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Wood Products as a Worldwide Commodity

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WOOD PRODUCTS AS A WORLDWIDE COMMODITY

Global Forest Products Trade

Wood has been an important commodity in world trade for centuries. Over 4500 years ago Lebanon exported wood to Egypt. Christopher Columbus carried mahogany from his explorations of the New World back to Europe. The continued significance of world wood flows is evident by a total value of global forest products trade in 1980 of $34 billion (Radcliffe & Sedjo, 1984).

As would be expected, wood products trade flows from wood surplus to wood deficit regions. Relatively few nations export forest products, as their domestic wood supply is used for meeting domestic requirements. This is especially apparent in the case where fuelwood, the end product of most wood harvested world wide, is a negligible component in world trade. Even though extensive forest resources exist in many nations, forest products exports are possible only if economic demand justifies the extraction and shipment of that wood. Wood product imports, likewise, occur when a country is deficient in economically satisfying its demand from domestic wood sources.

Presently, the two countries most heavily involved in forest products export trade are the United States and Canada (Fig. 1). Total U.S. forest products exports were valued at $5.6 billion in 1983 and, constituted about 12 percent of all forest products exports (FAO, 1985). In that year, Canadian wood exports were valued at $10.2 billion or 22% of total exports. On a regional basis in 1983, the following major contributions to forest products exports were recorded: Europe - $19.9 billion (42.0%); Africa, $1.1 Billion (2.3%); Central/South America, $1.4 Billion (3%); USSR -$2.6 billion (5.4%); Asia - $5.8 billion (12.2%); and Oceania, $.7 Billion (1.4%) (Figure 2) (FAO, 1985).

On the import side, the U.S. is also the largest importer of forest products. In 1983 its share was $9.0 billion or 16.9 percent of all world forest products imports. Japan was second at $6.1 billion or 11.4 percent. On a regional basis, in 1983, the following major import shares were recorded: Europe - $24.9 billion (46.9%); Asia - $12.5 billion (23.5%); Africa - $2.0 billion (3.8%), Central/South America -$2.1 billion (4.0%); Oceania, $.74 Billion (1.4%); and the Soviet Union, $.96 Billion (1.8%) (FAO 1985, Figure 3).

Major Forest Products Flows By Commodity - Current Picture

The major commodity groups considered in forest products production and trade are broadly defined as fuelwood (including charcoal), industrial roundwood (wood in log form), sawnwood

(lumber), wood-based panel products (including plywood, flake and chipboard products), wood pulp, printing and writing paper, newsprint, and other papers and paperboard. Additionally, roundwood, sawnwood and plywood panel products are frequently divided into conifer (softwood) and non-conifer (hardwood) categories.

The 1983 global pattern of export trade in these broad categories is shown in Figure 4 and is briefly summarized below.

Industrial Roundwood (Conifer)

The United States is the world's largest exporter of softwood logs. Its vast resources located in the Pacific Northwest, the Southeast, the Great Lakes, and Alaska, produced over 256 million cubic meters or 26 percent of the world's softwood log exports in 1983 (FAO, 1985). The primary destination of U.S. softwood logs was Japan, accounting for almost 52 percent of U.S. exports in that year. The second major softwood log producer and exporter is the USSR. In 1983 the USSR accounted for almost 25 percent of the world's conifer log exports (242 Mill M^3) with most of this material also destined for Japan (FAO, 1985). The species mix of larch/red pine found in the USSR is generally of lower quality than other softwood log producers and commands lower prices on world markets.

Extensive plantations of radiata pine (Pinus radiata) in New Zealand and Chile are rapidly maturing and this will assuredly establish these country's positions as major softwood log producers and potential exporters in the near future.

In addition to Japan, other major importers of softwood logs are the People's Republic of China (PRC), South Korea, Europe, and Taiwan. Figure 5 shows the major global trade flows in softwood logs as of 1981.

Roundwood (Non-conifer)

Hardwood log flows for 1981 are shown in Figure 6.

Hardwood species produced and exported in log form in the Pacific Rim come primarily from Southeast Asia. These are the so-called South Sea logs. The role of individual countries in South-Sea log export has shifted dramatically (and often) over the past two decades. In the sixties, the Philippines were the primary exporter of logs, but as resources became depleted through overcutting, mismanagement, and lack of adequate reforestation efforts, the government was forced to curtail exports. Today log exports from the Philippines are negligible.

Indonesia, based on the largest non-conifer forest base in the world, rapidly rose to the number one hardwood export position and supplied nearly 50 percent of all Southeast Asian non-conifer log exports in 1978 (FAO, 1985). Indonesia, not wanting to experience the same log supply problems encountered by the Philippines, and desiring to develop a domestic forest products industry, instituted a total ban on log exports which became effective January 1, 1985. By 1983, Indonesian hardwood log exports had fallen to 3 million cubic meters, or only 9 percent of the world total (FAO, 1985).

As noted, another motivating factor for Indonesian log ban was the country's desire to capture the value added that is generated by domestic processing of logs in country - in this case, primarily hardwood plywood. As will be noted later, Indonesia now ranks as the world's number one hardwood plywood producer.

Malaysia is presently the world's largest exporter of hardwood logs (18.8 million M^3 in 1983 or 58%). But indications point to a future reduction or ban on log exports as timber inventories are reduced. Other exporting regions for non-conifer logs are western and central Africa-producing valuable mahogany and ebony, France, and the United States, producing and exporting primarily oak. The main hardwood log importing countries historically have been Japan, South Korea and Taiwan, which rely on these imports to supply their own plywood and furniture operations.

Hardwood logs also go from both southeast Asia and Africa to the U.S. and Europe. The major flow here is from Africa to Western Europe, accounting for 29 percent of hardwood log trade in 1981.

Sawnwood (Conifer)

In 1983, world trade in coniferous sawnwood reached $8.1 billion or 17 percent of all trade in forest products. Over 97 percent of exports (value basis) originated in developed countries in 1983, Western Europe and North America accounted for 72 percent of the world's imports (FAO, 1985). Historically, over 80 percent of all trade is concentrated in only 5 or 6 global flows. Flows between Northern and Eastern Europe to Western Europe and intra-regional North American flows compose the major share of this trade.

The United States is also the world's second largest consumer of conifer sawnwood, the second largest producer, and the largest importer. In 1983 the U.S. imported an equivalent of over one third (12.3 billion board feet) of its domestic consumption (Forest Service, U.S.D.A., 1985). The USSR is the second largest

consumer of softwood lumber, and is also the second largest exporter. By far, Canada is the world's largest exporter (48% in 1983) and, along with the USSR and the Scandinavian countries, is the major exporter to the United States.

On the import side, the U.S. is the number one importer of softwood lumber and in 1983 accounted for almost 42 percent of the world's exports (FAO, 1985). The United Kingdom is a distant second, (10.6%), followed by Japan (6%), West Germany (6%), and others (FAO, 1985). Figure 7 highlights conifer sawnwood trade flows for 1981.

Sawnwood (Non-conifer)

In 1983, world export trade in non-coniferous sawnwood was $2.6 billion in value terms and accounted for 5.5 percent of world trade in forest products (FAO, 1985). As would be expected, the regions with the greatest non-coniferous resources are also the major producers and exporters. The most important of these regions is the ASEAN countries (Association of Southeast Asian Nations) which includes Indonesia, Malaysia, the Philippines, and Thailand, which accounted for 36 percent of hardwood sawnwood exports in 1981 - a quadrupling of its share over the previous two decades. Other secondary (but important) non-coniferous sawnwood exporting regions in 1983 were North America (13.6%), Africa (4.8%), and Latin America (8.2%) (FAO, 1985).

The major importing regions for hardwood sawnwood are Western Europe and North America whose shares were 56.9 percent and 10 percent in 1983 respectively. Much intraregional trade also takes place, especially within Western Europe. On a country specific basis, the major importing countries are Italy, Singapore (mainly for re-export), West Germany, France and Canada. On the export side, the major flows originate from Malaysia, Indonesia, Singapore, and the United States. Figure 8 shows the major global trade flows for non-coniferous sawnwood.

Plywood

Worldwide production of plywood (wood based panels) is in a state of stagnation and has remained virtually the same from 1972 to 1983. What is of interest is that while production in developed countries has remained relatively constant, the level of production in the developing countries doubled over this period. There has also been a restructuring of trade flows in plywood, resulting from the ban of log exports by Indonesia which is not evident in Figure 9. Before that ban, Japan, South Korea, and Taiwan imported much Indonesian timber as a supply for their domestic plywood industries which, at that time, were quite extensive. Following the Indonesian log ban, plywood production (and consequently exports) declined in importance in these

countries. Indonesia on the other hand, initiated an immense effort to produce plywood. While it exported almost no plywood in 1975, Indonesia now ranks as the world's number one exporter of hardwood plywood, exporting over 3 million cubic meters in 1984 (Asian Timber Annual Review, March 1985).

Other major exporters (and producers) of hardwood plywood are South Korea, Taiwan, Malaysia, the Philippines, West Germany, and the USSR.

The United States is the single largest importer of hardwood plywood, accounting for 15 percent of the world's imports in 1981 (Radcliffe & Sedjo 1984). In that year 85 percent came from the countries listed above.

Softwood plywood is produced and consumed almost exclusively in North America. At this point, it is a small component of global forest products trade. The intercontinental trade that does occur is mainly the flow from North America to the common market nations of Western Europe, primarily Belgium/Luxemburg and the Netherlands.

As substitute products become available-such as medium density fiberboard - aggregate demand for softwood plywood continues to decline. This trend is highlighted by the fact that the exports of softwood plywood from the U.S. declined 29 percent from the first half of 1984 to the same period in 1985 (FAS, August 1985).

Pulp

Global trade in pulp and paper products is the largest component of forest products trade with over 54 percent or $25.7 billion in 1983 (FAO, 1985). Pulp exports were almost $6.7 billion in 1983. Until 1967, Northern Europe was the largest exporter of pulp, but that region was surpassed by North America after that date. The major importing region is Western Europe, which has remained in this position for over two decades. Presently, eight bilateral trade flows in pulp comprise 80 percent of all global trade. The major flows are intracontinental trade in North America (primarily from Canada to the U.S.), from North America to Western Europe, and from Scandinavia to Western Europe.

On a country basis, the single largest importer of market pulp is the U.S. which in 1983 accounted for over 18 percent of total pulp imports (FAO, 1985). Of importance to West Coast producers is that Japan is the third largest importer of market pulp. Its market share has doubled over the past two decades to about 10.6 percent of the 1983 market. Figure 10 shows the significant global trade flows for market pulp as of 1981.

Paper

There are over 3000 various grades and types of paper being manufactured in the world today. To best summarize, the three broad categories of paper products most often analyzed are newsprint, other printing and writing papers, and other paper and board products.

Newsprint

The world export flow of newsprint represents another important component of forest products trade, accounting for 10.7 percent or 5.1 billion in 1983 (FAO, 1985). It is the fifth largest forest products commodity group traded. Four major newsprint trade flows comprise 80 percent of the world's newsprint trade. These flows are, in order of importance as of 1981: Canada to the United States, which accounted for 49 percent; Northern Europe to Western Europe (21%); North America to Western Europe (6%); and North America to Latin America (5%). Significant global flows for newsprint are shown in Figure 11.

Other Printing and Writing Papers

This commodity category is fourth in importance in world forest products trade, behind newsprint. In 1983, trade in "other printing and writing paper" accounted for 11 percent of world forest products trade or $5.2 billion (FAO, 1985). In 1982, 57 percent of trade in this commodity was a bilateral flow between eastern and Western Europe, and the flow from Northern Europe to Western Europe, up from 43% in 1962. North American intraregional flows rank third with around 8 percent of the world's trade in 1982, being largely Canadian exports to the U.S. To a lesser degree, these products also flow from the major exporting regions to Latin America, Africa, and Asia. Figure 12 displays the major trade flows for this category.

Other Paper and Paperboard

This general category of products includes construction paper and paperboard, household and sanitary paper, wrapping and packaging paper, and special paper grades.

Because this category encompasses so many paper types and grades, it accounts (as would be expected) for a major share of forest products commodity trade. It has ranked second only to pulp in terms of international trade value, and in 1983 ranked first, with exports of $7.9 billion worldwide. This was 16.7 percent of all forest products exports.

The major trade flows are essentially identical with printing and writing paper in both direction and magnitude (Figure 13).

The two flows from Northern Europe to Western Europe and within Western Europe have accounted consistently for over half the world's trade. Western Europe accounted for 63.1% of exports and 55.3 percent of imports in 1983. Other regions of importance with respect to imports are Asia (18.1%), Latin America (6.5%), and Eastern Europe (including the USSR) with about 8 percent each in 1983 (FAO, 1985). For North America, exports to Western Europe have been decreasing over time but have increased to Asia, particularly Japan. The overall export contribution for North America in this category in 1983 was $1.7 billion, or 21.4 percent of world trade in other paper and paperboard products. The largest share, $1.3 billion, was from the U.S.

THE ROLE OF THE UNITED STATES IN WORLD WOOD MARKETS

Recent overviews of the composition of U.S. trade in wood products have been published in "NFPA Trends in Trade: The United States World Wood Markets" (NFPA, 1985), "U.S. Timber Production, Trade, Consumption, and Price Statistics 1950-1984" (USFS, 1985), and: "Wood Products, International Trade and Foreign Markets" (FAS. Nov. 1985). These analyses are summarized very briefly here. Many of the trends have been noted in the previous sections with respect to the global overview.

U.S. Import/Export Overview

A broad mix of forest products is traded by the United States in world markets. The United States exports both softwood and hardwood logs, and such manufactured products as high quality softwood and hardwood lumber, structural panels, including softwood plywood, certain species of hardwood veneer, and a wide variety of pulp and paper products. It imports softwood lumber, hardwood plywood, hardwood lumber, particleboard, newsprint, wood pulp, and a mix of other paper and board products.

Solid Wood Products Trade

Exports: Softwood logs are the major solid wood product exported by the United States, accounting for 40.1 percent of the total value of wood products exported in 1984 (Fig. 14). Combined U.S. exports of softwood and hardwood lumber were 30.2 percent of the total value of solid wood products exports, while veneer, plywood, and other panel products together accounted for 10 percent of the total. The remainder (19.7%) includes hardwood logs, wood chips, building products, railroad ties and other miscellaneous items.

U.S. exports of solid wood products have grown dramatically in the past two decades, from $186 million in 1961 to a peak of

$3.7 billion in 1980. Although solid wood exports declined to the 2.8 -3.0 billion range in 1981-1984, they have stayed consistently strong in spite of the surging dollar and a worldwide recession (Figure 15). Even when adjusted for inflation, U.S. exports have increased by a factor of four since 1961.

Imports: Softwood lumber, virtually all of which comes from Canada, is the major solid wood product imported by the United States. This product accounted for $2.7 billion, or 67.5% of the total value of U.S. solid wood products imported in 1984 (USFS, 1985). Hardwood plywood, mainly from Pacific Rim developing countries, is the second biggest wood import ($422 million), accounting for 10.7 percent of the total that year. Hardwood veneer, hardwood lumber, and other products make up the balance. Solid wood imports for 1983 are summarized in Figure 16.

U.S. imports of solid wood products have also grown, although at a less rapid rate than exports, having more than doubled on a constant dollar basis between 1961 and 1984. As previously stated, the most important U.S. wood product import is softwood lumber, which has increased by a factor of three on a volume basis from 1961 to 1984.

In the long term, one of the most rapidly growing imported wood products has been hardwood plywood, which has increased from 1.1 million square feet (MMSF) in 1961 to 2.98 MMSF in 1984, after peaking at 5.1 MMSF in 1978. Hardwood plywood is the most important import category from the Pacific Rim. In 1983, Taiwan was the largest supplier of hardwood plywood to the United States, with 35.4 percent share of the import market. Indonesia was a very close second, with 33.1 percent, and Japan followed with 9.8 percent. South Korea was the fifth leading source, with just over 7 percent. This was a marked change from 1978 when Indonesia held only 1 percent of the market and South Korea held 49 percent.

During this period, Indonesia's production of hardwood plywood almost quadrupled; it is expected to grow further as that country completes construction of over 100 plywood plants planned during the eighties. The major facing species imported is Lauan, which now accounts for 74 percent of hardwood plywood imports, up from 39 percent in 1978.

Destination of U.S. Solid Wood Exports

As it has been the case for several years, Japan was the major export customer of the United States in 1984, accounting for $1.0 billion, or 38 percent of all U.S. wood products exports. Canada, China, South Korea and West Germany were also included in the top five export markets. Figure 17 shows U.S. exports to its top customers in 1984 (FAS, 1985). The same general pattern is shown for softwood solid wood product exports (Fig. 18). For the

first nine months of 1985, total softwood exports are up slightly (1%) over the same period of 1984. China continues strong growth, with a 40 percent increase during this period.

Softwood Logs: Japan consistently has been the largest market for U.S. softwood logs. It imported 1.75 billion board feet from the United States in 1984, 52% of total U.S. softwood log exports. Western species, particularly Douglas-Fir and western hemlock, dominate trade with Japan.

Japan and South Korea have historically been the major Asian markets for U.S. logs. However, the rapidly expanding Chinese market has made that nation the second largest softwood log market, accounting for 25.7 percent of the U.S. softwood log exports in 1984. Together these three countries, along with Canada, purchase virtually all U.S. softwood logs (97%). See Figure 19. Overall, log exports are up by 15 percent (nine months, 1984-85), with China increasing its log purchases (volume) by one half.

Softwood Lumber: Japan is also the largest overseas market for U.S. softwood lumber, taking 34% of 1984 exports (Fig. 20). As with softwood logs, western species dominate softwood lumber exports, accounting for 73 percent of the total. Of that, Douglas Fir makes up 32 percent, hemlock, 22 percent, and other species, 19 percent. Southern pine accounts for about 12 percent of all softwood lumber exports.

Softwood Plywood: The leading western Pacific Rim softwood plywood importer from the U.S. is again Japan, but which accounted for only 1.8 percent of total U.S. softwood plywood exports in 1984. The leading markets were in Western Europe, led by the United Kingdom which imported 102.9 million square feet (27.8%), Belgium/Luxemburg (13%), and Denmark and the Netherlands (11.2%). Canada was the fifth leading market, accounting for 8.2 million square feet (6.9%). See Figure 21.

