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Softwood Log Exports and the Value and Employment Issues

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SOFTWOOD LOG EXPORTS AND THE VALUE AND EMPLOYMENT ISSUES

Reference Abstract

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Direct employment per thousand board feet of logs processed is higher in domestic lumber and veneer and plywood industries than in the log export industry. Relative product values and indirect effects of domestic and export markets vary over time. Success of policies to maximize trade offs between markets is not certain because responses of industry members to changes in policies are uncertain.

KEYWORDS: Logging economics, export (forest products), employment (forest labor), trade policy (international).

RESEARCH SUMMARY
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1975

Potential value and employment trade offs between the log export and domestic timber processing industries are issues when the effects of log export control policies are weighed. Value and employment trade offs are only part of the broader debate over softwood log exports.

Direct employment per thousand board feet of logs processed in Washington and Oregon in 1973 was 4.72 man-hours for the log export industry, 12.58 for the lumber industry, and 19.47 for the veneer and plywood industry. Relative values of products in the two markets vary over time. Relative export values were higher in 1970 and 1973; domestic values were higher in other years over the period 1965-73.

Indirect effects of the domestic and export markets on value and employment are tied to direct values created in the two markets and vary over time. Owners of stumpage have become relatively more important in determination of indirect impacts of the two markets on value and employment.

The success of policies to maximize trade offs between the domestic and export markets is not certain because the responses of industry members to changes in trade policies are uncertain. These responses will be constrained by market and foreign policy conditions at the time of a change in trade policy.

Introduction

Many issues have been raised in the continuing debate over softwood log exports. An understanding of these issues is necessary to place in proper perspective the positions of various individuals and groups affected by log exports. In particular, it is important that trade offs among interests are considered in proposed or potential legislation on control of log exports.

Two key issues in the debate over potential log export control legislation are the value and employment associated with exporting logs compared with domestic processing of similar logs. Identification of the trade offs between the export and domestic industries in value and employment is important because of the potential effects of legislation on Pacific Northwest and U.S. economies.

Trade offs between export and domestic industries in value and employment are only part of the information necessary for weighing alternative policies on log exports. An understanding of the development of the log export issue is necessary to keep in perspective information on the value and employment components of the issue.

The total economic impacts of the export and domestic industries can be broken down into direct and indirect impacts. This report presents quantitative information on only the direct impacts of the two industries. However, an understanding of how and what kinds of indirect impacts are transmitted to the Pacific Northwest and U.S. economies is necessary to keep in perspective information on the relative direct impacts of the two industries.

The purposes of this report are:

1. To discuss the development of the value and employment issues within the perspective of the broader debate over softwood log exports.

2. To compare direct value and employment associated with exporting vs. domestic processing of similar softwood logs.

3. To provide a background on the possible indirect effects of the export and domestic markets on value and employment in the forest products industries.

Development of Issues

THE LOG EXPORT ISSUE HAS DEVELOPED OVER THE PAST DECADE

Log export volume from the U.S. west coast increased steadily through the 1960's into the 1970's (fig. 1). Exceptions were a decline in 1969 attributable in part to a decline in demand in Japan and a decline in 1971 caused in part by a labor dispute which affected west coast shipping for 3 months. Total volume stabilized in 1973. From 1962 through 1973, Washington and Oregon accounted for over 85 percent of annual softwood log exports from the west coast.

After 1969, exports became increasingly concentrated in Washington and Oregon, as did the focus of the issues involved with this trade. By the 1970's, the log export market accounted for about 15 percent of the timber harvest in Washington and Oregon (fig. 2). The developing log export market added pressures to the timber resource market in the Pacific Northwest. These pressures tended to peak during periods of high domestic demand and led to the development of many proposals to limit forest products exports, including softwood logs. For example, the Morse Amendment, in effect from 1968 through 1973, limited softwood log exports from Federal lands west of the 100th meridian to 350 million board feet. Before its expiration in 1973, the Morse Amendment was superseded by a ban on softwood log exports from

