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PNW-148

February 1983

Competition for National Forest Timber: Effects on Timber-Dependent Communities

EDITOR'S
FILE COPY

Names of Trees

Common name	Scientific name
Douglas-fir	Pseudotsuga menziesii (Mirb.) Franco
Lodgepole pine	Pinus contorta Dougl. ex Loud.
Ponderosa pine	Pinus ponderosa Dougl. ex Laws.
Western larch	Larix occidentalis Nutt.
White fir	Abies concolor (Gord. & Glend.) Lindl. ex Hildebr.

Metric Equivalents

424 board feet, lumber tally = 1 cubic meter

221 board feet, Scribner scale = 1 cubic meter

Competition for National Forest Timber: Effects on Timber-Dependent Communities

Richard W. Haynes
Technical Editor

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Abstract

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Results are reported for three studies that dealt with the influence of timber sale practices on competition for timber in the timber-dependent communities of Medford and Grant County in Oregon and those surrounding the Nezperce National Forest in Idaho. Results are also reported for a fourth study that examines how several firms managed their uncut volume under contract. Although the description of the various local economies is only indicative of others, these studies point out the fragile nature of the economies of timber-dependent communities where most jobs, wages, and government services depend on the forest products sector.

Keywords: Timber sales, National Forest policy, National Forest administration, stumpage sales arrangements, economic impact.

Contents

1. Introduction

Richard W. Haynes

A last minute addition to the National Forest Management Act required the use of "sealed bidding on all (timber) sales except where the Secretary (of Agriculture) determines otherwise by regulations."[1] This mandate was the congressional reaction to the possibility of collusion on USDA Forest Service timber sales that were sold by oral bidding, and it led to a debate about the effectiveness of sealed bidding.

[1]National Forest Management Act of 1976, Public Law 94-588, 94th Congress, S-3091-11.

RICHARD W. HAYNES is an economist, Pacific Northwest Forest and Range Experiment Station, U.S. Department of Agriculture, Forest Service, 809 N.E. Sixth Avenue, Portland, Oregon 97232.

The debate was especially intense in California, Oregon, Washington, Idaho, and Montana where a history of oral bidding contributed to the development of local bidding patterns. These patterns evolved slowly and, in some cases, were the natural consequence of the local resource or market situations. In other areas, these patterns evolved as established firms attempted to control entry of new bidders (referred to hereafter as outside bidders) through the use of preclusive bidding. For example, established firms bid away either their locational advantage or cost advantage to prevent outside bidders from acquiring a particular sale.

The introduction of sealed bidding was seen by many as a threat to communities dependent on Federal timber. Oregon Senator Robert Packwood's description of the problem posed by universal use of sealed bidding was typical. He said (Congressional Record, p. S 17278, 9/30/76):

> In many areas of Oregon there is only one lumbermill in a town.

> The town depends upon the mill for employment. When the mill owner knows that he is going to be short of timber, he will go out and bid to the sky, if necessary, to keep that mill going. And so long as the bidding is open, he knows how high he has to go. But when the bids are sealed, that owner may put in what he regards as a very high bid, but if for some reason somebody bids higher, that owner does not get the timber and the mill shuts down.
>
> What you end up with is a mill out of timber and a town out of jobs solely because sealed bids rather than open bids are used.

The concern about sealed bidding is two-fold: (1) that sealed bidding would lead to increased competition for timber sales and consequently higher bids, and (2) that sealed bidding would increase competition by outside bidders to the detriment of local communities. The second supposition led to modifications in the requirement that sealed bidding be used on all sales. The modifications permitted a mix of bidding methods consisting of about 75 percent oral bidding and 25 percent sealed bidding on sales, by volume of timber in areas tributary to adjacent dependent communities. In addition, if the volume purchased by firms with primary manufacturing facilities outside the adjacent dependent communities (outside bidders) equaled or exceeded the levels of previous purchases, then the proportion of volume sold by oral bidding could be increased.

These suppositions or hypotheses provided the stimulus for a research study with two objectives. The first objective was to assess competition for Forest Service timber under both oral and sealed bidding procedures. The second objective was to examine the relationship between timber flows from the National Forests and timber-dependent communities.[2] The assessment of competition was completed in 1978, and the results were published (Haynes 1979a, 1979b, 1980a, 1980b). This paper reports results of three studies that deal with the influence of timber sale practices on competition for timber in different timber-dependent communities. We also examine the rate at which some firms in the Forest Service Pacific Northwest Region (Region 6) harvest National Forest timber. The effect of the uncut volume under contract has often been ignored in the debates regarding the relationship between timber-dependent communities and Forest Service sale programs. In concept, however, timber volume already under contract may influence the effect of timber sale practices on competition for timber being sold.

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[2] This definition is from the Federal Register (42(106); 28258. Thursday, June 2, 1977):

> Dependent communities are areas with common social and economic interests bounded by established daily marketing and work force commuting patterns, and encompassing one or more primary wood products manufacturing facilities located within or adjacent to a specific area of National Forest timber upon which it is dependent for its timber supply and where 10 percent or more of the community work force is employed in the primary manufacture of wood products, including logging and log transportation, and National Forest timber accounts for at least 30 percent of the timber used in the primary wood products manufacturing facilities in the last five calendar years.

Models of Stability

In forestry, it is difficult to divorce the dominant historical theme of community stability from discussions of public harvest flows. Stability in that sense is most frequently interpreted to mean evolutionary change (Schuster and others 1976). Communities evolve to some expected social state as economic and resource conditions change through time. Concerns about community stability reflect traditional forest management policies that were designed to promote social and economic prosperity of timber-dependent communities through the perpetuation of timber and related resources. These policies evolved into sustained yield management practices designed to promote continuity of harvest. The purpose here is not to argue the advantages or disadvantages of sustained yield as a harvest model but rather to discuss two common views of community stability associated with the concept. Also, keep in mind that these communities are typically dependent on the forest product industry for the major portion of their economic activity and on public timber for that industry's supply of timber.

The first view is that the availability of timber to firms operating in timber-dependent communities is a key determinant of community stability. In this view direct employment and income are created in proportion to output or production. In dependent communities, it is assumed that this direct economic activity constitutes a significant proportion of basic economic activity within the community and is also the dominant source of secondary or indirect economic activity. Community stability, in this context, is subject to the direct contributions of the forest-based products and to the directly linked secondary activity in supporting sectors. Finally, the direct and secondary activities induce economic activities primarily, but by no means exclusively, through respending by wage earners in the community.

Waggener (1969), Schuster and others (1976), and other investigators have suggested an alternative view of timber dependency and community stability that involves a more complex relationship between the aggregative timber sales program (over time and by ownership) and log inventory, together with a link between timber inventory, log markets, log supply, and production. These economic links in both the log and forest products markets are recognized as major determinants of timber inventory policy, influencing both additions to inventory and withdrawals from inventory. In this second view, the community stability concept is more dynamic than in the first approach, reflecting the interaction of the forestry-based sectors of the economy, as well as other basic sectors, and log and product inventory accumulation and adjustment, net investment, and the influence of national markets and economic policies.

Timber sales remain a significant factor but are put in context within a much more complex economic framework. Timber sales are more directly linked to timber and log inventory than to production, as in the conventional model. Additions to and withdrawals from timber inventory are conditioned by economic factors in addition to sales volumes. Production is seen as dependent on external market and economic factors, including monetary and fiscal policy. The second view, in contrast to the first, looks to external determinants to influence production decisions which, in turn, influence timber inventory withdrawals.

The Case Studies

Three areas were used to study the influence of timber sale practices on competition for National Forest stumpage. These study areas were Medford and Grant County in Oregon and the area surrounding the Nezperce National Forest in Idaho. They were selected as representative of the types of communities considered dependent on National Forest timber. In these case studies, two questions raised by the introduction of sealed bidding were addressed. Both questions were reflected in the remarks of Senator Packwood, and both related to the possible destabilizing effects on timber-dependent communities of shifts from oral to sealed bidding methods. The first question deals with the effect of sealed bidding on stumpage prices in traditional timber markets. The second question is concerned with the influence of sealed bidding on increased competition from outside bidders. Changes in either stumpage prices or timber availability (resulting from successful outside bidders) have the potential to alter the economic health, or stability, of a timber-dependent community.

Each of these case studies examines the interaction between timber sales and community stability with a different approach and results. The Medford case study examines the origin of logs consumed in the Medford area for selected years between 1966 and 1976. It compares National Forest sale characteristics for 1975, 1976, and 1977 as a means of testing for impacts of the 1977 change to sealed bidding. The Grant County case study used a county input/output model, coupled with a linear programing model, to evaluate the effects of changes in stumpage in prices or quantities of stumpage on the local economy. The Nezperce case study examines the effects of sealed bidding on the timber sale programs of the Nezperce National Forest and on the surrounding communities.

A case study on a fourth area examines for three communities in Region 6 the relationships among timber sales, uncut volume under contract (sales 'purchased in past years but not yet harvested), and timber-dependent communities. The lag between purchase and harvest is a function of such factors as roadbuilding requirements, availability of logging crews and equipment, and levels of market activity for forest products. The proposition examined is that the uncut volume under contract serves as a buffer to mitigate the effects of losing a sale to a competing bidder.

One word of caution about interpreting the results of the various studies. The selected communities do not form a representative statistical sample. Rather they provide a cross section of all dependent communities. In that sense, the results and implications observed in each community are only indicative of what might be expected in other dependent communities.

Sealed Bidding and Competition for National Forest Timber

This section contains a brief summary of three issues dealing with sealed bidding that were addressed in the assessment of competition for National Forest timber (Haynes 1980a) and influence the results reported for the case studies. The first was that the method of bidding influenced timber prices in areas characterized by little competition. Sealed bidding led to higher bids in the Northern Region (Region 1) of the USDA Forest Service and in the east side of Region 6 on sales between 2 million and 8 million board feet. Both of these areas were characterized by relatively low levels of competition. In addition, sealed bidding led to higher bids on the smallest and largest sales in the west side of Region 6. Elsewhere, sealed bidding led to higher overbidding, but the results were not statistically significant.

The second issue was that the mix of sealed and oral bidding methods actually used in 1977 may have resulted in higher prices than those before the switch to sealed bidding.[3] Empirical analysis demonstrated that the relationship between high bids and various sale characteristics remained unchanged for the entire period.

[3] During 1977 the USDA Forest Service offered timber sales by both oral and sealed bidding. The proportions of each method varied from Forest to Forest, depending on the degree of dependency of local communities on National Forest timber. In general, the smaller the dependency the greater the propensity of the Forest Service to use sealed bidding.

