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1960

# Financial Management of Large Forest Ownerships

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FOREST OWNERSHIPS

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## INTRODUCTION

AS American forestry becomes more mature, its techniques more refined and its goals more intricately entwined with product utilization, an understanding and wise application of the financial aspects of timberland management become of paramount importance.

The Industrial Forestry Seminars of the Yale School of Forestry have recognized this need and have included in their programs several days on financial considerations. The Thirteenth Seminar held in New Haven during the week of January 18, 1960 was devoted entirely to "Financial Management of Large Forest Ownerships." Twenty-one forest managers from all regions of the country met in an open forum and exchange of ideas with Seminar leaders from the fields of economics, finance, forestry, law, accounting and management.

The Seminar papers are presented in this Bulletin as a valuable addition to the literature on this aspect of forest management.

ZEBULON W. WHITE

*Professor of Industrial Forestry*



# CAPITAL BUDGETING FOR ACQUISITION AND DEVELOPMENT OF TIMBERLANDS

## *A Theory and Method for Forest Management Planning*

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### I. THE CAPITALISTIC NATURE OF FORESTRY

**T**IMBER growing, or forest management, is an investment type of enterprise. Cash outlays made today for land, growing stock, roads, reforestation, equipment, improvements, and protection are largely for wood-yields and income that will be realized in the more or less distant future; often annually or periodically but sometimes only as a single return. Such expenditures, or capital outlays, are investments for future earnings. Most timber management activities have this capitalistic nature, a nature more commonly referred to in the forestry literature as the long period of production between stand establishment and harvest; or in other words, the long period between initial investment and the realization of all the expected earnings.

The annual cash outlays in the forest enterprise, however, are only a fraction of the capital that is the concern of the forest manager. The major portion of the capital subject to the decisions of the forest manager are the existing land holdings, growing stock, roads, equipment, and improvements. These assets are the consequence of past investments. Decisions to hold and maintain them, to liquidate, or to replace them are largely a reflection of the manager's analysis and judgement of their future earning capacity.

The task of planning the allocation of new capital outlays, or proposals therefor, and the management of existing capital assets is capital budgeting. The forest manager, insofar as he exercises responsibilities for new capital outlays and decisions for the maintenance, replacement or liquidation of the existing assets of the forest enterprise, is an investment manager. This is his primary function whether his role is to make the final decisions or to participate in them with top management by developing and presenting budget requests and proposals. His key problem is to attract capital into the forest enterprise, or release it for better use elsewhere, and budget its allocation or re-

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lease to those forest assets and management functions which will contribute most to the objectives of the owner. In this respect, forest management is no different than the management of any other business in a competitive, capitalistic private economy.

In 1958 capital outlays for new and expanded plant facilities among 100 nonfinancial corporations in the U.S. having the largest sales revenues were \$10.7 billion, an average of \$1,650 per employee. The total value of the capital assets managed by these same firms was \$135 billion, averaging \$21,000 per employee. Of this total, shareholders' equity constituted \$87 billion, long term debt \$25 billion, and current liabilities \$23 billion. For manufacturing firms in this group the capital investment per employee was \$20,000 ranging from \$7,000 for aircraft companies to \$60,000 for petroleum manufacturers. For telephone systems the ratio was \$32,000 per employee; for railroads, \$38,000, and for gas and electric utilities, \$98,000. For the largest retail and wholesale trade companies, the ratio was \$8,000<sup>1</sup>. For major integrated pulp and paper firms the ratio varies from about \$18,000 to \$28,000. The ratio of capital to management, of course, is much higher, and for the upper levels of management will run into the millions of dollars in the largest firms.

In the forest enterprise the ratio of capital per employee or to management is a less well-known statistic. It is quite high; higher than most foresters appreciate. An estimate of the ratio can be derived using a model case for a 50,000-acre regulated forest enterprise. Table I is taken from a normal yield table for Douglas-fir. Average stocking per acre for a regulated forest on Site III land and an 80-year rotation would be about 12,500 board feet.

TABLE I. NORMAL YIELDS FOR DOUGLAS-FIR ON FULLY STOCKED LAND. AVERAGE SITE III. FOR TREES 12 IN. AND LARGER.

<i>Age</i>	<i>Yield in Board Feet Scribner Rule</i>
30	300
40	4,500
50	12,400
60	23,800
70	35,200
80	45,700

Valued at \$10 per M, the growing stock would be worth \$125 per acre and \$6,250,000 for the property. Four miles of road per section at \$12,000 per

<sup>1</sup> First National City Bank Monthly Letter, Business and Economic Conditions, New York, September 1959, pp. 104-105.



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mile would increase the per acre value by \$75, bringing the total property to \$10,000,000.

The reproduction and advance growth in the age classes below 30 years, taken at a minimum of \$20 per acre, adds another \$5 to the average per acre value. Land value can add another \$10 per acre and equipment and improvements other than roads, perhaps another \$5 per acre. Thus, total assets approximate \$11,000,000 or \$220 per acre for this mode 150,000-acre property<sup>2</sup>.

Using the foregoing model and assuming 20 year-around employees (1 man per 2,500 acres) including foresters but excluding commercial logging, the capital ratio per employee would be \$550,000. The manager's capital responsibility would be \$11,000,000 for existing assets not including the logging operation. Forestry obviously is a capitalistic enterprise. The fact that the foregoing values may not appear on company books because roads are depreciated and regrowth is not capitalized except for planting costs does not alter the reality of the financial responsibility of the forest manager.

If it is kept in mind that very few industrial forest properties are as fully developed as this model, it should be immediately apparent that one of the major problems in capital budgeting is to plan and justify the many capital proposals for roads, equipment, reforestation, protection, stand improvement, and even additional accessions to convert the property to a regulated sustained yield enterprise. Moreover, it is necessary that such proposals be allocated on the property to obtain the maximum advantage from both the new capital and existing capital assets, i.e. land, growing stock, roads and other improvements.

### II. OBJECTIVES OF CAPITAL BUDGETING

The forest property is a part of the integrated industrial forestry firm only because it serves the interests of the business as a whole. Similarly, capital budgeting for the acquisition and development of timberlands is only a segment of the total capital budgeting problem of the firm. In this sense the objectives of the forest enterprise and its capital budgeting are dependent on those for the firm. Hence, an understanding of the firm's basic objectives and its capital budgeting procedures and criteria are a necessary part of an adequate appreciation of the objectives of forest management and capital budgeting

<sup>2</sup> In the South, where rotation ages are much shorter and road costs much less, per acre values will be much lower. One firm estimates the potential capital value of its 50,000-acre management units at \$5,000,000 or \$100 per acre.

as a general theory and method for forest management planning. The next sections develop the economic objectives of the firm and subsequently for the forest enterprise.

### *Economic Objective of the Firm*

Capital budgeting in its broadest sense is planning for the future earnings of the firm. As a general proposition and from the standpoint of economic theory, the ultimate objective of any firm is to budget its capital outlays and production so as to earn the maximum profits over the years it plans to be in business. In practice profit maximization over time may only be the proximate goal of business managers, but it is sufficiently close to the truth to serve our purposes.

From this view, then, management plans capital outlays and production, and thereby its costs, sales and revenues, in such a way that the expected stream of net earnings over the years will be a maximum. This is the goal whether or not it is actually realized. Expressed in terms of the immediate present, planning to maximize future profits is equivalent to maximizing the net present worth of the firm's future earnings and thereby the net present worth of the firm. The net present worth of the firm will be a maximum when the difference between the discounted expected gross revenues and the discounted costs including investments for plant, equipment, land, etc. is a maximum.

This is analogous to the soil rent doctrine with which foresters are so familiar in connection with determination of optimum rotation age and management system for even-aged stands. The optimum rotation and management system is that schedule of capital outlays and annual expenses for planting and other cultural operations (costs) and that schedule of thinnings and final cuts (gross revenues) which lead to the maximum soil rent, or in other words, the maximum net worth of land when discounted to the present. The land in this special case is analogous to the firm in the general case. Thus, the principle of maximizing earnings and the net present worth of a series of expenditures and gross revenues is not an unfamiliar concept to foresters.

For a static business or economy, where sales and gross revenues are expected to remain more or less stable in the future, capital budgeting is concerned with investments for replacement of inefficient and obsolete equipment, improvements in plant facilities and property, and cost-reducing proposals. In an expanding and highly competitive economy such as we have experienced since the end of World War II capital budgeting will, in addition, be concerned with investments for expansion of production, development and production

## CAPITAL BUDGETING FOR TIMBERLANDS

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of new products, and research. The object of capital budgeting is to select investments in replacements, improvements, cost-saving, expansion, new products and research which will increase the future net earnings of the firm, and thereby its net present worth. .

### *Economic Objective of the Forest Enterprise*

The decision of top management to own and manage forest land on a sustained yield principle implies that the firm expects its net earnings to be greater, not necessarily this year but over all the years represented in its planning horizon, if it grows some of its own wood needs. Ostensibly, a firm makes the investments necessary to grow part of its wood requirements because it is more profitable to do so than to buy all of it on the open market. For such a firm the forest is a profitable enterprise; presumably, more profitable over the years than the same amount of capital invested elsewhere in the business or in outside opportunities.

Viewing the forest enterprise from the general objective of the firm, i.e., the principle of maximizing the net present worth of future earnings, provides the key to planning its management. Considering the forest enterprise as an investment for future wood production, the objective is to make those investments in land, growing stock, roads, equipment, improvements, and functional activities such as reforestation, stand improvement and protection which, in combination with all other production investments of the firm, will maximize its present net worth. This concept carries with it the connotation that the capital allocated to the forest enterprise and represented by the existing forest assets is a more profitable use of those funds than any other unexploited alternative within or outside the business. It places the forestry enterprise in direct competition with all other business alternatives of the firm for new capital, operating capital, and the maintenance of the capital assets of the forestry enterprise itself.

### *The Strategic Character of the Forest Investment*

The main justification for investment in forest enterprises among integrated wood-processing firms has been the strategic value of company control over the source of supply of its basic raw material. The term strategic is used because the major benefits are largely risk-reducing in character; real enough but difficult to quantify, accruing more or less to all other parts of the business, and extending more or less indefinitely into the future. The forest enterprise is expected to sustain a certain flow of wood to company plants, protect the

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firm against risks with respect to price, quantity and delivery schedule associated with outside wood supply sources, and provide long-term security for the firm's share of the product market and its profit position.

The reasoning behind strategic investments in company-owned sources of wood supply depends more or less on estimates of the long-run wood supply situation from the standpoint of both price and quantity of wood available from outside sources to meet future mill requirements. In general it is the prospect of higher costs of open-market wood, unreliable delivery schedules, financing difficulties, and profit losses due to excessive wood costs or loss of market share through lack of wood that becomes the motivating force for owning and growing part of the firm's wood requirements.

Timber growing is not yet generally regarded as an income and profit producing enterprise in the same sense as manufacturing or sales. Among the larger integrated wood processing firms, however, there is a distinct trend toward setting it up as a profit center with a separate accounting record.

Viewed as a strategic investment, the forest enterprise protects the firm's future profit position. The function of the forest investment is to produce that quantity of wood in each of the future years which will maximize company earnings over time. For any given schedule and combination of manufactured products, the optimum company wood program is that supply schedule whose net present worth is a maximum.<sup>3</sup> Net present worth is the difference in the discounted value of all future expenditures and investments in company wood production and the corresponding discounted cost (value) of the same wood purchased on the open market for the corresponding years. Current open-market wood costs cannot be used for this purpose, since it is the expected increase in long-run wood costs or reduction in supply that is the primary basis for considering forest investments in the first place. Future open-market wood costs, however, are difficult to determine objectively and probably impossible to quantify with any great reliability. They depend on future demand for wood by all competitors in the company's wood supply area and the amount of wood that will be available for harvest at the future dates.

In practice forest investments are evaluated in terms of current prices and costs. Investment decisions, in turn, are guided by expected rate of return

<sup>3</sup> This concept is much simpler to consider than that for the more realistic situation where several alternative product output schedules can be contemplated. Under such circumstances the optimum company wood program would be indicated by the particular output and company wood supply schedules which maximize total net present worth of the firm simultaneously.

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criteria that are lower than those applied to plant expansion, new products, new equipment and replacement investments. The use of a lower guiding rate in decisions involving strategic forest investments is an alternative to predicting future wood costs and prices. The level at which it is set is entirely a judgement matter. It is a necessary acknowledgement that there are real benefits associated with forest investments which cannot be quantified or are less risky to allow for by adjusting the guiding rate of return criteria than by predicting wood costs and prices. This lower guiding rate, in the sense discussed above, has been labelled a handicap or exception rate in capital budgeting. It is a vital consideration in planning the acquisition and development of timberlands where the motives are for strategic advantage and is taken up in more detail in the section on acceptance criteria.

Where exception rates are used in planning forest investments, they may be supplemented with other criteria such as a percentage figure on the amount of company wood the firm believes desirable for maximizing its earnings in the long run. This likewise is a judgement matter reflecting the imponderables associated with strategic investments. It places a physical limit on total forest land investment and in that way it is a helpful supplement to a subjective exception rate. In the South the ratio of 50 percent of total expected pulpwood requirements has been widely cited as a guide to total investment in forest land among integrated pulp and paper firms. Higher ratios have been cited more recently. Such estimates are based largely on wood procurement experience and the long-term outlook for pulpwood growth and yield from non-industrial forest lands. They are practical guides but like the exception rate, lack the economic objectivity desirable for rationing capital to alternative investment opportunities.