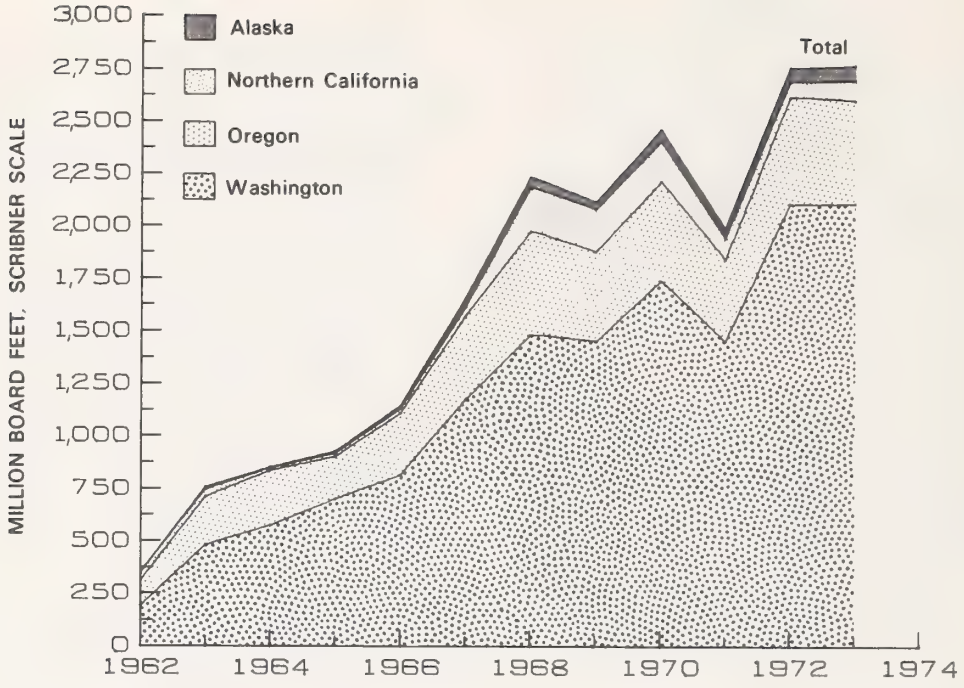

Figure 1.--Softwood log exports from the Alaska, northern California, Oregon, and Washington Customs Districts, 1962-73. Source: Ruderman (1975).

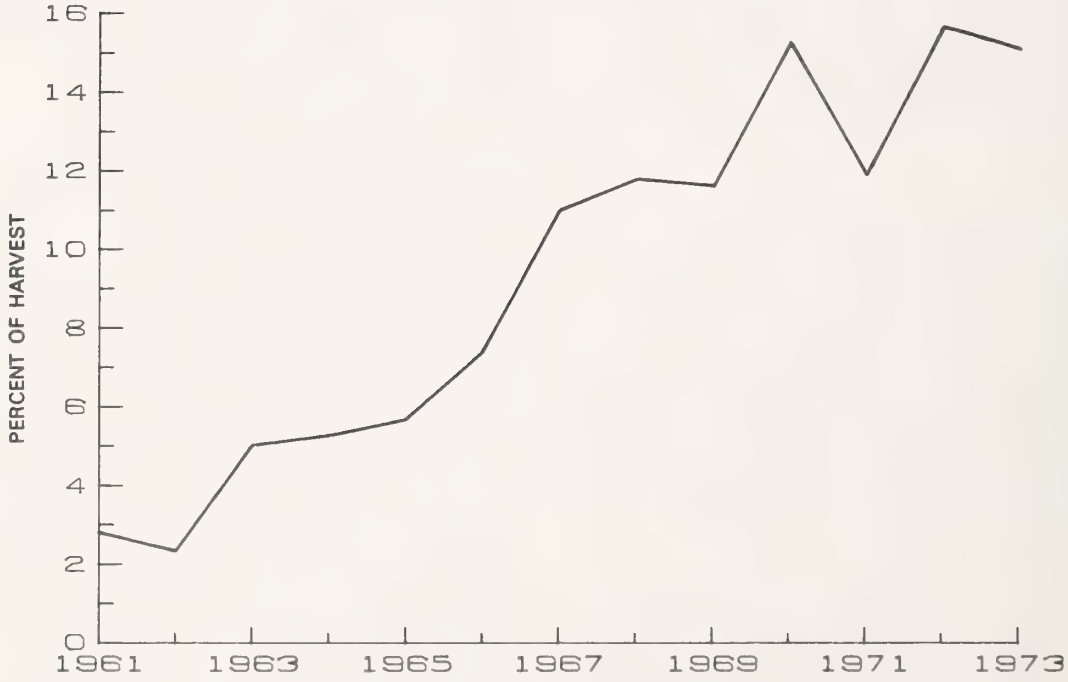

Figure 2.--Softwood log exports as a percent of timber harvest in Washington and Oregon, 1961-73. Source: Ruderman (1975).