The third issue dealt with the probable impact of outside bidders on communities dependent on National Forest timber. These were bidders whose primary manufacturing facilities were located both inside and outside the "adjacent dependent community" but who had not in the past bid for local National Forest timber. The classification of bidders was subjective and based on the opinion of Forest Service personnel as to whether the bidder, because of location, would normally and traditionally be expected to bid on a particular sale.

The concern was that successful outside bidders would transfer logs from a dependent community to another community for processing. This would lead to a loss of processing jobs and adverse indirect impacts on the first community. Opponents of sealed bidding claimed that sealed bidding would increase the activity of outside bidders. Empirical analysis demonstrated that this was true only in the west side of Region 6. The supposition was not true in the east side of Region 6, which has always had a higher incidence of outside bidders than the west side. The higher incidence of outside bidders during 1977 also led to higher bids in both areas of Region 6 (Haynes 1980b).

Available Data From Forest Service Sales

Each study used timber sale data summarized from records for each sale made in the National Forest System. These records include four general variables: physical characteristics, cost and price information, bidder identification, and administrative variables.

The most common physical characteristics were total sale volume and species mix or proportion of the sale accounted for by a major species, such as Douglas-fir or ponderosa pine. Cost and price variables are volume-weighted averages for each sale and are expressed in thousand board feet, Scribner scale. The bidding price was adjusted for road costs for which the purchasers received a credit. Several of the studies used a variable termed "overbid" and defined as bidding price minus road costs and appraised stumpage. Overbid was used because it provides an absolute (real) measure of competition, as well as a consistent measure through time (Haynes 1979b). Number of bidders was the main bidder-related variable and was defined either as all bidders who qualified for bidding or as the actual number of bidders who actively bid. Administrative variables included sale location (Forest and District) and auction method (oral or sealed bidding).

2. The Medford Case Study

J. Douglas Brodie and Lee E. Harris

This study analyzes three l–year periods during the transition of sales method for the Medford area of southern Oregon.[4] The Medford area of southern Oregon is composed of the logging and manufacturing enterprises in Jackson and Josephine Counties and selected Ranger Districts of four National Forests in Oregon and three National Forests in California, on which these enterprises have bid for timber during the period. The years analyzed are fiscal years 1975 (July 1, 1974, to June 30, 1975) and 1976 (July 1, 1975, to June 30, 1976) and calendar year 1977 (January 1, 1977, to December 31, 1977).

The last two quarters of calendar year 1976 were not analyzed because of tran–sition problems during the switch from oral to sealed bidding. The National Forests and Ranger Districts for which sale data were analyzed are shown in figure 1. All Ranger Districts on the Rogue River National Forest were in–cluded, along with selected Districts where timber sale activity from enter–prises in the Medford area has been noted on surrounding Forests. These Forests are the Umpqua, Winema, and Siskiyou in Oregon and the Six Rivers, Klamath, and Shasta–Trinity in Cali–fornia (fig. 1).

[4] More detail is given in the report, "Trends in Timber Flow and Consumption in the Medford Area and Influences of Changes in Forest Service Bidding Method"; unpublished report on file at the Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

J. DOUGLAS **BRODIE** is an associate pro–fessor and LEE E. HARRIS (deceased) was a graduate student, Department of Forest Management, Oregon State University, Cor-vallis, Oregon 97331.

Impacts of Forest Service Sale Characteristics and Bidding Methods

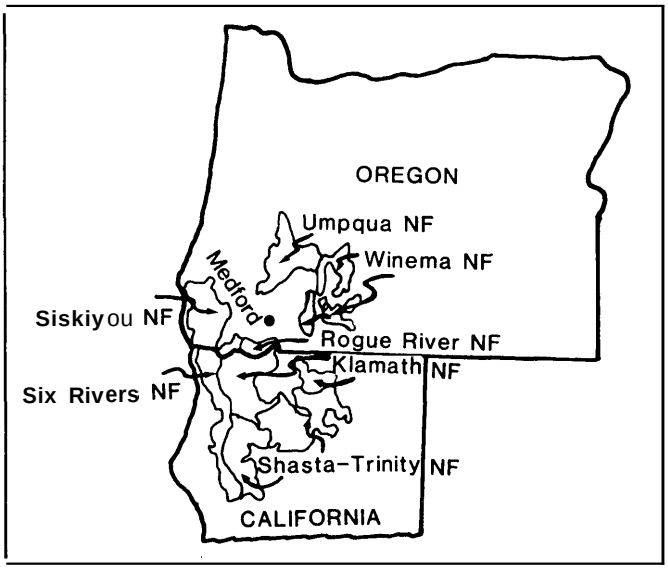

Figure 1.--National Forests and Ranger Districts for which sales data were analyzed for the Medford case study.

In the decade 1966 to 1976 log consumption in the Medford area declined (14 percent) as a consequence of declining public and private log supply (Austin 1969, Howard and Hiserote 1978). The sources of timber supply also shifted during this period, with greater quantities coming from Klamath County and California in 1976 than in 1966. The decline in log consumption did not affect the lumber and plywood industries equally. Log consumption by sawmills fell by 215 million board feet (41 percent), whereas log consumption by plywood mills increased by 98 million board feet (33 percent).

Standard Forest Service data on sale characteristics and bidders were obtained for all National Forest sales identified as part of the Medford area. These data were then used to examine the impacts of the switch from oral bidding to sealed bidding auction methods. In particular, two popular propositions (see Senator Packwood's statement in the introduction) about the switch to sealed bid auctions were examined. The first was that local bidders would be forced to bid to their maximum feasible price on a "one shot only" basis, possibly dissipating their profit and depreciation reserves. Second, outside bidders might be stimulated to participate in auctions since local bidders could no longer preempt them in the oral auction. If the outside bidders processed timber from their successful bids outside the local area, then the scarcity of timber in the local area might be intensified.

Both propositions can be examined empirically by treating comparisons of fiscal years 1975 and 1976 with calendar year 1977 as experimental evidence (only semi-controlled) for testing hypotheses. The first hypothesis is that sealed bidding should result in higher overbids. This hypothesis can be tested by use of available sale data.[5] The second hypothesis is that sealed bidding should increase the activity and success of outside bidders. Our ability to test this second hypothesis is limited in two ways.

[5] Hypothesis tests with sales data used an "F" test for variance and a "t" test for means. The tests conducted were two-tailed, defining a probability range for which the null hypothesis cannot be rejected. Unless otherwise specified, the 5-percent level of significance is used throughout. For the t-test, the probabilities can simply be halved to test a hypothesis about the direction of differences. Both "pooled variance" and "separate variance" estimates were conducted.

First, the classification scheme for outside bidders is at best subjective. Second, the incidence of outside bidders has been increasing the last decade because bidders in southern Oregon have extended their participation in other timber markets to maintain adequate timber supplies.

Auction Methods

Before calendar year 1977 and from 1978 to the present, the choice of oral bidding or sealed bidding was an administrative decision; both methods were used in various Forest Service Regions at the discretion of sale personnel. Within broad legislative guidelines sale procedures also vary between Regions and forest types. For instance, in the Pacific Southwest Region (Region 5), the several species on a sale have been traditionally bid with the auction going to the high cumulative bidder for all species. In Region 6 it has been traditional to bid for only a single major species, with expectations about minor species being lumped into this single bid. Before the mandate of sealed bidding in the National Forest Management Act of 1976, it was more common to use sealed bidding in Region 5 than in Region 6. Statistical tests performed on a larger number of sales in Region 5 than in the Medford area indicate that sealed bidding tended to be much lower than oral bidding in total volume and percent of major (premium) species during the discretionary 1975 and 1976 periods. Sealed bidding was used in small sales when its use was optional. During the 1977 period, when sealed bidding was mandatory unless relaxed because of local community dependency, sale characteristics were similar for both methods.

Sales in the Medford Area

For the 3-year study period, 466 sales were analyzed in the Medford area; 154 sales occurred in fiscal year 1975, 152 in fiscal year 1976, and 160 in calendar year 1977. Table 1 shows the breakdown of these sales by method and illustrates the impact of the shift to sealed bidding in 1977. The dependent community provision for oral bidding was invoked for 47 percent of the sales in the Oregon part of the area and 13 percent in the California part during 1977.

Table 1--Number of Forest Service sales in the Medford, Oregon, area by method and Region, fiscal years 1975 and 1976 and calendar year 1977

Sale method	USDA Forest Service Region	1975	1976	Total, 1975-76	1977
Oral	5	35	32	67	5
	6	113	107	220	58
Sealed	5	5	12	17	31
	6	1	1	2	66

Table 2 summarizes statistical tests for differences in Forest Service sale characteristics on the basis of sale method. During the discretionary years 1975 and 1976, there was a wide difference in the average total volume per sale--sealed bidding was used on only a few sales, and the average volume was only 4 percent of the average oral bidding sale size in 1975 and 7 percent in 1976. Sealed bidding auctions predominated in 1977. The average size of the sealed bidding sales was still significantly smaller, averaging 72 percent of oral bidding sales.

Table 2--Tests for differences in Forest Service sale characteristics in the Medford, Oregon, area by year and sale method

Year and bidding method	Total volume	t value[1/]	Overbid	t value[1/]	Number of active bidders	t value[1/]
	Thousand board feet		Dollars per thousand board feet			
1975:						
Oral	6,755.6	12.46*	54.98	5.61*	3.7	5.4*
Sealed	267.3		14.48		1.7	
1976:						
Oral	7,165.6	12.20*	58.25	1.21	4.2	.60
Sealed	485.0		40.85		5.0	
1977:						
Oral	6,635.9	2.20*	65.50	1.32	4.2	4.36*
Sealed	4,746.3		57.58		6.0	

[1]Asterisk indicates that the null hypothesis of no difference at the 0.05 confidence level can be rejected on a single tail separate variance basis.

Sealed bidding sales had a significantly lower overbid in 1975, reflecting the differences in sale size and other characteristics. These differences were not significant in 1976 or 1977, but in each case were lower for the sealed bids. This comparison does not support a hypothesis of sealed bidding extracting higher returns for public timber or forcing purchasers to bid more recklessly than by oral bidding.

Sealed bidding and oral bidding were compared by number of active bidders, rather than total bidders. The distinction between active and total bidders applies primarily to oral bidding where many bidders qualify by submitting an appraisal-level bid in a preliminary sealed bid and then fail to raise their bid at the oral auction. For this study, these purchasers were classified as inactive bidders. In sealed bidding, qualification and bid occur simultaneously, and almost all bids are above appraisal so that active and total bidders are nearly always identical. In 1977, there was no difference between average number of total bidders in sealed and oral auctions, but there was a significantly larger number of active bidders in the sealed auctions.