In the practical operation of existing forest assets, firms tend to work toward maximization by planning forest management and log production to minimize wood costs and meet long-term growth goals, favoring those new investments in the property which, after taxes, will compete more favorably with other internal investment opportunities.

### *The Forest Enterprise as a Cost-Saving Investment*

Broadly speaking, wood-processing firms look upon their manufacturing and sales operations as their primary source of profits. Wood is a raw material, and whether from company lands or outside sources, it is dominantly regarded as a cost item rather than a profit source. **Backward integration into timber growing**, therefore, can be looked upon as an investment to save on present

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purchasing costs of raw material which the company formerly bought from outside sources. This rationale has not been the main influence in the industrial trend toward expanded ownership and intensification of forest management on the sustained yield principle.<sup>4</sup> The dominant motive has been reduction of risk of wood supply shortages for manufacturing plants. However, once a firm is committed to a forest enterprise, cost-savings are important in attracting new and replacement capital for developing the productivity of the forest property.

New investments in forest land have to bear the fixed cost of the land, ad valorem taxes, protection and administration. Once the property is acquired and ownership committed for the indefinite future, additional investments for improvement of productivity do not have to bear the burden of these costs. This view is particularly applicable to capital outlays which increase yields immediately or at relatively early dates following investment. Important in this respect are investments for timber stand improvement, pruning, cost-saving equipment, and roads in young growth for thinnings and for salvage of mortality in old growth. The early additional yield from such outlays ordinarily will replace the most expensive purchased wood. Cost-savings and tax-savings associated with such investments can be substantial, often showing rates of return after taxes which will compete successfully with other investment opportunities without the aid of a handicap.

### III. THE CAPITAL BUDGETING PROCEDURE

There are three major aspects to the capital budgeting problem. The first is determination of the total demand for capital within the firm. What are the internal investment opportunities and needs? What rates of return will these opportunities yield? Developing a schedule of the capital requirements and investment opportunities for the firm may be considered the first step in capital rationing.

The second aspect has to do with the supply of capital available to the firm. How much capital can the firm generate from internal sources, new equity

<sup>4</sup> Among firms whose management and technical experience is oriented toward product manufacture and sales, investments in backward integration can often be politically and technically unattractive. Such investments may also be required to earn premium rates as risks associated with unfamiliar fields tend to be exaggerated. However, as experience in new fields is acquired, attitudes tend to be better balanced. The experiences in the new field provide guides to the actual risks involved and clues to where and what kind of investments in the new fields are most profitable.

## CAPITAL BUDGETING FOR TIMBERLANDS

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**financing**, and new borrowing? What is the cost of such capital?

The last aspect is the selection and rejection of various capital proposals. This involves determination of criteria for acceptance or rejection, usually expressed in terms of an expected or guiding **rate of return**, or in terms of the **cost of capital**. Different rates may be set for different kinds of investments, particularly strategic investments where it may be difficult to measure all the benefits completely.

The next sections develop the three aspects of capital budgeting, with greatest emphasis on the demand for capital and development of investment proposals. These are matters with which the forest manager is most directly concerned. An understanding of the sources of capital, problems of supply, and the final decision-making process, however, is important to an adequate appreciation of the entire problem and procedure of capital budgeting.

### *Determining the Demand for Capital*

The great expansion in the American economy since the war has made **capital budgeting, i.e. planning for future production, one of the most important functions of the firm's management**. Outlays for new and expanded plant facilities just for the 100 U.S. financial corporations having the largest sales revenue in 1958 (\$526 million to \$9.6 billion) were \$10.7 billion, almost 10 percent of the total value of assets managed by these same corporations. As national income has risen and population increased, and as production methods have become more complex, the total demand for capital for private domestic investment has increased from an average of \$37 billion a year during 1946-50 to \$60 billion in the years, 1954-58. Business plant and equipment outlays have varied between \$25 billion and \$37 billion since 1951 and are estimated at about \$33.3 billion for 1959.<sup>5</sup>

A rapidly expanding economy, such as that of the United States in the last decade, requires **tremendous amounts of capital** to provide **productive facilities** to meet increasing demands for goods and services. The prospects for continued growth in the American economy and the world generally make capital budgeting one of the most vital aspects of business planning and growth.

*The firm's demand for capital.* The firm's demand for capital conceptually is the schedule of investment opportunities or proposals showing both the **capital requirements for individual investments and the corresponding ex-**

<sup>5</sup> First National City Bank Monthly Letter, Business and Economic Conditions, New York, October 1959, p. 110.

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pected earning rates. For an integrated forest products firm the schedule of proposals would include:

1. Expansion of plant capacity and equipment for established product lines.
2. Installation of new product lines and product improvements.
3. Replacement of depreciated or obsolete equipment and facilities.
4. Strategic investments for risk reduction, research for new and improved products and techniques, and welfare outlays for improved employee satisfaction and public relations.

Investment proposals flow up the management hierarchy from the lower levels and smaller operating units of the firm and commonly constitute part of the annual budget requests or long-term plans for growth and development. Some may originate with top management, particularly expansion and new product proposals. Others will flow from the pulp and paper mill, paper converting plants, the sawmills, plywood and other forest product plants, research facilities, sales establishments, and timberlands. If there are geographic, functional or product subdivisions within these categories, then each of the individual subdivisions will have capital proposals for expansion, new facilities, replacements, cost-savings, and strategic benefits. The proposals ordinarily represent capital projects which management at the lower levels, or at the higher levels, is ready to undertake. They should be proposals which will

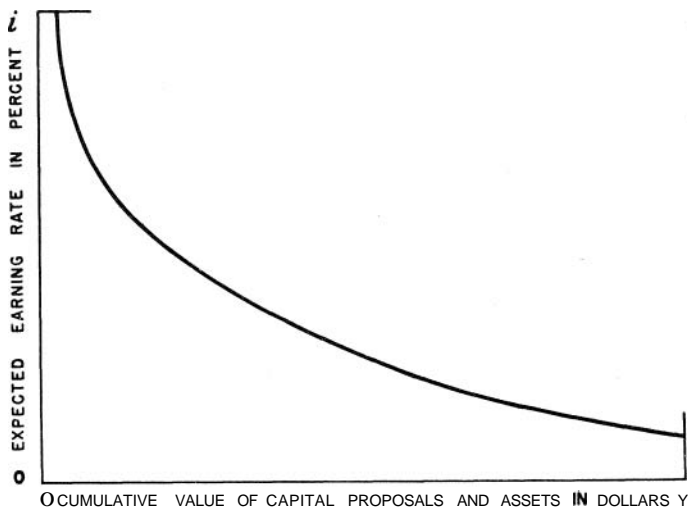


FIGURE I. Idealized demand schedule for capital for a hypothetical firm



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improve the company's future earnings, or in other words tend to maximize the net present worth of the firm. Economically attractive capital projects, then, are likely to be those that reliably show high rates of return on investment.

The aggregation of all proposals for new capital outlays and the installed capital assets in terms of quantity of investment and expected earning rates would produce a demand schedule for capital that would approximate the generalized schedule presented in Figure 1. The capital requirements for new proposals and the value of installed assets is accumulated according to the expected earning rates. The high earning investments are at the left, the low earning prospects at the right.

The schedule itself presents a rationale for capital budgeting and maximizing the net present worth of a firm. It suggests favoring those capital proposals and installations **which show prospects of a high rate of return on the invested dollar**. Rejection of low rate of return proposals and liquidation of installed assets of low productivity for purposes of reinvestment in the higher

TABLE II. SCHEDULE OF CAPITAL PROJECTS FOR A HIGHLY INTEGRATED  
SAMPLE FIRM X IN A RECENT FOUR-YEAR PERIOD

1. A new headquarters office building at O.	for better package designs for consumer products.
2. A new distributing plant at O.	16. Equipment improvements to increase paper machine capacity at W, at E and at S.
3. A corrugated box plant, a paper converting mill, a bag plant and a small paper machine at A.	17. Improvements to plywood and lumber mills at E to increase efficiency.
4. A new paper converting plant at R.	18. Timberland acquisitions of 80,000 acres at L, at P and at V.
5. A bag plant at B.	19. Access road construction for final harvests and thinnings.
6. A box plant at D.	20. Planting approximately 50,000 acres at L and at P.
7. A new paper mill at N.	21. A decentralized wood yard with debarking and chipping facilities at J.
8. A new pulp mill and bleach plant at E.	22. Replacement of barking equipment at F and at T to reduce cost and increase chip output.
9. A new bleach plant, a third liquor recovery unit, and a third lime kiln at C.	23. Research in soils, new uses for paper and adaptation of paper to other materials.
10. A sawmill at E to utilize small logs formerly sold to lumber industry.	24. Converting plant at G shut down; machinery transferred to A.
11. A green veneer plant at H to utilize logs formerly sold to lumber industry.	25. Shut down of waste burner at F.
12. Expansion of plywood capacity at F.	26. Disposal of interest in fiberboard plant at K.
13. Expansion of pulp capacity at C, at L, and at E.	
14. A second paper machine at E, at A, and at G.	
15. New printing equipment at P and M	

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earning opportunities is likewise indicated. However, some sort of criterion is needed to determine where to draw the line. The model suggests use of some guiding rate of return as a standard. The determination of this standard is discussed indirectly in the next section on the supply of capital and more specifically in the subsequent section on acceptance and rejection criteria.

To provide a more empirical insight into a firm's demand for capital, Table II presents a partial schedule of a capital program completed by a highly integrated sample firm during a recent four-year period. The schedule in Table II is not complete and does not reflect proposals that were rejected. It excludes practically all smaller items such as trucks and other mobile equipment, replacement of depreciated or obsolete equipment, modification of equipment for new product designs, chemical spraying for timber stand improvement and many other items of the same sort. Most of the listed outlays are for expansion of established product lines including new plants and expansion of established facilities. Some improvements and replacements for increased efficiency and reduced costs are listed as well as a few assets scheduled for liquidation. A trend toward more effective and complete plant integration with the firm's resource base, a general characteristic of the forest product industries, is likewise indicated by the schedule.

The capital expenditures for the four years including most of the above projects is given in Table III. These outlays are higher than average for firm X. During the preceding 8-year period, for example, total additions to property were \$176 million, averaging \$22 million per year. The total capitalization is a half billion dollars, having more than doubled in the last ten years. This is consistent with the general expansion that has taken place in the American economy since the end of the War.

TABLE III. AMOUNT AND USES OF CAPITAL DURING RECENT 4-YEAR  
PERIOD—SAMPLE FIRM X

Additions to property	\$187,922,000
Plant improvements	39,700,000
Advances on construction not depreciable in one year	18,290,000
Investment in new paper company	<u>4,800,000</u>
4-year total	\$250,712,000
Average per year	\$ 62,678,000

*The forest enterprise's demand for capital.* From the standpoint of capital management the forest manager has two major functions. He needs to develop capital proposals and budgets which will improve the present net worth of th

## CAPITAL BUDGETING FOR TIMBERLANDS

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firm, and he has to plan the management of existing timberland assets in a way consistent with the maximizing principle. This distinction between new capital proposals and existing forest assets is somewhat artificial but helpful to understanding the problem of capital budgeting for the forest enterprise. In practice the planning of new capital outlays and the management of the existing assets ordinarily go hand in hand. One is generally relative to the other. Proposals for reforestation and timber stand improvement will be relative to the current and future productivity of the established forest assets. Proposals for roads to thin young growth and salvage periodic mortality in old growth will be relative to present and future productivity of existing stands.

Capital budgeting will be concerned with both the long-term wood supply and current wood costs. Planning for long-term wood needs largely has to do with investments for expansion of timberland holdings, increased timber growth and yield, adjustment of growing stock structure and level of stocking, and such long-run improvements as permanent roads, protection facilities, tree nurseries and various office and workshop structures. Planning to reduce current wood costs is concerned with capital outlays to reduce logging costs, increase current wood recovery per acre, and improve efficiency of labor in timber growing activities.

Planning wood production requires a keen understanding of the long-term expansion plans of the firm on the one hand, and the outlook for the future outside wood supply situation and expected wood demands of competitive firms on the other. The former is necessary to appreciate the quantities and kinds of wood the firm will need and the timing; the latter to evaluate the impact of the prospective wood supply situation on the economy of company wood production. The need to understand company growth plans and the long-term outside wood supply situation requires close ties for company woodland management with the wood procurement division and the top management people responsible for long-run expansion plans. The forest manager needs a keen sense of top-level business management within his firm combined with a penetrating appreciation of the methods and objectives of capital management associated with long-term raw material production.

The demand schedule for new and installed capital for the forest enterprise is analogous to that for the firm. It is a schedule of the investment opportunities and existing forest assets organized accumulatively in dollar value terms according to expected earning rates. Table IV lists the major types of proposals that should be approached from the viewpoint of capital planning and

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management. New proposals ordinarily will come under the scrutiny of upper management levels and often top management. Capital requirements necessary for current wood production may not require rate of return justification. Other proposals, however, having to do with long-run needs ordinarily demand stronger empirical justification, preferably in terms of expected earning rates on investment, additional wood production and future cost reduction. These are meaningful criteria that will enable top management to evaluate proposals with respect to maximizing the long-run earnings and the net present worth of the firm.

