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**Accounting and Financial Management
in the Forest Products Industries:
A Guide to the Published Literature**

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ACCOUNTING AND FINANCIAL MANAGEMENT IN THE FOREST PRODUCTS INDUSTRIES: A GUIDE TO THE PUBLISHED LITERATURE

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A review of the available literature relating to the forest products industries reveals an enormous volume of published information on subjects ranging from leaf abscission to the construction of yield tables. However, there is very little published information dealing with the accounting and financial aspects of the management of forest products industries. While there is a substantial amount of information available to the forest manager on the economic aspects of the timber resource, there is little detailed material that has been written to assist financial and accounting personnel in managing and controlling their enterprises.

Forest products industries by nature are susceptible to dynamic change in all phases of their production and management processes. Consequently, a manager, if he is to be effective, must keep himself informed and up to date on developments that will affect his ability to achieve satisfactory results. One way to keep up to date is to keep abreast of the latest published literature. But too often either the available literature does not cover those topics that are of concern to the manager, or the manager simply does not know where to look for the information he needs.

It is our purpose in this monograph to deal with both of these problems, insofar as they relate to subjects on accounting and financial management in the forest products industries. In the first instance, we intend to emphasize, and hopefully draw attention to, those important subjects about which little or no material has been published, and, in the second instance, we hope to guide managers to the literature that does exist on a variety of pertinent topics.

We have designed the monograph to serve as a general reference tool and as a source of information for those who may be interested in specific problem areas. We intend that it be useful not only to members of management within these industries, but to those who may be doing research on

the industries' accounting and financial problems. While it is not our intention to totally bridge the information gap—which is considerable—we do hope to focus attention on the fact that there is a tremendous lack of timely information in many areas that are important to successful management of businesses in the forest products industries.

The monograph itself is composed of two sections. The first section is a review of the literature in which we briefly discuss available information on a topic-by-topic basis. The second section consists of a detailed bibliography, arranged according to subject headings that basically correspond to the headings used in the review, although not necessarily in the same order. They are as follows:

- Accounting in the Forest Industries
 - Cost Accounting
 - The Balance Sheet
- The Canadian Forest Industries
- Computer Systems
- Energy and the Environment
- Financial Management of the Timber Resource
 - Capital Investments
 - Futures Trading
- Forest Valuation and Appraisal
- Management Reporting
- Marketing
- Taxation
- Timber Production
 - Production Opportunities and Costs
 - Timber Stand Improvement
- Transportation and Shipping

The articles in the bibliography have been numbered so that when a subject is discussed in the review section of the monograph we have been able simply to list, in parentheses, the numbers of articles that are representative of that subject, thus making it easy for the reader to locate them in the bibliography.

A limited number of recent books are cited under the appropriate subject headings, but the majority of the references cited are from journals or periodicals commonly associated with forestry and the forest-based industries, or with the accounting and financial management professions. There is also valuable information to be found in

pamphlets published by the Federal and state governments. And while there is a substantial amount of information on forest-based industries available from foreign sources, the only foreign literature included is that of a general nature, which may prove of equal interest to U.S. and Canadian-based industries.

THE LITERATURE: A REVIEW

ACCOUNTING

Available literature on the subject of accounting procedures in forest-based industries reflects, in general, the most significant problem that faces the accountant: the necessity of accounting for, and controlling the costs originating from, a great variety of sources. Aside from the usual manufacturing and overhead costs, it is necessary to account for costs of the logging operation, reforestation and site preparation, and a seemingly infinite number of expenditures made over the length of the rotation—from road construction to fertilization and thinnings.

Thus, much of the literature available on accounting in these industries deals with cost control and cost accounting practices. Some of this is of a general nature, referring to allocation of overhead and common costs (5,6). One author suggests that the use of a standard cost system in the forest industries will improve managerial effectiveness (10). The allocation of joint product costs, characteristic of the wood conversion industry, is also examined, with the suggestion that, through mathematical analysis, an optimum solution by product line may be obtained (5).

In response to the impact of inflation, many firms have recently adopted the last-in, first-out (LIFO) inventory valuation method. The effect of LIFO on the forest products firms was examined in the first monograph of this series (12).