Conclusions

Differences within the Medford area.--Within the Medford area, there was (during the 3-year period) a significantly larger proportion of sealed bid auctions in California than in Oregon. Average sale volume was larger in California (62 percent in 1975 and 1976 and 17 percent in 1977). The sales in Oregon, however, contained more of one species (Douglas-fir) than did sales in California. There were no differences in average number of bidders per sale except in 1977 when there were more active bidders in Oregon.

There were slight differences among the four Oregon National Forests within the Medford area. There was very little sealed bidding before 1977. The Winema National Forest (an east-side Forest) differed from the three west-side Forests in that it had the least number of sealed bid auctions during 1977, largest average sale size, a greater mix of species, and generally less competition. Of the three west-side Forests, competition was least intense on the Siskiyou National Forest and most intense on the Umpqua National Forest. In general, the overbids were roughly equal for the west-side Forests and 42 percent higher in 1977 than those for the Winema National Forest.

These results do not support a hypothesis of higher financial recovery from sealed bid auctions relative to oral auctions because the overbid is lower, though not significantly so, on the sealed bid sales. Where competition for public stumpage is high, as indicated by the number of active bidders, either method extracts an overbid well above the Region 6 average.

Outside bidder activity.--The adoption of sealed bidding was accompanied by a more than doubling of the average number of outside bidders (9.3 percent of all bidders) during 1977. There was, however, no comparable increase in successful bidding by outsiders. Roughly 1 percent of the sales went to outside bidders in each of the 3 years.

Stumpage markets in the Medford area have been characterized by Haynes (1980a) as very competitive. In late 1976 the National Forest Management Act mandated a switch from oral to sealed bidding. Subsequent legislation in 1977 relaxed the requirement somewhat, but sealed bidding remained the predominant method during 1977. This switch precipitated considerable concern among National Forest bidders about price pressure on stumpage and loss of supply to outside bidders. Analysis presented in this study indicates that in a competitive market such as the Medford area, the sealed bidding method caused no price increase; however, the general upward trend continued. The switch in bidding method did cause an increase in activity by outside bidders but produced no increase in sales successfully purchased by outside bidders.

3. Grant County, Oregon: Impacts of Changes in Log Flows on a Timber–Dependent Community

Frederick W. Obermiller and Lester F. Miller

In this chapter, the effects of changing Forest Service sales practices on the Grant County economy are evaluated. Grant County is a rugged and sparsely populated east–central Oregon county (fig. 2). In 1977 it depended on the forest products industry for 35 percent of total county employment, *24* percent of all goods and services sold, and *48* percent of all goods exported from the county. The forest products industry is, in turn, dependent for timber on the Malheur National Forest which accounts for over half the total county land area.

FREDERICK W. OBERMILLER is an associate professor, Department of Agricultural and Resource Economics, Oregon State University, Corvallis, Oregon 97331. LESTER F. MILLER is an economist, Kootenai National Forest, U.S. Department of Agriculture, Forest Service, Libby, Montana 59923.

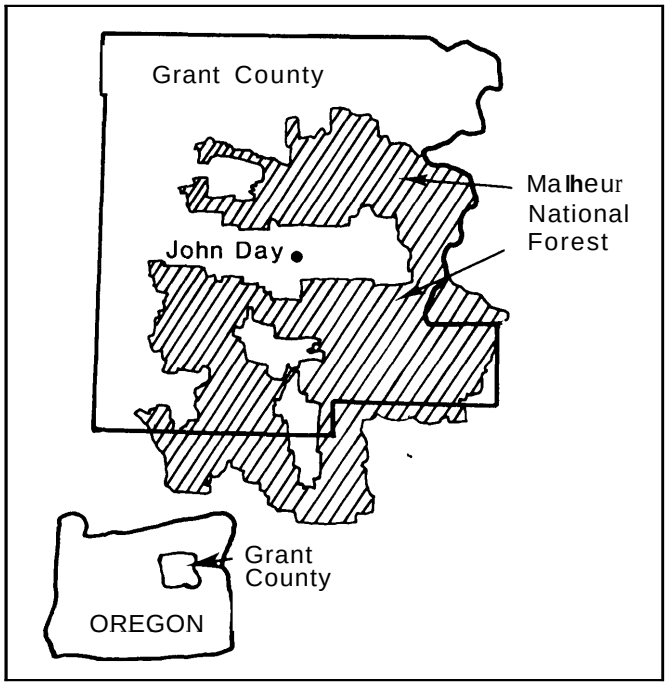

Figure 2.--Grant County, Oregon.

This evaluation required a methodology that considered both the structural and interindustry relationships among National Forest timber supplies, the forest products industry, and the Grant County economy. The methodology adopted combined input–output analysis and linear programing.[6] In the linear program, changes in stumpage prices and quantities are represented as changes in production costs or timber availability, and they affect the distribution of timber resources to processors and for other end uses. The direct and indirect effects of changes in log and lumber exports generate increased (or decreased) business income, wage income, or employment according to the input–output model. Consequently, the flow of information, or direction of impact, in this case study is from the local forest products industry to the broader local economy. Put differently, patterns of resource reallocation conditional on changes in National Forest System stumpage prices and availability of stumpage induce changes in economic activity throughout the local economy. Solutions from the linear programing model are used as inputs to the input–output model.

[6] Details on actual model construction are given in "Grant County Oregon: Impacts of Changes in Log Flows on a Timber Dependent Community," by Lester F. Miller; unpublished report on file at the Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

The economic interrelationships in Grant County demonstrate its reliance on manufacturing lumber for sale outside the county. Total sales for Grant County product groups (groups of similar economic sectors) in 1977 are given in table 3. Forest products, for example, accounted for 24 percent of all sales. The $45 million in forest products sales included $6 million in the timber hauling and harvesting sector, plus about $39 million in the lumber and wood products processing sector. Resource–based product groups (forest products and agriculture) accounted for 32 percent of all sales. The households product group contribution (25 percent) represented mainly wages, profits, and transfer payments such as social security. The remaining product groups contribute less to total business transactions in the county than do forest products and households.

Table 3--Sales, exports, imports, and wage income by product group and total value, Grant County, Oregon

Product group	Sales	Exports	Imports	Wage income
	Percent			
Forest products	24	48	13	44
Households	25	11	25	0
Services	18	8	24	16
Other products	14	10	23	5
Government	11	8	10	32
Agriculture	8	15	5	3
Total	100	100	100	100
	Thousand dollars			
Total value	188,185	68,800	78,953	24,676

The export base of Grant County (shown in table 3) is dominated by the resource-based product groups--forest products and agriculture. These two groups accounted for 63 percent of all sales outside the county in 1977. The remaining groups each accounted for about 9 percent of all products and services marketed outside the county.

Business imports for Grant County in 1977 are spread more evenly among product groups (table 3); both forest products and agriculture contributed proportionally less to total county imports. Imports were 15 percent (about $10 million) larger then exports in 1977, reflecting negative trade balances. Resource-based product groups accounted for only 18 percent of all outside purchases. Excluding "imports" of nonlocal government services (nonlocal taxes) of 10 percent, 72 percent of all outside purchases were attributable to nonresource-based businesses and households.

Wages paid by product groups also differ markedly in Grant County. As shown in table 3, wages paid by resource-based product groups accounted for 47 percent of all wages covered by the State Unemployment Insurance Law. The large proportion of wages attributable to government is the result of $5 million in State and Federal agency payrolls, especially those for local employment by the USDA Forest Service. Since these results include only covered payrolls and not proprietors' incomes, however, proportions reported for these two product groups may be overstated. The relative importance of wages paid in Grant County to individuals by resource-based industries and government, however, are probably representative of the prevailing situation in other eastern Oregon counties.

Within the forest products sector, the interrelationships between forest products firms and other product groups are oriented toward purchased transactions. The forest products firms, for example, account for a large proportion of total local input purchases (labor, electricity, taxes). Sales to other product groups by forest products firms are small relative to total sales. Also, nearly 11 percent of total sales of the sector in 1977 represented inventory accumulation.

The forest products group is made up of firms that are interrelated through timber resource flows. Wood processors purchase stumpage from government sources and logs from logging contractors. Log transactions between firms and logging contractors provide a short-term "dampening" effect when stumpage price or quantity relationships change.

Empirical Results

The purpose of this section is to evaluate the local economic consequences of three possible timber supply and stumpage price scenarios. Here, the distribution of log flows, lumber production, business income, wage, and employment effects are projected by use of the linear programing model for these hypothetical changes in stumpage market activity.

Impact Analysis *of* Changes in Stumpage Availability

Studies by Mead (1967) and Haynes (1980a) have indicated that the use of sealed bidding or the entry of outside bidders into timber markets can mean locally increased stumpage prices or decreased availability of stumpage. Such changes in local timber market activity ultimately affect the level of county export sales, the effects of which ripple throughout the economy.

The imposition of sealed bidding or entry of outside buyers is assumed in this study to increase stumpage prices or decrease local stumpage supplies from the levels of 1977. The effects of these assumed changes in the local timber market should be manifest as changes in local economic transactions. Of special interest are impacts on lumber and log exports, business income, wages, and employment.

Price or quantity relationships or both are assumed to fluctuate by 20 percent under these alternatives:[7] (1) a 20-percent increase in the maximum stumpage price on Forest Service timber sales, (2) a 20-percent decrease in the minimum stumpage available on these sales, and (3) a combination of (1) and (2).

Timber availability.--For each of the three assumptions, total stumpage volume available from the Malheur National Forest exceeded the annual production capacities of the existing mills. Most of the available timber was from timber sales let prior to 1977 (table *4).* This sizable uncut volume under contract plus the existence of a log transfer market served as a "buffer" between short-run production requirements and potential timber market instabilities.

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[7] These amounts are for illustrative purposes. During 1977, the use of sealed bidding on the Malheur National Forest resulted in higher overbids (although not statistically significant) but roughly similar total bids. Higher overbids on sealed bidding sales were offset by lower appraised prices for sales offered by sealed bidding. These lower appraised prices resulted from a lower selling value (10 percent), among other things. Sealed bidding sales were also typically smaller than oral sales (2.1 vs. 7.5 million board feet). Also, during 1977 the activity of outside bidders tripled in Grant County although the level was still the lowest in eastern Oregon.

