3,045	2,841	2,139
	Unit value *(dollars per ton)*				
Canada	$470	$579	$657	$641	$471
Brazil	455	587	607	612	427
South Africa	445	593	741	640	606
Chile	401	528	517	377	383
Portugal	521	629	708	627	552
Sweden	542	656	710	626	494
Spain	524	628	713	720	587
West Germany	662	640	891	919	1,020
Swaziland	367	558	540	464	468
Finland	502	650	743	597	749
All other	25	631	847	736	806
Average	460	582	656	638	471

[1] Less than 500 metric tons.
[2] Less than $50,000.
[3] Less than $500,000.
[4] Not applicable.

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

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

Table 10
Wood pulp and waste paper: U.S. imports of wood pulp, by domestic grades, and waste paper, 1987-91

Grade	1987	1988	1989	1990	1991
	Quantity *(1,000 metric tons)*				
Dissolving pulps	179	225	258	201	157
Paper grade chemical pulps	4,144	3,927	4,046	3,924	4,086
Groundwood and other pulps	179	327	337	326	301
Total market pulps	4,502	4,480	4,642	4,452	4,544
Total waste paper	116	146	157	111	111
Grand total	4,618	4,626	4,798	4,563	4,654
	Value *(million dollars)*				
Dissolving pulps	81	132	184	133	89
Paper grade chemical pulps	1,922	2,347	2,720	2,567	1,927
Groundwood and other pulps	66	128	141	141	122
Total market pulps	2,069	2,608	3,045	2,841	2,139
Total waste paper	19	27	33	26	25
Grand total	2,088	2,635	3,078	2,867	2,164
	Unit value *(dollars per ton)*				
Dissolving pulps	$450	$584	$713	$660	$570
Paper grade chemical pulps	464	598	672	654	472
Groundwood and other pulps	370	393	419	433	407
Avg. market pulps[1]	460	582	656	638	471
Avg. waste paper[1]	166	187	212	237	223

[1] A grand average unit value including wood pulp and waste paper is not representative of either. Therefore, only an average market pulp unit value and an average waste paper unit value are shown.

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

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

FOREIGN MARKETS

Foreign Market Profile

Generally, the principal markets for wood pulp and waste paper are in those countries that have a relatively high level of paper/paperboard consumption (undeveloped countries are excluded), a domestic paper industry, and a requirement to supplement their supply of intermediate papermaking materials with imported pulp and/or waste paper (Canada and the Nordic countries are excluded). Japan, the European Community, and developing nations along the Pacific Rim are good examples of countries that meet these three criteria, and subsequently are leading foreign markets for wood pulp and/or waste paper. A handful of nations in Latin America are developing/expanding their paper industries, but their present low-per-capita consumption level of paper/paperboard is not yet conducive to increased imports. Likewise, many Eastern European countries have a low consumption level of paper/paperboard and are currently not substantial foreign markets.

Japan is the second-largest paper/paperboard market in the world and consumes about 12 percent of world consumption. Japan is a major pulp and waste paper importer and accounts for about one-eighth of world imports. In 1991, Japan was the leading market for U.S. exports of pulp and waste paper ($702 million). Recently, the United States and Canada have supplied Japan with about four-fifths of its total imported pulp and waste paper requirement.

The major EC paper-consuming and producing countries include Germany, the United Kingdom, France, and Italy. These EC countries supplement their papermaking capability by purchasing a significant amount of market pulp from several sources (the Nordic countries, Canada, the United States, and certain Latin American countries). Germany is the third-largest paper/paperboard consumer and fifth-largest paper/paperboard producer. It is estimated that Germany accepts about one-sixth of world pulp imports; about one-third of these imports originates from the Nordic countries and another one-third originates from North America. France, Italy, and the United Kingdom each consume about 2 percent of

world pulp. Collectively, these three countries accept about one-quarter of world pulp and waste paper imports. Like Germany, it is estimated that about one-third of all imports into France, Italy, and the United Kingdom originates from North America, and about another one-third originates from the Nordic countries. It is also estimated that about one-seventh of all pulp imports into the four largest EC paper markets (Germany, France, Italy, and the United Kingdom) is collectively supplied by Portugal, Spain, Brazil and Chile.