Hardwood Products: Hardwood exports have increased rapidly during the past few years. Though hardwood log exports have remained fairly stable, hardwood lumber exports grew from 271 million board feet (MMBF) in 1978 to 466.5 MMBF in 1984 (USFS, 1985). Hardwood exports for 1984 are shown in Figure 22.

Canada and West Germany were the two leading hardwood markets (24.1% and 20% respectively) (Figure 23). Taiwan and Japan are the third and fourth largest importers of U.S. hardwood logs, importing 9.9 percent and 9.4 percent of the total U.S. exports in 1984. Japan, Taiwan, and South Korea account for the only significant Pacific Rim hardwood imports from the U.S.

Pulp and Paper Products Trade: U.S. export trade in pulp and paper products is also significant, accounting for $175.7 Million in pulpwood exports (included in industrial roundwood), $1.35 billion in wood pulp, and $1.72 billion in paper and paperboard products in 1983 (FAO, 1985). The U.S. was also a significant importer, with a total of $1.49 billion in wood pulp and $3.7 billion in paper and paperboard imports in 1983 (FAO, 1985).

Total pulp and paper exports, excluding pulpwood, totaled $4.1 billion in 1984 (Figure 24). Wood pulp was the most important product exported, accounting for 31.8 percent of volume and 33.1 percent of value. Waste paper, while accounting for 28.6 percent of volume, was only 9 percent of export value due to the low unit values. Kraft linerboard exports were $631 million (13.9%) and converted paper products exports were $762 million (16.8%).

Market shares for exports are shown in Figure 25 for 1973 and 1983. Western Europe and Latin America remain major markets, although market share has declined. Far East markets have increased significantly, to 25.3 percent, with exports to Canada also up slightly on a percentage volume basis (Meister, 1984). Pulp and paper imports into the U.S. in 1984 were predominantly newsprint ($3.3 billion) and wood pulp ($1.8 billion) in 1984. Other paper and board imports were $1.5 billion (Figure 26).

ALASKA'S ROLE IN FOREST PRODUCTS INDUSTRY AND TRADE

The Forest Resources of Alaska

Alaska is a timber rich state of 375 million acres (571,000 square miles) of which 120 million acres (or nearly 1/3) is forested. This accounts for 16 percent of all forest land in the United States (Brady, 1985).

A disproportionate percentage of the states' commercial forest land is contained in the interior (80%) but this land contains only 29 percent of the total softwood sawntimber volume (Clark, 1983). The remaining 71 percent of the sawntimber volume is found in the coastal forests of Southeast Alaska from Ketchikan to the Kodiak area. Alaska's forests contain 10 percent of the nation's softwood growing stock and 1 percent of the U.S. hardwood growing stock (Brady, 1985).

Most of the standing timber in Alaska is old growth, meaning the timber has never been commercially cut. The highest volume of timber, as stated, is found in the coastal southeast area of the state. These forests are primarily Western hemlock (Tsuga heterophylla) and Sitka spruce (Picea sitchensis). Secondary

species are Western Red Cedar (Thuja plicata) and Alaska yellow cedar (Chamaecyparis nootkatensis). As can be seen in Table 1, which summarizes the U.S. Forest Service 1980 harvest data from the Tongass National Forest, indicates the relative economic importance of these species. The coastal forests average more than 32,000 board feet of standing timber per acre compared with only 1,370 board feet per acre of standing timber found in the interior (Alaska Department of Commerce and Economic Development, 1985). Most of the coastal forests are of trees greater than 30 inches in diameter.

The Interior region of Alaska, on the other hand, with a vastly greater percentage of the commercial forest land, contains only a fraction of the timber volume. Trees average 11 to 20 inches in diameter and are generally lower grade and value species such as white spruce (Pacia glauca) and various hardwoods, including paper birch (Betula papyrifera), quaking aspen (Populus tremuloides), and balsam poplar (Populus balsamifera).

Ownership Patterns

At the time of Alaska statehood in 1959, a dramatic shift in land ownership began. Table 2 shows land ownership as of 1982 and projected changes for 1990. As land transfers continue, the ownership percentages and availability of timber will continue to change also. Prior to 1959, the federal government owned virtually all undeveloped land in the state. After 1959, the State of Alaska, under the Statehood Act, was authorized to select 104 million acres of land (27% of the total state land area). To date, the State has applied for approximately 110 million acres, of which 23 million acres have been patented and an additional 57 million acres have been tentatively approved for transfer (Alaska Department of Commerce and Economic Development, 1985).

In 1971, a second piece of legislation was passed which also impacted the pattern of land ownership in Alaska. This was the Alaska Native Claims Settlement Act (ANSCA). Under this act, the thirteen Native corporations were granted title to 44 million acres (12% of the state's total area). Approximately 8 million of these acres are timberland.

The third major legislative act affecting patterns of forest ownership is the Alaska National Interest Lands Conservation Act (ANLICA) passed in 1980. The act added 104 million acres to Alaska's national parks, preserves, monuments and other conservation areas.

Wood Utilization - A Brief Historical Overview

Because of the forest resource structure and accessibility conditions, the development of Alaska's forest industry has

occurred primarily in the Southeast coastal region. Development of the timber resources for commercial purposes began in the early 1900's. A lack of adequate infrastructure, including transportation systems, coupled with the overall inaccessibility of the resource, and location relative to markets, has largely precluded viable large scale forest products operations. However, as early as the 1880's, small and medium scale timber operations were in existence. For example in 1889, 11 sawmill operations were reported to be operational in Southeast Alaska. By 1910 the annual cut in this region was 27 million board feet (Alaska Department of Commerce and Economic Development, 1985).

Historically, the Interior region has not been a major factor in Alaska's forest industry. As previously stated, only 29 percent of the sawntimber volume of Alaska is contained in this region and the remoteness and high costs of extraction have discouraged development. In the early part of this century there existed many small mills producing mostly firewood or rough lumber. This pattern has continued to the present.

During World War II, demand for Alaska's spruce timber increased. Spruce is a very light and structurally strong wood and was used extensively as components in airplanes. In 1943 - 1944 Alaska produced 38 MMBF of spruce for such purposes (Alaska Department of Commerce and Economic Development, 1985). After World War II, the U.S. forest Service attempted to encourage development of the timber resource. In the late 1940's, the emphasis was primarily directed toward the pulp industry. The prime incentive was the availability of long term timber contracts (50 years) that were intended to assure a continuous flow of raw material.

In 1954, Alaska's first large pulp mill, located in Ketchikan, became operational. This was followed, in 1959, by a second mill, owned by the Japanese, located in Sitka. Both of these mills continue to produce dissolving sulphite alpha pulp which is used in the manufacture of rayon. A number of problems, such as high labor costs. disputes with environmental agencies, and declining market conditions, have placed the Alaska pulp industry in a precarious economic position. Table 3 shows the trend of Alaska's export of pulp over the past 5 years (Gruenfeld, March 1985). Total exports in 1984 (211 Thousand Tons) was only 67.8 percent of the 1980 level (312 Thousand Tons). Reported value ($93.6 Million) was 61 percent of the 1980 value ($153 Million). The drop in unit value per ton contributed significantly to this overall value decline.

Lumber and roundwood production continued to increase after the war. A continuous supply of raw material of lower quality was required to sustain the pulp mills, and higher quality material was cut into sawntimber and cants for export - shipped almost

entirely to Japan. The volume of softwood logs exported grew during the 1960's, reaching a peak of about 262 million board feet in 1973. Shipments to Japan accounted for 211.7 million board feet (80.1%), and 15.6 million board feet went to the People's Republic of China (USFS, 1985). Between 1975 and 1982, the annual timber harvest averaged about 530 million board feet (Alaska Department of Commerce and Economic Development, 1985), indicating that about 45 percent of volume is exported in log form.

As can be seen in Figure 27, softwood log exports from Alaska are continuing to increase and compare favorably with exports from British Columbia, a strong competitor. On the other hand, as evident from Figure 28, Alaska softwood lumber exports are steadily declining, and are not competitive with British Columbia at present. Exports in 1983 were about 136.7 million board feet, down from over 400 million board feet in 1973. As with logs, Japan is the leading lumber market (87.6%) with exports to China quite variable to date.

The export of wood chips has also been quite variable, increasing to over 151 thousand short tons in 1980, then declining to an average of about 75 thousand short tons in 1981-1982. Chip exports in 1983 were only 6.6 thousand short tons, highlighting the severely depressed market (USFS, 1985).

Economic Contribution of Forest Products Industry

Total Alaska exports of forest products over the years 1979 to 1984 are valued at $1.55 billion (Brady, 1985). The trend is one of decline, shown by export values of $339 million in 1980, $272 million in 1983, and $217 million in 1984 (Alaska Department of Commerce and Economic Development, 1985).

Native Corporations, which received prime timber land through the Alaska Native Claims Settlement Act, currently play a major role in the contribution to Alaska's economy through the export of roundwood (logs). As noted, these log exports increased from 25 million board feet (about 7 shiploads) to a peak of 160 million board feet (46 shiploads) in 1980. This has greatly helped to offset the general decline in the export market for sawn cants since 1980. In terms of species composition, logs and cant exports consist of 51 percent western hemlock, 42 percent Sitka spruce, and 7 percent other species such as cedar. In terms of value, spruce logs are the highest value product per board foot, with hemlock cants the lowest.

The current economic situation in the forest products industry in Alaska (Southeast) is unstable at best. Global markets have been weak, causing a 50 percent drop in the annual Alaska harvest according to Michael Barton, Regional Forester for the U.S. Forest Service, Region 10, Juneau. Barton,

speaking at a Resource Development Council forum in September 1985, stated that the timber industry's net worth, even with strong markets, has declined by $180 million over the past 50 years (Resource Development Council for Alaska, Oct. 1985). In 1985, the situation has worsened, with employment in the forest products industry dropping 18 percent through the third quarter.

Many reasons are cited for this decline. In the case of pulp production, the two pulp mills are running at less than 60% capacity. World capacity for sulphite pulp production has increased as worldwide demand has declined. A relationship also exists between crude oil and pulp that has a bearing on Alaska's pulp industry. Many petrochemical products compete with synthetic products such as rayon made from wood pulp. If oil prices continue to drop, specialty pulp prices will likely experience downward pressures. This will further exacerbate the current situation.

Table 4 reflects the fact that the Alaska forest products industry is experiencing economic difficulties. Output is substantially below capacity in both the pulp and sawmill sectors. Two sawmills are currently in bankruptcy proceedings. Most of output from Southeast Alaskan sawmills is either in the form of cants for export or is green lumber for use within the State. As noted, the greatest market for round logs and sawntimber is Japan, in particular the housing market in that country. Through June 1985, housing starts in Japan were up 4.5 percent over the previous year, but wood-frame housing gained only 1 percent compared to non wood-frame housing which registered a 10 percent growth rate. The trend to multiple story structures can be expected to continue as population pressures, coupled with increasingly limited and costly land for new construction, will persist in Japan. Wood houses now comprise less than half the total starts. Western-sytle (2x4) construction, while growing, is still only about 4.5 percent of wood units, or 2 percent of total units.

Other factors which also intensify the current forest industry economic difficulties in Alaska are periodic labor problems (including wage disputes), shipping rates, raw material costs, and the strong U.S. dollar vis a vis other international currencies -including the impact of the Canadian dollar on U.S. domestic markets.

Outlook/Opportunities/Strategies

Alaska's vast physical forest resources hold great potential in the economic development of both the forest products industry and the state economy. The current constraints to development as well as areas of opportunity must be rationally analyzed.

Realistic strategies that can work within the foreseeable State economic framework must be developed and put into action.

Paula P. Easley, Executive Director of the Resource Development Council for Alaska, Inc., recently outlined several factors worth noting: "...we should consider some of the constraints (not prioritized) in doing business in Alaska.

1. Lack of transportation and other infrastructure
2. High labor costs, lack of skilled labor
3. High transportation costs
4. Remoteness
5. Limited local markets
6. Lack of significant utility development
7. Institutional and regulatory problems
   - uncertain land status
   - environmental constraints
   - uncertain tax policies
   - lack of coordinated state development plan
   - federal government influence
8. Weather" (Easley, 1985)

These factors apply to all industrial sectors but are especially pertinent to the forest products industry.

These constraints cannot be easily mitigated. A careful analysis of the underlying causes is needed, as are statewide strategies to reduce their impacts. To a great extent, these contributing problems are beyond the control of individual firms and businesses. State, private, and federal cooperation will be necessary.

For the forest products industry, various specific recommendations and strategies have been proposed. One of these is the attempt to attract new investment in the processing of forest products. There are no restrictions on foreign investment in land, standing timber and/or processing and transportation facilities in the state. The state has been actively seeking to attract new investment, particularly from Asia, a region that has played an important role in Alaska's forest products industry over the past three decades. Opportunities <u>potentially</u> exist for foreign investment in all areas of products processing, including logs, pulp, plywood, sawnwood, and finished products.

One area of particular interest is the potential to develop forest industries in the interior region of the state. Specifically, the greatest resource opportunity for industry expansion lies in the Tanana Valley. The new 2,500 square mile Tanana State Forest (1.6 million acres) alone could provide at least 16 million board feet of spruce and 115,000 cords of fuelwood annually (Gruenfeld, September 1983). Needless to say,

the occurrence of the physical resource and its economic utilization are quite different issues.

One primary limiting factor in the development of the Interior Forest is the lack of an adequate transportation infrastructure. Only 30 percent of the annual allowable cut in the Tanana Valley is presently accessible (Packee, 1984). Consequently, various transportation options (rail, road or sled) would need to be explored before the resource can be economically developed.

With regard to markets, a soon to be published trade research study completed by the U.S. Forest Service indicates that the outlook is favorable for Alaska's lower quality end logs in export markets. Prices for this material, including logs which compete with coast grade No. 3 hemlock from Washington State, the new Canadian grade-4, radiata pine from Chile or New Zealand, and logs from the Soviet Union, are expected to rise by 14 percent by 1990. Volumes of this material utilized by the Pacific Rim countries is expected to rise by 25 percent by 1990 and an additional 10 percent by 1995 (Flora & Vlosky, 1986).

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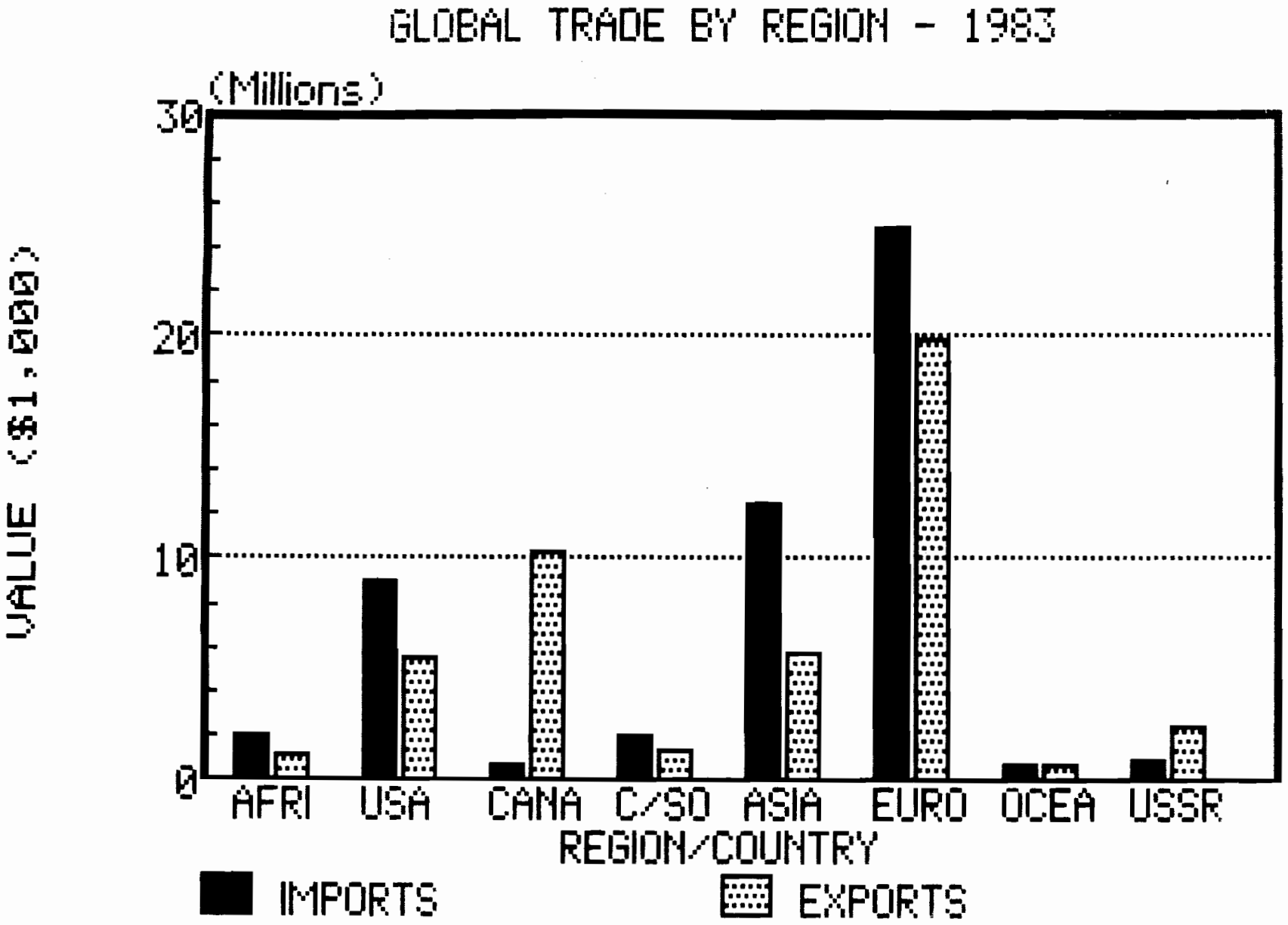
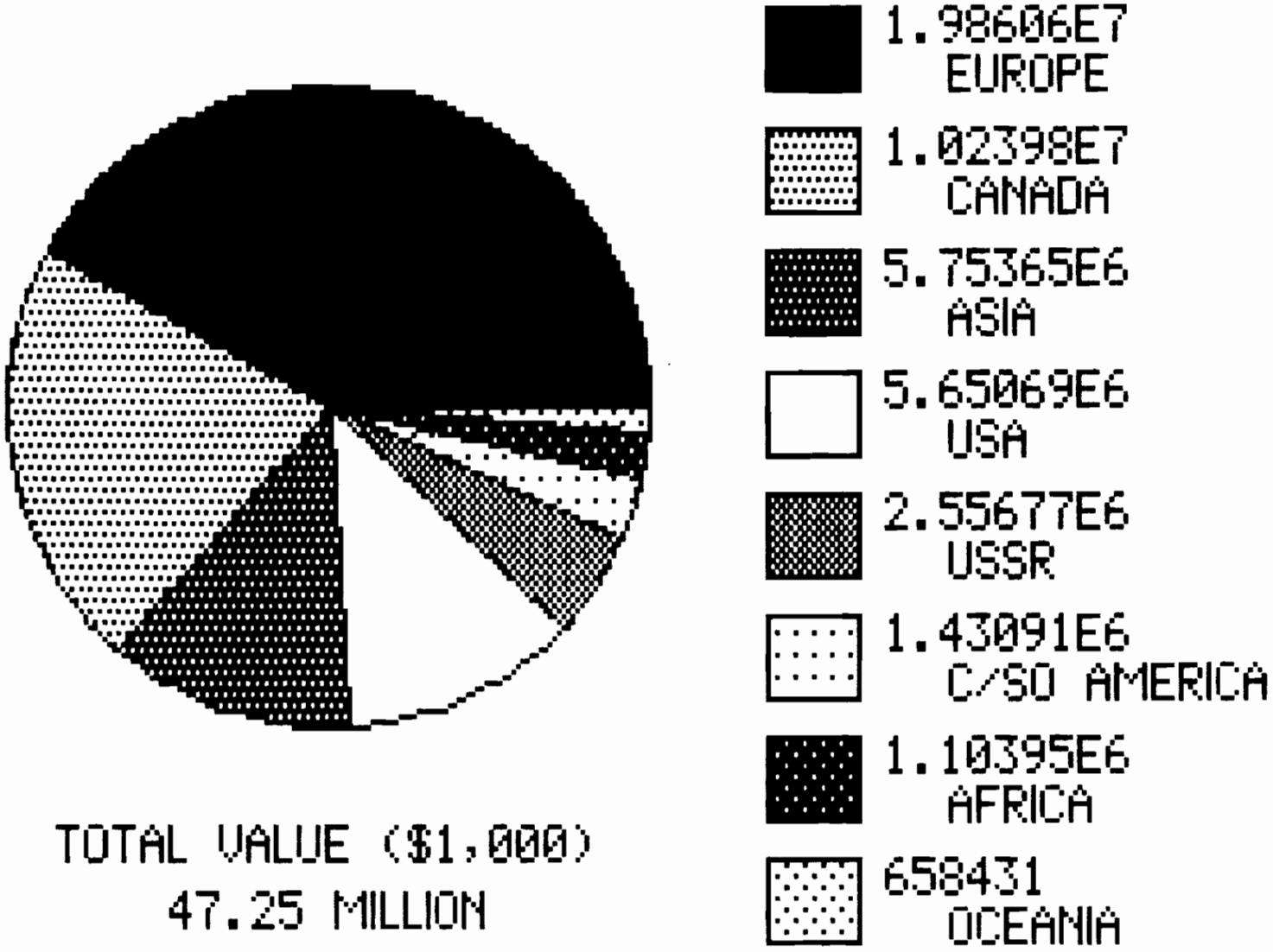
Figure 1