Federal lands west of the 100th meridian; log exports from State of Oregon lands had been banned in 1961.

VALUE AND EMPLOYMENT TRADE OFFS ARE ONLY PART OF THE LOG EXPORT ISSUE

Policies to limit trade, including softwood log exports, involve trade offs. Arguments for and against log exports which have developed over the past decade are centered primarily on the impact of the export market on:

1. Price and availability of timber in the Pacific Northwest.
2. U.S. housing costs.
3. U.S. balance of trade.
4. U.S. trade and foreign policy.
5. Value and employment created in the export market compared with the domestic market.

It is not the intent here to either develop or evaluate these pro and con positions. Hamilton (1971) describes the nature of the trade offs involved in log export policy. The intent is to emphasize that value and employment associated with log exports compared with domestic processing comprise only part of the picture to be developed for evaluating trade offs between the two markets.

VALUE AND EMPLOYMENT TRADE OFFS DEPEND ON UNCERTAIN EFFECT OF EXPORT MARKET ON TIMBER AVAILABILITY

Lack of historical precedent prevents prediction of reactions of Pacific Northwest log producers and foreign consumers to a reduction in softwood log exports. Pacific Northwest log producers are only part of a "Pacific Rim" softwood supply-demand framework. Japan imports softwood products from British Columbia and the Soviet Union as well as from the Pacific Northwest States. The United States relies on British Columbia for softwood timber products. The Pacific Northwest forest products industries must compete with foreign producers for the Pacific Rim and other foreign markets. Within the United States, Pacific Northwest industries must compete with other regions for domestic markets.

Domestic and foreign producer and consumer options, in the event of reduction in U.S. softwood log exports, would be constrained by the market and foreign policy conditions at the time of the reduction. The options available at any given time in the future and reactions to these options cannot be predicted with certainty. How much of the log export volume would be processed domestically in the event of a reduction in exports will remain a major uncertainty in evaluations of value and employment trade offs between the two markets.

EXPORT VOLUME IS CONCENTRATED IN HEMLOCK; DOMESTICALLY PROCESSED VOLUME IS IN DOUGLAS-FIR

Although uncertainty surrounds any estimate of the volume of exported logs which might be processed domestically, available information on the species and grades of logs going into the two markets indicates that at least some of the volume going into the export market could be processed domestically. However, physical characteristics are only an indicator of potential and not a predictor. Log flows between the two markets are limited by relative economic conditions in the two markets, log supply constraints, and the objectives and capabilities of owners of stumpage and logs.

The following tabulation shows that log export volume was more concentrated in hemlock than was domestic volume in Washington and Oregon.

Percent of log consumption by species, 1972[1/]

Species	Sawmills	Veneer and plywood mills	Log exports
Douglas-fir	49.4	81.2	27.4
Hemlock	17.6	4.9	56.3
True firs	5.1	4.7	4.7
Spruce	.6	2.0	3.6
Western redcedar	4.0	1.2	4.9
Other species	23.3	6.0	3.1
Total	100.0	100.0	100.0
Total volume (thousand board feet, Scribner scale)	9,026,474	4,510,122	2,437,373

Douglas-fir was the most important species in total log volume consumed in the two domestic industries but accounted for only 27.4 percent of the total export volume in 1972.

Log export volume is concentrated in the No. 2 and Better saw-log grades:

Percent of sales by log grade, 1973[2/]

Grade	Water and inland	Export
Peeler	5.9	9.7
Special mill	6.6	22.4
No. 1 sawmill	.8	4.3
No. 2 sawmill	37.2	45.9
No. 3 sawmill	24.8	17.1
Cull, Utility, and No. 4 sawmill	17.7	.5
Ungraded	7.0	.1
Total	100.0	100.0
Total sales volume (thousand board feet, Scribner scale)	585,714	517,723

[1/] Sources: Bergvall and Ormrod (1974) and Schuldt and Howard (1974).

[2/] Source: Industrial Forestry Association (1974).