South Korea appears to be the largest market for waste paper and is estimated to accept almost one-fifth of such global trade. Japan and several other developing economies in the western Pacific Rim region (China, Taiwan, Indonesia, Thailand, and the Philippines) also purchase a significant amount of waste paper. Fiber from waste paper, if marginally blended with wood pulp, results in a paper/paperboard of secondary quality, but a quality acceptable for certain applications in markets within these countries. Due partially to relatively lower transportation costs, Canada and Mexico receive a sizeable portion of U.S. pulp and waste paper exports. Venezuela also imports a significant amount of pulp and waste paper from the United States and currently has the highest per capita consumption of paper/paperboard in South America.

Internationally, many paper/paperboard mills that require pulp and/or waste paper imports often prefer diversifying their import sources throughout the world. Diversifying pulp sources lowers a paper/paperboard mill's risk of being confronted with an insufficient fiber supply (or inventory), and consequently being unable to supply its own customers with finished paper/paperboard. Particular upstream variables (i.e., in the fiber and pulp supply stream) that could adversely effect a nonintegrated paper/paperboard mill include labor-management disputes, political instability, unobtainable stumpage, volatile pulp prices, etc.

U.S. Exports

Wood Pulp

U.S. exports of wood pulp ranged between 8 percent and 10 percent of total U.S. production in the period 1987-91. Most pulp (and paper) mills that export pulp are also engaged in other paper/paperboard production activities. However, there is a handful of domestic pulp mills that rely heavily on market pulp earnings (in the form of export earnings). Pulp mills may export directly or utilize pulp brokers (see earlier section on pricing and distribution that addresses contractual arrangements).

Wood pulp exports increased steadily from 4.6 million metric tons, ($2.3 billion) in 1987 to 5.8 million metric tons ($3.6 billion) in 1989 (table 11 and figure 8). Since 1989, the value of wood pulp exports has declined to $2.9 billion while the quantity of exports fluctuated slightly between 5.5 million metric tons and 5.8 million metric tons. Between 1989 and 1991, the unit value of pulp exports declined by 21 percent, reflecting the global oversupply situation that developed during that time.

The largest U.S. export market for wood pulp, Japan, received about 20 percent of all U.S. exports in 1991. The EC, South Korea, Mexico, and Taiwan are also significant recipients of U.S. wood pulp exports. About three-quarters of all U.S. exports of wood pulp consists of sulfate (kraft) grade pulps (table 12), and about one-eighth of all U.S. exports of wood pulp consists of premium-priced pulps——the dissolving and special alfa grades. Domestic production of these pulps is primarily for export markets and domestic market pulp sales; very little is used in captive and other nonmarket pulp applications.

Waste Paper

During 1987-91, U.S exports of waste paper fluctuated between 4.0 million metric tons in 1987 and 7.5 million metric tons in 1988 (table 13). The value of these exports increased from $553 million in 1987 to $780 million in 1990, and then dropped to $715 million in 1991. During 1987-91, exports ranged between one-fifth and one-third of U.S. industry collections. In recent years, the value of U.S. exports of waste paper is estimated to account for about one-half of world trade in waste paper. Between 1987 and 1991, on average, waste paper exports were valued at about one-fifth the level of wood pulp exports. In 1991, Taiwan, South Korea, Mexico, and Japan received about 64 percent, on a quantity basis, of all U.S. waste paper exports (table 13). In 1991, the average unit value of U.S. waste paper exports to all markets was $119 per ton. Relatively high unit values of $184 per ton and $161 per ton for Canada and Venezuela reflect a higher quality waste paper exported (across all grades). In contrast, U.S. exports to Taiwan, Indonesia, and Thailand are believed to consist mostly of low-quality waste paper (across several grades), reflected by unit values of less than $100 per ton in 1991. U.S. exports of waste paper, by grade, are shown in table 14. Unbleached kraft paper is the most important grade, and accounted for 40 percent, by volume, of total exports in 1991.