TABLE IV. MAJOR TYPES OF CAPITAL PROPOSALS IN THE FOREST ENTERPRISE

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1. New land acquisitions to improve age-class structure, expand output, to block up holdings, to improve access and general efficiency of operations.
2. Regeneration of unstocked and newly cut-over areas.
3. Harvest of low productivity stands and trees, including salvage and thinning proposals.
4. Timber stand and tree improvement.
5. Roads for final harvests, thinnings and periodic salvage of mortality in old-growth.
6. Equipment for forestry and logging purposes. Includes new items to reduce operating costs and replacement of depreciated and obsolete equipment.
7. Forest protection facilities and hazard reduction programs.
8. Improvements such as forest nurseries and associated facilities, garage and repair facilities, workshops, communications equipment, and offices.
9. Forest inventories and permanent inventory systems.
10. Forest product processing plants such as sawmills, debarking and chipping facilities, veneer and plywood plants, log concentration, sorting and storage facilities.
11. Improvements in wood procurement facilities and wood inventory program to reduce wood costs and capital requirements for wood inventory.
12. Research studies to improve productivity or reduce costs.

The management of existing assets of the forest enterprise do not come under the same close scrutiny of top management except as reflected in new capital proposals or in monthly and annual cost statements for current wood production. Earning rates on installed timberland assets usually are not calculated or known explicitly. Accounting for timberlands more often than not is oriented toward costing company-produced wood. Abnormally high costs obviously indicate an unfavorable impact on current profits, and low costs a favorable influence.

Minimizing current wood costs does not necessarily maximize long-run earnings unless the impact on future costs and productivity of the forest assets is taken into account. The forest manager, therefore, not only needs to keep a careful eye on current wood costs but also to appreciate the relation

## CAPITAL BUDGETING FOR THE NETHERLANDS

of wood production methods and plans to the future productivity of the forest enterprise. This requires that he be aware of the earning rates of the installed assets and plan for liquidation or replacement of those forest assets whose productivity is lowest or below some minimum acceptable rate. Unfortunately, the effect of current wood production operations on future wood yields and costs and the productivity of the residual growing stock is not reflected in current cost or other operating statements and thereby tends to be obscured from top management. There are few firms with accounting systems that will even provide a realistic measure of the average earning rate of the entire forest enterprise, let alone individual segments. This is a major deficiency wherever it exists since it makes it difficult, if not impossible, to evaluate the efficiency of the capital invested in the forest enterprise. The relative productivity of particular forest assets is one of the best explicit guides to the allocation of new capital outlays and the harvest of stands and trees.

The demand schedule for new and installed capital for the forest enterprise can be aggregated as in Figure 3. Although such a model is highly idealized, it is nevertheless consistent with the realities of timber management. For example, growing stock which is just entering the merchantable class typically

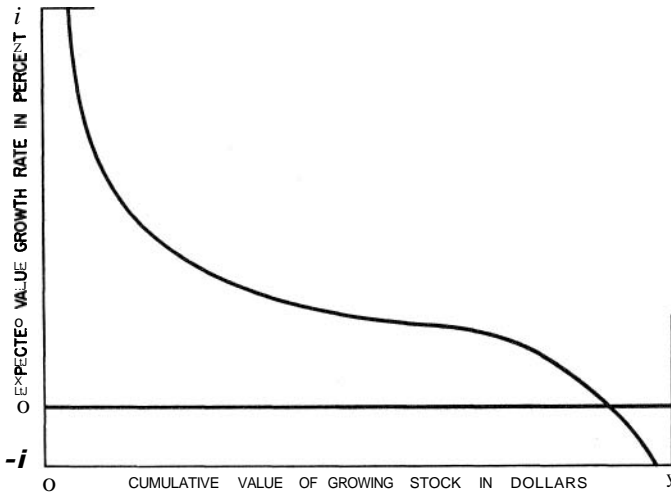


FIGURE 2. Idealized model of growing stock productivity. The abscissa can be viewed as the aggregation of the dollar value of individual trees or stands according to their value growth rates

has a high growth rate, and therefore, a high earning rate. On the other hand, old growth or trees in excess of 25 inches in diameter have consistently lower earning rates. Trees which are expected to succumb due to stand competition, insects, or disease are capital losses and imply a negative value growth rate; the capital they constitute is subject to loss unless salvaged. Thus, it is possible to aggregate the growing stock by individual trees or stands in dollar terms according to prospective value growth rates as in Figure 2. The figure immediately suggests harvest of growing stock or capital having negative and lowest growth rates, i.e., the liquidation and reinvestment of unproductive capital. It also suggests managing the residual capital to increase its earning rate. Implications for specific action are classification of stands according to relative productivity and design of periodic inventories to reveal growth performance of stands.

In a similar way it is possible to aggregate reforestation and timber stand improvement proposals for different sites, locations, and planting or stand conditions. Prospective investments in advance roads for thinnings and periodic salvage of mortality can be aggregated in the same manner. Other types of capital assets and proposals can be similarly viewed. All can be aggregated into a collective model as presented in Figure 3. Here, the lumpy character of installed assets and new capital proposals is retained. As would be expected, the installed assets constitute a much greater proportion of the total capital involved in the management of a forest property in anyone year.

The value of the foregoing models is largely in the over-all view or theory it gives for the problem of capital management. It directs attention to the productivity of capital, i.e., its expected earning rate. It emphasizes the importance of identifying low productivity investments and eliminating them or replacing them with more productive capital. It guides the development of new proposals and thereby the flow of capital into the most productive opportunities within the forest enterprise. These are the opportunities which can compete most favorably with demand for capital elsewhere in the firm and are most likely to attract the favorable interest of top management. They are the opportunities which contribute most efficiently to the long-term earnings of the firm and the maximization of its net present worth.

### *The Supply of Capital*

The supply of capital refers to the funds that a firm can generate and their cost for internal investment purposes. Here, the subject is treated briefly and

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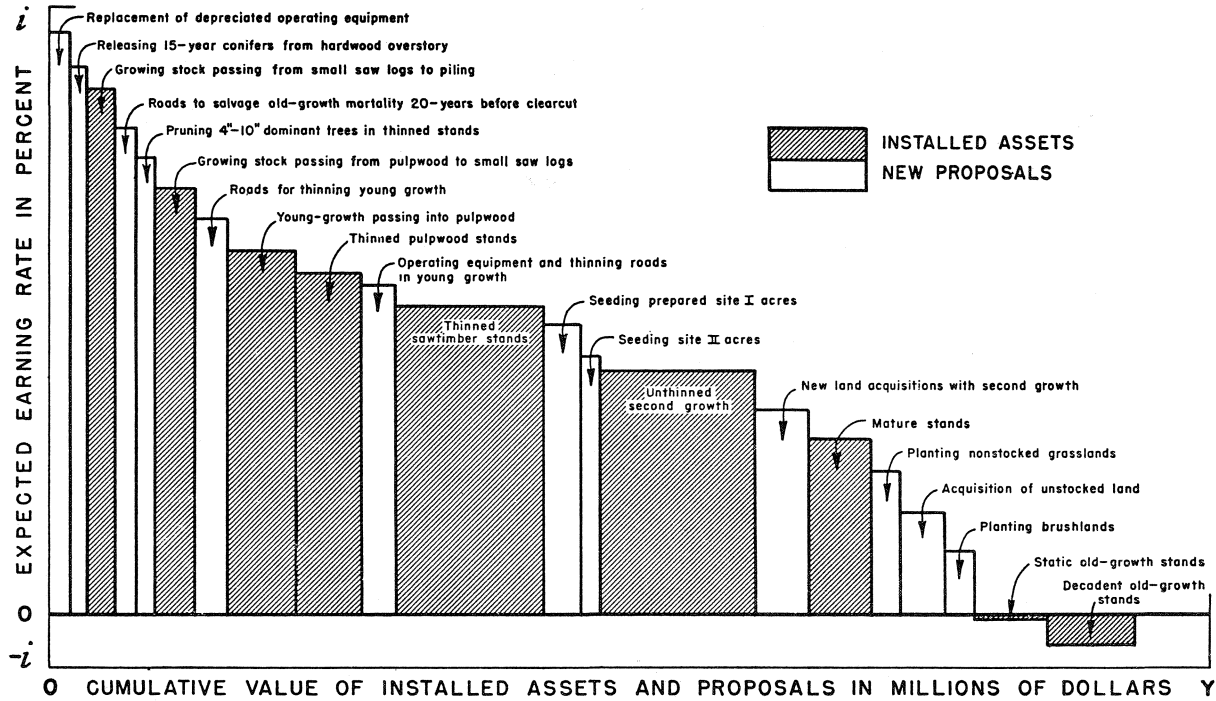


FIGURE 3. Hypothetical composite model of capital demand schedule for a managed forest property

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TABLE V. SOURCES OF FUNDS AND INCREASE IN PLANT AND EQUIPMENT  
ASSETS AMONG AMERICAN CORPORATIONS, 1946-1957<sup>a</sup>

<i>Sources of Funds</i>	<i>Billions of Dollars</i>												<i>Average Percent of Total</i>
	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	
Depreciation	4.2	5.2	6.2	7.1	7.8	9.0	10.4	11.8	13.5	15.7	17.7	19.7	40.6
Retained Earnings <sup>b</sup>	7.2	11.4	12.6	7.8	13.0	10.0	7.4	7.9	6.3	10.9	10.2	8.8	35.9
Stocks	1.3	1.4	1.2	1.6	1.7	2.7	3.0	2.3	2.1	2.7	3.0	3.4	8.4
Bonds	1.1	3.0	4.7	3.3	2.0	3.6	4.9	4.8	3.8	4.2	4.8	7.5	15.1
Total	13.8	21.0	24.7	19.8	24.5	25.3	25.7	26.8	25.7	33.5	35.7	39.4	100.0
Increase in plant and equipment assets	12.5	17.0	18.0	16.3	16.9	21.6	22.4	23.9	22.4	24.2	29.9	32.7	—

<sup>a</sup> Adapted from Table 3, "Financing Business in Recession and Expansion" by H. I. Liebling, *Survey of Current Business*, October 1958. Banks and insurance companies are excluded.

<sup>b</sup> Includes depletion.



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largely with the view of developing a general appreciation of the cost of capital and its significance in capital budgeting.

*Sources of funds.* A firm has two main sources of permanent capital funds: internal sources, which are principally depreciation, depletion and retained earnings, and external sources in the form of stock and bond issues. Depreciation and depletion essentially represent the recovery of previous capital outlays. Retained earnings are the undistributed portion of net earnings after taxes. In the last decade internally generated funds have been the main source of capital for internal investment among American corporations. Table V shows the relative importance of the alternative sources of permanent capital for the years 1946-57. The large increase in depreciation is associated with a near tripling in the book value of gross capital assets of corporations as American industry has expanded. There has also been an increase in average depreciation rate due to statutory changes and increase in ratio of equipment to plant facilities. Depreciation and retained earnings have typically provided about 75 percent of the long-term capital funds.

External financing has been less attractive relative to the dependence upon internally generated funds. Plowback of retained earnings has certain tax advantages to stockholders, especially those in high brackets, and saves on brokerage fees and underwriting expenses associated with security issues. Debt financing often carries restrictions on uses of funds, future financing, and other aspects of corporate management. Debt also tends to lower the credit status of a firm. Equity financing ordinarily does not involve restrictions associated with debt capital, but Security and Exchange Commission regulations involve costs and time-consuming details and procedures.

Table VI shows the average annual capital generated by source for sample firm X during a recent four-year period. The pattern is fairly consistent with that for corporations generally.

TABLE VI. AVERAGE ANNUAL CAPITAL GENERATED BY SAMPLE  
FIRM X DURING A RECENT 4-YEAR PERIOD

<i>Source Of Funds</i>	<i>Thousands Of Dollars</i>	<i>Percent</i>
Total net earnings	\$41,365	
Dividends paid out	25,993	
Retained earnings	15,372	29
Depreciation and depletion	19,834	37
4½% Notes	15,816	3°
Stocks	2,380	4
Total capital generated	<u>\$53,422</u>	100

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*Growth accumulation.* Growth that is accumulated to build up growing stock is a form of retained earnings, but with its own special characteristics. As a general principle and up to a certain level, the growth per acre of a stand of timber is directly correlated with the amount of growing stock per acre. Thus, as growing stock is increased as a result of harvesting less than the total growth both the total capital and the total annual earnings of the forest enterprise are increased automatically and therefore simultaneously. In this sense growth is a source of capital for increasing future earnings of the firm. As here outlined, the accumulation of growth in the form of growing stock is a form of automatic reinvestment, if the decision not to harvest all the growth is excepted.

An important aspect of the growth accumulation process for building up capital is that the additional capital is not subjected to annual income taxing. The accumulated growth does not appear in the income statement or in any cash form and thereby is a tax-free form for reinvesting corporate earnings. In this sense it has a special advantage as a source of capital for increasing future company wood yields.

*The cost of capital.* The cost of capital refers to the interest rates paid on debt capital plus selling commissions and other expenses associated with bond issues. For equity capital the cost is calculated as ratio of expected earnings per share of common stock to the expected price, less flotation costs, per share of a new stock issue. The ratio of current earnings to current stock prices is only an estimate of the cost of new equity capital and is valid only if it can be assumed that a new issue will not affect the market for the firm's stock.