Compared with log export sales, domestic sales (water and inland) reported by the Industrial Forestry Association (1974) are concentrated in the No. 2 and lower quality saw-log grades.[3/]

POTENTIAL TRADE OFFS BETWEEN DOMESTIC AND EXPORT INDUSTRIES WOULD VARY WITHIN THE PACIFIC NORTHWEST

The impacts of a reduction in log exports would vary by local area within the Pacific Northwest. This should be considered in evaluations of trade offs between the two industries. For example, in 1972, log exports from the Olympic Peninsula of Washington amounted to 39.1 percent of the 2.4 billion board feet of logs consumed by the region's forest products industries (Bergvall and Ormrod 1974). By contrast, log export volume from northwest Oregon in 1972 amounted to 15.5 percent of total consumption of 2.4 billion board feet; for the rest of western Oregon, log exports amounted to 1.9 percent of total log consumption of 6.1 billion board feet (Schuldt and Howard 1974).

Available domestic processing capacity and other market constraints as well as the objectives of individual landowners are examples of the factors which would vary the trade offs between the two markets within the Pacific Northwest.

CYCLES IN THE EXPORT AND DOMESTIC MARKETS CAN CAUSE TRADE OFFS TO VARY OVER TIME

In the Pacific Northwest, log exports are now permitted only from private and State of Washington lands. Before 1973, log exports from U.S. Forest Service and Bureau of Land Management (U.S. Department of the Interior) lands were permitted under terms of the Morse Amendment. The following tabulation shows for 1972 that the two private landownership categories accounted for about 71 percent of total log export volume, and State lands, 20.8 percent.

Percent of log exports by landownership, Washington and Oregon, 1972[4/]

Ownership	Percent
Forest industry	59.8
Farmer and miscellaneous private	10.8
State of Washington[5/]	20.8
National Forest	7.8
Other public	.8
Total	100.0

In contrast, the sawmill and veneer and plywood industries in the two States depended on U.S. Forest Service and Bureau of Land Management lands for 50.4 percent of their log consumption.

One effect of the restriction on log exports from Federal and State of Oregon lands is a contribution to the development of two distinct markets for logs in the Pacific Northwest. Constraints on log flows, when combined with different building cycles in the United States and Japan, can lead to the development of different price levels for similar logs in the two markets. Softwood products processed from logs exported to Japan are used primarily for construction in Japan.

3/ Industrial Forestry Association data have the following shortcomings for comparing export and domestic markets but were judged to be reasonable indicators of differences between the two markets: (1) The data refer to sales which may not correspond with actual market of end use; (2) a higher proportion of export sales than of domestic sales is sampled; and (3) within a log grade, there may be a tendency for better quality logs to be sold to the export rather than to the domestic market.

4/ Sources: Bergvall and Ormrod (1974) and Schuldt and Howard (1974).

5/ Log exports from State of Oregon were banned in 1961.

Population, income, mortgage interest rates, mortgage money availability, and other cost components of housing are examples of factors which determine the demand for construction in the United States and Japan. These variables change over time and lead to cycles in construction demand. Only coincidentally would these variables at the same point in time have the same relative effect on construction in both countries.

The value of U.S. currency relative to Japanese currency fluctuates under the floating exchange rate system. Variations in the exchange rate between the two currencies can cause price variation in the log export market unrelated to other variables of log supply and demand.

Prices received for logs in the two markets determine the amount of money available to stumpage owners, log processors, and other industry members for investment or other expenditures which affect employment levels. Variation in prices over time causes variation in the direct and indirect trade offs in value and employment between the export and domestic markets.

Direct Value and Employment Associated with Log Exports Compared with Domestic Processing

LOG PRICES ARE CONSISTENTLY HIGHER IN THE EXPORT MARKET THAN IN THE DOMESTIC MARKET

Adams (1974) found that over the 1960's and into the 1970's, annual average prices of similar logs were higher in export than in the domestic market (fig. 3). The difference in price between the two markets increased sharply in 1972 and 1973. It is difficult to attribute this export market price increase to any particular set of factors. However, devaluation of the U.S. dollar relative to the Japanese