U.S. TRADE BALANCE

During 1989 and 1990, U.S. trade (imports plus exports) in wood pulp exceeded $6 billion. However, during 1991 this trade was valued at barely $5 billion. Overall, the United States has been posting a modest trade surplus in wood pulp in recent years. This trade surplus grew irregularly from $273 million in 1987 to $750 million in 1991. The United States posted a trade surplus in wood pulp with all of its major trading partners, except for Canada and Brazil. Table 15 shows the U.S. wood pulp trade position, by quantity and value, for selected major U.S. trading partners.

Table 16 expands on table 15 and shows the U.S. trade balance for waste paper plus pulp (all summary products), but only on a value basis. The United States registered a $1.4 billion surplus in 1991, up from $807 million in 1987, primarily as a result of increased exports to the EC and Japan. The United States has historically accounted for the majority of its own pulp requirement, but has traditionally supplemented U.S. production with Canadian pulp. Major changes to these trade patterns are unlikely in the foreseeable future. However, minor changes are more likely among U.S. export markets than among U.S. import sources.

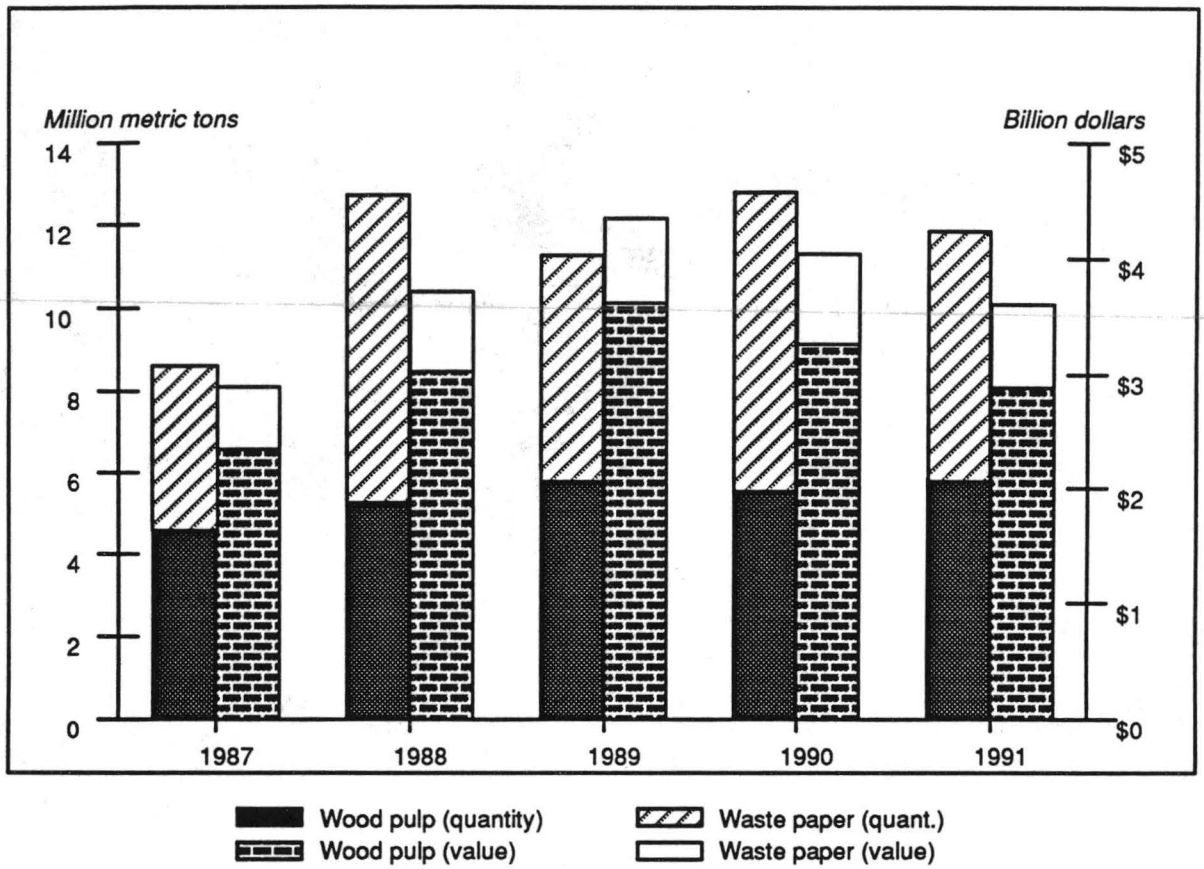
Table 11
Wood pulp: U.S. exports of domestic merchandise, by principal market, 1987-91