The cost of using internally generated capital is measured by the earnings foregone on investment opportunities outside the firm. In other words the condition for reinvesting company funds internally is that such plowback will add more to the investors' earnings than investments in the loan market or in another firm. Theoretically, then, the cost of internal capital is the foregone earnings on the best investment opportunities of the same risk outside the firm. Such earnings, however, should be calculated after taxes on stockholders' dividends and other transfer costs have been taken into account.

Currently the cost of debt capital is at a new high. For domestic corporate bonds current yields are averaging 4.7 percent; 4.5 percent for the highest grade bonds and 5.1 for the lowest Moody ratings. Industrial bonds are averaging 4.6 percent. In mid-1958 corporate bond yields were averaging 4.0 percent, with industrials at 3.8 percent. The rise in cost of debt capital

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reflects a general increase in demand for credit and the current government fiscal policy. U.S. Treasury bond yields have risen from 3.3 percent in mid-1958 to 4.1 percent in mid-1959. Reflecting the increased cost of long-term borrowings, corporate bond flotations in the first half of 1959 have fallen to \$3.5 billion, \$2 billion less than the first half of 1958.

The cost of equity capital is considerably higher than long-term borrowing. In the first half of 1959 net earnings, based on Moody's Index for 125 industrial stocks, were 6.0 percent after taxes and 12.5 percent before taxes. Since corporate earnings are taxable and interest on debt is tax-deductible, the relative costs of debt and equity capital are best estimated by before-tax comparisons. Unless investments can show rates of return in excess of the cost of equity capital, financing through new stock issues ordinarily is not attractive to management. Moreover, for individual firm earnings on investment of funds from the sale of new shares must promise a higher rate of return than current earnings in order not to dilute present stockholders' interest and earnings.

The corporate income tax on earnings obviously makes equity financing expensive and necessarily tends to restrict its use to the most highly productive investments. Debt financing has been preferred for this reason, but it must be kept in mind that restrictions other than interest charges limit long-term corporate borrowings. An excessive ratio of debt to equity in the capital structure of a firm tends to have an adverse effect on credit ratings and increases the burden of fixed costs. In manufacturing enterprises low debt ratios are the general rule. Restrictions on use of debt capital also limit long-term borrowing.

The cost of internal capital, of course, is related to the bond and stock earnings available outside the firm. Retained earnings are not taxed as dividends and therefore are cheaper than paying out all dividends and financing with new stock issues. The cost of such capital can be regarded as intermediate between debt and new equity capital and has the advantages of no restrictions on use and freedom from the regulations of the Securities and Exchange Commission.

From the foregoing, it is obvious that the average cost of capital, before income taxes, for corporate enterprises lies between a minimum of 4 to 6 percent on debt capital and in excess of 12 percent on equity capital. For higher risk and unstable firms such as unintegrated lumber businesses the cost of capital will be very high, placing a severe restriction on investments in timber growing. For larger and more stable businesses, such as the highly inte-

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grated pulp and paper firms, risks and capital costs are relatively lower and access to capital markets easier. The relatively greater advances in intensification of forest management among integrated firms, particularly those engaged in pulp and paper manufacture, is indicative of the more favorable position of such firms in the capital market.

Table VII shows earning rates and cost of debt capital for three highly integrated forest products firms. The lower apparent tax rate for firm C may be a reflection of tax-savings realized in the high value and proportion of company wood. For the lumber and wood products industry earnings before taxes on stockholders' equity averages over 20 percent. However, annual earnings are much more volatile for the lumber industry than pulp and paper. Average annual earning rates before taxes for the lumber industry varied between 11 percent and 36 percent in the 9-year period 1947-1955.

TABLE VII. EARNING RATES AND COST OF DEBT CAPITAL FROM THREE  
SAMPLE INTEGRATED FOREST PRODUCTS FIRMS

	<i>Firm A</i> 1958	<i>Firm B</i> 1958	<i>Firm C</i> 1956
Earnings as a percent of stockholders' equity			
Before taxes	15.5	15.1	20.8
After taxes	8.8	7.9	13.9
Earnings as a percent of market price of stock			
Before taxes	8.1	12.9	7.7
After taxes	4.4	6.5	5.2
Cost of debt in percent	4.1 <sup>1</sup>	3.6	No debt

<sup>1</sup> Different issues and notes vary between 2.4 and 5.0 percent.

### *Acceptance and Rejection Criteria*

In the discussion on demand for capital, proposals as well as installed assets were arranged according to their prospective earning rates as in Figures 1, 2, and 3. These schedules implicitly suggest the order of priority to be assigned capital projects. The supply of capital which an individual firm can generate and its cost provide the conceptual criteria for determining which proposals ought to be favored and which rejected. Theoretically, it is profitable for a firm to invest in its internal opportunities so long as the additional units of capital outlay promise to cover the cost of capital, thereby increasing the total net profit prospects, and the net present worth of the firm. The cost of capital in a competitive economy, which is an implicit measure of alternative opportunities, suggests itself as the basic criteria for rationing capital within a firm.

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This is consistent with the nature of a free competitive capitalistic system where investment funds tend to flow into those opportunities which promise the highest earnings after risks and uncertainties are taken into account. It is also compatible with stockholder interest in earnings on investment.

*The guiding rate of return.* In practice, top management determines the guiding rate of return, or the rejection rate as it is sometimes called, for capital rationing purposes. Theoretically, it should not be less than the firm's long-term cost of capital. This is not always known. The firm's long-term average earning rate is sometimes used as an estimate. As such it is an historical reflection of the earning rate which has consistently met the interests of stockholders and has proven adequate to attract capital and provide for the growth of the firm. The long-term rate may be estimated in terms of the future earning rate necessary to maintain stockholder satisfaction and to attract new capital. However the long-term cost of capital may be determined, it constitutes the minimum rate for acceptance. It sets a floor below which investments ought not to be made irrespective of the supply of funds available for internal investment.

From year to year the guiding rate applied by management may be varied, at levels above the long-term cost of capital, to reflect short-term changes in capital cost or supply of capital funds, to adjust to prospective changes in future profit and the corresponding demand for capital, and to meet dividend requirements when earnings fluctuate. For individual firms the long-term cost of capital can be taken to lie between 12 and 30 percent, more often perhaps, between 15 and 20 percent. The current acceptance rate, however, may be set as high as 50 percent or higher where economic conditions dictate severe restriction of capital outlays. These rates are before taxes.

The guiding rate as an estimate of the firm's cost of capital should not be used slavishly nor as a substitute for judgement founded on tested experience in accepting and rejecting capital proposals. However, the definition of a guiding rate serves to concentrate efforts in uncovering and developing capital proposals and planning a firm's growth on the more attractive opportunities. It also serves as an aid to judgement in reviewing proposals and making final decisions. Calculated rates of return on prospective investments are predictions. As such, they are not as precise as the underlying mathematics and seldom perfect substitutes for the judgement and intuition of experienced management. Nevertheless, a calculated rate of return in favor of an investment or against its acceptance often simplifies the judgement process, making routine much which otherwise could be complex for the manager.

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*The payout period.* The payout or payback period, the time until net earnings, depreciation and tax-savings, if any, have recovered the capital outlay, is also used as a criteria in choosing between investment alternatives. Generally speaking, the payout period suggests favoring those capital proposals promising early recovery of the capital. However, there is no necessary correlation between the payout period and the productivity of investments, and therefore, the payout period ought not be used as a substitute for rate of return on investment. Suppose, for example, there is a choice between two pieces of production equipment: one with an expected useful life of 4 years and the other with a useful life of 10 years. The latter ordinarily would involve a greater capital outlay, and because of its longer life, a longer payout period. However, the more expensive equipment could well be more efficient so that the rate of return on capital investment would be higher than that for the alternative equipment with the shorter life. Using the payout period as the sole guide, management would be inclined to employ the less efficient, less profitable, equipment for the sake of an earlier capital recovery.

The payout period is a measure of the rate of cash recovery, and where this is important, it can usefully supplement the guiding rate criteria in comparing investment alternatives. However, it can sometimes be a misleading guide in appraising investments in long-term company wood production. Choice of early payout alternatives will tend to favor timber liquidation alternatives relative to sustained yield management. It must be kept in mind that the forest enterprises operated under the sustained yield principle do not depreciate as manufacturing plants and equipment do. Furthermore, they do not become depleted even though tax laws permit depletion of growing stock investments. In a sense the depletion fiction, if we can call it that, is a heritage of the days when only old-growth timber was available and mills actually operated such timberland much as a mine. For sustained yield forests the depletion regulations serve as an economic advantage, making investments in growing stock more attractive than they would be otherwise.

Finally, investments in growing stock do not ordinarily suffer the catastrophe of obsolescence. Historically, forests have appreciated relative to the value of other commodities. Established species have become more valuable and many previously unused species have acquired commercial importance. This trend has not yet changed.

The properly managed, sustained yield forest enterprise is an appreciating asset. Unlike manufacturing plants and equipment, it does not depreciate. Unlike an oil well or mine, it is not depletable. Unlike many new products and

## CAPITAL BUDGETING FOR TIMBERLANDS

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equipment developments it does not suffer sudden obsolescence. If necessary, it can **always** be liquidated to recover the original capital outlays. As a permanent nondepreciating asset it should be and slowly is coming to be regarded as sound permanent collateral for borrowed capital when borrowing is necessary. The main requirement in the financial management of a forest enterprise should not be early payback periods, but maintenance of the value of the capital assets and realization of an earning rate that satisfies the guiding rate of return.

*The guiding rate for strategic investments.* For strategic investments such as the forest enterprise, calculated rates of return on prospective capital projects using current prices and costs will underestimate the real profitability of such investments. Such proposals are inherently handicapped in the internal competition for capital with the sales and production divisions where the guiding rate for capital budgeting is given by the firm's current cost of capital. Handicaps of this sort **often all too obviously can obscure the best interests of the firm.** For this reason it is not uncommon for firms to use a handicap rate which will shelter strategic investments from the full rigors of cost-of-capital competition. Among forest products firms, rates of return as **low as 3 percent are** often used in appraising new acquisitions of land and growing stock, evaluating plantation investments, and setting rotations for regulating forest production. These are exception rates and may be regarded as an alternative to estimating long-run wood prices in absence of any, or'additional, company wood production. As such they are no more than a guess of the extra benefits of company-owned woodlands, but more acceptable for planning purposes than long-run price predictions. A useful supplement to such exception rates are estimates of the proportion of wood which should come from company-owned woodlands relative to the open market. In the South, for example, the ratio of 50 percent has been widely used among pulp and paper firms in recent years. Again such figures are but estimates.

For various reasons, rates of return may not be calculated or used in planning the acquisition of new lands, plantation investments, and rotation ages. In light of the capitalistic nature of the forest enterprise, this is a paradox. It may be argued that the market establishes land and growing stock prices and a firm has no alternative but to pay the so-called "retail" or "wholesale" price. For purposes of the transaction this may be a valid argument. But it seems obvious, that management should be aware of the earning prospects on such investments as calculated at current prices and costs. Calculated earning rates of this sort provide a basis for setting the guiding rate of return for

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strategic timberland investments and appraising future acquisitions. When practiced generally by the wood industries it can be an aid to market price formation which is consistent with the best interests of the industry.

While regeneration is obviously a necessary condition for sustained yield enterprises, failure to evaluate expected rates of return on reforestation projects leaves management without explicit financial guides for improving efficiency and productivity of such investments. Regeneration investments are long-term outlays and for that reason have the character of strategic investments. Guiding rates of return, however, may be set higher than those for new land acquisition, since land costs, taxes and other annual expenses may be treated as fixed where the firm does not contemplate reducing its timberland holdings.

Once a firm is committed to the ownership of timberland for the strategic advantages of company control over raw material supply, the next most vital decision from the standpoint of capital management and wood production is the rotation age. In setting rotation age, the forest manager by and large determines the total capital that the forest enterprise will require and accumulate. Given the land on which the forest is located, and the general system of management to be practiced, the rotation age decision also determines the total annual growth, and therefore, the annual earnings and average rate of return of the forest enterprise. In this sense, the setting of rotation age is one of the most critical decisions in capital budgeting for the forest business. It can be tantamount to fixing the rate of return which the forest enterprise will yield as a segment of the firm's total operations. The earning rate of a forest property is not entirely inflexible, notwithstanding the strategic considerations. The goal of maximum wood growth per acre per year, as given by the culmination of mean annual increment, involves acceptance of a zero or nearly zero rate of return on the last accumulations of capital in the form of growing stock. Rotations based on this criteria imply a most desperate supply situation with respect to both wood and additional land. Because of the nature of tree growth, and the current wood supply situation generally, guiding rates for setting rotation ages on industrial forestry properties will commonly be on the order of 3 to 5 percent, possibly 6 percent in a few cases. The use of a rate of zero percent, which corresponds to the technical rotation based on mean annual increment, is unlikely. Rates used in planning rotation ordinarily will be lower than those used in planning capital outlays for manufacturing plant and equipment. Generally speaking, lower exception rates lead to longer rotations, higher capital requirements and lower average earning rates on total

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investment, but greater wood growth and dollar earnings per acre. The last two will increase at a diminishing rate as the guiding rate is lowered.