Perhaps the most important conclusion to be drawn from a general review of the accounting literature is that there are topics of importance to the industries on which there is little, if any, available information. For example, although the importance of various wood by-products (chips, for

example) has increased drastically during the past few years—and will undoubtedly continue to increase as even greater utilization of wood resources becomes necessary—there is a marked absence of literature available on accounting for by-products. Similarly, there is a lack of literature on methods of allocating log costs to different products.

Resource accounting

A central element in the management of any forest-based industry is the available supply of the raw resource—the timber—whether contracted or company owned. Yet, in spite of their paramount importance, and the resulting effect on company financial statements, there is little published information on practices of timber depletion or capitalization policies for timber contracts.

Price-level accounting

The use of price-level accounting as one way of dealing with the effects of inflation on financial statements is currently being debated in all sectors of industry. As with the LIFO method of inventory valuation, the use of price-level accounting as a supplement to financial reporting would greatly affect the financial statements of any firm in the forest products industries. In view of the fact that price-level accounting may become obligatory in the not-too-distant future, there is a definite need for information concerning its implications for the forest products industries.

Cost accounting

As mentioned earlier, much of the literature that is currently being written on accounting and financial management in the forest products industries is concerned with cost control and cost accounting. Yet, even in these areas, there is a shortage of information—a shortage that is particularly acute for industries of the proportions of those that are forest related. Furthermore, the pieces that are being published are quite limited in their coverage, especially when compared with the wide range of topics encompassed under cost accounting and control.

While a single reference has already been cited (10), which addresses itself to the use of standard costs in the industries, there seems to be virtually no recently published data concerning the variable budgeting concepts that are employed. In the forest products industries, informative articles on the application and use of standard costs, and on the various budget control concepts, would greatly enlarge the base of knowledge in these areas for all those concerned with effective management and control. Indeed, with the increasing complexities facing the wood products manager in all phases of operations, ready access to timely information is an invaluable asset. Standard costs and variable budgeting are integral parts of the information systems that facilitate the management of control processes. With greater availability of informative literature on these areas of management accounting, improvement in the management control processes could be substantial.

FINANCIAL MANAGEMENT

Within the forest products industries, financial management is a highly visible component of the management process. In this area, as in others, there is a gap in the literature. What has been published in recent years in this area has emphasized the *philosophy* of resource ownership and of the investment decision process. Little has been written about specific methods and practices or about those considerations that may be necessitated by the unique nature of the forest investment decision. The reason for this may be that the capital investment decision in the forest products industries is not considered to be particularly unique—not terribly different from that of industry in general. As a result, reliance is placed almost solely on general sources, such as past experience and

education, for information on capital budgeting methods and the investment decision process.

However, the forest products industries are seriously affected by various aspects of the investment process—for example, the cyclical pattern of demand, the availability and cost of the raw resources, and the availability of capital. As a result, there is a substantial need for detailed information. Particular emphasis should be placed on those factors affecting capital investment that are uniquely related to the nature of the forest-based industries, such as future timber availability and cost trends, alternate uses of the forest resources, recreational and public demand for the timberlands, utilization trends, and, of course, future markets. Of critical importance will be the issue of where the funds will come from for the needed investment. Information on factors such as these, as well as guidelines for integrating them into the investment process, would greatly enhance the ability of many to deal effectively with this area of financial management.

The many general issues surrounding timberland ownership and financial management are treated quite ably in two articles by Gerald S. Gilligan (21, 22) and in a summary of papers published by the Yale University School of Forestry (20). The Gilligan articles deal with timberland ownership and with those factors that most affect its profitability, such as asset management, company goals, ownership patterns, and price trends. The Yale papers cover subjects ranging from capital budgeting for timber acquisition to those factors that most attract borrowed and equity capital to timberlands. Important topics concerning the leasing of forest properties and the resulting effects on financial management have received almost no coverage at all.

There is one particular phase of financial management that has received rather substantial coverage of late—futures trading. Recent articles have emphasized the role that hedging can play in a business when proper consideration is given to such things as seasonal patterns and price trends (30, 31, 32).

TAXATION

As may be expected, the aspect of management that has received the greatest attention in recent literature is taxation. Due to the efforts of others, this material is already fairly well organized and accessible. Therefore, we have provided only a

sampling of the literature in our bibliography. We do plan, however, to cover specialized areas of forestry taxation in other monographs later in this series.

