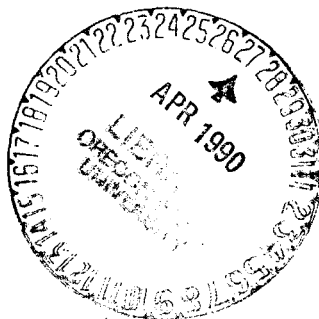


D
755
067
PHOTO BINDER



College of Business
College of Forestry

Studies in Management and Accounting for the **FOREST PRODUCTS INDUSTRY**

Gainsharing Plans For Mill Operations In The Forest Products Industry

C. W. Dane
College of Business
Oregon State University

William L. Hebert
Controller-Finance
Louisiana-Pacific Corporation

K. Stanley Martin
Vice-President, Finance
Solid Wood Division
WTD Industries, Inc.

Monograph Number 32
October 1989

Charles W. Dane is a professor of production management at Oregon State University. He obtained his undergraduate and master's degrees from OSU's forestry school in the 1950's and his doctorate in economic analysis from Indiana University's Graduate School of Business in 1968. Chuck is a registered engineer and licensed by the Internal Revenue Service to represent clients in tax matters.

William L. Hebert is employed with Louisiana-Pacific as Controller-Finance and the company's primary contact with the investment community. Born in Escanaba, Michigan, Mr. Hebert earned a B.S. in accounting in 1973 from Northern Michigan University. Following his graduation, he went to work for the Forest Products Division of Universal Oil Products in Escanaba. A year later, the division was acquired by Louisiana-Pacific Corporation. In 1977, Mr. Hebert was transferred to L-P's corporate headquarters in Portland, Oregon. Mr. Hebert serves on the accounting principles subcommittee of the American Paper Institute and is a member of the Advisory Council of the forest products research and monograph program at Oregon State University. He is a member of the Financial Executives Institute and the National Investor Relations Institute.

K. Stanley Martin received his B.S. degree in Business and Technology from Oregon State University in 1964, with concentrations in finance and accounting, and a minor in Industrial Chemistry. Mr. Martin is a CPA and has over twenty years of corporate accounting and financial management experience, primarily in the wood products industry. His current position is Vice President-Finance, Solid Wood for WTD Industries, Inc.

INTRODUCTION

During the last five years, interest in productivity-based group incentive plans for mill operations in the forest products industry has increased. In a 1983 monograph in this series titled "Company/Employee Gainsharing Programs," Michael B. McKay anticipated this trend. In that monograph, he defined "gainsharing" as a "group incentive plan." Based primarily on experience in other industries, McKay's monograph also showed how gainsharing bonuses might be calculated and listed key factors affecting success. Since that time, many forest products companies have adopted gainsharing plans for mill operations; many of these plans differ significantly from those described in the academic and professional literature.

This monograph summarizes current experience with gainsharing plans developed for forest products mill workers. The monograph first reviews various types of incentive plans, and then gives results of a survey of current gainsharing plans used by mill operators in the forest products industry. The monograph concludes by identifying the factors which have proved important for mill operations. Among the survey's most important findings was that a great deal of thought must go into selecting criteria for productivity-based incentive plans.

INDIVIDUAL (OR CREW) INCENTIVE PLANS

While gainsharing plans apply to groups of individuals, some incentive plans can apply to either individuals or to crews. These plans require that the work performed by an individual or crew be measurable. For crew plans, the crew must carry out a common unit of work; for example, operation of a glue-spreader by a three-person team. If the work can be easily measured, the worker(s) can be rewarded for contributing to company goals. There are several ways of doing this.

CONSTANT RATE PLANS

"Piece rates." Workers can be paid by the unit of production. For example, a worker loading lumber onto flatbed cars might be paid \$1 for loading each thousand board feet (M). The worker's pay would therefore vary with the amount of lumber loaded.

"Standard hour" plans. A variation on piece rates is to convert the amount of work done into "standard hours" and to pay the worker an hourly rate for the standard hours earned. Output required for a "standard hour" must be specified; for example, a worker receiving \$6 per "standard hour" would receive credit for 10 minutes time (1/6 of a standard hour) for each thousand board feet loaded. As long as the pay rate remains \$6 per hour, this is identical to paying

the worker \$1 per M. The standard hour plan emphasizes hourly pay rates; this can be an advantage if workers consider the hourly pay "good."