*The guiding rate for development investments.* Once a firm has acquired lands and the initial growing stock it judges necessary to meet future wood requirements, the exception rate for acquisition and rotation determination purposes may not be applicable to the optimum development of the forest enterprise. Once the fixed assets necessary to protect the long-run wood supply are acquired, additional investments in development may be guided by the cost of capital criteria or a higher exception rate. The cost of acquisition and annual expense of retaining ownership, including administration, protection and ad valorem taxes are fixed and unavoidable costs in attaining control of X percent of company wood supply. These are taken into account in acquiring the strategic advantage. In developing the property, however, they are relevant only insofar as they change as a result of development. They are not chargeable to capital projects which increase productivity of the land and growing stock. Investments in roads for thinning, or salvaging mortality in old growth, capital expenditures for timber stand improvement and pruning, and outlays for equipment should be subjected to a higher guiding rate than the exception rate applied in planning acquisition, regeneration, and perhaps the rotation age for the forest enterprise. A higher rate is also justifiable to direct management efforts to the best investment opportunities in the forest enterprise. This will be particularly important in the transition period from an extensively managed, unregulated forest to a sustained yield unit under intensive management.

*Estimates of increased wood yields and open-market supply.* Since the fundamental reason for the forest investment is provision for future wood needs, rate of return appraisals on capital projects for property development and increasing productivity should be supplemented with information on the additional wood yields expected as a result of the new outlays. For maximum usefulness such data should indicate when the additional yields will be realized, and these should be compared with expected yields in case the proposal is rejected.

Because the prospect of excessive cost or lack of adequate supply of open-market wood is the primary justification for strategic investments in the forest enterprise, it is important that the outlook for outside wood supplies be re-evaluated periodically. Important factors that need to be taken into account are: the long-term expansion plans of the firm; changes in inventory and productivity of noncompany and company wood lands; technological changes

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affecting utilization of little-used species and wood residuals in the supply area; prospective changes in the forest landownership pattern and the associated management policy; and the impact of wood requirements of competitors and potential competitors on the future open-market wood supply.

The long-term outlook for wood supply is a key consideration in establishing a forest enterprise; it should continue to be a primary guide in its development and management. The forest manager and top management should be continually informed on the long-term supply outlook and capable of acting objectively in adjusting the forest enterprise to important changes in that outlook. Close coordination is necessary between the forest manager and the wood procurement division which ordinarily should have close appreciation of the open-market wood situation. They, in turn, must be able to work closely with top management which is best informed on expansion plans and technological changes in prospect for the firm and responsible for the profitability of the total business.

*Some impacts of the Federal income tax.* Returns from forest investments are subject to a different rate of income taxation than manufacturing and sales revenues of corporate businesses. For this reason they should compete with other capital proposals within the firm on an after-tax basis.

Where corporate earnings are taxed at the ordinary rate of 52 percent, the stumpage value less the depletion allowance for company-produced wood is taxed at only 25 percent, the capital gains rate. The intent of the law is to improve the relative attractiveness of forest investments. It does so by making substantially lower before-tax rates of return on forest investments equally or more attractive than the often higher rates before taxes on capital investments outside the forest enterprise. For example, a 13 percent return before taxes on a forest investment subject to the capital gain tax rate usually will be equivalent to a 20 percent return on an investment subject to the 52 percent ordinary tax. Actually, in many cases the relative advantage will be much greater.

The expensing of outlays for cultural work other than planting is another important provision that greatly improves the after-tax earning rate of forest investments in timber stand improvement, pruning, fertilization, and other similar cultural treatments. The net investment in such capital projects is less than half the cost, actually only 48 percent, for corporations in the 52 percent ordinary tax bracket since funds for such projects are taken from company earnings *before income taxes*.

The capital gains tax provision and the expensing of cultural investments probably have had a profound effect on the flow of capital into corporate

## CAPITAL BUDGETING FOR TIMBERLANDS

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forestry investments than any other public policy or program. Because of the great impact of these provisions on the earning rates of forest investments, evaluation of capital proposals for the forest enterprise are seriously defective until the tax effects are taken into account.

### IV. OUTLINE FOR DEVELOPMENT OF CAPITAL PROPOSALS

The object of capital budgeting is to direct the flow of capital into the most profitable investment opportunities available to the firm. It requires the discovery or creation of opportunities that promise high rates of return. It implies uncovering low productivity assets and planning for their liquidation or replacement. This is as much the task of the lower levels of management as it is ultimately the responsibility of top management.

Expansion and continued high earning power require a surplus of opportunities promising high rates relative to the amount of capital available for new and replacement investments. A characteristic of good management, therefore, is an awareness of the importance of capital productivity to planning the firm's business and the ability to uncover or create opportunities for profitable investment.

#### *Recognizing the Opportunities*

Given the existing forest properties for a particular firm, the investment opportunities are associated with increasing productivity of established stands and unstocked lands, reducing cost of current wood production, and increasing utilization intensity through improved logging techniques and market development. The discovery and development of highly productive investment proposals ordinarily require considerable thought, time, and effort in searching out opportunities and preparing the analyses and final proposals. The first step is recognizing the opportunities. This requires an on-the-ground appreciation of the current productivity of forest assets and logging operations supplemented by an excellent knowledge of forestry technology, close touch with research and new developments in equipment and technology, and an awareness of markets, prices, and costs. When these are changing rapidly, as they have been in the last decade and will continue to well into the future, it is important for management to stay abreast of the progress in order to obtain the maximum advantage in capital planning. Among the larger forestry firms, company experimental forests and staff are designed to help meet this need.

Once the opportunities are recognized, it is the task of management to

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select those which are likely to prove most productive, for analysis of every possibility in anyone year is an impossible undertaking. This is a judgement matter, and largely the responsibility of the forest manager. It fares best, when there is an abundance of productive investment opportunities and a well-developed experience in uncovering and analyzing capital proposals.

The functions of forest management provide the guide lines for seeking out opportunities. They are protection, marketing, harvesting, thinning, salvaging, road development, stand improvement, tree improvement, regeneration of harvested stands, reforestation of nonstocked lands, equipment purchase and replacement, regulation of the flow of wood and the mill yard inventory, forest land acquisition and sale, and a number of others. The practical job is to determine which functions should be undertaken or expanded; how much should be done; where the functions should be applied; and the technology and intensity of practice that should be used. This requires a rather thorough on-the-ground knowledge of stand and ground cover conditions; site quality, growth, and yields; species and stocking; terrain and accessibility; production rates for men and equipment for the various functions and stand conditions; stumpage and log values; market possibilities; tax effects, and much else. Obviously these are matters often best known to the forester directly responsible for managing a particular area. He is the key figure in recognizing opportunities. He needs to be a good business manager, aware of the firm's objectives, as well as a good forester and logging engineer. The general manager for the forest enterprise needs to appreciate this point keenly and develop his land managers accordingly. Being in closer touch with top management and the wood procurement problems of the firm, he can direct the attention of his land managers toward those activities, which generally promise to be most fruitful for the firm as a whole. He can request proposals for capital projects that will meet particular problems or interests of the firm.

### *Defining Proposals and Alternatives*

Appraisals of proposals will be best appreciated by top management if several alternatives with respect to the same opportunity are examined simultaneously. After an opportunity is selected for analysis and development, the next step is to define the present method of operation or management and one or more alternatives which prospectively constitute a profitable improvement over the present method. The following case examples present several types of proposals which might be selected or set up for study by a forest enterprise.

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## CASE NO. 1

A firm has an X-acre tract of old growth which is now scheduled for clear-cutting in 20 years. In similar areas where access roads have been established, it has discovered that it can economically harvest dead and down timber in old-growth stands. The old growth in the harvest area is classified as decadent. The firm recognizes that advance roading to realize the current salvage and to capture the periodic mortality on the unharvested portions during the next 20 years has favorable economic prospects. The following proposals may be developed.

### *Plan A*

1. Clear-cut all timber on a 20-year harvest plan.
2. No prelogging of salvage or mortality in leave stands.
3. 20-year road program for systematic clear-cutting on entire tract.

### *Plan B*

1. Clear-cut green timber on 20-year harvest plan.
2. Prelog all dead salvage on entire tract in 10 years.
3. Follow-up salvage cuts at 5-year intervals after the first prelogging.
4. 10-year roading program for clear-cutting and prelogging salvage to capture maximum part of total mortality on the entire tract.

### *Plan C*

1. Clear-cutting green timber on a 20-year harvest plan.
2. Prelogging all dead salvage and half of the anticipated 5-year total mortality from the green stand in 10 years.
3. Follow-up salvage and anticipated mortality cuts from high risk trees at 5-year intervals after the first prelogging.
4. 10-year roading program for clear-cutting and prelogging salvage and anticipated mortality on the entire tract.

## CASE NO. 2

A proposal similar to Case No. 1 could be developed for management of young growth stands. Here, the alternative to extensive management on a clear-cutting basis would be advance roading and thinning at periodic intervals. The latter alternative can be broken down into several subordinate proposals to reflect marketing alternatives.

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### *Plan A*

Clear-cut young growth on a 75-year rotation. No advance road program or thinning.

1. Deliver all wood to pulp mill.
2. Sell sawlogs and deliver balance to pulp mill.

### *Plan B*

Clear-cut on 75-year rotation. Advance road 30-year old stands and thin periodically at 5-year intervals.

1. Deliver all wood to pulp mill.
2. Sell sawlogs and deliver balance to pulp mill.
3. Plan management, thinnings, and final cut to yield maximum volume of poles, piling, and other high value products. Sell sawlogs and other high value products and deliver balance to pulp mill.

These proposals actually represent five alternative management systems for company timber. They require that thinning yields and the final cut be differentiated according to product proportions. The alternatives are real possibilities in the Douglas-fir region. In the South similar alternatives are available. Among the questions that need to be answered in Cases No. 1 and NO.2 are the following:

- a. What additional wood yields by products are realized from the plans involving advance road programs for salvaging mortality or thinning?
- b. What are the additional costs, revenues, and profits associated with the alternatives to the clear-cutting proposals in Plan A?
- c. What are the additional annual and total capital requirements for the advance road programs for salvaging mortality or thinnings in young growth?
- d. What are the expected rates of return, before and after taxes, on the additional capital requirements?
- e. What is the payout period on the capital outlays?

### CASE NO.3

A southern firm is primarily interested in growing pine pulpwood. It has many stands of cull and low-grade hardwoods with an understory of pine. The indicated management is to girdle or poison the hardwoods to favor the pine. Several alternatives are possible.

### *Plan A*

Allow the stands to develop naturally without any treatment to release the pine.

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### *Plan B*

Remove all cull and low-grade hardwoods 6 inches and larger in diameter.

### *Plan C*

Remove all competing hardwoods 2 inches and larger in diameter.

### *Plan D*

Remove all competing hardwoods 1 inch and larger in diameter or more than 5 feet in height.

These proposals contemplate evaluating the profitability of releasing pine and determining the optimum intensity of release. They can be further refined to compare alternative techniques for release. The possibility of utilizing hardwood pulpwood along with pine can be introduced. The same types of proposals can be developed to appraise the profitability of precommercial thinning.

The principal questions that need to be answered are:

- a. What are the expected yields including thinnings under each plan at rotation age of 30 years?
- b. What are the additional costs, revenues, and profits associated with the alternative proposals?
- c. What are the capital requirements for the release alternatives?
- d. What are the rates of return, before and after taxes, on the respective additional capital requirements of Plans A, B, C, and D?
- e. What is the payout period on the capital outlays?

### CASE NO.4

An eastern pulp and paper firm is dependent upon sap-peeling for its annual supply of debarked hardwood pulpwood. The development of chemical debarking, in which it participates, provides an alternative and cost studies show that chemical debarking costs are less than sap-peeling. The firm does not have a drum debarker and this likewise is an alternative. These three alternatives are refined to reflect the proportions of company wood and outside wood involved. The alternative proposals might be defined as follows:

### *Plan A*

All wood sap-peeled; 40 percent from company lands, 60 percent from outside sources. This is the current wood procurement program.

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### *Plan B*

Chemically debarking all wood; 45 percent from company lands and 55 percent from outside sources. The increase in proportion of company wood reflects anticipated increases in yields per acre due to effectiveness of chemicals in debarking small and irregular bolts, which ordinarily are not sap-peeled.

### *Plan C*

Drum debarking all wood; 45 percent from company lands and 55 percent from outside sources. The drum debarker will handle small and irregular bolts almost as well as chemical debarking.

The main questions toward which the analyses of these proposals should be directed are:

- a. What is the total cost of annual wood requirements under each alternative?
- b. What are the capital requirements for wood inventory and major debarking equipment under each proposal?

### *Development of Production and Yield Schedules*

The next step after defining the alternatives is the development of the production rates and schedules and the wood yields relevant to each of the proposals. These are the basic data necessary for the economic analysis and final appraisal of alternatives. Company data are not always available. Information may have to be synthesized from other related experience or derived from outside sources and trial projects. The types of data required for each of the foregoing case examples are outlined below. The technical details regarding their development are omitted.

#### CASE NO. I

#### *Comparison of Alternative Harvest Plans A, B and C*

1. Total yields for each alternative.
2. General logging plan and cutting schedule for each plan.
  - a. Final clear-cutting schedule by area and volume.
  - b. Volume yields and area schedule for first and subsequent periodic mortality salvage cuts.
  - c. Road development program.



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### CASE NO.2

#### *Yield Schedules, Roading and Equipment Requirements for Each Plan*

1. Final yield per acre by products for each alternative.
2. Thinning yields per acre by products for each thinning cut.
3. Road requirements for each alternative"
4. Additional equipment requirements for thinning programs.