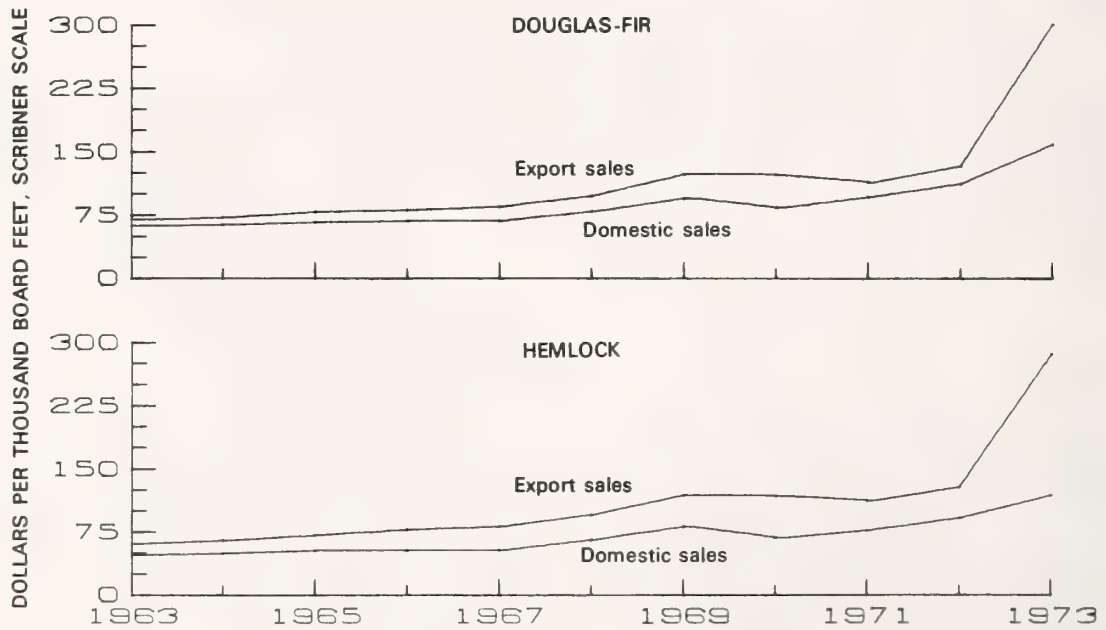

Figure 3.--Average prices for Douglas-fir and western hemlock No. 2 sawmill logs for export and for domestic sales, 1963-73. Source: Adams (1974).

yen and rapidly increasing demand in Japan apparently contributed to the jump in price.

Adams and Hamilton (1965) also found log prices to be higher in the export than in the domestic market.

PRICES FOR EXPORTED LOGS WERE HIGHER IN 1973 THAN THE VALUE OF LUMBER PRODUCED FROM SIMILAR LOGS; RELATIONSHIP VARIES OVER TIME

The relative contributions of the export and domestic lumber markets to the Pacific Northwest economy vary over time in direct value (table 1). The export product value per thousand board feet of a Douglas-fir No. 2 sawmill log in 1970 was nearly equal to the value of lumber and chips produced from similar logs; the export value exceeded the domestic value in 1973. Product values from domestic processing were higher in each of the other years from 1965 to 1973.

Relative export and domestic values for hemlock logs followed a pattern similar to that for Douglas-fir logs; the export value was higher in 1970 and 1973 but lower in each of the other years.

Domestic price controls are reflected in the price data for 1971-73. Although their effectiveness has been questioned (McKillop 1973), the intent of these controls was to dampen domestic prices; export prices were not controlled.

TABLE 1--*Product values of No. 2 Douglas-fir and hemlock sawmill logs in export market and in domestic lumber processing, 1965-73*

(Dollars per thousand board feet, Scribner scale)[1/]

Year	Douglas-fir		Hemlock	
	Export	Domestic	Export	Domestic
1965	93.70	124.82	71.00	96.36
1966	95.50	129.10	77.80	99.83
1967	100.00	130.52	81.70	100.52
1968	112.90	170.99	96.00	128.95
1969	138.80	173.84	119.30	137.73
1970	135.90	138.79	116.40	106.99
1971	127.30	182.95	110.50	140.27
1972	148.50	220.00	128.60	177.48
1973	319.10	284.98	287.40	231.09

[1/] Export values are for No. 2 sawmill logs. Domestic values are for 24-inch No. 2 sawmill logs which were considered representative. Domestic values include lumber and chips.

Sources: Export log price data from Industrial Forestry Association (1974); assumes $15 loading and handling charge each year except $18 for 1973. Domestic lumber processing data based on 1973 data from USDA Forest Service (1974), adjusted for changes in lumber prices.