In both the piece rate and standard hour plans, pay is directly related to production. The advantage of these plans lies in making it easier to predict direct labor costs. The disadvantage is in coming afoul of minimum wage laws unless workers are guaranteed a minimum pay regardless of daily or hourly output. To guarantee a minimum wage, the incentive plans have to become "variable rate" plans.

VARIABLE RATE PLANS

Both piece rate and standard hour plans can be modified to guarantee a minimum hourly wage or to provide different incentives by varying the pay for each unit of production. Some variable rate plans give the worker more pay per unit as production increases. Under other plans the pay per unit is actually less when more is produced. Each system claims its advantages; neither has been shown to be superior.

Those who propose increasing the unit pay as output increases claim that the higher pay will provide more incentive to produce more. Under these plans, the piece rate or the "standard hours" earned increase as daily output goes up. Some plans propose that workers get a low piece or hourly rate for production up to the desired output, and then get a higher rate. If 48 M were the target output per 8-hour shift, a worker would get \$0.90 for each M up to 48 M and \$1.20 per M above that level. A worker loading 44 M would receive only \$39.60; if 60 M were loaded, the worker would receive \$57.60:

\$0.90 per M for the first 48 M =	\$43.20
\$1.20 per M for the 12 M above the desired =	<u>14.40</u>
	<u>\$57.60</u>

A differential "standard hours" rate gives the same results.

Of the variable plans paying lower rates for production above the target, most guarantee workers a "floor" amount of pay. One such plan pays a set amount of money for an hour's work. Output above a given level is rewarded on a piece-rate basis or by standard hour credits. In effect, this results in a higher rate for production below the target and a lower rate for that above it.

Variable individual incentive plans can be tailored to guarantee the worker a certain minimum daily wage. For an 8-hour day of loading lumber, the worker could be guaranteed \$48; for production beyond the desired 48 M per day the worker would be paid an additional \$0.80 per M.

A worker loading 44 M in 8 hours would still be paid the \$48—effectively \$1.09 per M. Yet a worker who loaded 60 M would receive \$57.60, or \$0.96 per M:

Guaranteed daily pay =	\$48.00
Incentive pay of \$0.80 per M	
for 12 M above desired 48 M	<u>9.60</u>
	<u>\$57.60</u>

GROUP INCENTIVE PLANS IN THE LITERATURE

The incentive plans just discussed cannot be used where a crew or an individual's work cannot be measured or where so many people are covered in a plan there is no single satisfactory output measure. "Group incentive" or "gain-sharing" plans have been proposed as a means of achieving the same results in situations where crew or individual plans would not be satisfactory. At least six different gainsharing plans are used in the U.S. today. The plans all share the same primary goal: to improve productivity. They differ in their levels of worker participation, suggestion making, the basis for calculation of the bonus, frequency of paying out the bonus, the role of unions, the role of supervisors, and the role of managers. These differences arise primarily from the philosophies behind each plan.

Three of these plans, the Scanlon, Rucker and IMPROSHARE plans, have been widely discussed in the academic literature. They are briefly mentioned here for comparison with plans developed in the forest products industry. In the forest products industry the most popular gainsharing plans are the "bonus" and "profit-sharing" plans discussed below.

SCANLON PLAN

In the United States, the most widely used group incentive plan is the Scanlon Plan, named for Joseph N. Scanlon, the cost accountant/union leader who developed and applied it in the steel industry prior to WW II. As many as 500 companies have tried the plan, and in 1983 200-300 of the plans were reportedly in operation. Training in the Scanlon Plan is offered jointly by Massachusetts Institute of Technology and The Scanlon Plan Associates.

The entire Scanlon Plan requires management to create a climate for "excellence" through an "employee centered participative leadership style" that encourages employee participation through a suggestion committee approach. Any improvement in labor productivity is to be shared with employees, though the benefits of savings other than through labor productivity go to the company. Most plans allocate 75 percent of labor-based savings to the employees and 25

percent to the company. The savings are shared with the workers through cash bonuses, usually paid monthly. Since labor savings can fluctuate, a portion of the savings is held back in a reserve fund to cover any deficits. The amount held back for the reserve fund varies from 10 to 35 percent of the monthly "labor savings."