Table 4--Available stumpage volume utilized by Grant County, Oregon, timber processors, for the 1977 base year solution and the 3 alternatives

Solution, alternative, and total	1977		Previous years		Total used in 1977	
	Stumpage volume	Percent of total available	Stumpage volume	Percent of total available	Stumpage volume	Percent of total available
	Thousand board feet		Thousand board feet		Thousand board teet	
1977 base year solution	39,474	15	120,629	46	160,103	61
Alternative 1	17,809	7	129,222	49	147,031	56
Alternative 2	28,997	11	129,222	49	158,219	60
Alternative 3	14,396	5	131,534	50	145,930	55
Total stumpage available to Grant County firms	91,370	35	172,184	65	263,554	100

The availability of uncut timber under contract at relatively lower prices and larger quantities leads to solutions that include stumpage from sales let prior to 1977. The base solution for 1977 indicated that the use of stumpage from prior year sales exceeded actual use of stumpage from prior year sales. As shown in table 4, about three-quarters of the estimated stumpage utilized in 1977 was attributable to sales from previous years. Also, the actual 1977 production requirements (used as the production constraint in the linear programing model) account for only 61 percent of available stumpage in the solution for 1977.

Under the three alternatives, the percentage of stumpage utilized declines, reflecting an increase in costs relative to revenues for local forest product firms. More significantly, the utilization of timber purchased in previous years increases by 8 to 11 percent as firms attempt to lower costs. The ability to buffer production against changes in stumpage markets is almost entirely limited to large firms (more than 100 employees) in Grant County. These firms control 97 percent of the uncut volume under contract. Small firms with little or no access to the uncut volume under contract are particularly susceptible to changes in stumpage prices as shown in table 5.

Independent loggers also respond to changes in stumpage market conditions (table 5). In the model solution process, a maximum annual volume transaction constraint of 9 million board feet was placed on these firms. There is considerable variation in stumpage distribution among species below this limit that results from different log transfer demands under each alternative. Under alternative 1 and 3 large firms increase their purchases of ponderosa pine from logging contractors. Under alternative 2 small firms increase their purchases of Douglas-fir--western larch and lodgepole pine from logging contractors.

Table 5--Distribution of stumpage from the Malheur National Forest, Oregon, for the base year 1977 and the 3 alternatives by type of firm, independent loggers, and species

Type of firm, loggers, and species	Base year, 1977	Alternative 1	Alternative 2	Alternative 3
		Thousand board feet, Scribner scale		
Large firms:,1/				
Ponderosa pine	106,182	101,424	106,745	100,620
Douglas-fir--western larch	20,960	18,919	20,832	18,877
White fir	14,386	11,913	13,604	11,636
Lodgepole pine	5,017	4,007	4,607	4,032
Total	146,545	136,263	145,788	135,165
Small firms:				
Ponderosa pine	509	220	220	220
Douglas-fir--western larch	965	553	696	553
White fir	83	10	33	10
Lodgepole pine	3,071	971	2,411	971
Total	4,628	1,754	3,360	1,754
Loggers:				
Ponderosa pine	3,119	4,278	2,589	5,060
Douglas-fir--western 1arch	1,200	842	1,499	751
White fir	893	340	463	448
Lodgepole pine	3,788	3,540	4,449	2,741
Total/	9,000	9,000	9,000	9,000

1/Firms with more than 100 employees.

/Maximum annual volume constraint of 9 million board feet.

Additional log supplies are available to firms, from net inventories, imports, and log transfers. These sources constitute *14* percent of total industry purchases, and each acts to moderate the impacts from changes in local timber market activity. Under each alternative, large firms maintain higher net inventories as a result of their production requirements than do smaller firms.

Lumber production, log exports, and net inventories.—Utilization of stumpage supplies in lumber production constitutes about 75 percent of all revenue generated in the forest products industry. The remaining activities, log sales for use outside the county and net accumulation of inventory, provide an additional market outlet for volumes not used in production and for short-term storage of excess log supplies.

The availability of stumpage from previous years and from the log transfer market enables large firms to maintain production at capacity for all alternatives. Solutions of the linear program indicate that price increases in local stumpage markets under alternatives 1 and *3* would restrict the availability of low value stumpage (white fir and lodgepole pine) to smaller firms, resulting in lower production levels (19 percent for alternative 1, *4* percent for 2, and 23 percent for 3). Although decreases in quantity (alternative 2) are less restrictive than increases in price, the differential price structure for stumpage still limits the available quantity of low value species.

In the linear programing model, the higher value of processed lumber compared with that of logs results in reduced log exports when stumpage prices increase. Net inventories are not appreciably affected by local changes in stumpage prices or by timber supplies. Logs in inventory are valued at the same market price as log exports in the model.

Neither production nor log exports by large firms are significantly affected by changes in price or quantity. The primary effect as indicated by solution of the linear programing model is the reduction in the output of small firms. This impact is the cumulative result of local changes in price and quantity, the availability of stumpage from other sources, and activities in the log transfer market.

Although production changes by Grant County wood products processors are the consequence of decreased availability of timber, net returns to the industry as a whole are not appreciably affected. Shifts in the prices and supply included in the three alternatives have the greatest impact on smaller firms, suggesting that in the short run the distributional consequences of sealed bidding may be more significant than the impacts on efficient production. In absolute terms, however, the industry-wide change in export activity over all price and quantity alternatives is slight.

Regional Impacts Using the Input–Output Model

Changes in lumber and log exports from Grant County under each alternative are small in relation to total forest industry exports. These impacts affect regional business income, wages, and employment (table 6) through decreased direct and indirect local transactions. Export declines in excess of $2 million under alternatives 1 and *3* yield 3 to 4 percent decreases in total business income, wages, and employment within Grant County. Minimal declines in exports under alternative 2 result in correspondingly modest total impacts on the regional economy.

Table 6--Impact of changes in exports of lumber and wood products on business income, wage income, and employment in Grant County, Oregon, by product group, base year 1977, and alternatives

Product group	Impact on business income				Impact on wage income				Impact on employment			
		Alternative				Alternative				Alternative		
	Base year	1	2	3	Base year	1	2	3	Base year	1	2	3
	Thousand dollars	Percent			Thousand dollars	Percent			Thousand dollars	Percent		
Forest products	56,541	-5	-1	-5	13,895	-5	-1	-5	930	-5	-1	-5
Households	52,614	-3	-.4	-3	0	0	0	0	0	0	0	0
Services	34,202	-2	-.3	-2	4,197	-2	-.3	-2	580	-2	-.3	-2
Other products	27,840	-1	-.2	-2	1,047	-2	-.3	-2	208	-1	-.5	-2
Government	24,012	-3	-.5	-3	8,929	-3	-.5	-3	853	-3	-.4	-3
Agriculture	16,178	-1	-.1	-1	803	-1	-.1	-1	98	-1	0	-1
Total or average (all sectors)	211,387	-3	-.5	-3	28,871	-4	-1	-4	2,669	-3	-.5	-3

These decreases are distributed predominantly among four product groups, excluding forest products: households, government, services, other products. In terms of business income other than household wages, the indirect effects on government, services, and other products account for the bulk of the impact on the regional economy. Declines in wage income and employment are primarily manifest in the forest products and government sectors which account for over 80 percent of all household income losses under each alternative.

Changes in production levels as a consequence of increased stumpage prices or decreased local timber supplies, or both, directly affect the regional economy. Results from the input-output analysis indicate that these changes reduce regional business income, wages, and employment by less than 5 percent from base-year levels.

Summary

The economic stability of Grant County is dependent on use of natural resources. Lumber and log exports play a major role, contributing significantly to business income, wages, and employment. Changes in the stumpage market affect exports which in turn influence local economic transactions.

As processors, wood products firms in Grant County contribute heavily to the economic base. Since lumber and wood exports are based on local stumpage supplies, use of exogenous timber inputs (log imports) are minimized, resulting in a relatively large business income multiplier for the wood products industry. The high labor input levels associated with wood processing also result in this sector's having the largest wage income and employment levels of all sectors in the local economy.

Impacts on wood processing firms resulting from changes in prices and availability of stumpage have been shown to vary by size of firm. Timber availability under these conditions is most restrictive on smaller firms because of a higher overall cost structure and minimal uncut volume under contract. Increases in price of stumpage or declines in availability are accompanied by an increase in stumpage value and volume harvested by independent logging contractors. These results emphasize the significance of timber sales and log transfers from previous years, which act as a buffer against short-term adjustments in local stumpage markets.

Decreases in lumber exports, with corresponding declines in net returns, are primarily associated with low value stumpage and small wood processors. Log exports significantly decline for all species and firms, further reducing net returns. Relative to base-year levels, however, variations in these exports in absolute terms are small for the selected market condition alternatives.

Impacts on business income, wages, and employment resulting from changes in the stumpage market are also small when compared with the base-year simulation. Indirect effects on households and government product groups are relatively more pronounced. In the short term, existing uncut volume under contract can be expected to mitigate the destabilizing effect on timber-dependent communities of changes in price or quantity in local timber markets, or both. In the longer term, as uncut volume under contract and log inventories are exhausted, destabilizing impacts on income and employment, which could be associated with changes from oral to sealed bidding, would in all likelihood become more severe. The assumptions underlying the methodology used in this case study, however, are such that long-term analysis is precluded.

4. The Nezperce National Forest Case Study

E. Lee Medema

This report analyzes the impacts of changes in sale procedures during 1977 on three timber-dependent communities adjacent to the Nezperce National Forest. One concern about increased use of sealed bidding was the effect it would have on the ability of local firms to compete for National Forest timber. The implication was that any change in sale procedures would have serious consequences in the various adjacent dependent communities.

The data analyzed included all sales over $2,000 *(44* sales) sold by oral and sealed bidding methods on the Nezperce National Forest for fiscal years 1973 through 1977.[8]

[8]More details are given in "Impacts of Forest Service Timber Sales on a Timber Dependent Community--The Nezperce Case" by E. Lee Medema, unpublished report on file at the Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

E. LEE MEDEMA is an assistant professor, College of Forestry, University of Idaho, Moscow, Idaho *83843.*

The Study Area and Communities

The Nezperce National Forest, located in central Idaho in the Forest Service's Northern Region (Region 1), contains 2,206,500 acres of National Forest lands, including 849,000 acres of commercial forest land (fig. 3). This is about 11 percent of the total National Forest acreage and 6 percent of the National Forest commercial forest land in the State of Idaho.[9]

[9]U.S. Department of Agriculture, Forest Service. Land areas of the National Forest System. File 1380 *(5400).* Washington, D.C. 1978. 109 p.