DIRECT EMPLOYMENT REQUIRED PER THOUSAND BOARD FEET OF LOGS PROCESSED DECLINING IN BOTH THE DOMESTIC AND EXPORT INDUSTRIES

Technology, changing characteristics of the resource input, and the amount of equipment available for use by workers all influence the amount of labor required to process a thousand board feet of logs for the export or domestic market. These factors are reflected in figure 4 which shows that employment in logging, lumber, and veneer and plywood manufacture per thousand board feet of logs processed has tended to decrease in Washington and Oregon. Logging employment has gone from about 3.5 man-hours per thousand board feet in the early 1960's to about 3 man-hours in the 1970's; lumber, from 10 to less than 9 hours; and veneer and plywood, from 21 to 16.5 man-hours.

Employment required per thousand board feet in logging for the export market should approximate the trend shown for the domestic market in figure 4. Employment required for shiploading and log handling are the other two major components of employment in the log export industry. The following tabulation shows that employment in shiploading has gone from an average of 2.76 man-hours per thousand board feet in 1964 to less than 1 man-hour in 1973.

Man-hours required per thousand board feet, Scribner scale, to load logs for export[6/]

Type of operation	Average 1964	Average 1973
For special log ship:		
Large cranes (dockside)	2.03	0.90
Ship's gear	2.56	.83
For other ships:		
Large cranes (dockside)	2.69	(7/)
Ship's gear	3.76	(7/)
All types (average)	2.76	.85

6/ Sources: Adams and Hamilton (1965) and USDA Forest Service (data collected for Pacific Northwest Forest and Range Experiment Station, Portland, Oregon, 1974).

7/ No volume loaded.

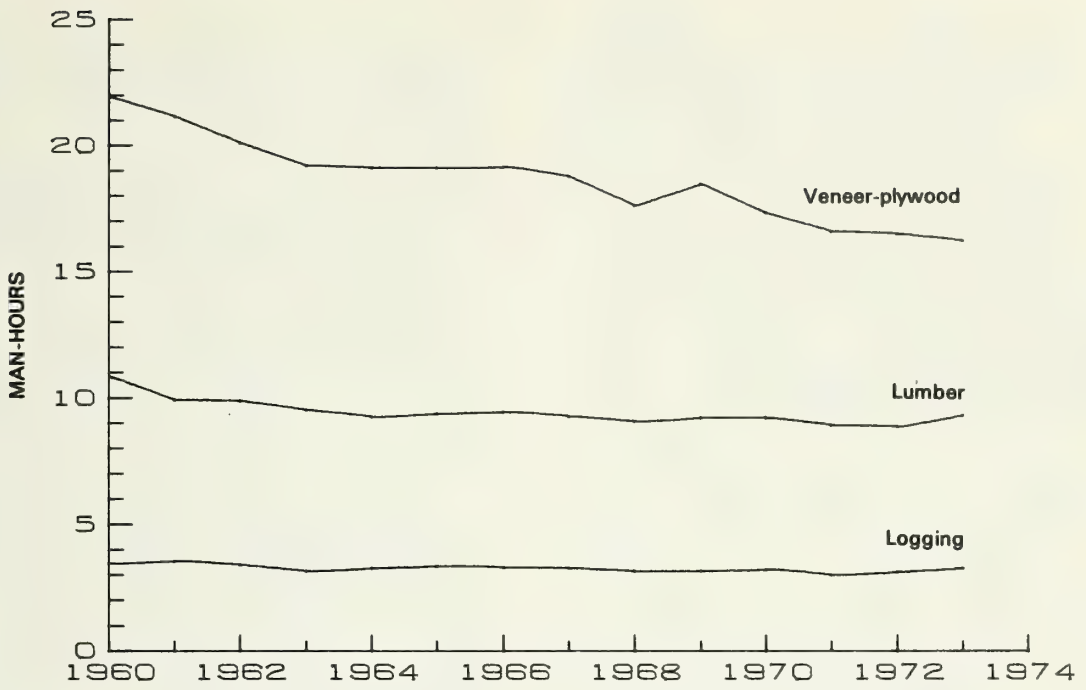

Figure 4.--Man-hours required per thousand board feet of logs processed in the logging, veneer and plywood, and lumber industries in Washington and Oregon, 1960-73. Source: Wall and Oswald (1975).