The Scanlon Plan Associates recommend that all employees, both management and labor, share in the bonus. Some companies, however, exclude managers and outside salespeople, particularly when they have separate performance bonuses.

Labor costs are measured as a percentage of sales. This percentage is referred to as "the ratio." The "labor-cost-to-sales" ratio for two to five years of normal or near-normal operations is used as a "base ratio." Each month, actual labor costs are compared to "base labor costs," which are calculated by multiplying the month's sales by the base ratio. The difference between actual labor costs and base labor costs is the "savings" or "deficit." Any savings (above the amount held back for the reserve fund) are shared with the employees, while deficits are subtracted from the reserve fund.

THE RUCKER PLAN

The Rucker Plan, registered with the Eddy-Rucker-Nickels Company, is similar to the Scanlon Plan in its requirements for management participation and insistence upon a formal suggestion program, but it uses a different formula to determine the "bonus" available for distribution. About 200-300 Rucker Plans are in operation today.

Rucker, an economist, found that within an industry labor cost as a percentage of value added remained quite stable over long periods of time. "Value added" is the difference between the sales and the total cost of materials, supplies, and purchased services other than employee costs. The Rucker Plan uses this ratio to determine the amount of wages and bonus given to labor.

For example, on the basis of industry data, a firm determines that 40 percent is an appropriate ratio of labor cost to value added. From that point on, labor would receive 40 percent of the month's value added as its share. When the month's ratio was 40 percent, labor's share would all come as wages. When the ratio dropped to 35 percent, 5 percent of the month's value added would be placed in a fund out of which monthly bonuses would be paid.

A reserve should be kept for those months when the ratio is over 40 percent; it would be used to reimburse the company for the additional costs of labor above 40 percent.

Since bonuses can be increased either by lowering labor costs or by increasing the value added, this plan provides an economic incentive both to lower costs and to make more profitable products.

THE IMPROSHARE PLAN

In 1974, Mitchell Fein introduced a gainsharing plan for improved productivity sharing (IMPROSHARE). The plan places less stress on specific management practices and a formal employee-involvement program than the Scanlon and Rucker plans do. It relies almost entirely upon economic incentives, allowing a group of workers to be paid for more hours than they actually work.

To calculate these bonus hours, the company determines the direct and indirect labor hours needed to produce one unit of product. When weekly production hours are less than a calculated amount, the savings are split 50-50 between employees and the company. The credited hours, expressed as a percentage of the total hours worked, are used to increase the worker's weekly paycheck.

For example, workers were expected to work 50,000 hours per week to produce 100,000 units of output. Instead, production took only 40,000 hours. With the 10,000-hour savings split 50-50, the workers would get credit for 5,000 hours; expressed as a percentage of the 40,000 hours actually worked, this would mean a 12.5 percent increase on each timeslip.

To avoid weekly fluctuations, bonuses are based on a moving average maintained for four to six weeks. No reserve fund is needed, since the moving average adds savings, subtracts losses, and pays only when the cumulative amount is positive.

BONUS PLANS

Both the Rucker and IMPROSHARE plans are copyrighted. However, many other gainsharing plans are based on similar ideas but vary in important aspects. Typically, these plans offer workers a bonus based on improvement in some combination of output per hour, waste, or number of lost-time accidents. The bonus can be determined by a formula, by management, or by a committee. Bonuses can be paid weekly or quarterly and can be added to paychecks or paid separately.

PROFIT SHARING

The ultimate bonus plans are profit-sharing plans, where workers receive a portion of the net income of the firm. The amount of the bonus depends upon the amount of income declared in a specific time period. This means that many factors outside the workers' control will influence the size of the bonus. For example, profits might rise through increased demand caused by competitors' problems with strikes or unfavorable publicity. Conversely, bonuses would fall or disappear entirely when market prices dropped or natural disasters caused increased repair expenses.