Special Federal income tax problems of the timber industry (usually related to Internal Revenue Code Section 631), as reflected in articles published in legal, accounting, tax, and other periodicals and professional journals, are reported currently and on a cumulative basis in the *Federal Tax Articles Service* of the Commerce Clearing House, Inc., 4025 West Peterson Avenue, Chicago, Illinois 60646.

Broader coverage of tax-related subjects, including ad valorem and severance taxes in the various states, is available in the annual *Timber Tax Journal*, published by the Forest Industries Committee on Timber Valuation & Taxation, 1250 Connecticut Avenue N.W., Washington, D.C. 20036. The topics covered in this journal provide as comprehensive a coverage of forest-related taxation as is available. The journal also includes a topical index of subjects it has covered since its inception in 1965, as well as the timber tax laws for the individual states and recent timber tax cases and revenue rulings (45).

ENERGY AND THE ENVIRONMENT

The range of topics that are relevant to effective financial management in most industries has expanded. An increasingly turbulent environment dictates that the forest products firm—like many others—must be aware of all the aspects of management that will affect its financial position. For example, the successful firm will be the one that can effectively cope with the pressure that is currently being brought to bear by changes in the environment. Although the forest products industries may require less energy to convert their raw resources into finished products than, for example, the steel industry, solutions must be found for the energy crisis and related environmental problems.

Additional literature is needed on the subject of energy and the environment. The elimination of water and air pollution in the industries has a definite financial impact upon individual companies. Yet, in spite of the importance this situation holds, and the importance of the fuel crisis, there is relatively little published material to which management can turn to increase its knowledge, improve its understanding, and guide its action.

STABILITY OF SALES AND EARNINGS

Forest products industries have been marked susceptible to economic cycles and fluctuations within the general economy, and the problem of stability has therefore been one of great importance. The periods of depressed markets and subsequent shutdowns and layoffs have cost the employer and the employee millions of dollars in lost sales and wages. Although many of the underlying problems are certainly outside the realm of influence of the forest-based industries, it may be that there are certain factors that are at least partially under the control of the industries and that, if certain actions were taken, could help to alleviate some of the most painful problems. Some of these actions may require changes at both the planning and operating levels of the organization. Studies and articles such as those dealing with financial comparisons, over a period of time, of publicly and privately held companies, with particular attention paid to the key areas of the most successful and enduring companies, may provide insight into the means for obtaining greater stability within the industries. Similarly, trend analyses of the financial results of timber companies could supply information to management that may be helpful not only in running their current operations but in planning for future operations as well.

TIMBER PRODUCTION AND FOREST VALUATION

Although distinct subjects in their own right, timber production and forest valuation and appraisal are closely related to certain components of financial management. The majority of the published information in these areas has concentrated on southern and eastern operations and on the opportunities for pulpwood production (47, 48, 50) and the costs associated with production alternatives (51, 52). Timber stand improvement (TSI) is an integral part of the production alternatives and, as such, has received a great deal of attention in the current literature (54, 55, 56, 57). Most of the information on TSI is found in professional forestry publications and is intended for the forest manager.

Forest valuation and appraisal is important to the wood products companies, whether they own substantial timberland or are supplied through cutting rights or leases, because the method of appraisal has a direct effect on tax liability, asset management, and the cost of timber. The subject ma-

terial of the few articles that are available in the area of forest valuation and appraisal range from the importance of the timber cruise (36) to the valuation of non-wood benefits (34). Two articles discuss relatively new alternative methods to timber appraisal—a transactions-based approach and a cost approach (33, 35). The deficiency of literature in the area of valuation and appraisal indicates that this is an area that falls largely under the responsibility of the forester and that present-day authors have left it to past experience and older writings.

COMPUTER SYSTEMS

In addition to the numerous topics already discussed, we are going to include several additional ones that, although they may not be specifically concerned with accounting or financial management, are nonetheless equally important and have received at least minor coverage in the literature.