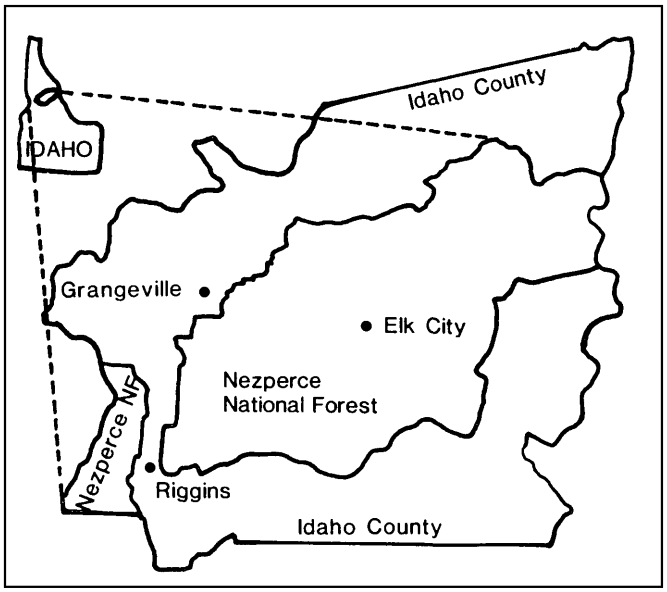

Figure 3.--The Nezperce National Forest, Idaho County, and the timber-dependent communities.

At the time of this study (1979), the Nezperce National Forest was mainly undeveloped, with 933,000 acres of inventoried roadless area being considered for possible wilderness designation and 735,000 acres in wilderness and primitive areas. The annual programed harvest was expected to average 100 million board feet in the late 1970's (Norman and others 1977). Between 1972 and 1977, the period of analysis for this report, the annual volume sold averaged about 78 million board feet, ranging from a high in calendar year 1972 of 138 million to a low in calendar year 1973 of 63 million. This volume comprises about 11 percent of the total annual sales from National Forest lands in the State of Idaho.

A dependency analysis conducted by the Nezperce National Forest in implementing the sealed bidding provision was used to define the dependent communities.[10] From this analysis, the dependent communities (defined in footnote 2, p. 2) were identified as the communities surrounding Grangeville, Elk City, and Riggins (fig. 3). Each of these communities satisfies the criteria for a dependent community (table 7).

[10] "Dependency Analysis for the Nezperce National Forest"; unpublished report of the Forest Supervisor, Nezperce National Forest, to the Regional Forester, Region 1, Missoula, Montana, March 17, 1977.

Table 7--Results of analysis of 3 communities' dependence on timber, Nezperce National Forest, Oregon

Community	Total community work force	Employment in wood products manufacturing		Total community log input	Log input from Nezperce National Forest	
		Work force	Percent of total		Input	Percent of total
	Number			Million board feet		
Grangeville	3,785	610	16	50	38	76
Elk City	364	136	37	20	19	95
Riggins	428	145	34	18	17	94

Implementing Sealed Bidding on the Nezperce National Forest

The Forest Service implemented the sealed bidding provision in a manner that considered the degree of dependency of the local community on National Forest timber and existing mill inventories (including uncut volume under sale contract). It was determined that Grangeville was not as dependent on National Forest timber as were Elk City and Riggins. For timber sales in which either of the latter communities were the destinations for appraised timber, up to 49 percent of the volume sold could be offered by oral bidding. For timber appraised to Grangeville, however, the sealed bidding method would be used for all sales. These sale methodologies were implemented at the start of the 1977 calendar year.

Effective July 1, 1977, the Forest Service developed a new system of implementing the sealed bidding provision. On the Nezperce National Forest, this system was designed to achieve about 75 percent oral bidding and 25 percent sealed bidding in terms of volume sold for all sales offered regardless of the degree of dependency of the appraised destination. This system was used for the remainder of calendar year 1977 and until May 1978, when the sealed bidding provision was amended.

These changes in the implementation procedure for the sealed bidding provision both among the dependent communities and through time complicate the analysis. To reduce confounding errors in interpretation, only the first period from January 1, 1977, to June 30, 1977, was treated as the **implementationperiod" in testing the various arguments of the opponents of sealed bidding.

The total volume sold by oral bid for the 42-month period before implementation of the sealed bidding provision was 67 percent for Grangeville, 41 for Elk City, and 73 for Riggins. Oral bidding was the predominant method used to sell the majority of the volume appraised to the Grangeville and Riggins communities. For sales appraised to the Elk City community, however, the majority of the total volume was sold by sealed bidding.

During the implementation period no sales appraised to the Grangeville community were sold by oral bidding. For the two sales appraised to the Elk City community, the largest (19.2 million board feet) was sold by oral bidding. No sales were appraised to the Riggins community during the implementation period.

The change in sale procedures to favor sealed bidding had little effect on sale methods for timber appraised to these three communities. Only in the Grangeville community did the changes result in a shift in bidding methods from oral to sealed.

Testing Specific Concerns About the Effects of Sealed Bidding

The effects of sealed bidding were frequently described in terms of changes in stumpage prices resulting from increased (or more effective) competition. In the dependent communities around the Nezperce National Forest, the concerns about sealed bidding (discussed in the "Introduction") can be expressed as three hypotheses that can be tested by use of sale data. These hypotheses are:

1. Sealed bidding results in higher bidding prices.
2. Sealed bidding results in an increase in the activity of outside bidders.
3. Sales with outside bidders have higher bidding prices than sales with no outside bidders.

A t-test procedure (see footnote 5, p. 8) was used to test each hypothesis.. The null hypotheses were that:

1. During the implementation period, sealed bidding resulted in no change in bidding prices from those observed before the implementation period.
2. During the implementation period, sealed bidding resulted in no increase in the activity of outside bidders from that observed before the implementation period.
3. During the entire data period, sales with outside bidders had the same bidding price as other sales.

The available data (44 sales) for testing these hypotheses are divided among the three communities by bidding method:

	Before the implementation period		During the implementation period	
	Oral	Sealed	Oral	Sealed
Grangeville	11	10	C	3
Elk City	2	8	1	1
Riggins	5	0	0	3

The lack of any sales by sealed bidding before the implementation period prevented testing the first two hypotheses in the Riggins community. The results for the second hypothesis in the Elk City community have to be interpreted with caution because only one of the two sales appraised to the community was sold by sealed bid.

The results of these tests are as follows:

Hypothesis	Grangeville	Elk City	Riggins
1	Reject	Reject	Not tested
2	Reject	Reject	Not tested
3	Accept	Accept	Accept

The first two hypotheses deal with the effects of sealed bidding. In the first hypothesis, sealed bidding did not lead to higher bid prices in either the Grangeville or the Elk City community. The increased activity of outside bidders expected (hypothesis 2) after the implementation of sealed bidding also did not occur. The number of outside bidders per sale in the Grangeville community was the same for both the historical and implementation periods. In the Grangeville community, however, the number of outside bidders per sale was significantly larger for sales by sealed bidding than by oral bidding.

Conclusions

The third hypothesis deals with the assumption that sales with outside bidders have higher bids than sales with no outside bidders. For sales appraised to each community during the entire data period, all the testable results yielded significant differences--sales by both oral and sealed bidding had significantly higher bids when there were outside bidders than sales with no outside bidders.

Outside bidders appear to be the major source of competition for sales appraised to each of the dependent communities relative to internal competition among local bidders. In the period analyzed, no sales contained more than one local bidder for sales appraised to the Grangeville or the Elk City community, and only one sale had more than one local bidder for sales appraised to the Riggins community. In the Grangeville community, the average number of outside bidders per sale (on sales with more than one bidder) was always greater than the average number of local bidders.

One could hypothesize that the above results may have been distorted by changes in average sale characteristics before and during 1977. This question was examined for each hypothesis and community. Only in the third hypothesis did the sale characteristics differ in such a way as might bias the bidding prices upward. In this case, sales with outside bidders had a significantly lower average selling value per sale and a significantly greater average number of bidders per sale.

Similarly, for oral bidding sales appraised to the Grangeville community and for sealed bidding sales appraised to the Elk City community, the average number of bidders per sale on sales with outside bidders was significantly larger than for sales with no outside bidders. Again, this could have biased the bidding price upward.

The implementation procedure for the sealed bidding provision of the National Forest Management Act of 1976 was designed to have sealed bidding as the predominant bidding method for sales appraised to the three communities dependent on the Nezperce National Forest for a supply of timber. This resulted, however, in a change in the mix of bidding methods from one dominated by oral bidding to one dominated by sealed bidding in only one of the dependent communities--the Grangeville community. For the other dependent communities, either sealed bidding was historically the predominant bidding method used, or no sales were sold during the implementation period.

Where the mix of bidding methods was changed to one of predominantly sealed bidding, no increase in the activity of outside bidders and no increase in bidding prices were evident. Outside bidders, however, did exhibit a greater propensity to bid on sealed, rather than oral, bidding sales, and the bidding prices on sales with outside bidders was significantly larger than on sales with no outside bidders.

5. Interaction Between Timber Sales, Uncut Volume Under Contract, and Timber-Dependent Communities

Thomas R. Waggener

Throughout the legislative history of the National Forest Management Act of 1976 and the subsequent regulations and amendments, there has been a tendency to assume that any deviation in the pattern of timber sales among potential buyers constitutes a threat to the economic stability of a dependent community. The truism that a mill cannot produce lumber and other wood products if it does not have a supply of logs has been traditionally set forth as "proof" that less wood means economic instability. From this, it is asserted that the continued production of a mill is dependent on individual timber sales--and hence the economic stability of the community is threatened by a potential mill closure (permanent or temporary) necessitated by the short fall of timber supply.

THOMAS R. WAGGENER is a professor, College of Forest Resources, University of Washington, Seattle, Washington 98195.

This chapter has two objectives. The first is to examine how specific firms manage their uncut volume under contract. The purpose is to put individual sales into perspective and to examine whether individual sales are critical to the economic health of both a firm and the community in which it operates. The second objective is to examine for three timber-dependent communities the links between individual timber sales, economic conditions, and uncut volume under contract. These links will be examined for the communities of Packwood-Randle in Washington and Baker and Union in Oregon. The period of examination is December 1974 to September 1977.[11] This period covers the interval just before enactment of the Forest Management Act of 1976 and the initial period of the sealed bidding policy.