CURRENT GAINSHARING PLANS IN THE FOREST PRODUCTS INDUSTRY

During June 1988, a survey was conducted of forest products firms in the U. S. The survey was designed so that the chance of any mill site being selected was equal and the selection would be based on a process that hopefully did not predispose one site being selected over any other. Respondents at these selected mill sites were asked to provide information about "gainsharing" plans applicable to mill workers in their production facilities during 1987. The survey avoided requesting specific results, on the assumption that demanding too many details would reduce cooperation.

The types of gainsharing plans in use appeared to vary with the industry classification.

THE PULP AND PAPER INDUSTRY

Approximately four percent of the 619 pulp and paper mill "sites" in the U. S. were contacted. A "site," defined as a specific geographical location where one or more mills was owned or operated by one firm, could include a pulp mill and more than one paper machine.

Approximately 20 percent of the sites surveyed have some sort of gainsharing plan for their operating employees; some have been in effect for a decade. Based on extrapolation of the survey's results, gainsharing plans cover approximately one-third of the pulp and paper industry's employees and accounted for one-quarter of the industry's capacity. However, there is no statistical relationship between the existence of a gainsharing plan and the size of the site (in either capacity or number of employees).

Bonuses came as a separate check, generally paid quarterly; a few were paid annually. Usually the plans covered the entire [operating] workforce at the mill

or site, and each person received identical bonus payments. When some operating personnel were omitted from a plan, it was because they belonged to a different union. Most, but not all, of the sites with plans were unionized.

The predominant type of plan in the pulp and paper industry would be classified as a "profit-sharing plan." The operating personnel were paid from a bonus pool that depended on the mill(s) reaching a minimum "profit"; a percentage of that "profit" that would be shared, usually less than 20 percent. The mill(s)' "profit" would usually be a "gross profit" figure for the mill. That would be the allocated "sales revenue" less cost of goods sold—not including the mill's selling and administrative expense, if such were included. This figure would be calculated by the company using current transfer prices—if appropriate. Some plans were based on pre-tax "profit," others on after-tax "profit."

SOLID WOOD PRODUCTS INDUSTRY

The situation in lumber and plywood mills is entirely different; "profit-sharing" plans are rare. Individual or crew incentive plans have been used for years, but they usually apply to a few specific operations such as boxcar or truck lumber loading, or glue-spreading. In one instance, however, all the operations in a mill were on individual and/or crew incentive plans similar to those described at the beginning of this monograph. Except at a few mill sites, gainsharing plans are a relatively new phenomenon; most are those described as "bonus plans." However, the dimensions and criteria of plans in use differ greatly. To illustrate this, two gainsharing plans used in the solid wood products industry are described below. Although a few details have been changed to provide anonymity, these are plans that were actually in use at the time the survey was conducted.

Firm A. The bonus plan covers all hourly-paid employees in the sawmill, including some maintenance and supervisory personnel. Salaried employees who already receive bonuses tied to overall company profits are not included in the plan. Bonuses to the hourly-paid employees are paid weekly in separate checks along with paychecks.

The bonus each worker receives depends on the number of "countable" days worked and the amount in the bonus pool. The basis for paying bonuses remains constant for any three-month period, but the company reserves the right to change the basis at the end of each three months.

Workers cannot get credit for days they were tardy, had an unexcused absence, or lost time due to accidents. A worker who has a lost-time accident on Monday, is late on Tuesday and Wednesday, and has an unexcused absence on Thursday will get credit for only one countable day in the week. The bonus pool is divided by the week's countable days for all workers to obtain the bonus per "countable" day. A worker with five countable days gets five times the bonus of a worker with only one. The amount in the bonus pool depends upon

two major factors: improvements the worker can influence and the general profit position of the company. Profit is basically determined by market conditions that affect the difference between log costs and the selling price of the firm's products. The more favorable this difference, the greater the bonus pool. It is possible that selling prices could become so low or log costs so high that no bonus would be available.

Factors influenced by the workers include improvement in unit production cost and recovery percentage from a "base." The base is determined by management, as is the amount of improvement required for specific bonuses. The relation between improvement and bonus pool increase is not "straight line." In general, large increases in productivity increase the bonus pool much more than small increases do. If one week's unit cost is \$5 below the base unit cost, there might be a 10 percent increase in the bonus pool. Yet a \$15 dollar decrease might result in a 50 percent increase in the pool.