Source: FAO, 1983 Forest Products Yearbook

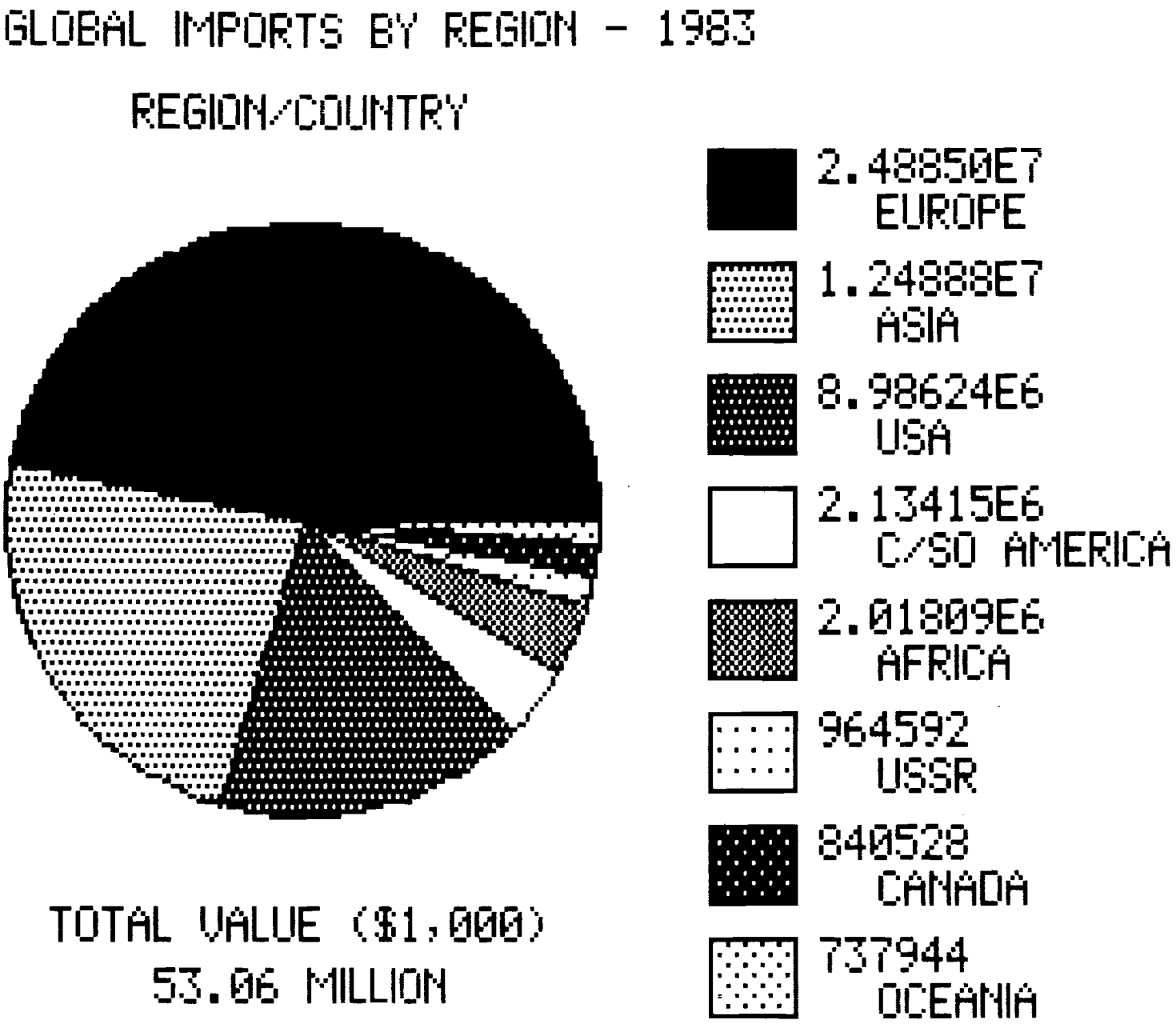
Figure 2

GLOBAL EXPORTS BY REGION - 1983



Source: FAO, 1983 Forest Products Yearbook

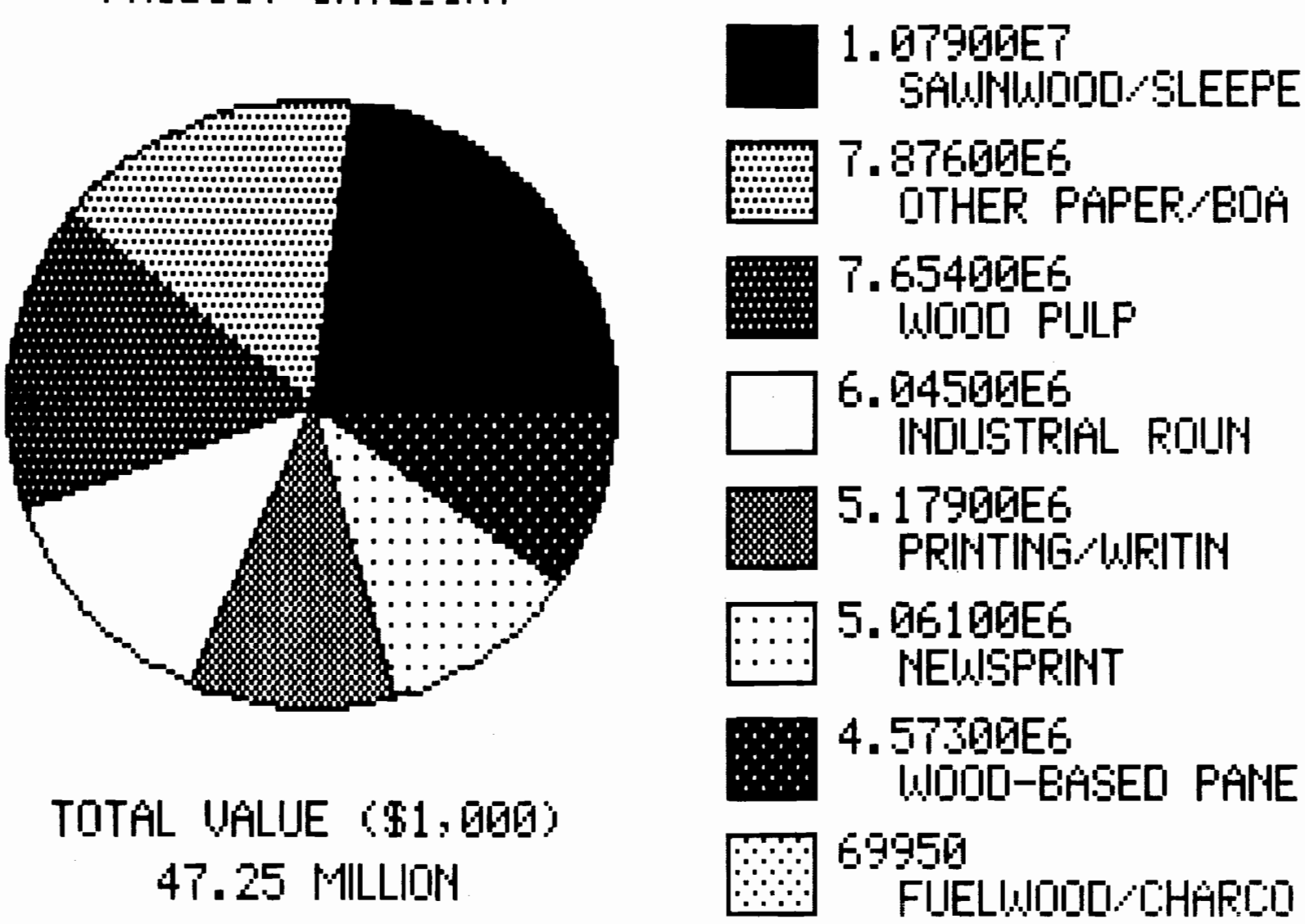
Figure 3



Source: FAO, 1983 Forest Products Yearbook

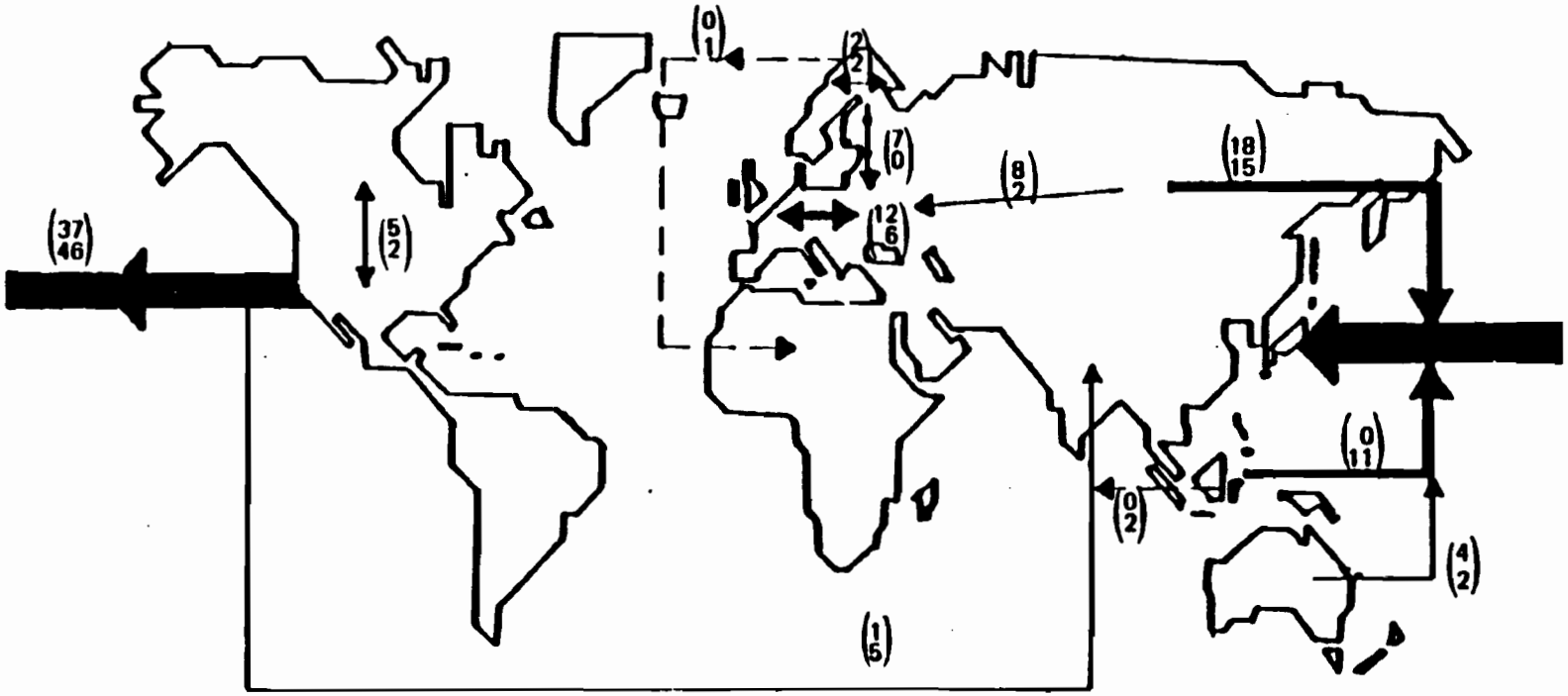
Figure 4

GLOBAL FOREST PRODUCTS EXPORTS - 1983



Source: FAO, 1983 Forest Products Yearbook

Figure 5



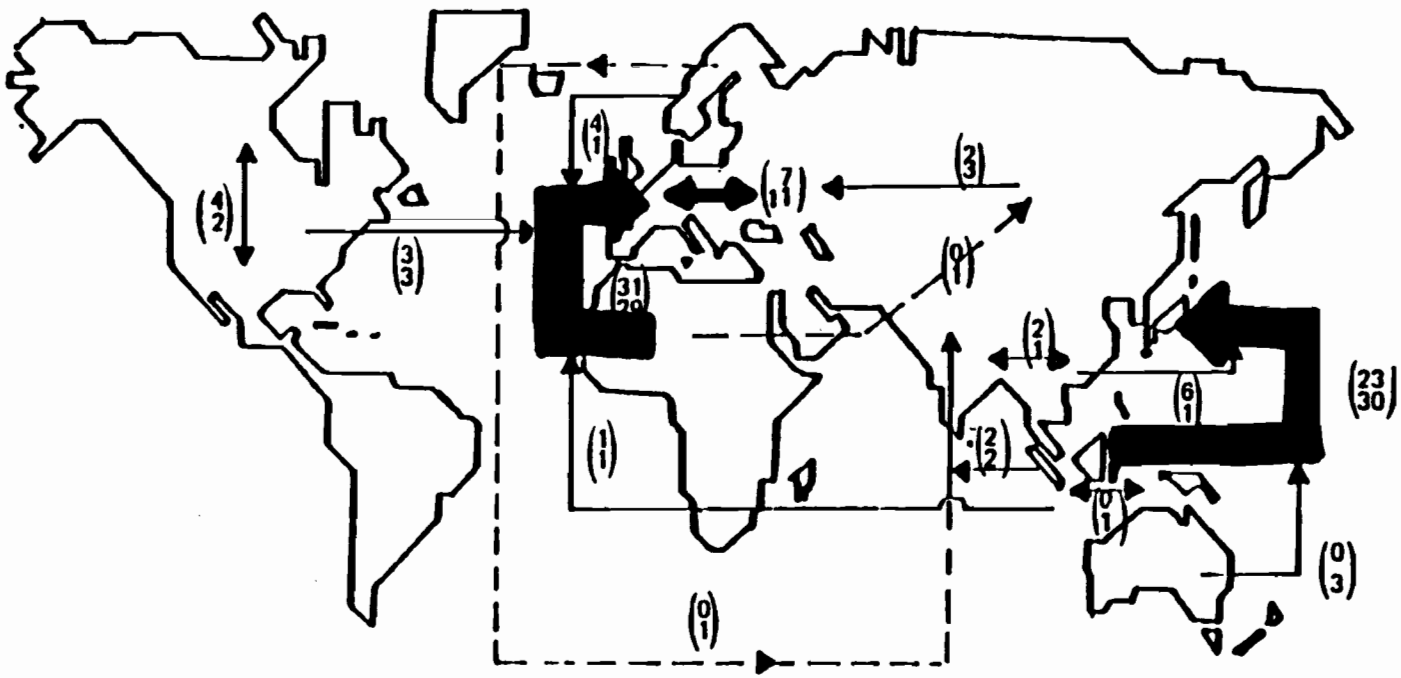
Coniferous Logs: bilateral trade flows ≥ 1% of world trade in 1981.