This outline is for analysis on an average acre basis. It can be extended to cover a young growth management unit by developing an area cutting schedule related to age classes for the period of a single rotation or some other appropriate interval.

### CASE NO.3

1. Final yields per acre at rotation age.
2. Periodic thinning yields.
3. Labor requirements per acre for each plan.
4. Equipment requirements for hardwood removal.

This outline also is for an average acre. It can be extended to include all stands that are expected to respond favorably to release treatments. In the latter case it may be desirable to stratify stands according to condition classes, age of the pine, and character of the hardwood overstory. The type and intensity of treatment may also be varied according to the conditions. A simple analysis of individual condition classes, however, could be a more practical approach.

### CASE NO.4

#### *PlanA*

1. Total annual wood requirement in peeled cords.
2. Monthly cutting and peeling schedule during the 3-month peeling season. Labor requirements.
3. Monthly woods inventory of peeled and piled wood.
4. Monthly hauling schedule.
5. Monthly wood inventory at mill yard.

#### *PlanB*

1. Total annual wood requirements in peeled cords.
2. Monthly treating schedule during summer season and labor requirements.
3. Average annual inventory of chemically treated standing timber. Chemically treated wood is not ready for harvest and delivery until a year or more after treatment.

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4. Logging and hauling schedule on monthly basis for chemically debarked wood.
5. Monthly wood inventory at mill yard.

### *Plan C*

1. Total annual wood requirements in rough cords.
2. Monthly woods inventory.
3. Monthly logging and hauling schedule.
4. Monthly wood inventory at mill yard.

### *Derivation of Unit Costs and Values*

Unit costs and values are often available from accounting records of the firm but sometimes have to be developed from outside sources or test studies on actual operations. Company wood ordinarily should be valued at the mill yard in terms of the cost of the most expensive outside wood that is delivered to the mill yard. The outside wood costs should include procurement costs and handling costs. The principle underlying this proposition is that company wood substitutes for the most expensive outside wood that the mill must purchase to meet its annual wood requirements. If the capital proposal increases company wood yields, ordinarily such extra wood production would replace the most costly outside wood.

In addition to unit costs, data on fair market value of stumpage and depletion rates will be needed to determine tax-savings realized by company wood. The difference between the fair market value per M and the depletion rate can be credited as part of the firm's net earnings before taxes. Since this amount is taxable at the 25 percent capital gain rate, it brings the firm a tax-saving of 27 percent on that portion of its earnings".

In preparing capital proposals the derivation of yields, production schedules, and unit costs and values should be presented in an appendix where it can be studied and checked by the accounting department and others who will have responsibility for reviewing capital proposals.

### *Analysis and Appraisal of Alternatives*

When the unit cost and value data are completed and the yields and production schedules worked up, the study is ready for economic analysis and comparison of alternative plans. Such analyses will vary somewhat for individual cases but ordinarily will take the following form which is developed for Case No. 1.

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### CASE NO. I-ECONOMIC ANALYSIS

- I. (a) What is the total cut under each plan?  
 (b) How much additional production is realized by the alternative plans over the current method of operation?  
 (c) When will the additional production be realized?

The data given below are hypothetical for the alternative harvest plans for Case No. I. The average increase per year will be realized more or less annually during the 20-year life of the old-growth tract.

	<i>Plan A</i>	<i>Plan B</i>	<i>Plan C</i>
Total cut	400,000M	420,000M	430,000M
Increase over Plan A		20,000M	30,000M
Percent increase		5%	7.5%
Average increase per year		1,000M	1,500M

- II. (a) What is the value of the additional production?  
 (b) What is the additional cost?  
 (c) What is the additional profit?

	<i>Plan A</i>	<i>Plan B</i>	<i>Plan C</i>
Total revenue	\$24,000,000	\$25,200,000	\$25,800,000
Total cost	<u>19,000,000</u>	<u>19,800,000</u>	<u>20,200,000</u>
Total profit (before taxes)	\$ 5,000,000	\$ 5,400,000	\$ 5,600,000
Additional revenue over Plan A		\$ 1,200,000	\$ 1,800,000
Additional cost over Plan A		<u>800,000</u>	<u>1,200,000</u>
Additional profit before taxes		\$ 400,000	\$ 600,000
<i>After Tax Profit</i>			
Fair market value	\$10,870,000	\$11,370,000	\$11,620,000
Depletion	<u>870,000</u>	<u>870,000</u>	<u>870,000</u>
Capital gain	\$10,000,000	\$10,500,000	\$10,750,000
Total profit less 52% tax	\$ 2,400,000	\$ 2,592,000	\$ 2,688,000
27% tax saving on capital gain	<u>2,700,000</u>	<u>2,835,000</u>	<u>2,902,500</u>
Total profit after taxes	\$ 5,100,000	\$ 5,427,000	\$ 5,590,500
Additional profit after taxes		\$ 327,000	\$ 490,500
Percent increase over Plan A		6.5%	9.5%

The total profits before taxes are the actual amounts by which the total net earnings of the firm will be increased when it implements Plans A, B, or C. These amounts are cost-savings that the firm realizes by operating its own timber as opposed to open-market purchase of the same volume of wood. If under Plan A, for example, the total net earnings of the firm were

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\$105,000,000 before taxes, then purchasing the same wood on the open market would reduce net earnings before taxes by \$5,000,000 or to \$100,000,000. In the latter event, treating all earnings as ordinary income at the 52-percent tax rate would reduce earnings after taxes to \$48,000,000. Under Plan A, earnings after taxes will be \$5,100,000 more or \$53,100,000.

Under Plan A, B, or C, the firm can treat income from operating its own timber as a capital gain subject only to a 25-percent tax. The capital gain is given by the fair market value of the stumpage less the depletion. Under Plan A, \$10,000,000 of the \$105,000,000 before taxes would be subject to the 25-percent rate and the balance to the 52-percent rate. The total tax would be \$51,900,000 and earnings after taxes \$53,100,000.

The above after-tax profit calculation treats profits from the timber investment in Plans A, B, and C as ordinary income in the first step (Total profit less 52% tax). The next step is to determine the capital gain and apply the 27-percent tax-saving rate to it ( $52\% - 25\% = 27\%$ ). This adjusts the earnings of Plans A, B, and C to a 25-percent capital gain tax and also credits them with 27 percent tax-saving on that part of the capital gain in excess of the total profit before taxes. The tax saving is on the ordinary income that the firm would earn even though Plans A, B, and C were not implemented. Federal tax regulations permit offsetting capital gains on company-held stumpage against ordinary income.

In planning a new investment in timber growing, the profit after taxes on that investment may be less than, equal to, or more than the profit before tax. When the capital gain is two or more times greater than the calculated before-tax profit, after-tax profits will be greater than the before-tax profit. This phenomenon is dependent on the relationship of fair market value to the before-tax profit per M and is demonstrated in the following case examples:

	<i>Case 1</i>	<i>Case 2</i>	<i>Case 3</i>	<i>Case 4</i>
(a) Profit before taxes	\$16.00	\$16.00	\$16.00	\$16.00
(b) Fair market value	\$13.00	\$17.00	\$25.00	\$33.00
(c) Depletion	1.00	1.00	1.00	1.00
(d) Capital gain	<u>\$12.00</u>	<u>\$16.00</u>	<u>\$24.00</u>	<u>\$32.00</u>
(e) 52% of (a)	\$ 8.32	\$ 8.32	\$ 8.32	\$ 8.32
(f) (a) minus (e)	\$ 7.68	\$ 7.68	\$ 7.68	\$ 7.68
(g) 27% of (d)	3.24	<del>4.32</del>	6.48	8.64
(i) Profit after taxes	<u>\$10.92</u>	<u>\$12.00</u>	<u>\$14.16</u>	<u>\$16.32</u>

When the capital gain is less than the before-tax profit on an investment, then part of the timber investment earnings are subject to the 52-percent

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ordinary tax rate. In Case 1, for example, the effective tax rate on the \$16.00 before taxes is 31.75 percent. In Case 2, where the capital gain is equal to the before-tax profit, the effective tax rate is the 25-percent capital gain tax rate. In Case 3, the effective tax rate is 11.50 percent. In Case 4, the capital gain is sufficiently great so that tax savings on ordinary income that can be offset against it are greater than the taxes payable on the additional net earnings of the timber investment.

### III. What additional investment is involved in Plans B and C?

	<i>Plan A</i>	<i>Plan B</i>	<i>Plan C</i>
Total road cost	\$1,000,000	\$1,000,000	\$1,000,000
Annual road outlay	50,000	100,000	100,000
Average annual undepreciated road balance	0	250,000	245,000
Years to complete roads	20 years	10 years	10 years

No additional investment is involved in Plans B and C. Only an acceleration of capital allocations for roads is involved. The accelerated outlays will require carrying a higher average annual undepreciated road balance during the 20-year period.

### IV. What is the payout period on total road cost?

	<i>Plan A</i>	<i>Plan B</i>	<i>Plan C</i>
Average annual depreciation	\$ 50,000	\$ 50,000	\$ 50,000
Average annual depletion	45,000	50,000	50,000
Average annual earnings after taxes	<u>255,000</u>	<u>271,500</u>	<u>279,500</u>
Average annual capital recovery	<u>\$350,000</u>	<u>\$371,500</u>	<u>\$379,500</u>
Payout period on road investment	2.8 yrs.	2.7 yrs.	2.6 yrs.

### V. What is the rate of return on the additional undepreciated road balance in Plans B and C?

	<i>Plan A</i>	<i>Plan B</i>	<i>Plan C</i>
Average annual undepreciated road balance (capital investment)	—	\$250,000	\$245,000
<i>Before taxes</i>			
Additional profit—20 years	—	\$400,000	\$600,000
Average annual profit	—	20,000	30,000
Average annual rate of return	—	8.0%	12.2%
<i>After taxes</i>			
Additional profit—20 years	—	\$327,000	\$490,000
Average annual profit	—	16,350	24,750
Average annual rate of return	—	6.6%	10.0%

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### CASE NO. 3—ECONOMIC ANALYSIS

This analysis is oriented to the appraisal of the profitability of releasing pine from hardwood competition on an average acre. Values are based on stumpage prices paid for purchased wood. Costs of logging and hauling purchased stumpage are assumed to be the same as for company stumpage. No extension to a management unit is introduced. Only the first ten years after treatment is examined.

I. What is the peeled wood production for treated and untreated stands in the 10 years following release?

	<i>Plan A</i>	<i>Plan B</i>	<i>Plan C</i>	<i>Plan D</i>
Present pine stocking in cords	3.3	3.3	3.3	3.3
Stocking 10 years hence	5.3	6.4	8.4	8.6
Increase in 10 years	2.0	3.1	5.1	5.3
Increase in yield over A	—	1.1	3.1	3.3
Increase in yield of C over B	—	—	2.0	—
Increase in yield of D over C	—	—	—	0.2

II. What is the net capital outlay per acre for each plan before and after taxes?

	<i>Plan A</i>	<i>Plan B</i>	<i>Plan C</i>	<i>Plan D</i>
Total treatment cost per acre	\$ 0.00	\$ 1.59	\$ 5.52	\$ 7.29
Net investment after 52% tax	0.00	.76	2.65	3.50
Additional investment in C over B	—	—	1.89	—
Additional investment in D over C	—	—	—	.85

It is necessary to keep in mind that expenditures for release of a pine understory are capital outlays for increased future yields. Since income tax provisions allow expensing of such expenditures, the net capital outlay to the firm is reduced by the 52-percent tax rate at which retained earnings are ordinarily taxed. In other words only 48 percent of the treatment cost would appear in the net earnings after taxes if the pine release proposal were not undertaken. This is the net capital outlay from earnings after taxes.

III. What are the stumpage values per acre at end of 10 years and the increases in value due to release?

	<i>Plan A</i>	<i>Plan B</i>	<i>Plan C</i>	<i>Plan D</i>
Stumpage value per acre	\$37.10	\$44.80	\$58.80	\$60.20
Increase in yield over A	—	7.70	21.70	23.10
Increase in yield of C over B	—	—	14.00	—
Increase in yield of D over C	—	—	—	1.40

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Since it is assumed that costs of handling wood to the mill yard are the same for purchased and company wood, the stumpage value of purchased wood becomes the gross cost-saving or value of company-produced wood.

IV. What are the additional profits shown by Plans B, C and D?

	<i>Plan B</i>	<i>Plan C</i>	<i>Plan D</i>
Increase in yields over Plan A	\$ 7.70	\$21.70	\$23.10
Net treatment cost per acre	.76	2.65	3.50
Additional profit over A before taxes	<u>\$ 6.94</u>	<u>\$19.05</u>	<u>\$19.60</u>
Less 52% ordinary income tax	- 3.61	- 9.91	-10.19
Plus 27% tax-saving	<u>2.08</u>	<u>5.86</u>	<u>6.24</u>
Additional profit over A after tax calculation	\$ 5.41	\$15.00	\$15.64
Additional profit of C and D over B	—	\$ 9.59	\$10.23
Additional profit of D over C	—	—	\$ 0.64

Note that the only costs chargeable against the increased yields of Plans B, C and D are the extra costs of achieving those additional yields. This is done on the assumption that the firm would continue to hold the land and incur the annual expenses of ownership and administration even though the pine release alternative was not undertaken.