The calculation of the bonus pool is in fact quite complicated. Apparently Firm A genuinely tries to assess improvements attributable to the plan's implementation, while still noting differences in market conditions; 30 to 40 percent of this cost saving is passed on to employees, who consequently get 30 to 35 percent of their earnings in bonuses. To date, workers at Firm A have had higher annual earnings than workers at the surrounding union and non-union mills.

The firm has learned to make the explanation of the plan as simple as possible while still letting workers know that their bonus is dependent upon (1) unit cost and recovery improvement, (2) market conditions, and (3) countable days of work each week.

Firm B. This bonus plan covers both hourly and salaried employees in a mill division with several different "departments:" maintenance, power, green end, dry end, and so on. The salaried employees are all managers, and the bonus is calculated differently for hourly employees and those on salaries. The salaried employees' bonus depends upon their specific departmental improvement, while improvement in the entire division determines the bonus for the hourly employees.

Both bonuses depend on improvement in output, cost, and quality. The improvement is measured against a base established by a two-year rolling average; the bonus accrues only when output is higher than the previous two years' average daily output. Improvement is calculated quarterly for each measurement, and the improvements are given a point value so that the bonus can be calculated from "overall improvement." Improvement and the bonus are directly related; that is, doubled improvement doubles the bonus. There appears to be an attempt to weight the measures so that bonuses don't exceed ten percent of average annual wages.

The bonuses are paid quarterly with a ten percent holdback until the end of the fiscal year—at which time the remaining bonus fund is disbursed. Written on

separate, color-coded checks, the bonus payments are presented quite separately from normal paychecks. All hourly workers receive the same bonus, regardless of their hourly pay rate, since their bonus depends on "overall improvement" in the entire division. All hourly workers within the division receive identical quarterly bonuses.

The bonus for a salaried worker varies with two factors—"salary level" and "overall improvement" in the salaried worker's department. In general, the higher the salary level, the greater the bonus.

DISCUSSION

The literature indicates that gainsharing plans differ in several respects. Ranging from the more mechanical to the philosophical, the differences may include frequency of payout, method of payout, gainsharing formula, role of supervisors, role of managers, form of suggestion making, amount of worker participation, role of unions, goals of the gainsharing plan, philosophy or theory behind the plan, and the impact on management style. For example, the Scanlon plan's philosophy is that workers can and will make suggestions, that managers and supervisors must be actively involved in a rather formal system of suggestion making and evaluation, and that managers will have to be very participative in their managerial style. IMPROSHARE, on the other hand, is based on the philosophy that economic incentives will be sufficient to improve performance, that no formal system for suggestion making need be set up, and that supervisors and managers are not as actively involved in the operation of the plan.

Several aspects of gainsharing plans in the forest products industry deserve comment. First, none of the mill operators surveyed use the Rucker, Scanlon, or IMPROSHARE plans, on which most of the gainsharing literature is based. This means that gainsharing plans in the forest products industry cannot be directly compared to those in the literature.

Second, gainsharing plans in the forest products industry typically have been designed, introduced, and operated by management. While the literature emphasizes employee involvement in the design and introduction of the plan, this has not usually been the practice in the forest products industry. In most cases, the initiative has come from management, although some firms have discussed the plans with workers before introduction and have occasionally modified them. Where collective bargaining contracts are in place, the gainsharing plans have been subject to negotiation, and sometimes modified or rejected. However, the gainsharing plans are clearly being championed by management.

It should be noted that an active argument is going on among academics and others over the importance of a "participative" climate to the success of gainsharing plans. Some maintain that a very high level of trust and worker par-

ticipation is necessary before gainsharing plans can be introduced, if the maximum results are to be achieved.