$\binom{1962}{1981}$ shares given

----- flow ≥ 1% only since the late seventies

Source: Francescon, Kornai, Nagy
IIASA

Figure 6



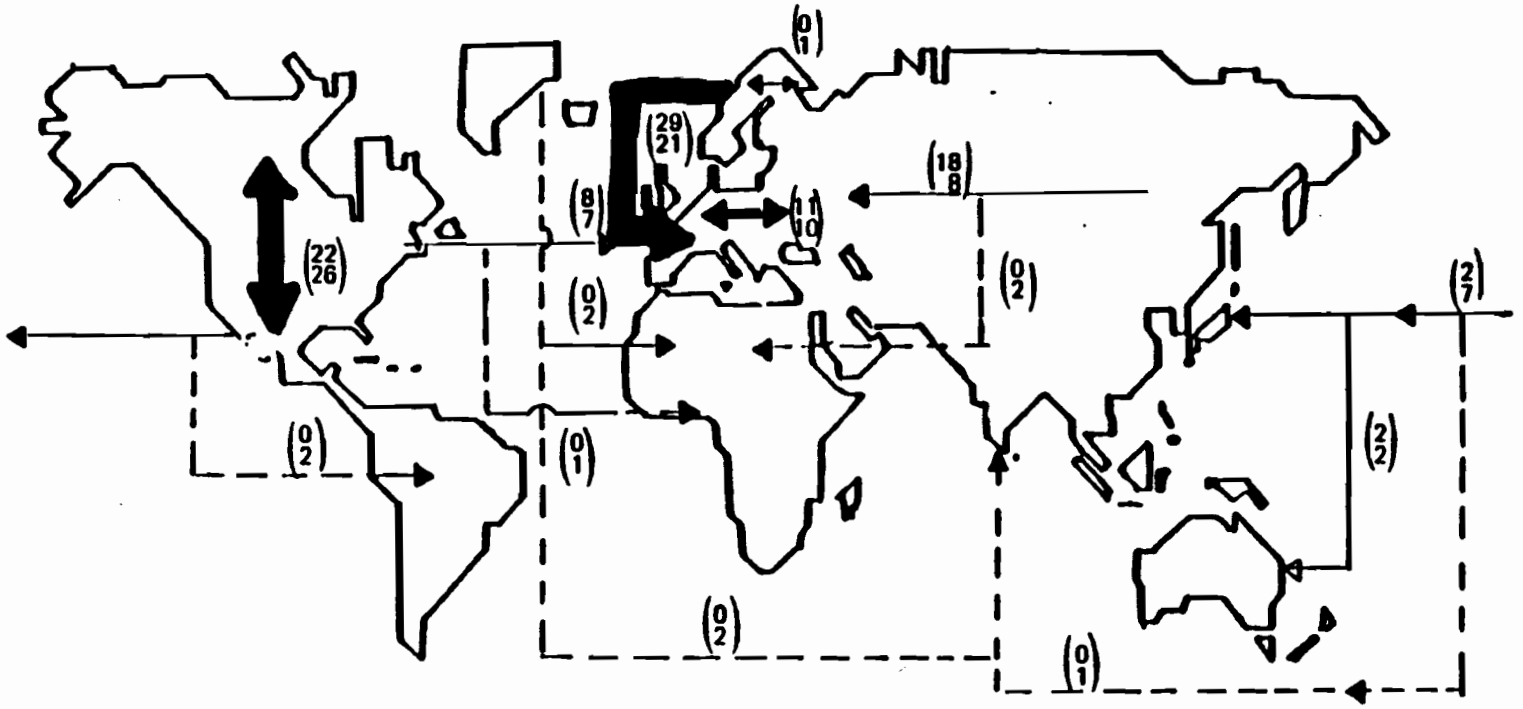
Non-Coniferous Logs: bilateral trade flows ≥ 1% of world trade in 1981.

$\binom{1962}{1982}$ shares given

----- flow ≥ 1% only since the late seventies

Source: Francescon, Kornai, Nagy
IIASA

Figure 7



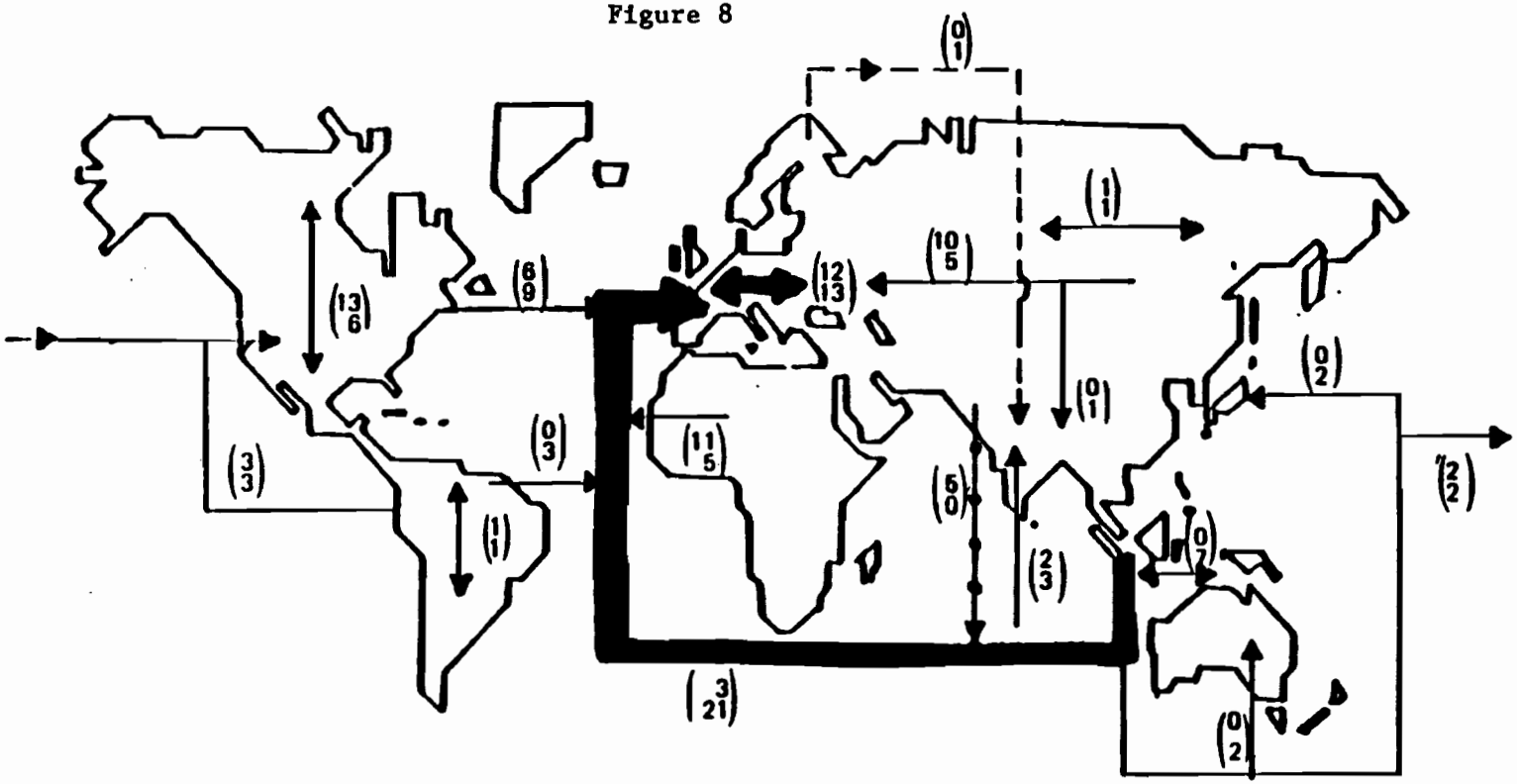
Coniferous Sawnwood: bilateral trade flows ≥ 1% of world trade in 1981.

$\binom{1962}{1981}$ shares given

----- flow ≥ 1% only since the late seventies

Source: Francescon, Kornai, Nagy
IIASA

Figure 8



Non-Coniferous Sawnwood: bilateral trade flows ≥ 1% of world trade in 1981.

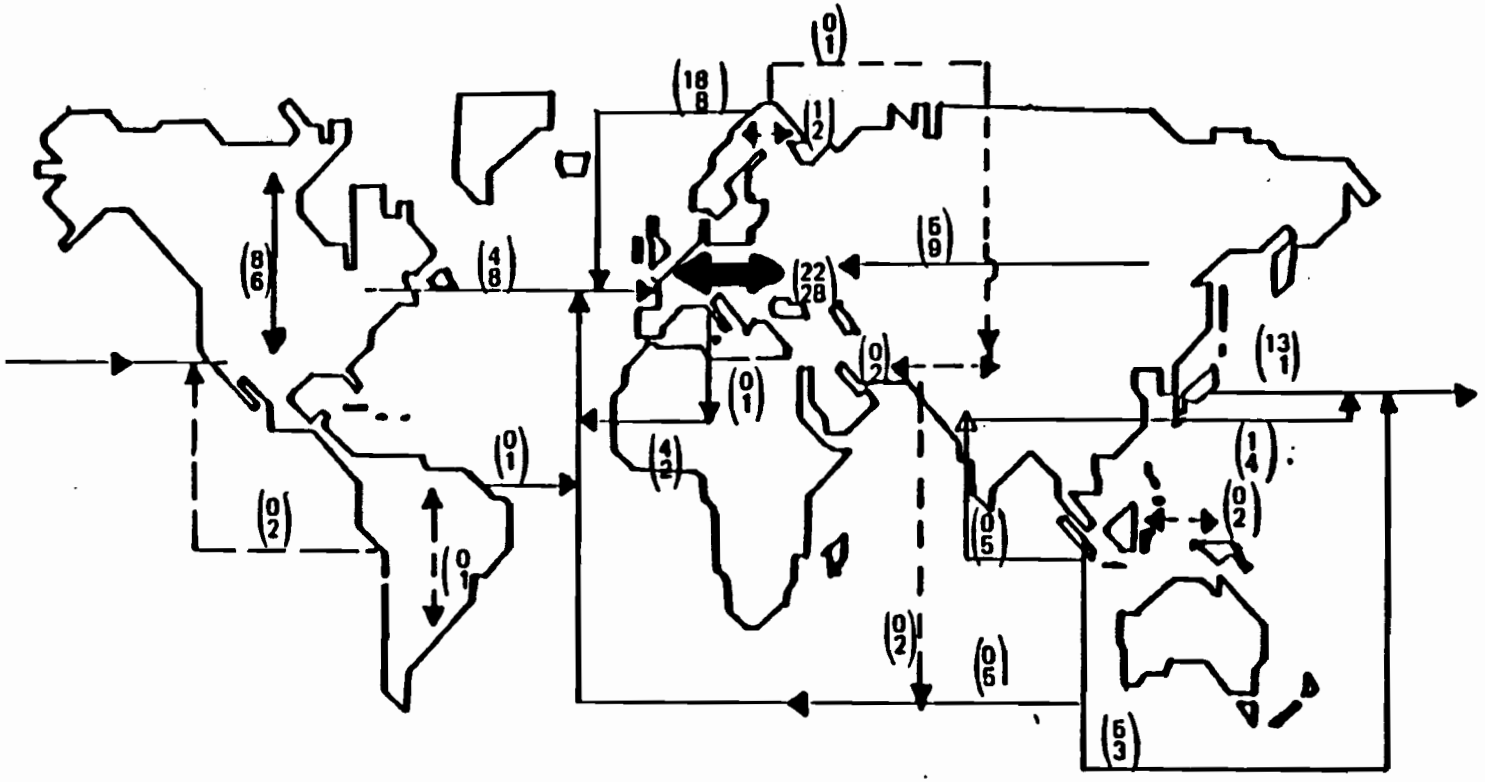
$\binom{1962}{1981}$ shares given

----- flow ≥ 1% only since the late seventies

—●●— flow ≥ 5% in 1962, but negligible by 1981

Source: Francescon, Kornai, Nagy
IIASA

Figure 9

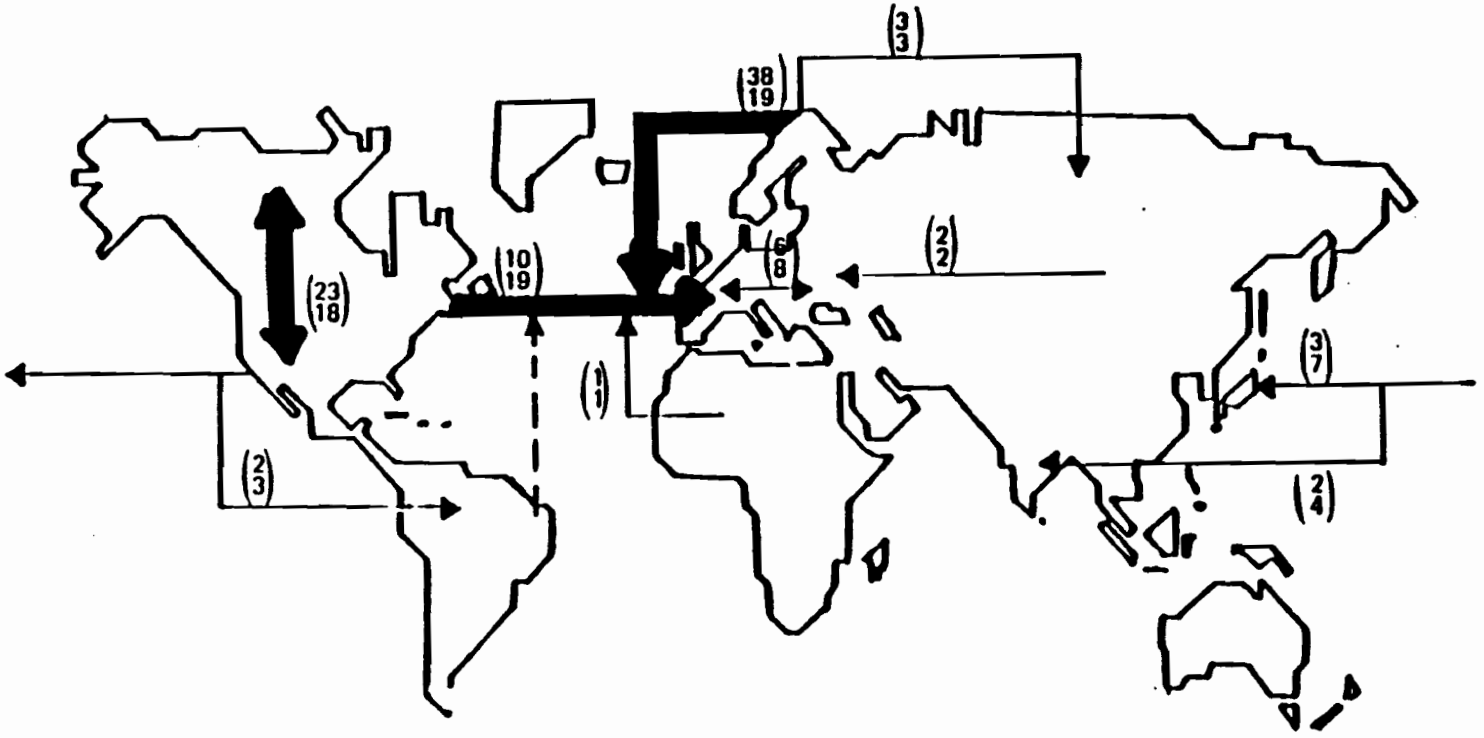


Panels: bilateral trade flows ≥ 1% of world trade in 1981.

$\binom{1962}{1981}$ shares given

----- flow ≥ 1% only since the late seventies

Figure 10



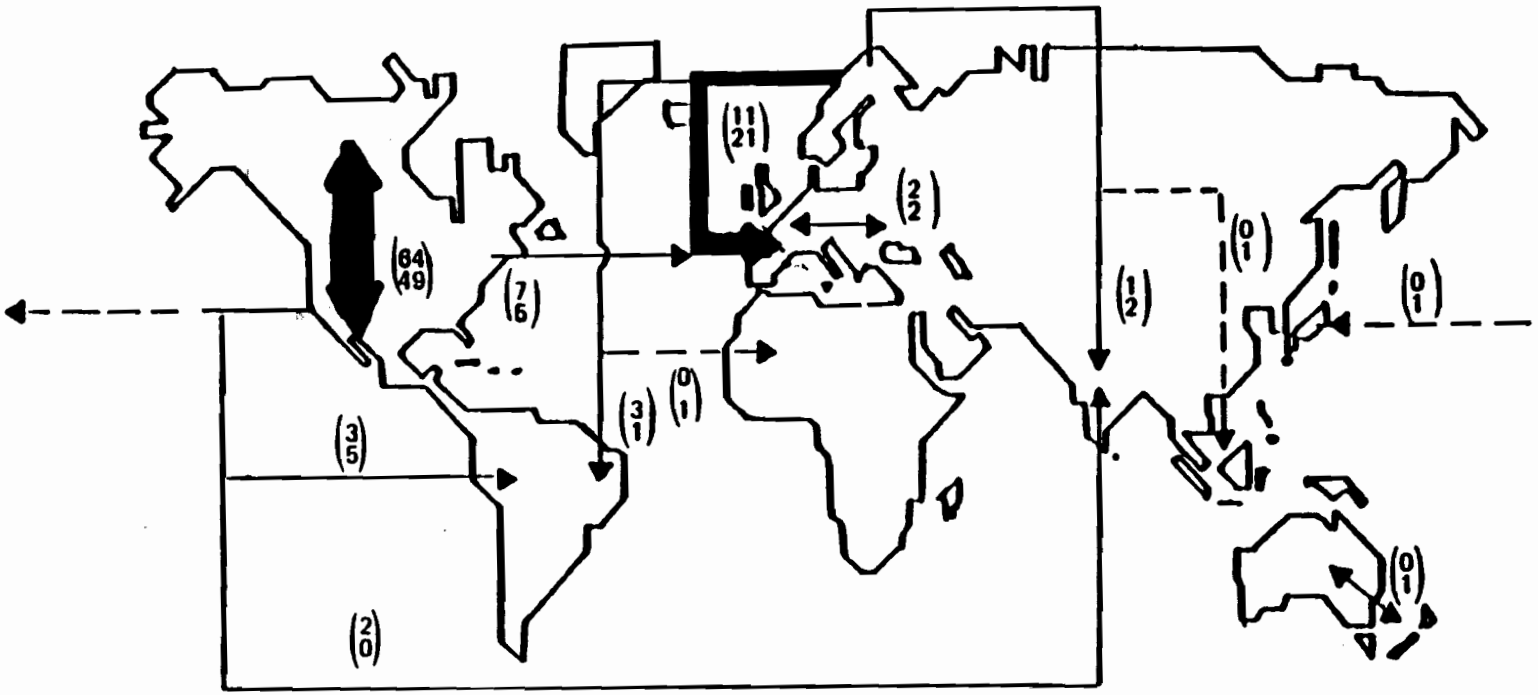
Pulp: bilateral trade flows ≥ 1% of world trade in 1981.