V. What is the rate of return after taxes on the net investment in releasing pine?

*Plan B compared with Plan A*

Net investment	\$ .76
Additional profit over A	<u>5.41</u>
Rate of return on total investment	21.7%

*Plan C over Plan A*

Additional net investment of Plan C over A	\$ 2.65
Additional yield of Plan C over A	<u>15.00</u>
Rate of return on total investment	18.9%

*Plan D over Plan A*

Additional net investment of Plan D over A	\$ 3.50
Additional yield of Plan D over A	<u>15.64</u>
Rate of return on total investment	16.1%

*Plan C over Plan B*

Additional net investment of Plan C over B	\$ 1.89
Additional yield of Plan C over B	<u>9.59</u>
Rate of return on additional investment	17.6%

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### *Plan D over Plan C*

Additional net investment of Plan D over C	\$ .85
Additional yield of Plan D over C	<u>.64</u>
Rate of return on additional investment	negative

Note that Plan D would not be a profitable undertaking relative to Plan C. The additional yield of Plan D over Plan C is not even sufficient to recover the additional capital outlay of Plan D. If only the average rate of return on the total investment in Plan D, 16.1 percent, were available, it would not have revealed the inefficiency of the additional intensity of release over Plan C. Where different intensities of capital outlay are possible to work toward the same objective, analyses of several alternative intensities are necessary to determine the optimum capital outlay for the task.

### CASE NO. 4—ECONOMIC ANALYSIS

For purposes of illustrating the analysis suited to Case No. 4, a hypothetical firm requiring 60,000 cords of hardwood pulpwood is used as a model.

<i>Plan</i>	<i>Annual Pulpwood Requirements in Cords</i>		
	<i>Total</i>	<i>Company Wood</i>	<i>Purchased Wood</i>
A—Sap-peeled	60,000	24,000	36,000
B—Chemi-peeled	60,000	27,000	33,000
C—Rough wood	69,000	31,050	37,950

I. What are the net costs per cord for company wood and purchased wood for each plan?

#### *A. Company wood cost per cord*

	<i>Plan A Peeled</i>	<i>Plan B Peeled</i>	<i>Plan C Rough</i>
Chemical treatment	—	\$ 1.20	—
Peeling to 95% bark free	\$ 2.10	1.00	—
Cut and pile	7.00	7.00	\$ 6.50
Roads	2.00	1.80	1.55
Hauling	6.00	6.00	6.00
Land management and overhead	<u>3.50</u>	<u>3.10</u>	<u>2.70</u>
Delivered to mill	\$20.60	\$20.10	\$16.75
Drum debarking	—	—	1.75
Total cost	<u>\$20.60</u>	<u>\$20.10</u>	<u>\$18.50</u>
Less tax-savings	- .27	- .28	- .28
Less depletion	- .50	- .45	- .45
Net cost of debarked at mill	<u>\$19.83</u>	<u>\$19.37</u>	<u>\$17.77</u>



## CAPITAL BUDGETING FOR TIMBERLANDS

### B. *Purchased wood cost per cord*

	<i>Plan A Peeled</i>	<i>Plan B Peeled</i>	<i>Plan C Rough</i>
Price delivered to mill	\$22.50	\$22.50	\$18.00
Procurement cost	1.00	1.00	1.00
Delivered to mill	<u>\$23.50</u>	<u>\$23.50</u>	<u>\$19.00</u>
Drum debarking	—	—	1.75
Net cost	<u>\$23.50</u>	<u>\$23.50</u>	<u>\$20.75</u>

### C. *Cost of all wood*

	<i>Plan A Peeled</i>	<i>Plan B Peeled</i>	<i>Plan C Rough</i>
Average net cost per cord	\$22.03	\$21.64	\$19.41
Total cost of 60,000 cords of debarked wood	\$1,321,800	\$1,298,400	\$1,339,290

II. What wood inventory is carried with each plan? Minimum mill yard inventory requirements are two months' supply or 10,000 peeled cords.

#### *Plan A*

Mill yard inventory on May 1 is 10,000 cords; increases to 40,000 cords in November, and then falls to 10,000 cords on the following May 1.

Woods inventory on company land begins building up in April; increases to 12,000 cords in August, and declines to zero by November.

The fluctuations are based on 3-month peeling season for all wood and 6-month hauling period.

#### *Plan B*

Mill yard inventory is maintained more or less uniformly at 10,000 cords.

Inventory of company wood chemi-treated the previous year is 24,000 cords in May. It increases to 42,000 cords in August as the current year's chemi-debarking is completed. Thereafter it falls to 24,000 cords on the following May 1.

Company woods inventory of cut and debarked wood is 4,500 cords per month.

#### *Plan C*

Mill yard inventory maintained more or less uniformly at 11,500 rough cords per month. Company woods inventory maintained more or less uniformly at 5,175 cords per month.

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III. What are the average monthly capital requirements for wood inventory for each plan?

	<i>Plan A</i>	<i>Plan B</i>	<i>Plan C</i>
Mill yard inventory	\$560,750	\$220,400	\$227,815
Roads on company land	48,000	48,000	48,000
Cut and piled company wood	68,250	41,400	33,635
Chemi-treated wood	—	39,600	—
Drum debarker investment	—	—	114,000
Average monthly capital requirement	\$677,000	\$349,400	\$423,450
Additional capital requirements over Plan B	\$327,600	—	\$ 74,050
Extra cost of capital at 6%	\$ 19,656	—	\$ 4,443

The results in this hypothetical case indicate that chemi-debarking should be favored. Total annual wood costs are cheaper and capital requirements less than for Plans A and C. However, the analysis does not reflect problems in recruiting seasonal labor for chemical debarking and in training farmers and jobbers to prepare chemi-barked trees a year or more in advance of actual cutting and delivery. Problems with scheduling chemi-debarked wood deliveries from outside sources a year or two in advance may be insurmountable where there is great dependence on many small suppliers.

### V. SUMMARY

The most fundamental economic fact in the acquisition and development of timberlands is the highly capitalistic nature of timber production. The ratio of capital to the annual cut or stumpage income for regulated forest properties is in the vicinity of 20 to 1. In the pulp and paper industry the ratio of capital to sales is 1 to 1, considered high for a manufacturing industry, and in the lumber industry it is closer to 1 to 2.

The capitalistic nature of timber production makes the earning rate of forest assets and the cost of capital paramount economic considerations in forest management planning. It is the basis for characterizing forest management planning as capital budgeting. This conception places the forest enterprise in its proper business perspective. The forest manager who grasps this concept and applies it effectively should be able to extract the maximum efficiency from a firm's timberlands. Firms which have grasped and applied this concept of the forest business are widely recognized as leaders in American forestry.

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## FACTORS WHICH ATTRACT EQUITY AND BORROWED CAPITAL TO TIMBERLANDS- THE INVESTOR'S VIEWPOINT

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**A**FTER years of experience in the investment field, I am convinced that the raising of money or capital should be and must be looked upon more as an art than a science. A lumberman friend of mine in the South has a wonderful philosophy for doing business. First, establish the confidence line, and then spread love and affection. Nothing is more important in this matter of raising money than to establish the confidence line, and that means to a major extent confidence in the people, that they have the capacity to carry out their projects and that they are people of integrity.

I was drawn into the forest products field because our firm, Blyth & Co., having originated on the Pacific Coast, had grown up in the area of some of the large forest products companies. When I returned to business in 1946 after the war, I determined that in the paper industry alone there were at least a hundred companies with annual sales of \$10 million and up. In our business a sales volume of \$10 million is sort of a benchmark or criterion of a company that is a prospect for financing, and I felt there would be a great deal of business to be found in the forest products field.

In financing these paper companies one is drawn into various phases of timber evaluation and timberland ownership and we have come to realize that every new situation presents new problems.

From the investor's point of view, timber holdings have sales value out of proportion to their earning power. If a consultant should make an appraisal of all the timber and timberlands in the United States, I have estimated that he would come out with a figure in the neighborhood of \$40 billion. The U.S. Forest Service gives an unofficial figure of \$41 billion. Yet the annual cash production of the \$40 billion of appraised value is about one billion dollars. This was a government figure of two years ago and includes stumpage value of all timber cut. Perhaps at today's levels it might be a billion and a half, but it means that on an over-all basis we are dealing with an industry which actually produces a cash return of 2.5 to 3.5 percent on its value.

Perhaps that is the reason why there has not been more capital invested in the research and engineering of the problems of harvesting timber-why

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it is still so costly to get a tree from the point where it is standing on its stump into the sawmill, and why the returns do not conform to any other business. On an average, industry in general earns about ten percent on its invested capital.

There are two ways in which invested capital is measured. One definition would be the entire assets. Usually, however, statistical ratios of earnings to invested capital are stated in the earnings on the *net* invested capital; that is, the stockholders' net worth. Where a corporation has no debt, the total invested capital and net worth are the same. For the owners, or stockholders, this is the best criterion of management that there is. What does the management accomplish with the capital that is put into its hands?

I generally use the net worth figure because I have been inclined to favor, in an industry as basic as forest products, that management take advantage of a moderate proportion of long-term debt.

The ratio of earnings to net worth is the best common denominator for comparison rather than earnings on sales which are highly variable. It so happens that today the industry which has the lowest percentage of earnings on sales has the highest percentage of earnings on net worth. It is the grocery-supermarket chain which earns from 1 to 1.5 percent on sales and 15 to 25 percent on net worth. Paper companies earn 5 to 6 percent on sales and 10 percent or better on net worth, after taxes.

Of course, the current, fair appraisal value of \$40 billion does not show upon the books of large and small timber owners as part of their net worth in those terms, and a distinction should be made between earning 2.5 to 3.5 percent upon this appraised value and the earnings on net worth.

But to make *new* timber investments, to acquire timber and timberlands, you have to pay a price which is in line with this \$40 billion valuation. How can you justify such investments if you must pay a price which is a part of this \$40 billion base, and can see earnings of only 2.5 to 3.5 percent? One method has been to exploit that investment immediately after the purchase, usually by the construction of a pulp mill and any necessary sawmills or plywood plants. Or, after purchase of a block of sawtimber, start immediately with a planned program of cutting it back to a pulpwood forest and thereby recoup a major share of the initial capital investment. Many of the large forest purchases in the South and in the West have been based on a plan of cutting in excess of sustained growth for the purpose of recouping a major part of the investment in what business frequently refers to as "the foreseeable future." In financing, this "foreseeable future" usually is rated at from 10 to 20 years.

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What are the answers to this question of why people invest in timberland? There have been accumulating in this country, particularly since 1945, a great many large family fortunes, estates, trusts, etc. We read about the days of the Vanderbilts and the Astors and the Goulds, when there were in this country a few family fortunes. Today wealth is more widely spread. Many of these family fortunes are seeking very long-term investments, quite frankly looking toward the next generation, and the second generation beyond. For that purpose investment in a growing natural resource is appealing.

There are sizeable funds seeking opportunities to make long-term investments in timberland with relatively little concern about current returns. However, all those with whom I have come in contact are sufficiently business-minded that they want these timberlands to support at least a normal interest charge during the long holding period, and today that interest charge is 5.5 to 6 percent. We are right back to the fact that investors will not buy timberlands on today's market on the basis of the annual return that can be derived from stumpage. It brings us, again, to a policy of accelerated harvesting for a sufficient period to reduce the debt to a point that can be supported by sustained yield management. Georgia-Pacific Corporation has been buying large blocks of timber with heavy borrowings backed by accelerated harvesting for debt repayment. They have a basic philosophy and they know where they are going. They are convinced above all of the very long-term future value of timber holdings. They are laying the groundwork for new growth and larger growth in the future.

Georgia-Pacific Corporation has stated that it believes in buying timberland and standing timber with borrowed money, using common stock to raise capital to build paper mills, lumber mills, plywood mills, distribution facilities, and for merchandising, in order to exploit timber ownerships.

St. Regis Paper Co. has expressed a different idea. It has used common stock for the acquisition of large timberlands, thereby setting the base for subsequent borrowings as needed to build manufacturing facilities.

One of the major reasons for the purchase of timberlands is to protect and insure a permanent supply of timber for multi-million dollar mills, making pulp, paper, plywood, lumber, poles, etc. Another reason is to profit by accelerated liquidation of the standing timber purchased in wholesale lots at less than going market prices. The idea of buying big tracts at wholesale and selling at retail is known to all of you. What is a wholesale discount from a retail appraisal? I have heard purchasers say, depending on the tract size and location, that they usually think in terms of a discount from retail appraisal

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of 20 percent to 40 percent. Those figures have been applied in some of the larger purchases, and would be a fair guess to keep in mind. If a company buys a block of timber at a 40 percent discount and accelerates liquidation, it can work out a plan whereby in ten to twenty years it will have its debts paid off and still own a good quantity of timber and timberland which can then be put on a sustained yield basis.