All the export volume in 1973 was loaded on special log ships which accounts for part of the decreased employment. Other employment in buying and selling, preparing, extra scaling, and rafting and towing of logs, and port operation, ship handling, and shipping agent services is difficult to measure but was estimated to have increased from 0.25 man-hour per thousand board feet in 1964 to 0.61 man-hour in 1973. This increase may in part reflect increased time for preparation and sorting of logs in 1973 compared with 1964.

DIRECT EMPLOYMENT REQUIRED PER THOUSAND BOARD FEET IS HIGHER IN DOMESTIC INDUSTRIES THAN IN THE EXPORT INDUSTRY

Direct employment per thousand board feet of logs processed for both domestic lumber and veneer and plywood manufacture was higher than for the export industry in both 1964 and 1973, as shown by the following tabulation:

Average man-hours of direct employment per thousand board feet of logs processed, Scribner scale[8/]

Industry	1964	1973
Log export	6.27	4.72
Lumber	12.44	12.58
Veneer and plywood	22.33	19.47

Employment in domestic lumber processing in 1973 was over two times

8/ Sources: Log export loading and ship and log handling data from Adams and Hamilton (1965) and USDA Forest Service (data collected for Pacific Northwest Forest and Range Experiment Station, Portland, Oregon, 1974); lumber, veneer and plywood, and logging employment data from Wall and Oswald (1975).

average employment in log exporting per thousand board feet of logs processed. Average employment in processing logs for veneer and plywood products was over four times average employment per thousand board feet of logs processed for the log export market.

Possible Indirect Effects of Export and Domestic Industries on Value and Employment

INDIRECT EFFECTS ARE TRANSMITTED THROUGH A MULTIPLIER EFFECT

Indirect impacts of the log export and domestic industries on value and employment in the Pacific Northwest occur when companies and their employees spend the money received for stumpage or timber processing. Recipients of the money spend it for things they need. The money continues to change hands, creating a multiplier effect. This effect stops when the money leaves the Pacific Northwest to buy imports from other areas.

From a national perspective, the money originating in the export and domestic forest products industries of the Pacific Northwest continues to generate value and employment as it circulates through other regions of the United States.

THE RECENT RISE IN STUMPAGE PRICES HAS INCREASED THE RELATIVE IMPORTANCE OF STUMPAGE OWNER AS A DETERMINANT OF INDIRECT ECONOMIC IMPACTS

Between 1970 and 1973, there was at least a threefold increase in stumpage prices on the major public landownerships in western Washington and western Oregon (table 2).

These prices are indicators of prices for stumpage purchased from private lands and a measure of the value of stumpage which is harvested from a mill's land and consumed by the mill. The costs of logging and processing have not increased to the same extent that stumpage prices have increased. Average appraised logging and processing costs for U.S. Forest Service sales in western Washington and western Oregon increased from $79 per thousand board feet in 1970 to $94 per thousand board feet in 1973 (USDA Forest Service 1970-73).

The rapid increase in stumpage prices has made the stumpage owner

TABLE 2--*Average stumpage prices for timber sold on public lands in western Washington and western Oregon, 1970-73*

(In dollars per thousand board feet, Scribner scale)

Area and public agency	1970	1971	1972	1973
Western Washington:				
U.S. Forest Service	30.06	25.53	56.44	105.61
State of Washington	52.15	46.42	77.65	202.01
Western Oregon:				
U.S. Forest Service	30.12	35.30	56.60	114.64
U.S. Bureau of Land Management	52.02	47.06	68.18	129.50
State of Oregon	35.52	36.76	64.15	120.55

Source: Ruderman (1975).

increasingly important in the indirect economic impact of the domestic and export industries on value and employment in the Pacific Northwest; these indirect impacts depend on how the stumpage owner spends his receipts.

Higher stumpage prices are an incentive for more intensive management of forest lands; higher prices in the export market increase this incentive. Whether or not increased stumpage receipts are used to intensify land management or for other purposes depends on the objectives and capabilities of individual landowners. Information is not available for the Pacific Northwest States on how receipts from higher stumpage prices are being spent nor on the extent of the multiplier effect on supporting industries. Individual and corporate landowners, who account for about two-thirds of the export and one-half of the domestic log consumption, have differing objectives and capabilities

AVAILABLE INFORMATION SHOWS OUTPUT MULTIPLIERS ARE SIMILAR FOR THE EXPORT AND DOMESTIC SAWMILL INDUSTRIES

The output multiplier measures the impact on total business sales in a region when an industry makes a $1 sale outside the region. Available information shows these output multipliers to be 2.47 for the logging industry, 2.45 for sawmills, and 2.1 for the plywood industry in the State of Washington (Business-Economics Advisory and Research, Inc. 1970) The multiplier for the logging industry should approximate the multiplier for the log export industry. For the logging industry, this indicates that $1's worth of logs exported from a Pacific Northwest State resulted in a total of $2.46 worth of business sales in the State. This total includes the original dollar of log exports. Multipliers for the other two industries are interpreted similarly.