$\binom{1962}{1982}$ shares given

----- flow ≥ 1% only since the late seventies

Source: Francescon, Kornai, Nagy
IIASA

Figure 11



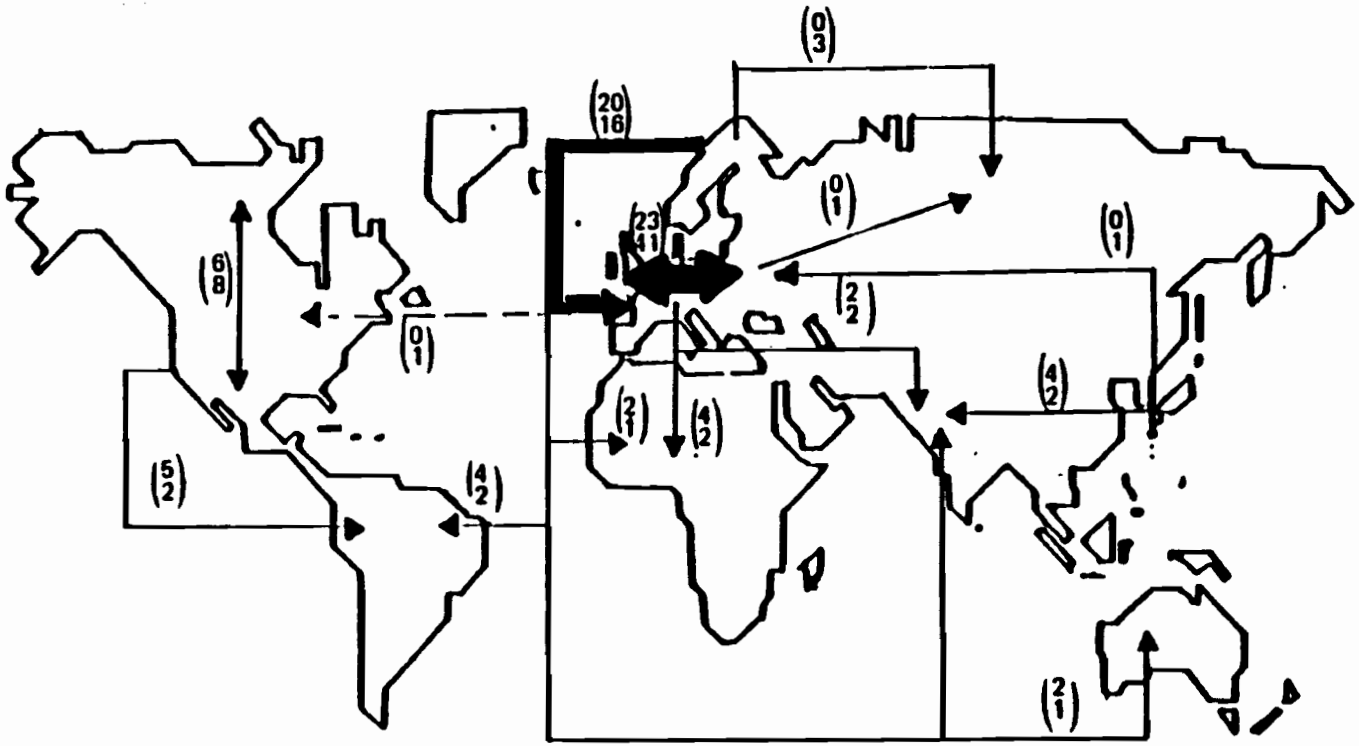
Newsprint: bilateral trade flows ≥ 1% of world trade in 1981.

$\binom{1962}{1981}$ shares given

----- flow ≥ 1% only since the late seventies

Source: Francescon, Kornai, Nagy
IIASA

Figure 12



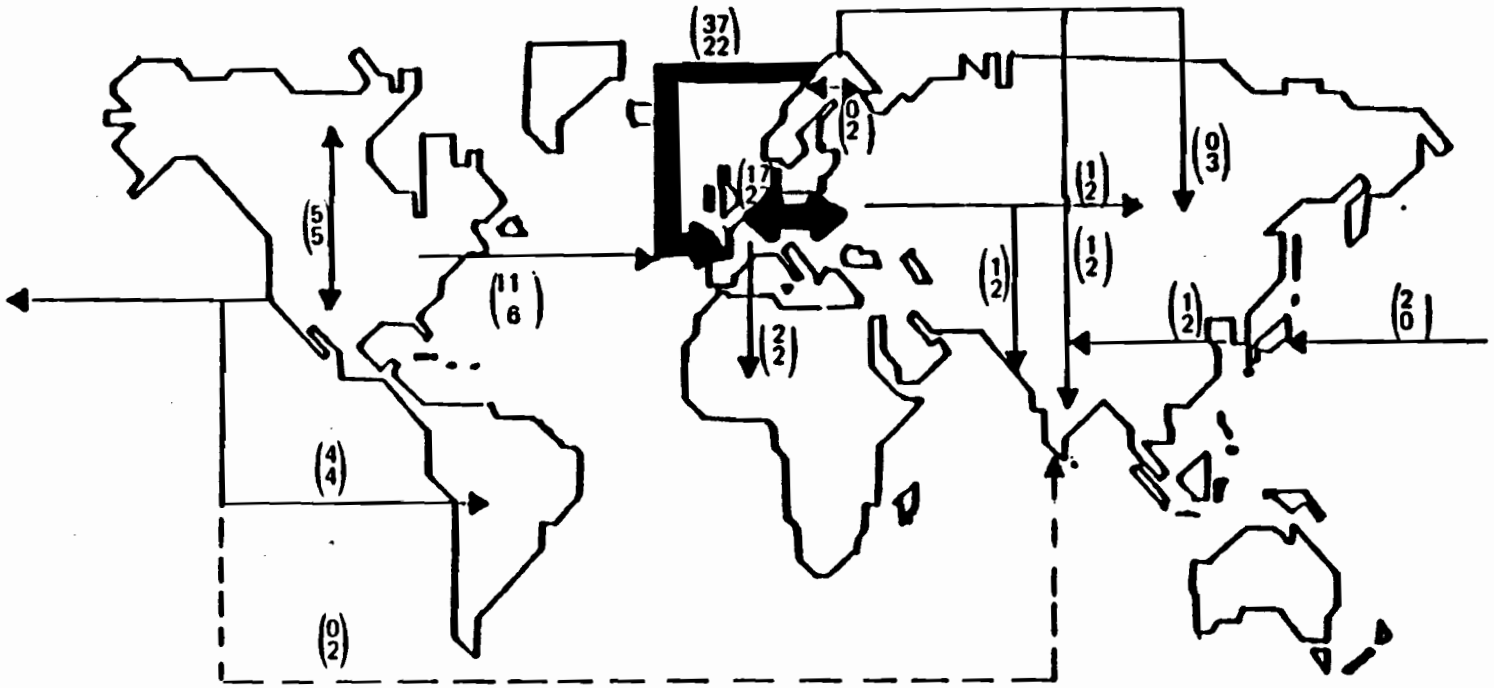
Other printing and writing paper: bilateral trade flows ≥ 1% of world trade in 1981.

(1962/1982) shares given

----- flow ≥ 1% only since the late seventies

Source: Francescon, Kornai, Nagy
IIASA

Figure 13



Other paper and board: bilateral trade flows ≥ 1.5% of world trade in 1981.

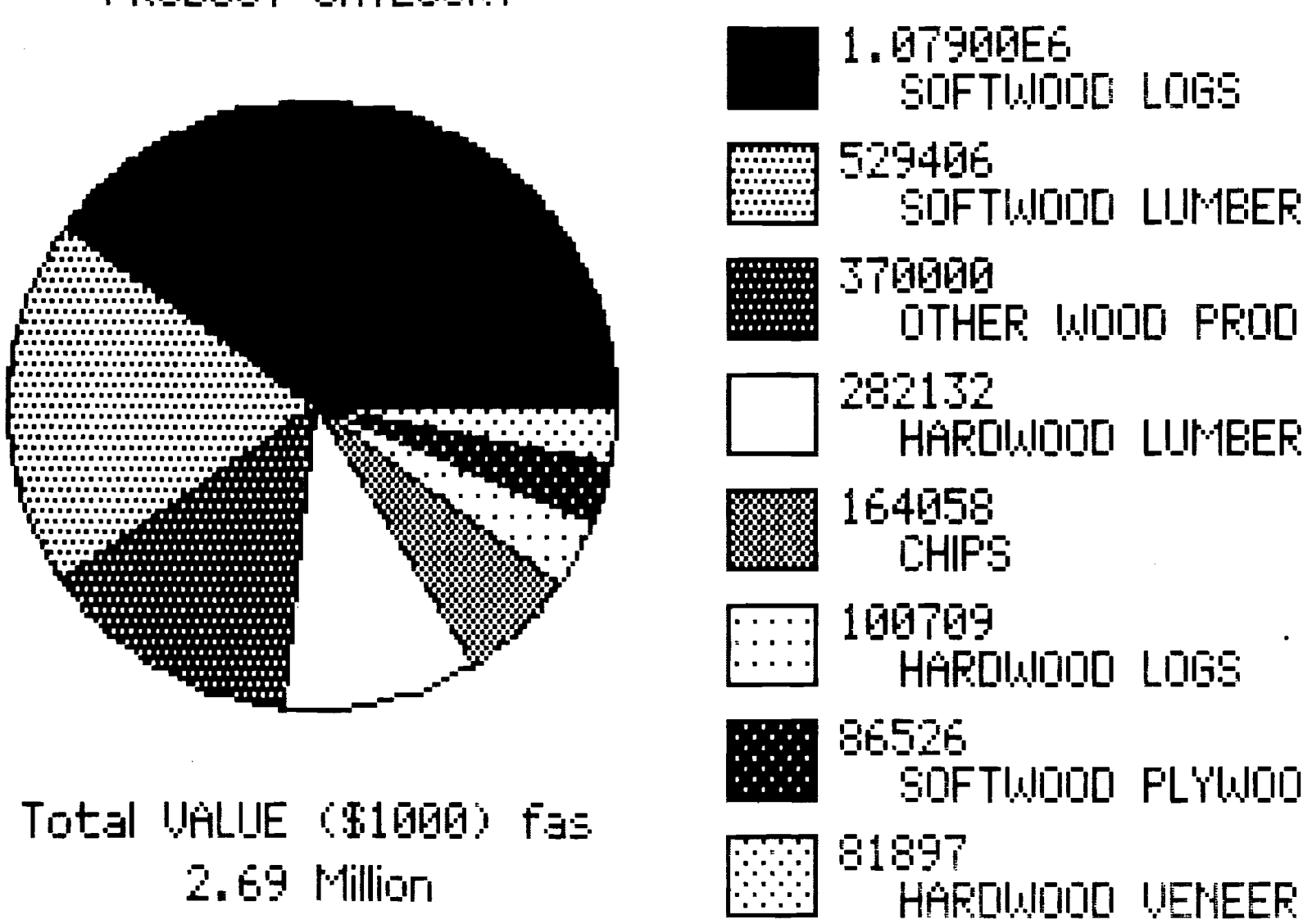
$\binom{1962}{1982}$ shares given

----- ≥ 1% only since the late seventies

Source: Francescon, Kornai, Nagy
IIASA

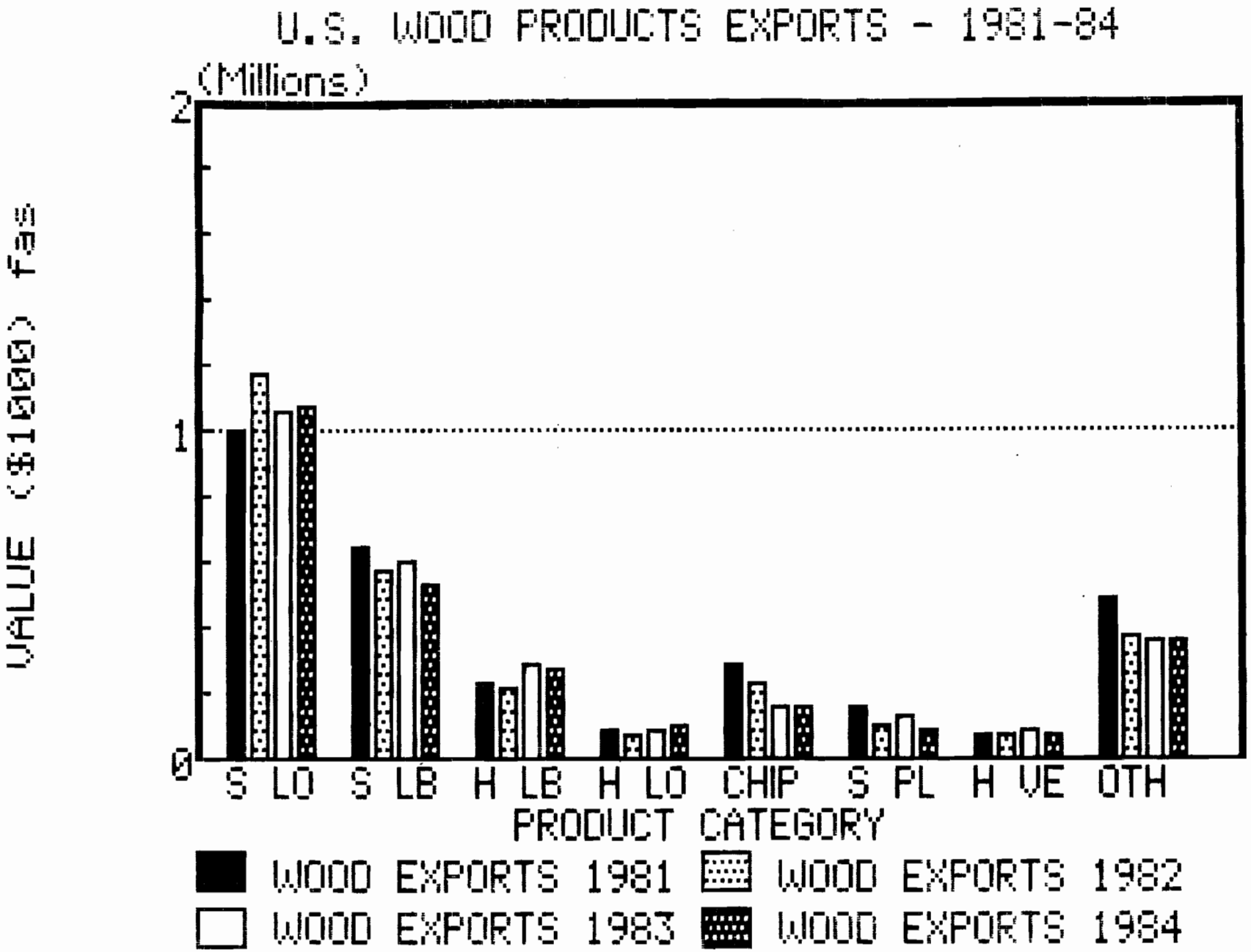
Figure 14

U.S. WOOD PRODUCTS EXPORTS - 1984



Source: Compiled from USDA, FAS Wood Products: International Trade and Foreign Markets 3rd Quarter, 1985 (Nov. 1985)