Market	1987	1988	1989	1990	1991
			Quantity *(1,000 metric tons)*		
Japan	897	1,143	1,386	1,085	1,194
Italy	334	372	484	418	642
South Korea	366	418	560	518	567
Mexico	365	383	404	396	376
France	243	247	262	295	366
West Germany	466	493	512	391	351
Netherlands	209	256	240	394	350
United Kingdom	267	289	289	244	275
Taiwan	172	173	222	201	238
Canada	233	331	326	302	238
All other	1,027	1,093	1,080	1,237	1,250
Total	4,581	5,198	5,764	5,480	5,848
			Value *(million dollars)*		
Japan	479	709	928	690	619
Italy	172	223	318	261	319
South Korea	182	243	317	264	229
Mexico	171	197	192	183	156
France	134	156	187	196	188
West Germany	253	307	358	281	220
Netherlands	105	135	160	220	159
United Kingdom	140	163	177	152	137
Taiwan	82	103	121	111	117
Canada	91	125	146	170	126
All other	534	666	710	733	618
Total	2,342	3,026	3,613	3,260	2,889
			Unit value *(dollars per ton)*		
Japan	$534	$620	$669	$635	$518
Italy	514	598	657	623	496
South Korea	495	582	565	510	405
Mexico	468	513	476	463	415
France	549	632	714	663	514
West Germany	541	624	701	719	626
Netherlands	504	527	664	559	455
United Kingdom	525	564	614	625	500
Taiwan	476	595	544	553	491
Canada	389	378	447	562	532
All other	520	609	658	592	494
Average	511	582	627	595	494

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

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

Figure 8
U.S. exports: Pulp and waste paper, 1987-91



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

Table 12
Wood pulp: U.S. exports by domestic grades, 1987-91

Grade	1987	1988	1989	1990	1991
			Quantity *(1,000 metric tons)*		
Dissolving pulps	681	785	759	709	700
Paper grade chemical pulps:					
Sulfate grades	3,338	3,801	4,424	4,239	4,668
Sulfite grades	373	383	407	369	336
Groundwood and other pulps	189	229	174	163	144
Total market pulps	4,581	5,198	5,764	5,480	5,848
			Value *(million dollars)*		
Dissolving pulps	385	504	572	504	486
Paper grade chemical pulps:					
Sulfate grades	1,691	2,196	2,691	2,428	2,125
Sulfite grades	164	194	231	211	173
Groundwood and other pulps	102	133	120	117	104
Total market pulps	2,342	3,026	3,613	3,260	2,889
			Unit value *(dollars per ton)*		
Dissolving pulps	$565	$642	$754	$711	$694
Paper grade chemical pulps:					
Sulfate grades	507	578	608	573	455
Sulfite grades	440	505	566	571	515
Groundwood and other pulps	538	580	690	721	725
Avg. market pulps	511	582	627	595	494

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

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

Table 13
Waste paper: U.S. exports of domestic merchandise, by principal markets, 1987-91