These output multipliers are based on 1967 data and do not reflect any change in sales and purchase patterns which may have occurred after stumpage prices increased in 1972 and 1973.

POTENTIAL TRADE OFFS BETWEEN EXPORT AND DOMESTIC INDUSTRIES IN INDIRECT IMPACTS DEPEND ON WHETHER EXPORTED LOGS WOULD HAVE BEEN PROCESSED DOMESTICALLY

Comparison of direct values created in the two markets indicates that differing business cycles cause these values to vary over time. For any one year, the direct value of lumber or plywood produced from logs might exceed the value of logs in the export market and vice versa. If the output multipliers which measure the economic impact per dollar of sales are equal, the market which creates the highest direct value per thousand board feet of logs processed would have the highest total economic impact in the Pacific Northwest per thousand board feet.

Indicated trade offs between these two markets would be realized only if logs to be exported would instead be processed domestically and vice versa. As has been previously discussed, the extent of movement of logs between these two markets in the event of a downturn in one of the markets will remain an uncertainty when other policies to maximize trade offs are weighed.

Summary

The continuing debate over national trade policies for softwood log exports is based on many issues which have developed over the last decade. Policy formulation is based on a weighing of these issues through the political process, and an understanding of the trade offs implied by different policies is necessary for proper perspective of the positions of various individuals and groups affected by log exports. Possible value and employment trade offs between the domestic and export markets are of interest for purposes of policy formulation because of the possible impacts on the Pacific Northwest and U.S. economies if log exports were curtailed

through legislation. Individual policymakers may weight these trade offs differently when evaluating them relative to trade offs implied in other issues.

This report has shown that the direct employment required to process a thousand board feet of logs is higher in the domestic lumber and veneer and plywood industries than in the log export industry. Constraints on log flows, floating exchange rates on currency, and different cycles in the demand for logs in Japan and the United States have caused development of different business cycles in the export and domestic markets. These cycles cause relative product values per thousand board feet of logs processed in the two markets to vary over time. Relative to the domestic lumber industry, export values tended to be higher in 1970 and 1973; domestic product values were higher in other years over the period 1965-73.

Indirect effects of the two markets are tied to the money received by industry members for products processed in the two markets. These receipts determine the investment levels and other expenditures which affect value and employment in supporting industries. The amount of the indirect effects flowing from the two markets varies over time according to cycles in the markets.

Available information shows output multipliers for the log export, lumber, and veneer and plywood industries to be within a range of 2.1 to 2.5. However, information is not available on how private stumpage owners are spending receipts from an increase in stumpage prices. About two-thirds of exported logs and one-half of logs consumed by domestic industry originate on private lands.

Potential value and employment trade offs between the two markets vary over time. Whether policies to maximize these trade offs would be successful depends on whether industry members could and would shift logs from one market to another in response to policy changes. Industry members' responses to changes in export policies cannot be predicted with certainty. Uncertainty surrounding these responses will continue to add uncertainty to estimates of trade offs between the export and domestic markets.

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The mission of the PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION is to provide the knowledge, technology, and alternatives for present and future protection, management, and use of forest, range, and related environments.

Within this overall mission, the Station conducts and stimulates research to facilitate and to accelerate progress toward the following goals:

1. Providing safe and efficient technology for inventory, protection, and use of resources.
2. Developing and evaluating alternative methods and levels of resource management.
3. Achieving optimum sustained resource productivity consistent with maintaining a high quality forest environment.

The area of research encompasses Oregon, Washington, Alaska, and, in some cases, California, Hawaii, the Western States, and the Nation. Results of the research are made available promptly. Project headquarters are at:

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Juneau, Alaska
Bend, Oregon
Corvallis, Oregon
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Portland, Oregon
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