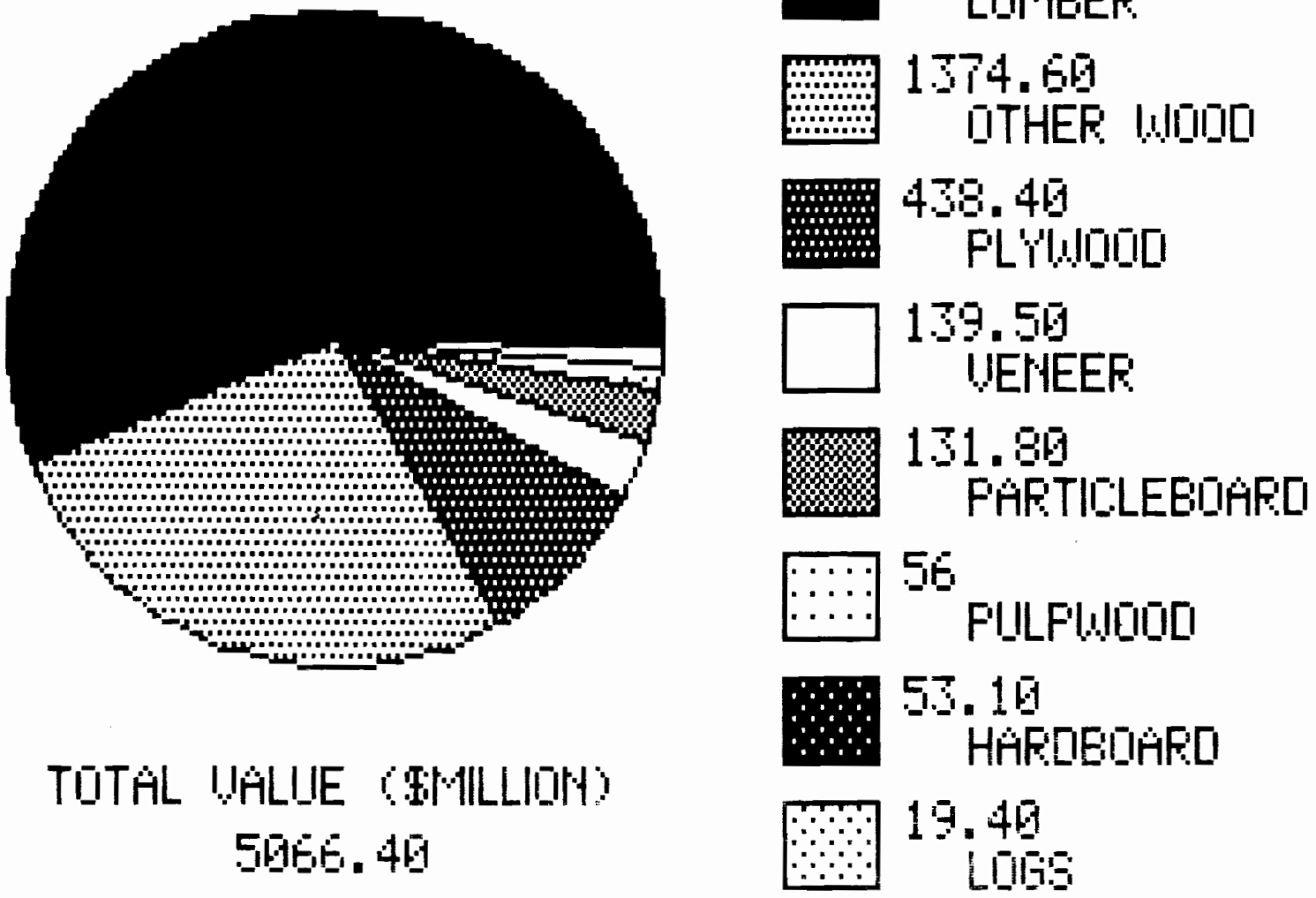
Figure 15



Source: Compiled from USDA, FAS Wood Products: International Trade and Foreign Markets 3rd Quarter, 1985 (Nov. 1985)

Figure 16

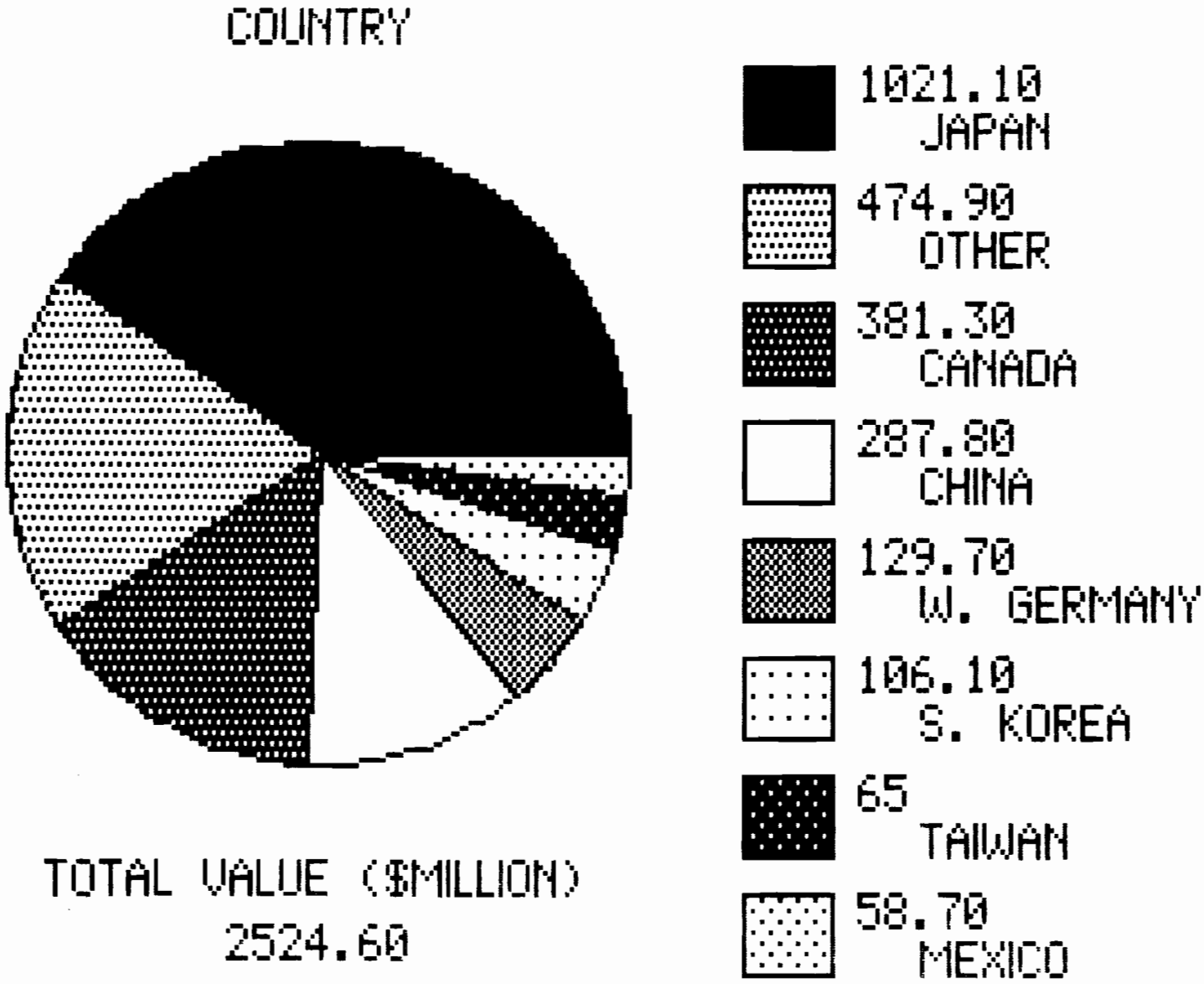
U.S. SOLID WOOD IMPORTS - 1984



Source: USDA Forest Service, 1985, "U.S. Timber Production, Trade, Consumption and Price Statistics, 1950-84"

Figure 17

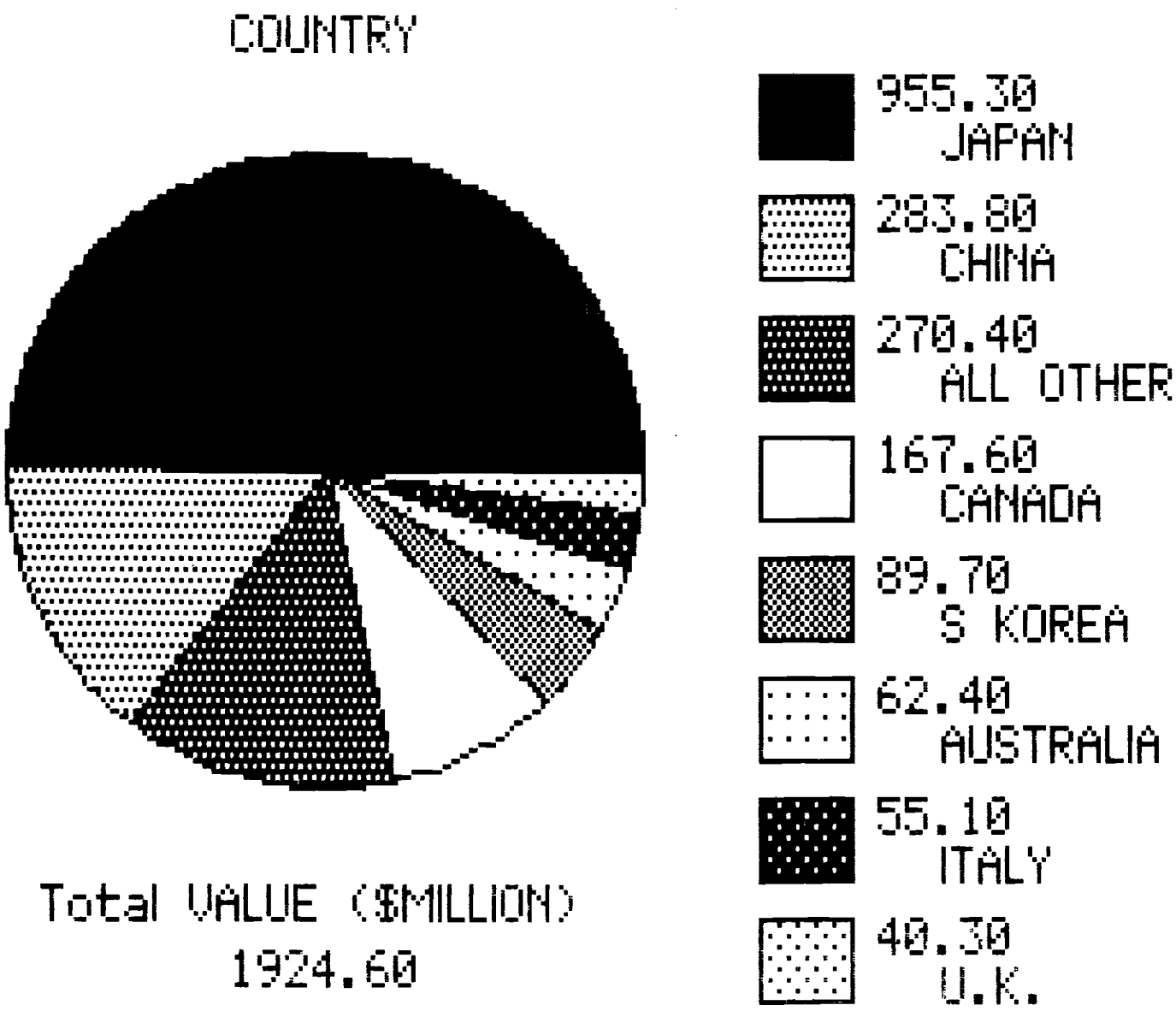
U.S. WOOD EXPORTS BY COUNTRY - 1984



Source: Compiled from USDA, FAS Wood Products: International Trade and Foreign Markets 3rd Quarter, 1985 (Nov. 1985)

Figure 18

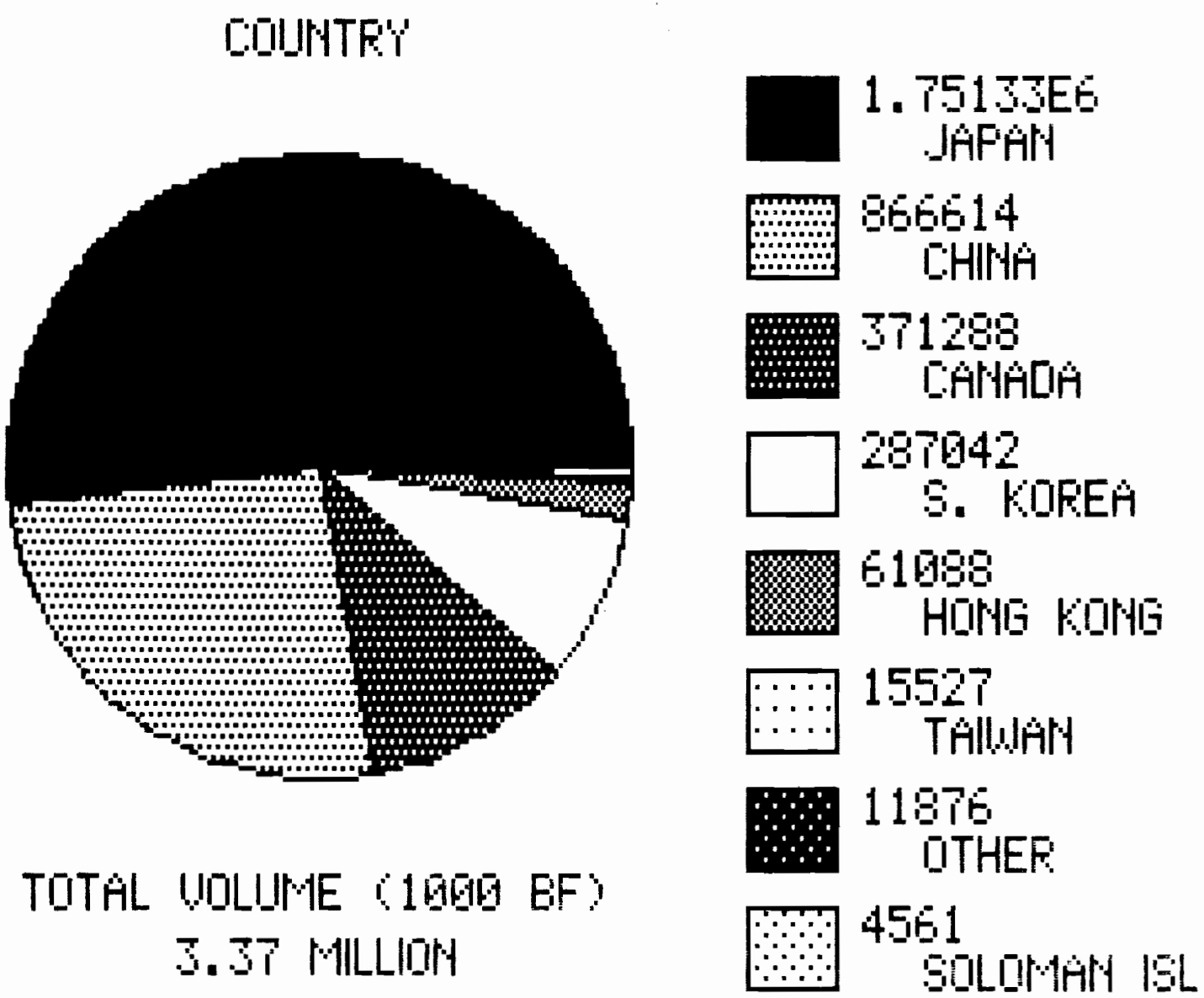
U.S. SOFTWOOD EXPORTS BY COUNTRY 1984



Source: Compiled from USDA, FAS Wood Products: International Trade and Foreign Markets 3rd Quarter, 1985 (Nov. 1985)

Figure 19

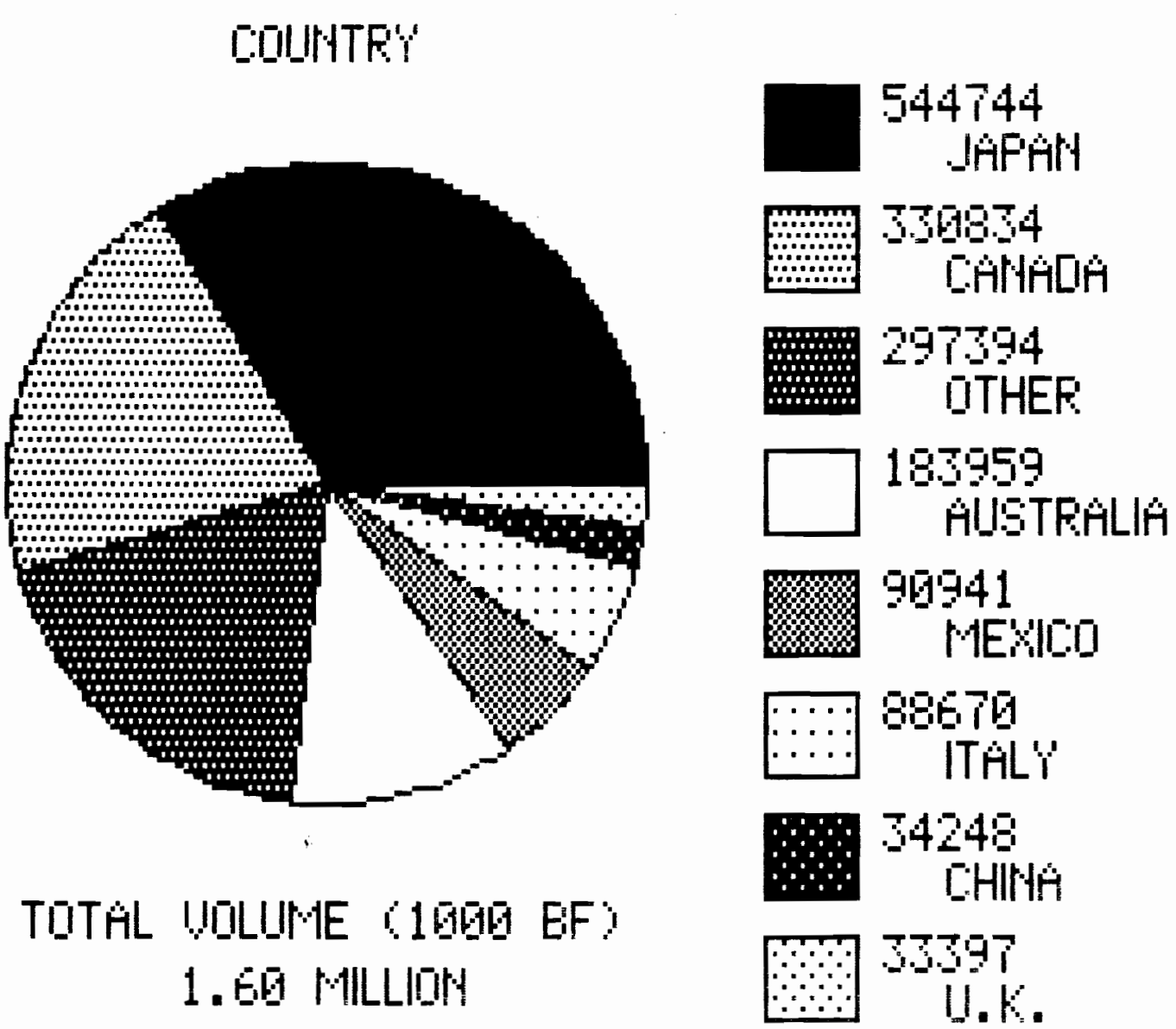
U.S. SOFTWOOD LOG EXPORTS - 1984



Source: Compiled from USDA, FAS Wood Products: International Trade and Foreign Markets 3rd Quarter, 1985 (Nov. 1985)