Market	1987	1988	1989	1990	1991
	Quantity *(1,000 metric tons)*				
Taiwan	811	945	1,060	1,114	1,136
South Korea	852	1,112	1,117	1,204	1,085
Mexico	709	3,394	1,062	2,191	895
Japan	599	551	481	685	700
Canada	260	301	258	593	548
China	40	106	123	84	202
Indonesia	72	118	158	181	190
Venezuela	42	60	73	157	175
Thailand	65	90	66	119	138
Philippines	83	91	112	127	132
All other	475	760 1,003	881	782	
Total	4,008	7,528	5,513	7,336	5,985
	Value *(million dollars)*				
Taiwan	90	99	100	92	89
South Korea	122	151	139	138	113
Mexico	101	145	170	134	128
Japan	93	90	73	85	83
Canada	31	38	39	116	101
China	6	14	15	10	23
Indonesia	10	16	21	20	18
Venezuela	7	9	15	29	28
Thailand	7	9	6	9	11
Philippines	15	15	15	17	14
All other	71	101	137	128	106
Total	553	688	730	780	715
	Unit value *(dollars per ton)*				
Taiwan	$111	$105	$94	$83	$79
South Korea	143	136	124	115	104
Mexico	143	43	160	61	143
Japan	155	163	152	124	118
Canada	117	127	149	196	184
China	161	134	124	118	115
Indonesia	136	134	133	109	94
Venezuela	169	144	211	187	161
Thailand	112	104	86	75	79
Philippines	182	170	138	132	109
All other	149	134	136	146	136
Average	138	91	132	106	119

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

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

Table 14
Waste paper: U.S. exports by domestic grades, 1987-91

Grade	1987	1988	1989	1990	1991
			Quantity *(1,000 metric tons)*		
Unbleached kraft papers	1,843	2,200	2,445	2,477	2,494
Bleached chem. papers	577	898	1,049	1,244	1,396
Newspapers and mechanical papers	1,121	3,801	1,115	1,140	1,184
Other, and unsorted waste papers	468	628	903	2,475	912
Total waste paper	4,008	7,528	5,513	7,336	5,985
			Value *(million dollars)*		
Unbleached kraft papers	246	263	285	260	258
Bleached chem. papers	97	163	192	230	214
Newspapers and mechanical papers	149	189	142	135	124
Other, and unsorted waste papers	60	73	110	155	120
Total waste paper	553	688	730	780	715
			Unit value *(dollars per ton)*		
Unbleached kraft papers	$134	$120	$117	$105	$103
Bleached chem. papers	169	181	183	185	153
Newspapers and mechanical papers	133	50	127	119	104
Other, and unsorted waste papers	129	116	122	63	132
Average waste paper	138	91	132	106	119

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

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

Table 15
Wood pulp: U.S. merchandise trade balance, by selected countries, 1987-91

Country	1987	1988	1989	1990	1991
	Quantity *(1,000 metric tons)*				
Japan	897	1,143	1,385	1,085	1,194
Italy	334	372	484	418	642
South Korea	366	418	560	518	567
Mexico	364	383	396	395	376
France	243	246	262	295	366
Netherlands	209	256	238	394	350
West Germany	465	492	511	389	346
United Kingdom	267	289	289	244	275
Taiwan	172	173	222	200	237
Brazil	(244)	(318)	(354)	(314)	(404)
Canada	(3,686)	(3,516)	(3,717)	(3,629)	(3,680)
All other	690	780	846	1,034	1,035
Total	79	718	1,122	1,028	1,304
	Value *(million dollars)*				
Japan	479	709	927	690	619
Italy	172	223	318	261	319
South Korea	182	243	317	264	229
Mexico	170	196	185	182	156
France	134	155	187	196	188
Netherlands	105	135	158	220	159
West Germany	252	307	358	279	215
United Kingdom	140	163	177	152	137
Taiwan	82	103	121	110	116
Brazil	(110)	(185)	(214)	(190)	(167)
Canada	(1,751)	(2,101)	(2,511)	(2,351)	(1,720)
All other	419	471	545	607	500
Total	273	419	568	420	750

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

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

Table 16
Wood pulp and waste paper: U.S. exports of domestic merchandise, imports for consumption, and merchandise trade balance, by selected countries and country groups, 1987-91[1]

(Million dollars)