[11] More details are given in the report, "Timber Sales, Uncut Inventory and Timber Dependent Communities," by Thomas R. Waggener; unpublished report on file at the Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

How Selected Firms Manage Uncut Volume in Three Communities

Packwood–Randle, Washington

The communities of Packwood and Randle in Lewis County, Washington, are surrounded by the Packwood and Randle Ranger Districts of the Gifford Pinchot National Forest. The major forest products firms in these two communities are Packwood Lumber Company at Packwood, Cowlitz Stud Company, Mt. Adams Veneer Company, and R.D.W. Manufacturing at Randle. Of these firms, the Packwood Lumber Company was selected for detailed examination.

Discussions with Packwood Lumber representatives indicated that Pacific Timber Company of Seattle operated both the Packwood Lumber Company in Packwood and Cowlitz Stud Company in Randle. As a consequence, the combined purchases of the Packwood Lumber Company, Pacific Lumber and Shipping Company, and Pacific Lumber Sales Company were aggregated for the two Ranger Districts and treated as a single firm in this analysis.

Timber purchases in the Packwood and Randle Ranger Districts by the Pacific Timber Company are summarized in table 8. There was a total of 384 timber sales active on the two Ranger Districts during the period January 1975 through September 1977, with an appraised volume of 1,440 million board feet. Of this total, 244 sales with a volume of 975 million board feet were sold before 1975 but remained active after that date. The Pacific Timber Company was the purchaser of 73 sales, with a volume of 410 million board feet. This represented almost 19 percent of sales and 28.6 percent of volume sold. Excluding sales before 1975, these firms purchased 20 sales (14.3 percent) with a volume of 113 million board feet (24.3 percent) during the 1975–77 period.

The disposition of timber purchases by the Pacific Timber Company is also shown in table 8. For the Packwood and Randle Districts, a total of 209 million board feet purchased before 1975 was actually harvested before 1975, leaving an estimated balance of 101 million board feet as uncut inventory.[12] Although 53 sales were purchased before 1975 and shown as active after January 1975, the actual uncut volume was contained on only 28 sales. Thus, 25 sales had been harvested before 1975, yet the sales remained active on Forest Service records although no further volume was harvested.

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[12] Because of datum problems, uncut volume remaining under contract cannot be determined directly by subtracting cut from purchases. Purchases are estimated volumes, whereas cuts are actual volumes. Uncut volumes discussed here have been corrected to the extent possible for differences in original estimates of volume and subsequent harvests.

Table 8--Total sales and volumes of timber sold and purchased, and sales and volumes purchased by the Pacific Timber Company, Packwood and Randle Ranger Districts, Gifford Pinchot National Forest, December 31, 1974, to September 30, 1977

Date	Total sales	Total volume	Purchased by Pacific Timber Company			
			Sales	Volume Cut		Uncut volume under contract[1/]
	Number	Million board feet	Number	- - - Million board feet - - - -		
12/31/7421	244	975	53	296	209	101
12/31/75	52	164	5	44	32	109
6/30/76	23	76	7	10	7	112
9/30/76	9	22	3	8	13	107
3/31/77	25	52	2	9	9	106
9/30/77	31	150	3	42	15	133

1/ Includes only volumes removed by harvest from appraised volumes.

2/ Active sales reported 12/31/74, including sales offered in 1974, as well as sales sold in preceding years but not completely harvested.

Baker, Oregon

Baker, located in Baker County in northeastern Oregon, is dependent on the Baker Ranger District of the Wallowa–Whitman National Forest for the timber to support the forest products economy of the region and community. The Ellingson Lumber Company and the Ellingson Timber Company comprise the major forest products firms within the community. The Ellingson companies operate both a sawmill and a softwood veneer mill.

Table 9--Total sales and volumes of timber sold and purchased, and sales and volumes of timber purchased by the Ellingson Lumber and Timber Companies, Baker Ranger District, Wallowa-Whitman National Forest, December 31, 1974, to September 30, 1977

Date	Total sales	Total volume	Purchased by the Ellingson Lumber Company and the Ellingson Timber Company			
			Sales	Volume	Cut	Uncut volume under contract[1/]
	Number	Million board feet	Number	- - - Million board feet - - -		
12/31/7421	16	106	9	64	58	18
12/31/75	9	33	2	21	16	22
6/30/76	1	3	1	3	9	39
9/30/76	3	1	1	1	1	39
3/31/77	2	10	2	10	15	36
9/30/77	6	37	6	37	17	56

[1/] Includes only volumes removed by harvest from appraised volumes.

[2/] Active sales reported 12/31/74, including sales offered in 1974, as well as sales sold in preceding years but not completely harvested.

Timber sale purchases on the Baker Ranger District are summarized in table 9. A total of 37 timber sales were active on the Baker Ranger District during the period 1975 through the third quarter of 1977, with a volume of 190 million board feet. Sixteen of these sales were sold before 1975, accounting for a total volume of 106 million board feet. The Ellingson Timber Company purchased 21 of the total active sales, totaling 136 million board feet.

The utilization of timber sales purchased by Ellingson Lumber Company and Ellingson Timber Company is also summarized in table 9. This summary does not include three sales on the Union Ranger District of the Wallowa-Whitman National Forest.

Ellingson Timber Company purchased a total of 11 sales (9 on the Baker Ranger District (table 9), 2 on the Union) before 1975, with a total volume of 77 million board feet, which were still active in 1975. Of these sales, seven were totally harvested before 1975 even though reported as active. Total cut on all active sales as of December 31, 1974, was 58 million board feet, and uncut volume was 18 million board feet.

Table 10--Total sales and volumes of timber sold and purchased, and sales and volumes of timber purchased by the Hoff-Ronde Valley Lumber Csmpany, Union Ranger District, Wallowa-Whitman National Forest, December 31, 1974, to September 30, 1977

Date	Total sales	Total volume	Purchased by the Hoff-Ronde Valley Lumber Company			
			Sales	Volume	Cut	Uncut volume under contract[1]
	Number	Million board feet	Number	- - - Million board feet - - - -		
12/31/74[2]	14	88	5	35	15	21
12/31/75	4	12	2	3	8	16
6/30/76	3	26	2	5	5	20
9/30/76	0	0	0	--	3	17
3/31/77	4	19	2	13	8	22
9/30/77	3	8	--	--	3	18

[1] Includes only volumes removed by harvest from appraised volumes.

/Active sales reported 12/31/74, including sales offered in 1974, as well as sales sold in preceding years but not completely harvested.

Union, Oregon

Union, Oregon, is in Union County about 35 miles north of Baker and is primarily dependent for timber on the Union Ranger District, Wallowa–Whitman National Forest. The primary forest products manufacturing facility in Union is a sawmill operated by the Hoff–Ronde Valley Lumber Company, a subsidiary of the Hoff Company, Inc., of Boise, Idaho.

Timber purchases by Hoff–Ronde Valley Lumber Company in the Union Ranger District are shown in table 10. A total of 28 timber sales were reported as active on the Union Ranger District, with a volume of 153 million board feet. Half of these sales (14) were sold before 1975, accounting for 88 million board feet (58 percent) of total sales volume. The Hoff–Ronde Valley Lumber Company was the purchaser of 11 sales (39 percent of all sales) with a volume of 56 million board feet (37 percent). Exclusive of sales before 1975, Hoff–Ronde purchased 6 of 14 sales with 21 million board feet.

The Ellingson Lumber Company also purchased three sales on the Union Ranger District, with a total volume of 34 million board feet. Two sales were purchased before 1975; and one large sale (21 million board feet) was acquired in the first half of 1976, accounting for almost 80 percent of volume sold during that period.

General Economic Conditions in the Three Dependent Communities

The 1975–77 period represented a variable economic picture as the backdrop for the activities of the forest products industry in the Pacific Northwest. The economy had been growing reasonably steadily after a slight decline at the end of 1970 until a peak in late 1973 and early 1974. A general downturn occurred in 1974, continuing through the first quarter of 1975. This was followed by a period of growth, beginning in the second quarter of 1975 and extending through the third quarter of 1977.

The broad trends in economic activity are reflected in the number of housing starts, which is generally considered a major determinant of forest products markets. Housing start activity for 1973–77 is shown in figure 4 and is characterized by a strong upward trend from 1975 to 1977, reaching nearly the 2 million level achieved in 1971–73.

Lumber and plywood production and prices reflected the trend in housing construction. Both prices and production recovered from the depressed 1974 levels and rose throughout the 1975–77 period. This rise in product prices was interrupted twice by brief economic slowdowns, but prices by the end of the period were 43 and 52 percent higher for plywood and lumber.

The economies of the study communities reflect the emphasis on timber-oriented activities. This is illustrated in table 11 for the counties containing the three dependent communities. In general, the forest products industry (represented by logging and wood products manufacture) accounted for the bulk of manufacturing jobs in each county. The annual variability in employment can also be gaged from table 11. Employment levels were lowest in 1974 and increased in subsequent years as construction and economic activity improved. Similar trends for payrolls are also shown, although inflationary increases in prices and wages mask actual trends in employment.

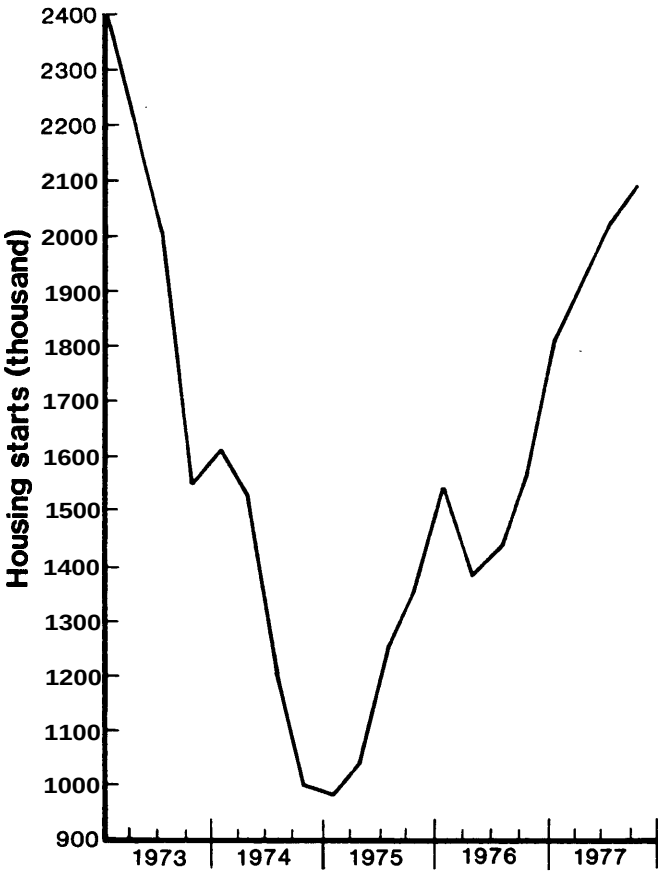

Figure 4.--Seasonally adjusted, annual housing starts, 1973-77.