Figure 20

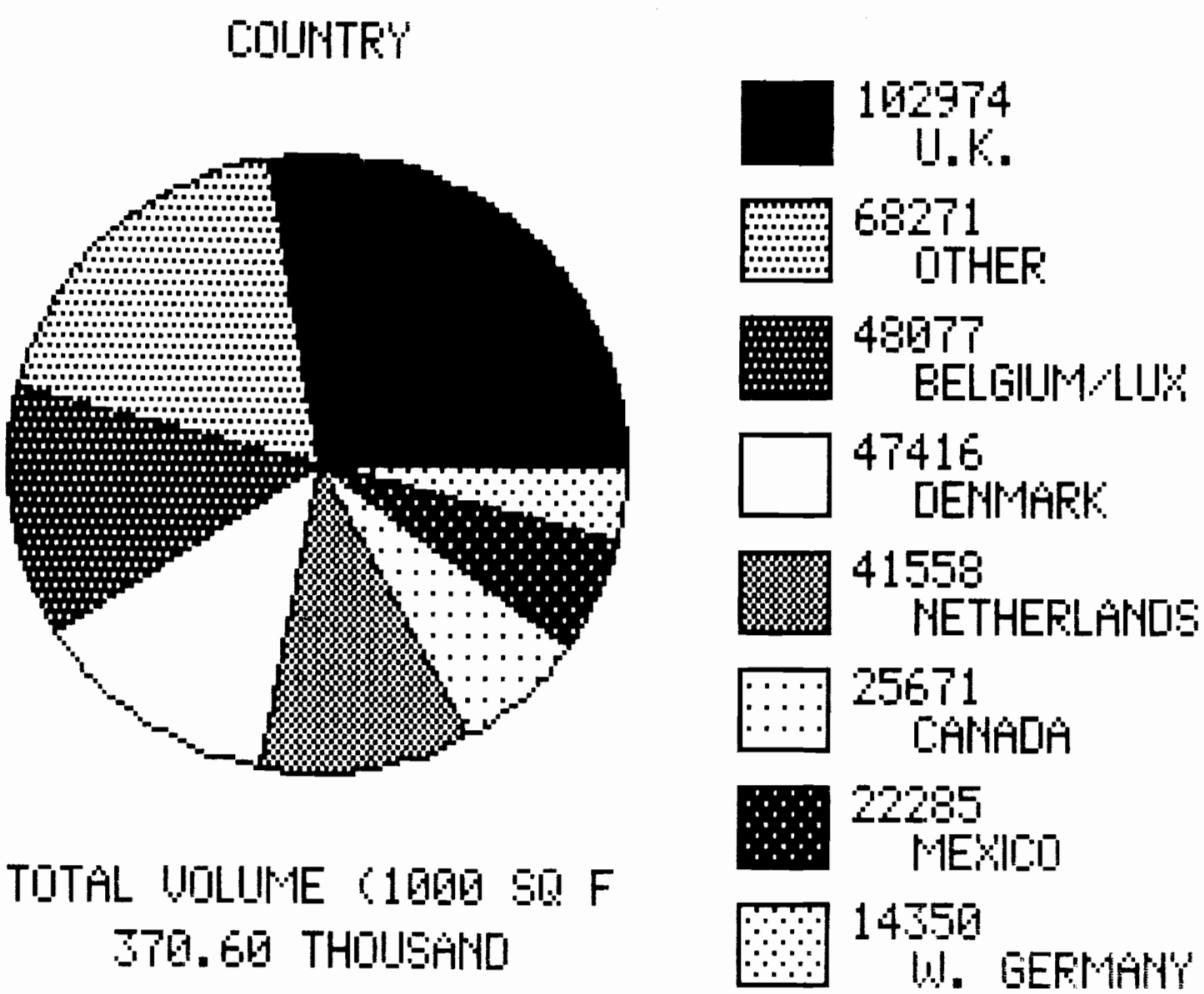
U.S. SOFTWOOD LUMBER EXPORTS - 1984



Source: Compiled from USDA, FAS Wood Products: International Trade and Foreign Markets 3rd Quarter, 1985 (Nov. 1985)

Figure 21

U.S. SOFTWOOD PLYWOOD EXPORTS - 1984

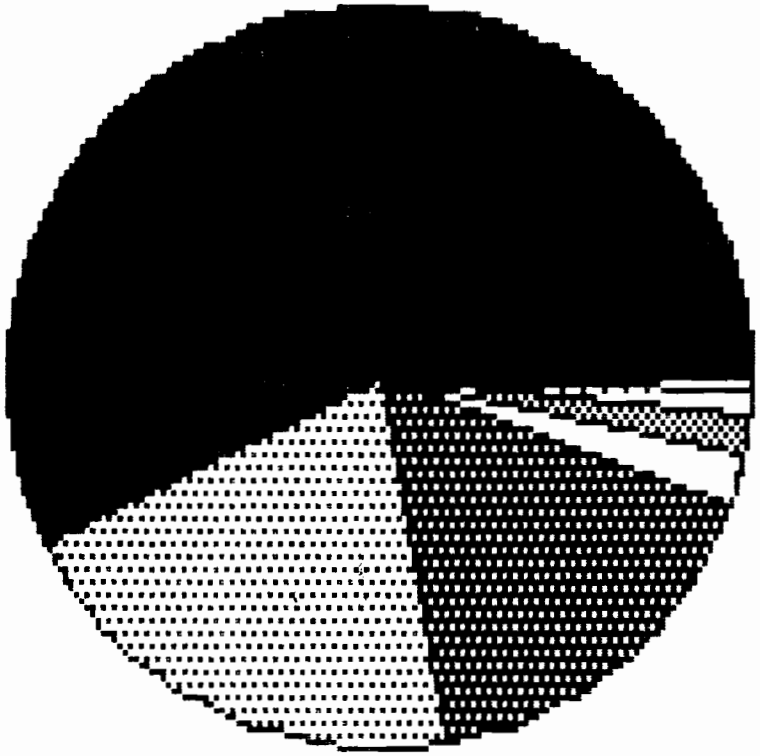


Source: Compiled from USDA, FAS Wood Products: International Trade and Foreign Markets 3rd Quarter, 1985 (Nov. 1985)

Figure 22

U.S. HARDWOOD EXPORTS - 1984

PRODUCT



282.10 LUMBER

100.70 LOGS

81.90 VENEER

11.60 RR TIES

8 PLYWOOD

5.70 FLOORING

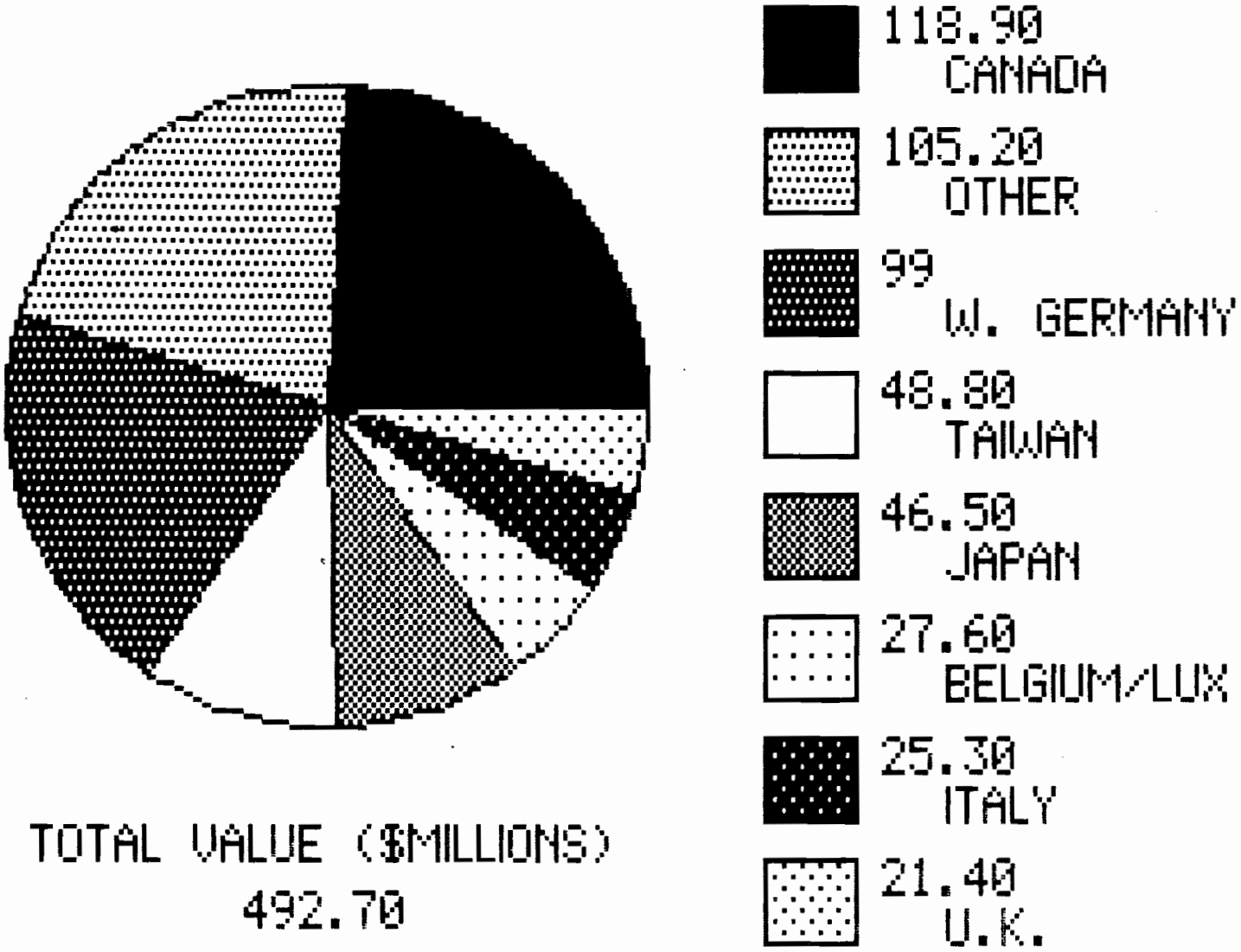
2.70 MOLDING/SIDING

TOTAL VALUE ($MILLION)
492.70

Source: Compiled from USDA, FAS Wood Products: International Trade and Foreign Markets 3rd Quarter, 1985 (Nov. 1985)

Figure 23

U.S. HARDWOOD EXPORTS - 1984

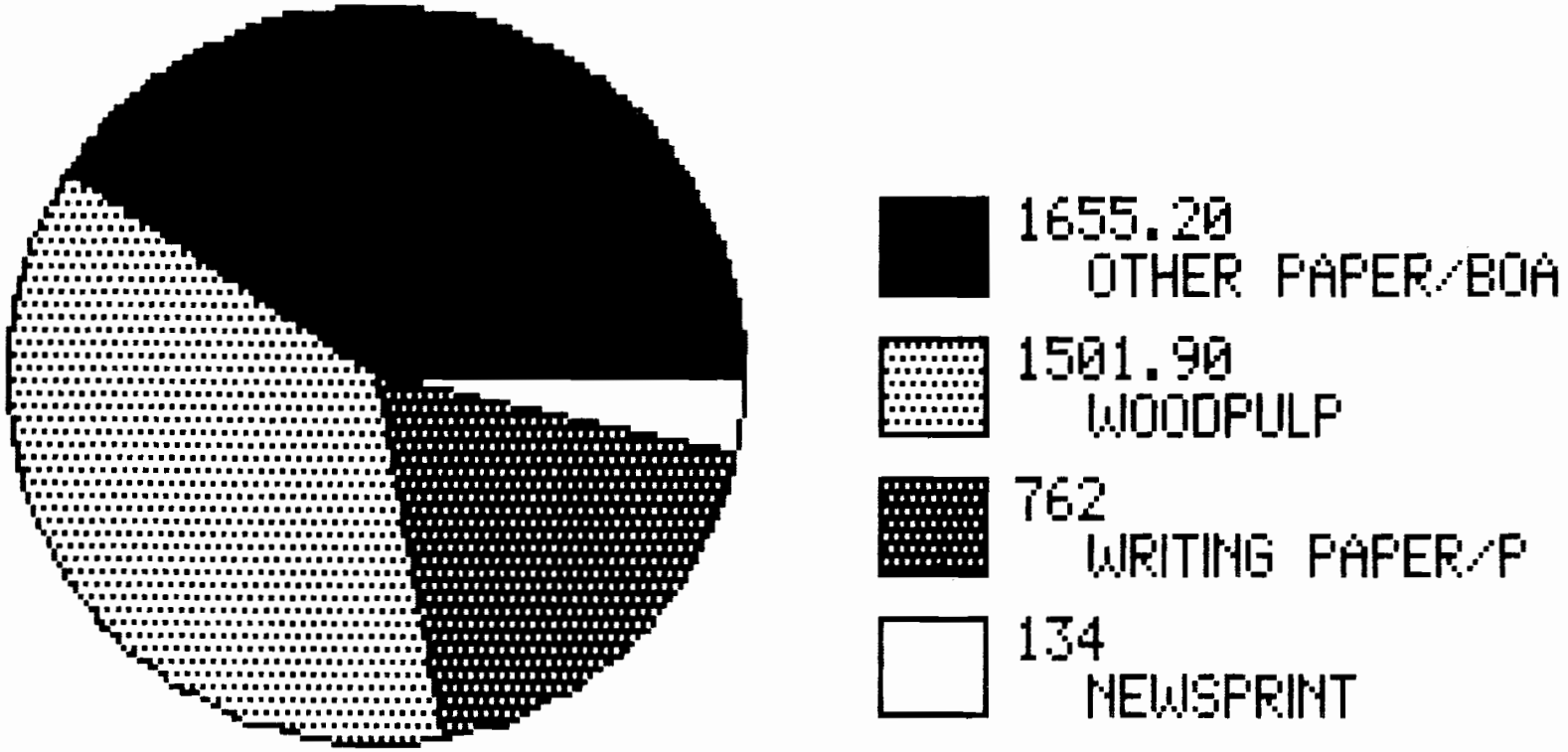


Source: Compiled from USDA, FAS Wood Products: International Trade and Foreign Markets 3rd Quarter, 1985 (Nov. 1985)

Figure 24

U.S. PULP AND PAPER EXPORTS - 1984

PRODUCT CATEGORY



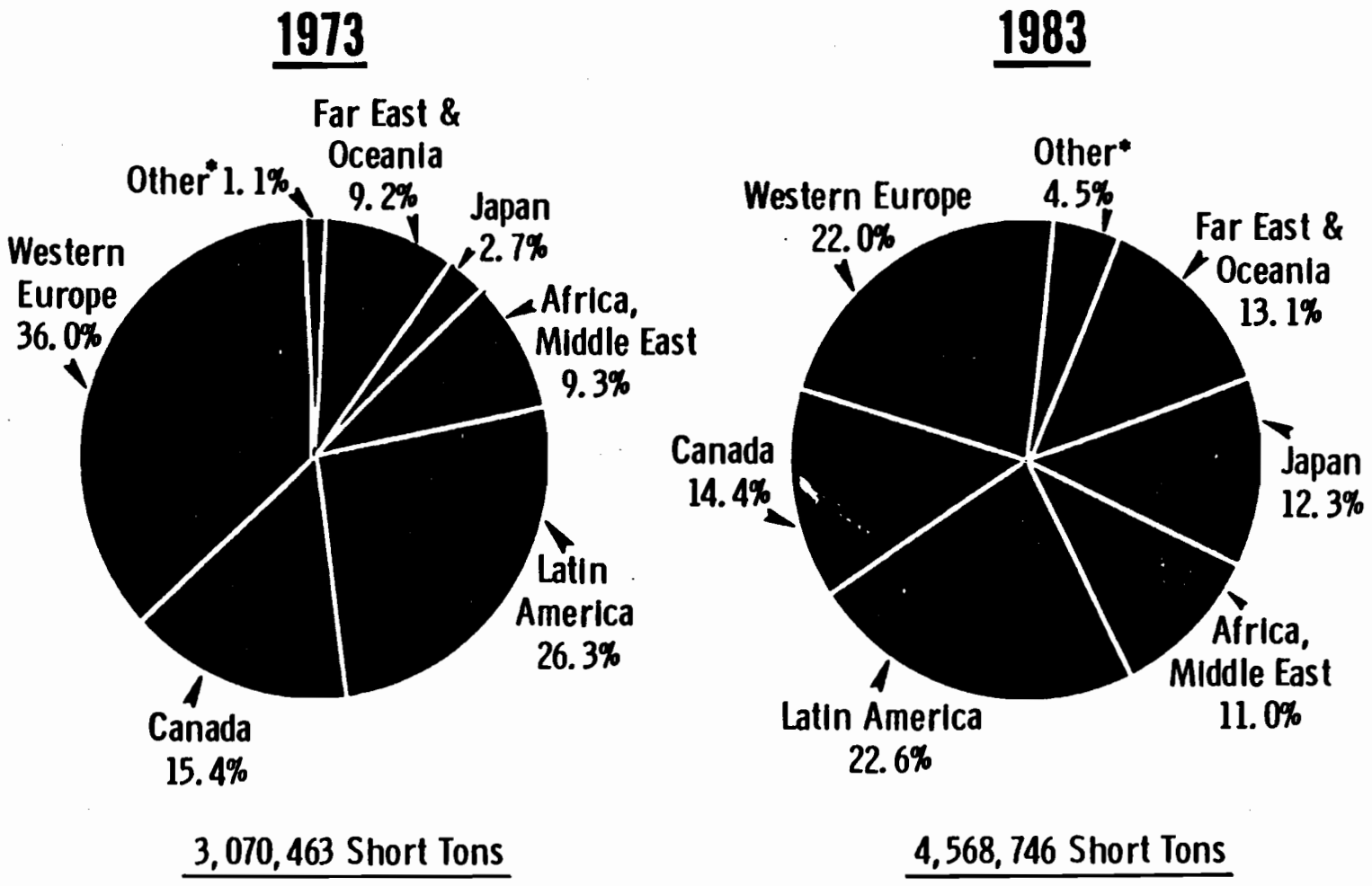
TOTAL VALUE ($MILLION)
4053.10

Source: USDA Forest Service, 1985, "U.S. Timber Production, Trade, Consumption, and Price Statistics, 1950-84"