Item	1987	1988	1989	1990	1991
U.S. exports of domestic merchandise:					
Canada	121	163	184	286	227
Japan	572	798	1,001	775	702
South Korea	304	394	456	402	342
Italy	188	251	339	279	331
Mexico	272	342	362	317	285
West Germany	255	312	362	287	223
Taiwan	171	202	221	203	206
Brazil	5	6	11	9	17
France	135	158	189	198	189
Netherlands	109	139	166	235	171
United Kingdom	141	166	185	160	144
All other	622	784	868	887	767
Total	2,895	3,715	4,343	4,040	3,604
EC-12	900	1,203	1,456	1,398	1,246
Asia[2]	250	356	358	335	324
Latin America[3]	123	137	113	137	144
U.S. imports for consumption:					
Canada	1,861	2,253	2,687	2,546	1,870
Japan	(4)	(4)	(4)	(4)	(4)
South Korea	0	0	0	(4)	0
Italy	(4)	0	0	0	0
Mexico	1	1	8	2	1
West Germany	1	1	1	2	6
Taiwan	(4)	(4)	(4)	1	1
Brazil	115	191	222	198	182
France	(4)	(4)	(4)	(4)	(4)
Netherlands	(4)	0	1	(4)	(4)
United Kingdom	(4)	(4)	(4)	(4)	(4)
All other	111	189	159	118	103
Total	2,088	2,635	3,078	2,867	2,164
EC-12	39	45	41	28	27
Asia[2]	1	(4)	(4)	(4)	(4)
Latin America[3]	122	204	230	210	200
U.S. merchandise trade balance:					
Canada	(1,739)	(2,090)	(2,503)	(2,260)	(1,642)
Japan	572	798	1,000	775	702
South Korea	304	394	456	402	342
Italy	188	251	339	279	331
Mexico	271	341	354	315	283
West Germany	254	311	362	285	218
Taiwan	171	202	220	202	205
Brazil	(110)	(185)	(211)	(189)	(165)
France	135	157	189	198	189
Netherlands	109	139	165	235	171
United Kingdom	141	166	185	160	144
All other	511	594	709	770	664
Total	807	1,080	1,265	1,173	1,441
EC-12	862	1,159	1,415	1,370	1,219
Asia[2]	249	356	358	335	324
Latin America[3]	1	(66)	(117)	(72)	(56)

[1] Import values are based on Customs value; export values are based on f.a.s. value, U.S. port of export.
[2] Does not include Japan, South Korea, and Taiwan.
[3] Does not include Mexico.
[4] Less than $500,000.

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 upon 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 Armenia, Bulgaria, the People's Republic of China, Czechoslovakia, Estonia, Hungary, Latvia, Lithuania, Moldova, Mongolia, Poland, Russia, the Ukraine and Yugoslavia are currently 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. Where eligibility for special tariff treatment is not claimed or established, goods are dutiable at column 1-general rates.

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, and reduced-duty treatment to certain other articles, which are 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 (IFTA), as provided in general note 3(c)(vi) of the HTS. Where 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 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*** (CFTA), as provided in general note 3(c)(vii) to the HTS.

Preferential nonreciprocal duty-free or reduced-duty treatment in the special subcolumn of column 1 followed by the symbol "J" or "J*" in parentheses is afforded to eligible articles the product of designated beneficiary countries under the ***Andean Trade Preference Act*** (ATPA), enacted in title II of Public Law 102-182 and implemented by Presidential Proclamation 6455 of July 2, 1992 (effective July 22, 1992), as set forth in general note 3(c)(ix) to the HTS.

Other special tariff treatment applies to particular ***products of insular possessions*** (general note 3(a)(iv)), goods covered by the ***Automotive Prod-***

ucts Trade Act (APTA) (general note 3(c)(iii)) and the ***Agreement on Trade in Civil Aircraft*** (ATCA) (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, antidumping 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 participating 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 establish quantitative limits on imports of textiles and apparel, of cotton and other vegetable fibers, wool, man-made 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.