Third, some plans pay a bonus whether or not there is "net income" or "profit" to pay it. Other plans pay a bonus only when there is a minimum level of "net income," "profit," or "return on investment." Those favoring the first type of plan argue that employees try harder when their bonus is based on factors they can control (labor costs, output rate, waste, quality) rather than on factors they cannot control (raw material costs, selling price, some types of overhead costs). The disadvantage is that bonuses in the first type of plan may have to be discontinued if the industry goes through a period of depressed prices, excessive stumpage costs, etc. Those who prefer the second type of plan argue that employees can accept discontinued bonus payments when external factors depress the firm's income.

There seems to be little agreement on the extent to which bonuses should be related to improvement in "profit," or productivity. Pulp and paper mills have generally adopted "straight-line" bonus plans. Some of the plans in lumber and plywood plants are straight line, but in most the bonuses are proportionally much greater for higher levels of achievement.

A large majority of the plans exclude managerial employees. Some plans specifically include managers of operating units but do not necessarily base their bonuses on the same criteria as those for operating employees.

Every mill contacted paid the bonus in a separate check; presumably this was to make the relation between improvements and the bonus very obvious. The typical interval for "profit-sharing" plans was quarterly. The "productivity-based" plans more common in the lumber and plywood mills paid bonuses more frequently.

IMPORTANT FACTORS AFFECTING GAINSHARING PLANS IN THE FOREST PRODUCTS INDUSTRY

Throughout the survey, one comment was repeatedly made. The criteria chosen to determine the bonus will become very important to operating personnel. Management's expectations will usually be met and often exceeded, sometimes at the expense of other important factors. If the bonus is based on tons-per-day, tons-per-day will improve. However, there may be a great reduction in recovery or quality yield. For that reason, people with experience in gainsharing plans suggest putting a great deal of thought into selecting of the criteria to be used.

In addition, even when criteria are very carefully selected, unexpected quirks may appear when the plan goes into operation. As a result, criteria may need to be adjusted or changed. "Profit-sharing" plans showed less need for change,

perhaps because "profit" was so inclusive a concept that operating personnel became concerned with many aspects of production, rather than focusing on just a few. Those planning to introduce a productivity-based gainsharing plan, however, should be prepared to adjust it.

SUMMARY

This monograph summarizes current gainsharing plans for mill workers in the forest products industry and compares them with plans in the literature. In general, gainsharing plans in the pulp and paper industry tend to be more uniform and to have been in place longer than those in the solid wood products industry. Gainsharing plans in the pulp and paper industry can generally be described as "profit-sharing" plans.

Most gainsharing plans in the solid wood products industry can be described as "productivity-based" plans and have been introduced fairly recently. Bonus payment method and frequency tend to be fairly constant. In all other aspects the plans vary tremendously. The basis for the bonus pool and the criteria used to determine bonuses tend to be tailored to the individual mill site and the productivity measures that seem important to local managers at the time.

SUGGESTED READINGS

Compiled by Dr. John A. Drexler, Jr., Professor of Management, OSU College of Business

Bullock, R. J. and Lawler, Edward E.
"Gainsharing: A Few Questions, and Fewer Answers"
Human Resource Management, 23: 23-40, Spring 1984

Hamerstone, James E.
"How To Make Gainsharing Pay Off"
Training and Development Journal, 41: 80-1, April 1987

Hauck, Warren C. and Ross, Timothy L.
"Sweden's Experiments in Productivity Gainsharing (Volvo's Kalmar and other plants)"
Personnel, 64: 61-7, January 1987

Miller, Christopher S. and Schuster, Michael H.
"Gainsharing Plans: A Comparative Analysis"
Organizational Dynamics, 16: 44-67, Summer 1987

Ross, Timothy L., Hatcher, Larry L., and Adams, Dan B.
"How Unions View Gainsharing"
Business Horizons, 28: 15-22, July-August 1985

Welbourne, Theresa M. and Gomez-Mejia, Luis R.
"Gainsharing Revisited"
Compensation and Benefits Review, 20: 19-28, July-August 1988

"Pay-For-Performance Programs Seem As Successful Despite Criticisms"
Journal of Accountancy, 158: 34+ S 1984