Figure 25

U.S. EXPORTS OF PAPER, PAPERBOARD AND CONVERTED PRODUCTS

By Major Area of Destination



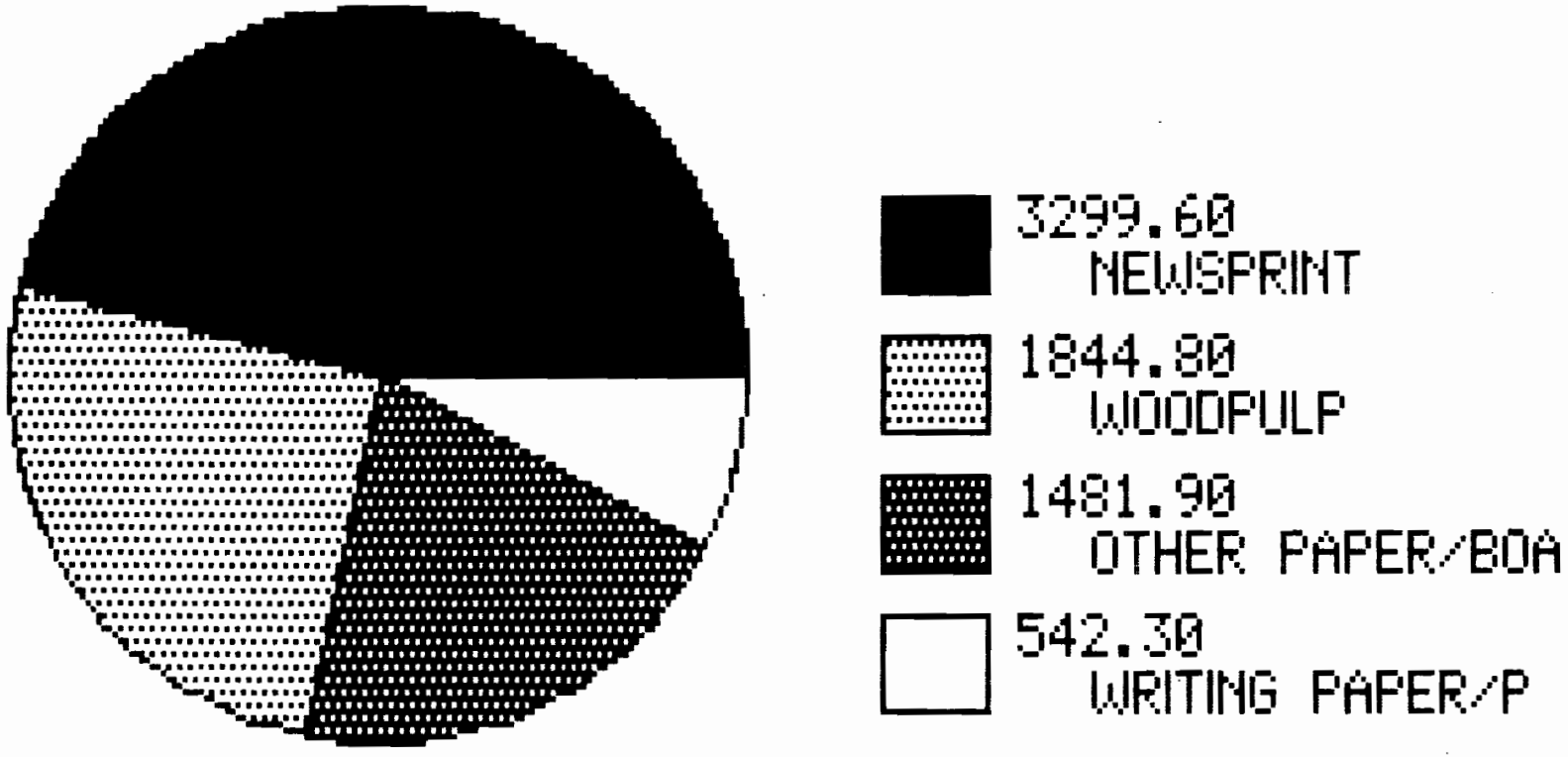
* Includes USSR / Eastern Europe and People's Republic of China

Reproduced from: Meister, Dr. Irene W., Multi-lateral Trade in Pulp and Paper. Conference on Canada/ U.S. Forest Products Trade. Duke University. April, 1984

Figure 26

U.S. PULP AND PAPER IMPORTS - 1984

PRODUCT CATEGORY



TOTAL VALUE ($MILLION)
7168.60

Source: USDA Forest Service, 1985, "U.S. Timber Production, Trade, Consumption, and Price Statistics, 1950-84"

Figure 27

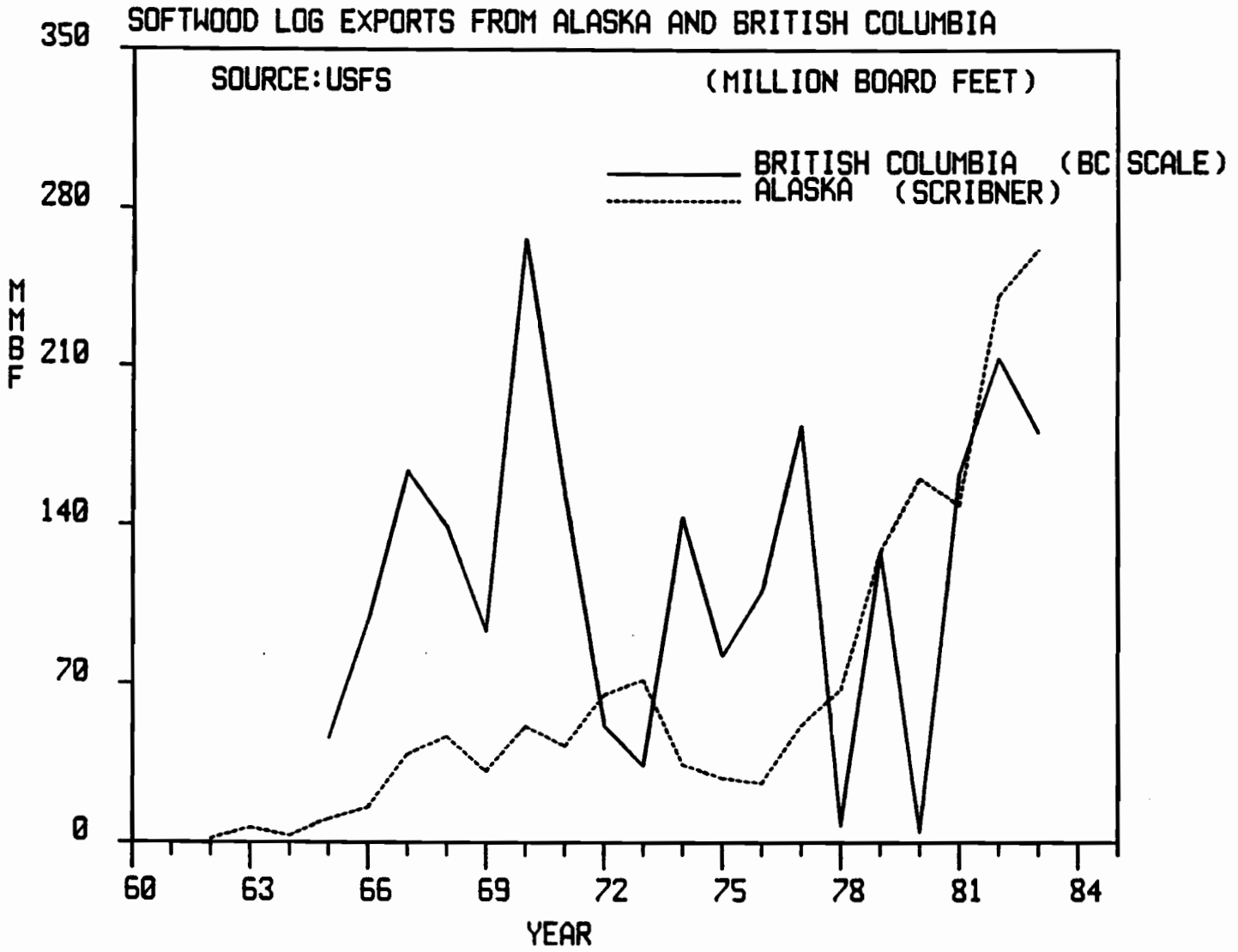

SOFTWOOD LOG EXPORTS FROM ALASKA AND BRITISH COLUMBIA
SOURCE:USFS
(MILLION BOARD FEET)
BRITISH COLUMBIA (BC SCALE)
ALASKA (SCRIBNER)
MMBF
350
280
210
140
70
0
60
63
66
69
72
75
78
81
84
YEAR

Figure 28

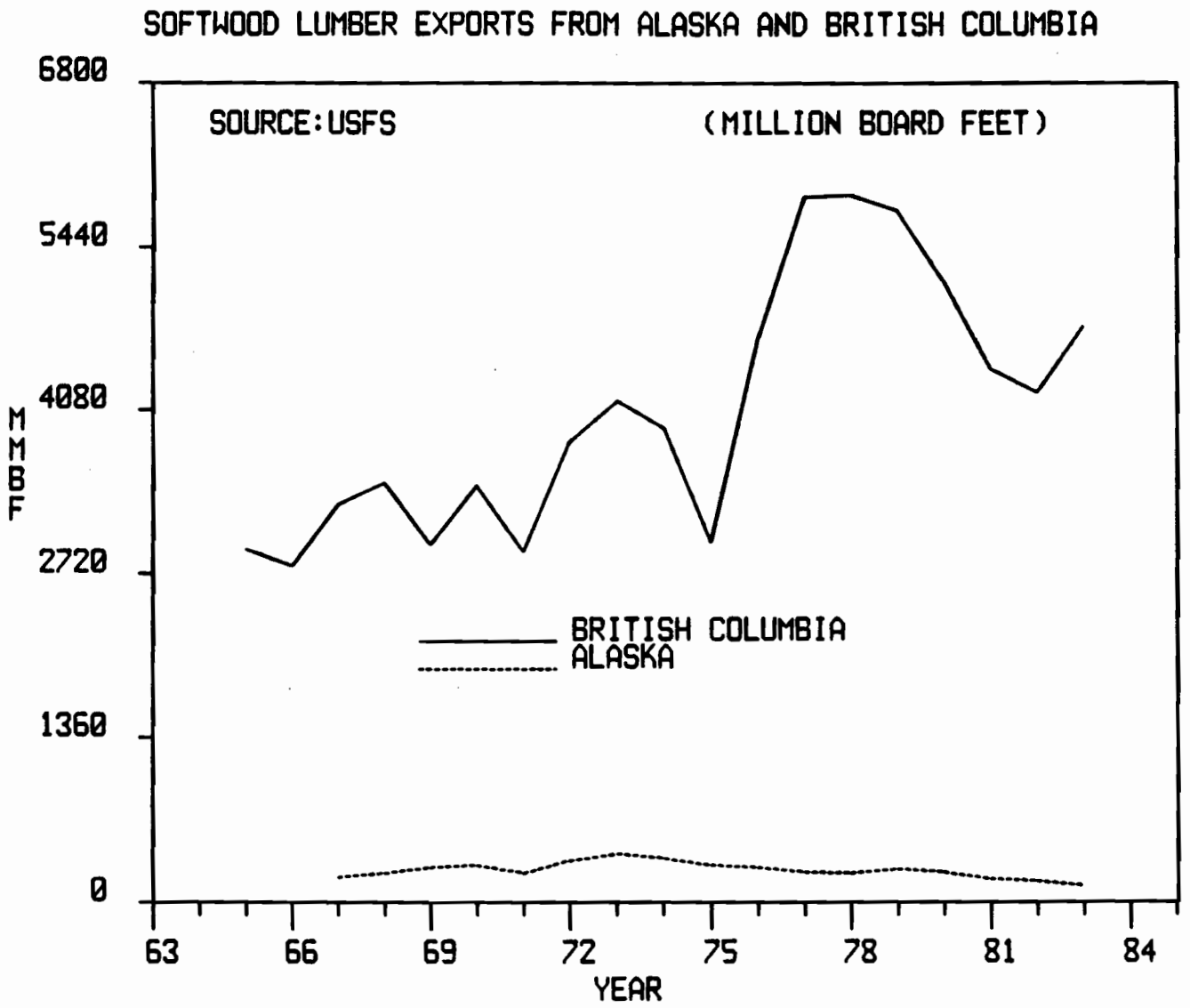

SOFTWOOD LUMBER EXPORTS FROM ALASKA AND BRITISH COLUMBIA
SOURCE:USFS
(MILLION BOARD FEET)
6800
5440
4080
2720
1360
0
MMBF
BRITISH COLUMBIA
ALASKA
63
66
69
72
75
78
81
84
YEAR

Table 1: 1980 Harvest - Tongass National Forest

Species	MBF (Thousand B.F. Scribner Scale)	%
Sitka Spruce (Picea sitchensis)	106,801	22
Western Hemlock (Tsuga heterophylla)	298,009	62
Western Red Cedar (Thuja plicata)	15,332	3
Alaska Yellow Cedar (Chamaecyparis nootkatensis)	9,174	2
Other	392	
Total Sawlog	429,708	89
Sitka Spruce Utility (Pulp) logs	7,626	2
Western Hemlock Utility (pulp) logs	44,166	9
Total Harvest	481,499	100

Source: Alaska Forest Market Report
March, 1983

Reproduced from: Alaska's Commercial Forest Resource. Dept. of Commerce and Economic Development. State of Alaska

Table 2

LAND STATUS IN ALASKA

OWNER	1982	1990
	(Million acres)	
Federal		
Conservation Units	151.8	152.4
BLM	147.6	70.0
Other	2.6	2.6
Total Federal	302.0	225.0
State (includes local govn.)	52.0	104.0
Native	20.0	44.0
Other Private	1.0	2.0
Total Alaska	375.0	375.0

Source: Alaskan Resources Development, edited by Thomas Morehouse, Westview Press, 1984

Table 3

EXPORTS OF ALASKAN WOOD PULP TO ALL DESTINATIONS
PERIOD: 1980 THROUGH 1985

YEAR	UNIT	TYPE OF PULP: BLEACHED SULPHITE	TYPE OF PULP: SULPHATE BLEACHED SOFTWOOD	TYPE OF PULP: SPECIAL ALPHA AND DISSOLVING	TOTAL PULP
1980	TONS	67,433	249	244,310	312,002
	$1,000	29,522	126	126,600	153,248
	$/TON	438	507	506	491
1981	TONS	37,916	1,929	246,381	286,226
	$1,000	14,637	951	124,905	140,493
	$/TON	386	493	507	491
1982	TONS	9,690	1,104	199,130	209,924
	$1,000	3,008	400	95,062	98,470
	$/TON	310	363	477	469
1983	TONS	3,880	0	238,084	241,963
	$1,000	1,054	0	116,729	117,783
	$/TON	272	0	490	487
1984	TONS	21,116	12,834	177,490	211,440
	$1,000	8,118	6,031	79,499	93,648
	$/TON	384	470	448	443

Value data is "Free Alongside Ship"
Sources: U.S. Dept. of Commerce Annual and Monthly Export Statistics
Reproduced from:Alaska Forest Market Report, March, 1985.

Table 4

Timber Processing Capacity and Output in Alaska, 1984

Company	Location	Capacity	1984 Output
Pulpmills:		(M tons)	
Alaska Pulp Co.	Sitka	192	152
Louisiana Pacific	Ketchikan	200	85
Sawmills:		(MMBF)	
Alaska Timber Co.	Klawock	45	6
Wrangell Forest Prod.	Wrangell	68	35
Louisiana Pacific	Annette Island	60	75
Louisiana Pacific	Ketchikan	60	0
Mitkof Lumber Co.	Petersburg	15	4
Pacific Forest Prod.	Haines	30	6
Yakutat-Kwan/Koncor	Yakutat	15	1

Source: Joe Mehrkens, U.S. Forest Service

Reproduced from: Alaska's Commercial Forest Resources. Dept. of Commerce and Economic Development. State of Alaska

Table 3

EXPORTS OF ALASKAN WOOD PULP TO ALL DESTINATIONS
PERIOD: 1980 THROUGH 1985

YEAR	UNIT	TYPE OF PULP: BLEACHED SULPHITE	SULPHATE BLEACHED SOFTWOOD	SPECIAL ALPHA AND DISSOLVING	TOTAL PULP
1980	TONS	67,433	249	244,310	312,002
	$1,000	29,522	126	126,600	153,248
	$/TON	438	507	506	491
1981	TONS	37,916	1,929	246,381	286,226
	$1,000	14,637	951	124,905	140,493
	$/TON	386	493	507	491
1982	TONS	9,690	1,104	199,130	209,924
	$1,000	3,008	400	95,062	98,470
	$/TON	310	363	477	469
1983	TONS	3,880	0	238,084	241,963
	$1,000	1,054	0	116,729	117,783
	$/TON	272	0	490	487
1984	TONS	21,116	12,834	177,490	211,440
	$1,000	8,118	6,031	79,499	93,648
	$/TON	384	470	448	443

Value data is "Free Alongside Ship"
Sources: U.S. Dept. of Commerce Annual and Monthly Export Statistics
Reproduced from:Alaska Forest Market Report, March, 1985.

Table 4

Timber Processing Capacity and Output in Alaska, 1984

Company	Location	Capacity	1984 Output
Pulpmills:		(M tons)	
Alaska Pulp Co.	Sitka	192	152
Louisiana Pacific	Ketchikan	200	85
Sawmills:		(MMBF)	
Alaska Timber Co.	Klawock	45	6
Wrangell Forest Prod.	Wrangell	68	35
Louisiana Pacific	Annette Island	60	75
Louisiana Pacific	Ketchikan	60	0
Mitkof Lumber Co.	Petersburg	15	4
Pacific Forest Prod.	Haines	30	6
Yakutat-Kwan/Koncor	Yakutat	15	1

Source: Joe Mehrkens, U.S. Forest Service

Reproduced from: Alaska's Commercial Forest Resources. Dept. of Commerce and Economic Development. State of Alaska