Table 11--Number of employees and annual payroll for manufacturing, lumber and wood products, and total employment--Lewis, Baker, and Union Counties, 1974–77

Date and industry	Lewis County		Baker County		Union County	
	Employees	Payroll	Employees	Payroll	Employees	Payroll
	Thousand	Thousand dollars	Thousand	Thousand dollars	Thousand	Thousand dollars
1974:						
Manufacturing	4,516	45,192	702	7,251	1,488	16,593
Lumber and wood products	3,412	35,003	486	4,892	1,219	13,976
Total county employment	11,547	96,543	2,724	19,322	4,359	33,524
1975:						
Manufacturing	4,554	53,413	429	6,356	1,253	16,864
Lumber and wood products	3,062	37,465	275	4,229	989	14,402
Total county employment	11,506	110,831	2,542	19,452	4,032	35,744
1976:						
Manufacturing	4,482	62,969	555	7,953	1,437	20,794
Lumber and wood products	3,015	45,425	393	5,483	1,193	17,877
Total county employment	11,749	128,109	2,675	24,487	4,836	46,621
1977:						
Manufacturing	5,009	67,766	597	9,158	1,583	23,352
Lumber and wood products	3,649	51,556	402	6,426	1,277	20,144
Total county employment	12,976	141,265	2,859	26,570	5,056	53,425

Source: U.S. Department of Commerce (1978a, 1978b).

National Forest Harvest in the Dependent Communities

Each of these communities depended on National Forest timber to support their forest products industry (Bergvall and others 1977, Howard and Hiserote 1978). The degree of dependency in 1976 was as follows:

	Lumber	Plywood
	(Percent)	
Lewis County	42	54
Baker County	75	71
Union County	57	—

Lewis County, Washington

The semiannual volume of timber sold and cut from the Packwood and Randle Ranger Districts of the Gifford Pinchot National Forest is shown in figure 5. With the drop in volume of timber both sold and cut during 1975-77, the estimated uncut volume of timber under contract remained unchanged over the 1975-77 period (fig. 6).

Uncut inventory on the Packwood Ranger District dropped by 30 million board feet in 1975, although the remaining uncut volume at year end (130 million board feet) was over twice the volume reported harvested from active sales during the year. The uncut volume increased during the first half of 1976, dropped slightly during the third quarter, fell by 10 million board feet during the fourth quarter of 1976 and the first quarter of 1977. The increase in sales activity in late 1977 resulted in an increase of uncut inventory to 159 million board feet by the end of the third quarter of 1977.

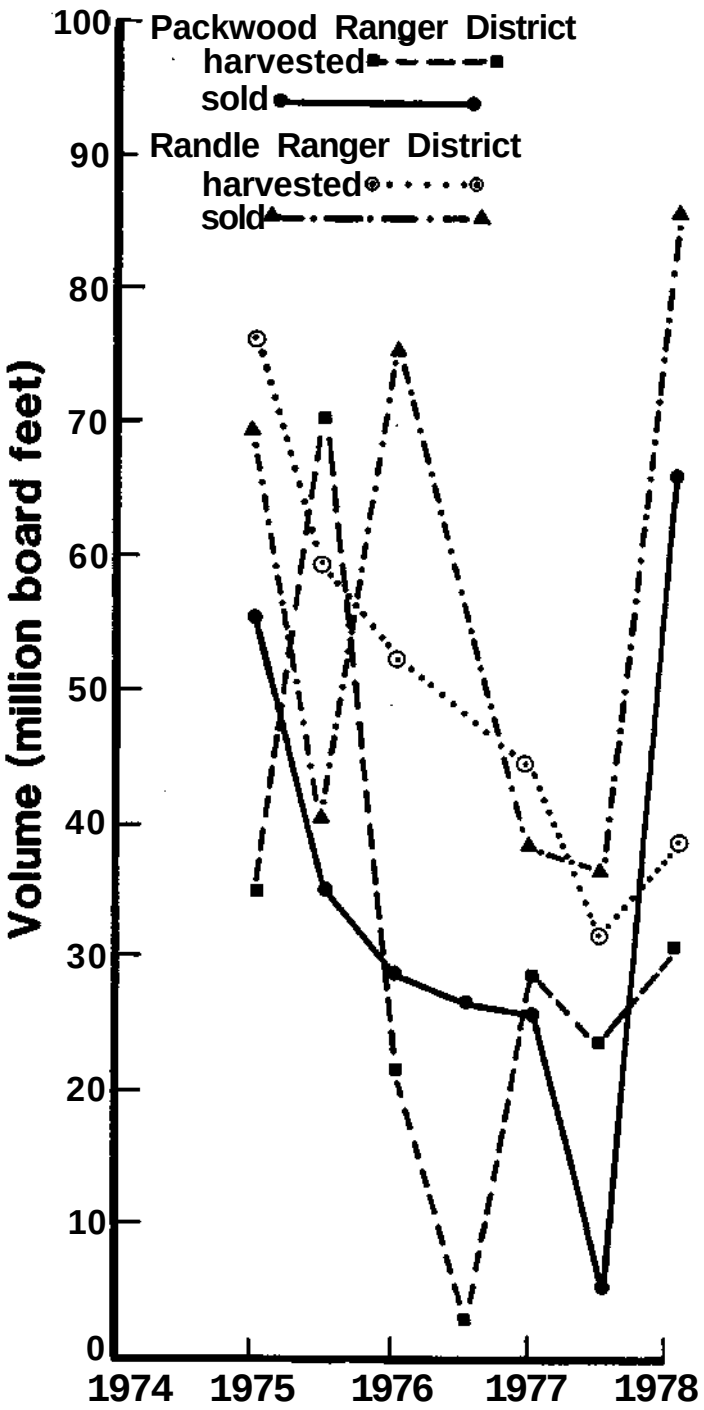

Figure 5.—Timber harvested and sold semiannually on the Packwood and Randle Ranger Districts, 1975-78.

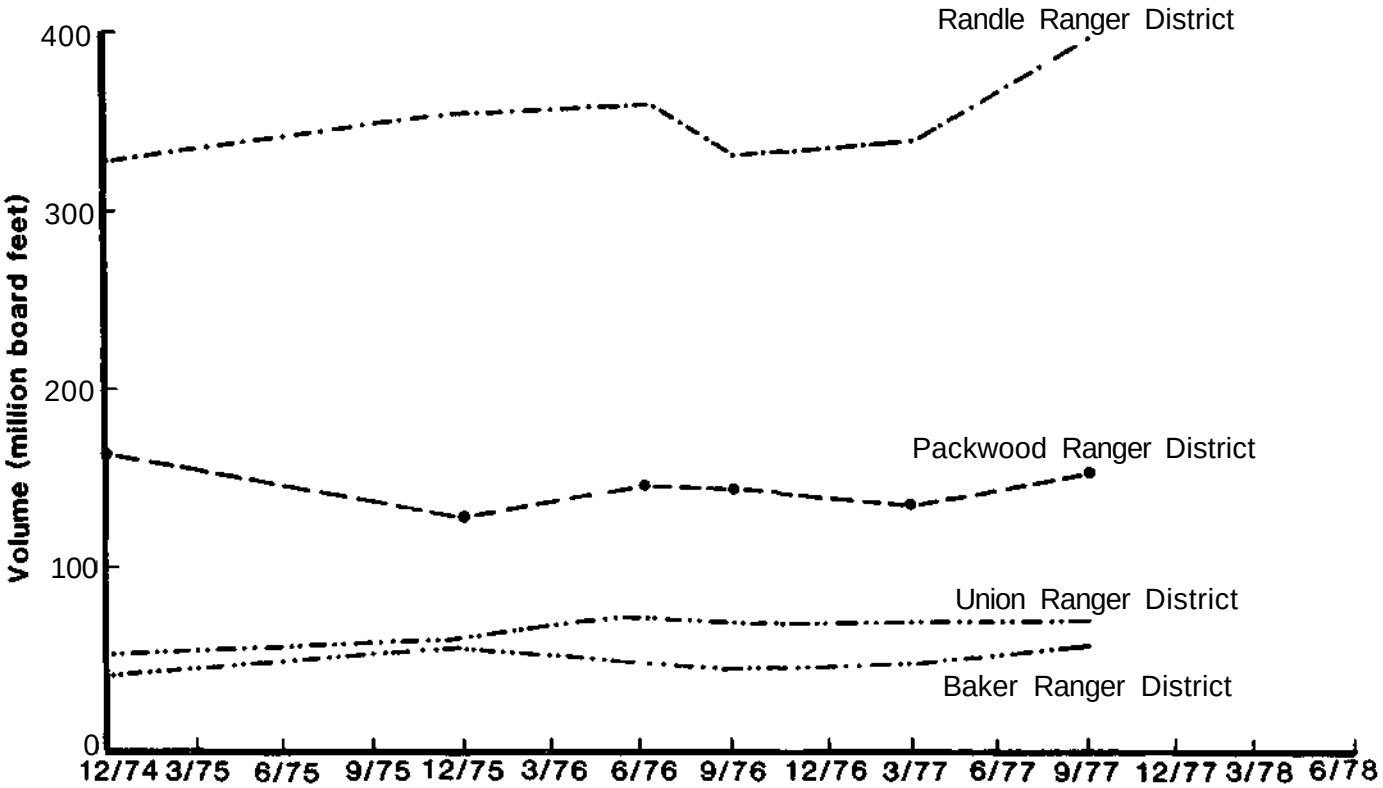

Figure 6.—Estimated uncut volume of timber by Ranger District, 1975-77.

Uncut inventory on the Randle Ranger District increased from the beginning of 1975 through mid-1976, at which time the uncut inventory was 364 million board feet. Uncut volume fell during the third quarter to 335 million board feet and then rose sharply to 404 million board feet by the end of the third quarter of 1977. Uncut inventory at the end of 1975 (359 million board feet) was 3.4 times the 1975 cut reported from active sales.

Baker County, Oregon

Annual volumes sold and harvested for the Baker Ranger District are shown in figure 7, together with the annual allowable cut. Although annual allowable cut was about 34 million board feet, actual sold volume was below the allowable cut in 1973 and 1974. Volume sold was 33 million board feet in 1975 and 14 million in 1976. Sales increased rapidly in 1977, totaling about 42 million board feet, Volume harvested dropped rapidly in 1974 from the high of about 43 million board feet to less than 20 million board feet. Volume harvested declined further in 1975 and then increased in 1976 and 1977, when harvest again exceeded the allowable cut by a slight margin.