While the implementation of computer systems is increasing in the forest industries, much of the computerization, and consequently the majority of the literature, has been centered on the production phase. In spite of the great potential the computer has in the areas of management planning and control, the opportunities for model building and simulation in the diverse phases of the industries are largely unexplored. Some insight into the potential of the computer in the area of planning and control is provided in an article on the use of simulation in achieving properly balanced logging systems (16). Applications such as this and others could lead to increased effectiveness in management control and decision-making and quite possibly to a greater knowledge of the interrelationships among the numerous organizational, industrial, and environmental components that affect company and industry profits and stability.

TRANSPORTATION AND MARKETING

An often neglected phase of the forest-based production cycle is transportation, both of the raw material and of the finished product. Two articles suggest that if the proper managerial steps are taken, it may be possible to realize substantial savings in the handling and shipping of materials (58, 59).

Transportation of the finished product is only one part of a much greater marketing system, a

function distinct from that of finance or accounting. Yet the three are closely related, primarily because marketing has an effect on the financial position of the company and because there is a need to account for marketing activities. A timely marketing information system, which provides information with respect to internal accounting data and market intelligence and research, would be extremely beneficial to the wood products manufacturer, making possible a more efficient allocation of marketing resources.

Transportation and marketing are both vitally important to effective control and to the realization of management goals. It is unfortunate that there is little published material on either subject.

PERFORMANCE EVALUATION

There has long been a question within the forest products industries of whether the responsibility centers should be established as profit centers or as cost centers. At present, the consensus of opinion seems to be that the use of a profit center organization has the potential for the greatest motivation (37), provided the organization's overall objectives are recognized. One key to the effective organization of a profit center is a system of performance reporting that is designed not only for managerial and center performance evaluation, but for the necessary integration of company and division goals and for emphasis on those elements of profit that can be influenced.

THE FOREST INDUSTRIES IN CANADA

The majority of literature that we have reviewed in this monograph has been addressed to the forest industries in the United States. Yet we must emphasize the importance of the Canadian forest industries and the applicability of the articles we have cited to the industries in that country. We have primarily been concerned with literature that pertains to improved managerial and organizational effectiveness, and, with the exception of certain tax subjects, it applies to the management of forest industries in all countries.

The Canadian forest industries receive substantial coverage in their own right, both from publications within the United States and from the forestry publications in Canada. An example of the

former is an article assessing the effect of U.S. legislation on the Canadian forest industry (14). From the Canadian literature come articles such as one on the Export Development Corporation, which was created to make loans to foreign purchasers of Canadian goods and to insure investments in developing countries (15).

CONCEPTUAL ACCOUNTING

There are relatively few conceptual articles within each of the major topics discussed. The conceptual approach seems to be overlooked in favor of addressing specific subjects or topic subcomponents—some of them rather minor, at that. As reiterated throughout this review, the basics of many of the important topics are largely ignored; capital budgeting techniques, capital funds availability, and the planning procedure within the capital investment process are examples. A conceptual approach could provide an excellent foundation for the further expansion of any of these topics.

Some of the articles referred to earlier have been developed on a conceptual basis—for example, the articles on timber ownership (21, 22). Articles such as these not only provide important background, but serve to provide a common base to which all subsequent literature can be related. The advantage of a solid conceptual approach to the literature becomes most apparent when we view the forest products industries as the dynamic industries they are—with fluctuating markets and changing environmental conditions.

SOME FINAL THOUGHTS

In this paper, we have stressed the need for accurate and timely information that will facilitate management control processes in the forest products industries. With costs escalating at every level, *cost control* will be the base upon which future earnings will be built. Effective management accounting and cost accounting will be the key components of that base, and industry management will be looking to the industry literature to address these subjects in a timely and in-depth fashion.

We have also indicated the importance of the capital investment process as an area of critical concern to the future of the forest products industries. In order to sustain economic growth, vast amounts of new capital are going to be needed. Old sources can no longer necessarily be relied upon. With depressed equity markets and many companies already having a substantial amount of leverage, funds are difficult to come by. Where *will* the money come from? How will the problem be solved? These are questions to which some authors might address themselves.

In summary, the range of topics relevant to effective financial management, and therefore relevant to the overall success of a company, has expanded. Our survey of the literature indicates—and once again we accentuate this point—that the information available to management in the forest products industries has not kept pace with its expanding needs. In many cases, the untouched topics tend to be those of crucial concern. It is a trend that will have to be reversed if industry management is to be able to effectively and efficiently cope with the challenges that lie ahead.

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