**STUDIES IN MANAGEMENT AND ACCOUNTING
IN THE FOREST PRODUCTS INDUSTRY**

Oregon State University

<u>No.</u>	<u>Monograph Title</u>
1	"The Rush to LIFO: Is It Always Good for Wood Products Firms?" (1976).
2	"Accounting and Financial Management in the Forest Products Industries: A Guide to the Published Literature," (1977 and 1981).
3	"A Decision Framework for Trading Lumber Futures," (October 1975).
4	"Capital Gains Tax Treatment in the Forest Products Industries," (June 1976).
5	"Measurement Difficulties in the Log Conversion Process," (June 1976).
6	"Capital Budgeting Practices in the Forest Products Industry," (March 1978).
7	"A Reporting and Control System for Wood Products Futures Trading Activities," (July 1978).
8	"Selected Issues of Financial Accounting and Reporting for Timber," (November 1978).
9	"Pool Log Transfer System," (August 1979).
10	"Fundamentals of Financing Major Timber Acquisitions," (February 1980).
11	"LIFO Inventories in the Forest Products Industry," (July 1980).
12	"Accounting Controls for a Forest Products Firm," (January 1981).
13	"Log Inventory Controls," (April 1981).
14	"Accounting Treatment for Wood Products Futures Trading Activities," (October 1981).
15	"A Reporting and Planning System for a Wood Products Operation," (November 1981).
16	"Boise Cascade's Productivity Improvement Program," (January 1982).
17	"Information Systems Planning in Weyerhaeuser Company," (August 1982).
18	"Developing a Strategic Plan for a Forest Products Company: A Case Study," (March 1983).
19	"Company/Employee Gainsharing Programs," (July 1983).
20	"Productivity Improvement Programs of Knowledge Workers in the Forest Products Industry," (November 1983).
21	"Microcomputer Modeling in the Forest Products Industry," (May 1984).
22	"Control and Measurement of Chips," (September 1984).
23	"Accounting for Buying Back Timber Cutting Contracts," (December 1984).
24	"Developing Cross-Hedging Strategies Based on Lumber Price-Change Variation and Seasonality," (May 1985).
25	"Unique Financial Reporting Considerations for Readers of Forest Products Companies Financial Statements," (November 1985).
26	"Improving Productivity Through Internal Contracting," (March 1986).
27	"Perspectives on the Timber Industry From a Lender's Standpoint," (October 1986).
28	"Long-Term Timber Supply and Its Importance in Strategic Planning," (March 1987).
29	"Microcomputer Applications in Timber Management and Accounting," (August 1988).
30	"Producing OSB Using Red Alder: A Feasibility Case Study," (January 1989).
31	"Export Marketing Activities of Small-Firm Lumber Manufacturers," (June 1989).
32	"Gainsharing Plans For Mill Operations in the Forest Products Industry," (October 1989).

**FOREST PRODUCTS MONOGRAPH SERIES
Advisory Council**

INDUSTRY COUNCIL

Patricia Bedient
Arthur Andersen & Co.

Clayton W. Knodell
Willamette Industries, Inc. (Ret.)

Richard D. Snyder
Gregory Forest Products

Frank H. Eiseman
Arthur Young & Co. (Ret.)

James E. Lawrie
Peat, Marwick Main & Co.

Kenneth Stancato
Weyerhaeuser Company

Wendell Hamilton
Coopers & Lybrand (Ret.)

K. Stanley Martin
WTD Industries

William L. Hebert
Louisiana Pacific Corp.

Ronald C. Parker
Roseburg Forest Products, Inc.

UNIVERSITY COUNCIL

Charles W. Dane
College of Business

George R. Martin
College of Business

Charles Neyhart, Director
College of Business

John A. Drexler, Jr.
College of Business

Robert O. McMahon
College of Forestry

CORRESPONDING MEMBER

Andrew R. Lessin
International Paper Co.

Studies in Management and Accounting for the Forest Products Industry

This series of monographs is published by the College of Business and the College of Forestry, Oregon State University, to disseminate information, research findings, and informed opinion about current problems and opportunities in the management of, and accounting for, enterprises in the forest and wood products industries. The views expressed herein are those of the author(s), and do not necessarily represent those of Oregon State University.

Additional information about these Studies may be obtained from the program director, at the College of Business, Oregon State University, Bexell Hall 200. Corvallis, Oregon 97331-2603.