Uncut inventory for the Baker Ranger District (fig. 6) increased from about 40 million board feet at the end of 1974 to almost 58 million board feet at the end

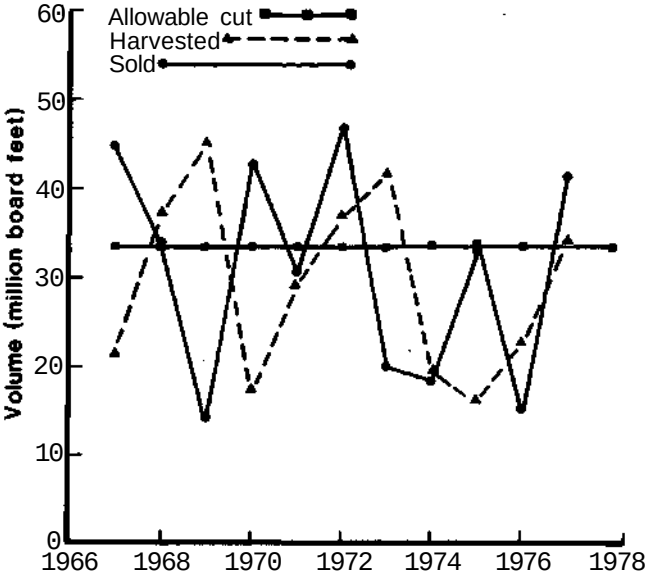

Figure 7.—Annual volumes of allowable cut that were sold and harvested on the Baker Ranger District, 1967-77,

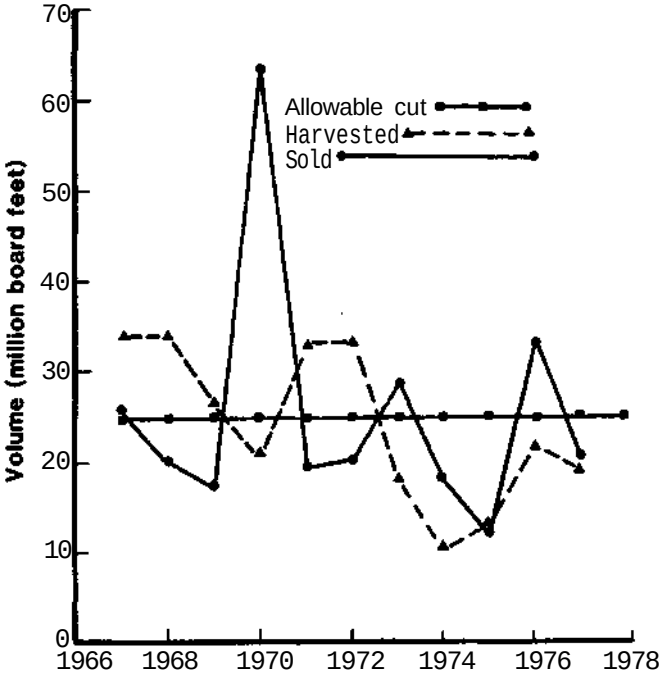

Figure 8,—Annual volumes of allowable cut that were sold and harvested on the Union Ranger District, 1967-77.

of 1975, reflecting the increase in volume sold together with the drop in harvest. Uncut inventory dropped by 10 million board feet during the first three quarters of 1976 and then increased by 12 million board feet by the end of the third quarter of 1977, reflecting the upswing in both sales volume and harvest. Uncut inventory at the end of 1975 was about 1.74 times the reported volume harvested from active sales during the year and 1.7 times the allowable cut. Uncut volume at the end of the third quarter of 1977 was about 1.75 times the allowable cut.

Union County, Oregon

Annual volumes sold and harvested for the Union Ranger District are shown in figure 8. The pattern in sales is similar to that for the Baker Ranger District, but the downturn in sold volume occurred in 1974 rather than 1973. Likewise, volume sold increased in 1976 from the 1974-75 lows, whereas volume sold did not recover on the Baker Ranger District until 1977. From 1973 through 1977, volume sold exceeded volume harvested, except 1975 when volume harvested exceeded volume sold by a slight amount.

Uncut inventory under contract (fig. 6) was 50.8 million board feet at the beginning of 1975. With sales volume exceeding harvest in 1976 and 1977, uncut volume increased to 52 million board feet by the end of 1975 and then to 75 million board feet by mid-1976, an increase of 24 million board feet (45 percent) during the first half of 1976. Uncut volume dropped slightly (to 71 million board feet) during the third quarter of 1976 and then increased to 73 million board feet by the end of the third quarter of 1977 as sales volume fell relatively more than the decline in harvest. The uncut inventory was about twice the allowable cut in 1975 and almost 2.9 times the allowable cut at the end of the third quarter 1977.

The Effect of Uncut Volume on Dependent Communities

One purpose of this study was to examine the role of uncut volumes under contract in timber-dependent communities. This role depends in part on the relationship between timber dependency and community stability. The results of this study support the view that economic market conditions are an important determinant of community stability. The cases examined in this study revealed that the transmission of economic fluctuations at the national level to local economies was responsible for the periods of economic instability during the study period. The absence of adequate markets, rather than timber inventory, contributed to economic instability.

The primary results of this study relate to the nature of timber supply for sustaining forest products manufacturing in the short run. Opponents of sealed bidding often assert that in many areas each timber sale is "critical" to continuance of production by firms in timber-dependent communities. The premise of this concern was that local firms critically in need of a specific timber sale to sustain their operations would "know the competition" and could offer counter-bids as necessary to obtain the sale. Another variation on this argument is the possibility that, by knowing the competition, local firms could collectively bid when necessary to protect against timber purchases by "outsiders."

The results indicate that several sales with uncut volumes are held by dominant firms in each of the dependent communities studied. In all cases, a minimum of 3 active sales was held, with the average per period being 26.2 active sales for the Pacific Timber Company, 5.2 for the Ellingson Lumber and Timber Companies, and 4.5 for the Hoff-Ronde Valley Lumber Company. In only two cases (Baker Ranger District in the fourth quarter of 1976 and the first quarter of 1977 and Union Ranger District in 1975) did the harvest exceed the volume purchased when the major purchaser acquired more than 50 percent of the sales sold. In both cases, the previously held uncut inventory exceeded the cut by a factor of at least 2.5 without the additional purchases.

As summarized in figure 6, the aggregate uncut inventory at the Ranger District level also does not support the "critical sale" concern. Rather, the patterns of uncut inventory reflect modest response to general economic trends, suggesting that timber inventories are economically determined and that firms balance short-run timber purchase and harvest decisions in response to overall economic conditions.

The pattern revealed in this study shows that a decline in both timber harvest and timber sales follows a downturn in general economic activity, with a relatively short lag of 3 to 6 months. During this adjustment interval, harvest and sales will continue at relatively high levels even as product prices soften and fall. During such periods uncut inventory may increase, reflecting the slack in the marketplace. This pattern was evident in the downturn of economic conditions in the slump of 1974 and early 1975.

Conversely, with the recovery in economic activity--as occurred in 1975 and early 1976--business activity increases, prices respond, harvest rates gradually increase, sales volume increases, and uncut inventory may temporarily decline as production accelerates. In spite of the drop in economic activity in 1974 and early 1975 and the rapid turnaround that occurred in 1975 and early 1976, uncut inventories at the District level remained steady and consistently exceeded the level of cut.

6. Summary

Richard W. Haynes

The issue of the impacts of sealed bidding on timber-dependent communities, although quiescent now, is not resolved. The spectre of disruptive bidding raised by opponents to sealed bidding did not materialize during 1977, nor did the choice of bidding method affect the economies of the timber-dependent communities examined in the various case studies. But the 1-year period of sealed bidding may not have been long enough to reflect the effects of sealed bidding on timber-dependent communities.

The lack of a systematic selection scheme for the various case studies diminishes our ability to draw inferences based on statistical validity. There are, however, several general conclusions that can be drawn from the case studies. The first is that the change in bidding method did not lead to significant increases in stumpage prices. The switch did, however, lead to increased activity by outside bidders, and the impacts of outside bidders were generally consistent with what had been assumed. That is, the presence of outside bidders usually led to greater competition and higher prices.

The various case studies indicated that in the short run outside bidders did not impair community stability. This leaves unanswered the question of long-term effects. Would increased prices in the long term increase costs of production to the point that local firms would go out of business with the attendant loss of jobs and indirect adverse impacts on the community?

Another general conclusion was that uncut volume under contract was used as a buffer against short-term changes. In several of the communities, changes in timber flows in any one year were mitigated by the uncut volume from sales obtained in previous years. This suggests that inventories of timber composed of uncut volume under contract and current purchases are managed in response to overall economic conditions. The insurance offered through access to uncut volume under contract is not enjoyed by all firms. Small mills depending on interfirm log transfers and independent loggers both have limited uncut volumes and, as a consequence, bear a disproportionate share of the effects of an economic downturn.

The Grant County case study best illustrates the interrelationships between National Forest harvest flows and county economies. Although this description is indicative of what might exist in other communities, it does point out the fragile nature of the economies of timber-dependent communities where the bulk of jobs, wages, and government services depends on the forest products sector. For example, in Grant County each dollar increase in lumber sales increases local transactions by that dollar plus another $1.55 for a total impact of $2.55. The degree of this dependence has evolved slowly as a function of the comparative advantage of each community.

Concerns for community stability should be oriented toward the causes--economic instability in major markets and the national economy--rather than viewed just in terms of local symptoms. Although adequate timber supply is a necessary prerequisite for production, these analyses indicate that a timber supply constraint, as the limiting factor affecting stability, is not nearly as critical as a healthy national economy.

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Results are reported for three studies that dealt with the influence of timber sale practices on competition for timber in the timbe'r–dependent communities of Medford and Grant County in Oregon and those surrounding the Nezperce National Forest in Idaho. Results are also reported for a fourth study that examines how several firms managed their uncut volume under contract. Although the description of the various local economies is only indicative of others, these studies point out the fragile nature of the economies of timber–dependent communities where most jobs, wages, and government services depend on the forest products sector.

Keywords: Timber sales, National Forest policy, National Forest administration, stumpage sales arrangements, economic impact.

Pacific Northwest Forest and Range
Experiment Station
809 NE Sixth Avenue
Portland, Oregon **97232**