I have here three tables showing the timber supply situation in the United

TABLE 1. DISTRIBUTION OF U.S. FORESTS  
BY AREA, VOLUME AND SPECIES GROUPS

*(Figures Include Coastal Alaska)*

Total Land Area	1,939,000,000 acres			
Commercial Forest Area	488,000,000 acres			
Timber <b>Growing</b> Stock	517,000,000,000 cubic feet			
Standing Sawtimber	2,057,000,000,000 board feet			
	<i>Area</i>		<i>Sawtimber</i>	
<i>Location</i>	<i>Millions of Acres</i>	<i>% of Total</i>	<i>Billions of Board Feet</i>	<i>% of Total</i>
West	121	25	1,434	7°
East	367	75	623	3°
Total	488	100	2,057	100
	<i>Billions Board Feet</i>			
	<i>Softwoods</i>		<i>Hardwoods</i>	
West	1,4°6		28	
East	242		381	
Totals	1,648		<b>409</b>	
	<i>Ownership of U.S. Forest Resources</i>			
	<i>Millions of Acres</i>	<i>% of Total</i>	<i>Billions of Board Feet</i>	<i>% of Total</i>
Federal	1°3	21	9°1	<b>44</b>
Other Public	27	6	76	<b>4</b>
Farm	165	34	308	15
Industry and Other Private	193	93	772	37
Totals	488	100	2,057	100
	<i>Billions of Board Feet</i>			
	<i>Softwood</i>	<i>% Total</i>	<i>Hardwood</i>	<i>% Total</i>
Federal	867	53	34	9
Other Public	62	4	14	3
Farm	14°	8	168	41
Industry and Other Private	579	35	193	47
Totals	1,648	100	4°9	100

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TABLE II. CONSUMPTION OF TIMBER FOR INDUSTRIAL PURPOSES IN THE UNITED STATES  
(Billions of cubic feet Annual Average)

<i>Decade</i>	<i>Lumber</i>	<i>Pulpwood</i>	<i>Veneer &amp; Plywood</i>	<i>Other</i>	<i>Totals</i>
1900-09	6.6	.3	.1	2.2	9.2
1910-19	6.0	.5	.1	2.1	8.7
1920-29	5.7	.9	.1	1.6	8.3
1930-39	3.6	1.1	.2	.9	5.8
1940-49	5.6	1.9	.3	.9	8.7
1950-56	6.2	3.0	.5	.9	10.6
Forest Service Medium Projections					
1975	8.4	5.3	.9	.8	15.4
2000	12.1	7.1	1.5	1.2	21.9

Note: Figures above include wood equivalent of net imports of forest products but do not include fuelwood estimated to decline from 2 billion cu. ft. currently to one-half billion in the year 2000.

TABLE III. FUTURE TIMBER GROWTH AND DEMAND

	<i>Live Sawtimber (Billions of Board Feet)</i>		
	<i>Total</i>	<i>Hardwood</i>	<i>Softwood</i>
Net Annual Growth, 1952	47.4	19.1	28.3
Medium Projected Demand:			
1975	68.2	18.3	49.9
2000	105.4	29.1	76.3
Medium Projected Growth:*			
1975	58.6	22.6	36.0
2000	25.2	12.2	13.0
Maximum Realizable Growth	100.7	30.5	70.2

\*Assuming timber were cut each year sufficient to meet medium projected demand.

States, which I prepared last year when some investment trusts in London wanted a rudimentary education on the timber industry in the United States. There was need for something of a simple and concentrated nature to bring this enormous subject into perspective for quick reading and understanding. These were mostly derived from the Timber Resources Review and show, as Dr. McCordle of the U.S. Forest Service recently restated, that the country may be facing an inadequate timber supply by the year 2000.

Investment values are all based on comparison. Here is the money; the money needs to be employed; what is available as a means of employment? What is available in the market? What affords us the best return that we believe we can get currently with adequate security? Whether one is an in-



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dividual buying 50 shares of stock, or an investment trust buying 100,000 shares of stock, or a large insurance company making a loan of \$10 million or \$100 million, it comes down to the same thing. For such a comparison in timber it is necessary to assemble in the simplest possible manner the basic facts as shown by these tables.

We have basic investment data on the Weyerhaeuser Company, because it is the one big company in this industry which has more or less bared its soul and told us what it has. It did that in a proxy statement in its merger with Kieckhefer Container Corporation in 1957 and I do not know of any other big company that has gone to this extent in telling exactly how much timber it has, what the kinds are, exactly what is the nature of its position in the lumber industry, the plywood and the pulp industry. To me this prospectus is a classic example of a simple, straightforward statement of a complicated situation.

In going after money of any kind you must realize that you are dealing to a considerable extent with people who know but little about your industry. I worked on financing of \$85 million for timber acquisitions for the Simpson Logging Co. of Seattle, three years ago, and it ended up \$25 million as a bank loan, maturing over a period of 6 to 7 years, and the balance of \$60 million in long-term debts. We found a strong feeling on the part of the banks and insurance companies that timber was something that they wanted to invest in, but they did not know how to measure it. One of the bankers said, "We are favorably inclined to\vard this loan but we want to wait and see what the insurance companies say about the long-term portion."

We did not hesitate to seek outside help in establishing the character and capacity of the people who own and manage the Simpson Logging Co. After reading a statement on the Simpson people by the leading bankers of the Pacific Northwest, the insurance companies said: "Here is an industry that we want to back; these are people in which we now believe; we want to put"" their capacity together with the timber so that we can have a good loan and make a good rate of interest. But what can we put in our files to prove that we exercised due diligence?"

In long-term borrowing from insurance companies and institutions, in creating the legal instrument, it is standard practice that an independent counsel be retained to represent the lender, and his fee is paid by the borrower. In this instance we recommended to the insurance companies that they select a recognized timber expert to represent them exclusively and that the borrowing company pay his bill. They obtained their own expert timber consultant from Portland and he became an advisor to the staff. That was using

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a perfectly proper device for establishing confidence, recognizing that the lenders did not have sufficient experience to do something that they wanted to do.

That is one answer to the question: How can we establish the confidence line? Until you do that you are sitting on the other side of the room from the people with whom you want to do business.

I will refer again to Weyerhaeuser, because the figures are available for comparison. I figured out from this Weyerhaeuser proxy statement that a fair commercial appraisal of its timber holdings and its operating properties would amount to \$70 to \$75 per share of Weyerhaeuser stock. It sells in the market at \$39. It earns about \$2.00 per share or less than 3 percent on my valuation of the properties. Here you see in the practical operation of one of the finest companies in this industry just exactly what I was talking about before—the problem of rationalizing this rate of earnings with the values that are behind it if those values could be realized, and the values that Weyerhaeuser or any other company have to pay if they go out to buy more timber.

I use Weyerhaeuser as an example when we are discussing situations where the values are primarily timber, and use International Paper in situations where the values are primarily in operating properties and merchandising. Excepting in the Long-Bell case I do not recall a situation where in quite some years International Paper has issued common stock for timber purchases. It has had the cash available. St. Regis, on the other hand, has issued common stock in its two big western timber purchases in recent years, St. Paul and Tacoma Lumber Co., and J. Neils Lumber Co. Georgia-Pacific, in a third method of financing timber purchases, has gone into debt to a major extent. Weyerhaeuser has had still a different problem, that of exploiting more profitably the vast heritage of timberlands and timber holdings which were acquired by the business in the early 1900's. You can study those four companies to get the fundamentally different methods of handling financial problems by four different, very successful companies.

You all know that stocks or equities have to pay dividends. To pay dividends they have to earn them. Conventionally, in the United States, dividends are about 50 percent of profits. The average American industry plows the other 50 percent back into reinvestment in the company. That is why common stocks have proved to be good long-term investments in this country. As long as those policies continue and until we reach the unknown stage of a "mature economy" I think that will continue to be the case. In an acquisition of timber

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based on the issue of common stock, you have to look ahead and ask: How can we get the money to pay dividends on this common stock and earn those dividends twice over?

If your plan is to cut the timber, you may not want to put out common stock for your purchase because common remains out forever. You can put out debt and liquidate that properly and soundly. So you try to strike a balance and use some equity and a considerable amount of debt. Some of the best companies in the industry have done this and have used a plan of accelerated liquidation in order to pay those debts. But you must show the lender two things: first, that the retail value, the going value, for which the timberlands could be sold, at least in small blocks, is substantially in excess of the amount of the loan. On a big, expensive house you may borrow up to 50 percent of the value; if it's a little house that has a ready resale, you may borrow 60-70-80 percent. The same thing is pretty much true in timberland. Secondly, you have to be able to demonstrate that there will be income to make payments regularly, from year to year, on both the interest and the principal. That almost invariably requires an independent expert to make a cruise, to give an estimated retail evaluation and to set up, with management, a liquidating program which can then be shown to the lender.

If the loan is conservative, say 50 percent of the appraised value, it can probably be made without any guarantees. In a large purchase, if you want to borrow 75 percent of the current appraised value of the timber and timberland, then usually the lender will require some type of guarantee. As a rule those guarantees are indirect, whereby the purchaser will set up a cutting contract, and agree that he will take a certain amount of timber from the lands, and that, whether he does the cutting or not, he will pay to the trustee for the loan a minimum amount each year. This annual guarantee of payment does not go on the company's balance sheet as a liability and yet it is similar to a lease on any other property because it is a long-term obligation and must be paid from year to year. With such a contract, the lender feels secure and makes his loan larger on the expected ability of that company to perform its contract and, to a lesser extent, on the value of the property itself. The extent to which the borrower has to go in committing his other resources to support a loan is determined largely by how large a loan he wants in relationship to the soundly appraised value of his timberland property.

To sell a big piece of timberland, look first to one of the established forest products companies, which in the main are always in the market. Then look at companies in other industries which have a leaning toward the cellulose

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industry. Recently, in connection with one of my projects, the president of one of the New York banks came to me and said, "I have a buyer for this timber property." The prospect was one of the great manufacturing corporations of the country that has built up a large cash surplus. It is trying to find an outlet in a different form of investment. To solve such a problem I would seek out an investment banking firm that could demonstrate broad and successful experience in this particular field. It would know the channels to explore, and in each one of these deals you have to explore.

Then we look to the individuals, the big family fortunes, that are less interested in current income than they are in building future values. You locate them to a considerable extent through friends in commercial banks, investment counselors and investment bankers, and in a few instances directly through the family which publicly sets itself up to find means of investment. J. H. Whitney & Co. of New York, for instance, is the investment medium for the Whitney fortune. Their interest in timber stems partly from their ownership in the Great Northern Paper Co.

The managers of a large fortune might invest as much as 20 percent of it in timberland. But I think this type of investment is applicable even to smaller investors, people who just want to put money away in a natural resource, who have become convinced that inflation is with us to stay and that timber holdings, if adequately scattered, are safe from disaster. They believe that timber values and land values will go up in the long run, and they don't care whether they go up in 2 years or 20 years. They also realize that new values are being created continually through growth. They are people who are in the high tax brackets and to whom current income is of relatively little value. They are thinking about creating values, usually for their children and their grandchildren. And there is a great deal of money throughout the country that is liquid, and is in banks, and is mobile and seeking for something in which its owners can believe.

But, you would not find this capital available unless you had established, through operation and earnings and dividend payment, capacity to handle such projects, to make them profitable, and to show a strong balance sheet.

If the Santa Fe timberlands became available for purchase tomorrow I do not think you could float new securities to produce anything like the amount of money that it would take to buy them. You would have to go through one of these other routes. They would have to be bought by a big company already in the industry, or with borrowed money by some company that already had the credit backing that would justify such a loan through a cutting contract.

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One of the largest timber and lumber aggregations ever sold for cash was Coos Bay Lumber Company. An investment banking firm purchased the entire equity for about \$100 million which netted the stockholders over twice **what** the shares had been trading for in the market. Then, through a process of constructive liquidation, the various parts were sold to interests capable of better and more profitable management than had been previously applied. The largest value was the timber itself, about 4 billion feet of old-growth timber that finally sold for \$70 million. That was offered to, looked at and considered by a number of prospective purchasers before final sale. The result was, and still is, profitable for all parties concerned. The banking firm was rewarded for having conceived the plan and for the risk of capital. The former owners received payments far beyond their expectations and the new owners of the various properties are operating them efficiently and profitably.

Many of the large investment banking firms have capital resources in excess of the requirements of their day-to-day turnover of securities. Usually they make an investment in a company in a situation that will put them temporarily in a controlling position, through which they believe that with their knowledge and connections they can bring about a constructive reorientation of that company's business and get their capital back, in a period of perhaps two years. This is not an investment trust that goes in for permanent investments; this is an investment bank **which** endeavors to keep its capital mobile. On this capital, for a two-year risk, they should earn not less than 10 percent, and if Quite successful as much as 50 percent.

An investor considering timber as an investment should break down his analysis into four major categories, as I see them: first, the over-all situation for timber as an investment, nationally. Second, the individual firm's plan for earnings. Third, the value of the assets on which these earnings are going to be made, their liquidation value. And finally, the confidence line.

I think the confidence line is the most important. In my first job at the National City Bank, studying so-called science of credit, there were three C's: Character, Capacity, and Capital. Capital was the financial aspects of the credit, and that was last. Character was first, and Capacity, that is the demonstrated capacity to carry through the business project, was second. That means having confidence in the people almost before you look at the figures.

### DISCUSSION

**Q:** In the investment field as of now, do you feel that there is an amply supply of capital to be invested in timber?

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MOISE: It is my impression that there is more capital available in institutions for this kind of investment than they have had use for. The long-term institutional lending market has not been the tight part of this whole money market. As a matter of fact, the total amount of loans and bonds of the kind that insurance companies buy had a peak in 1957, declined in 1958, declined again in 1959.

Q: Why would an insurance company be interested in acquiring a big tract now?

MOISE: Timberland investments are interesting to the same insurance companies that have been acquiring factories and store buildings, apartment houses and hotels, leased out to various people. They are looking for an investment return on their money, and when the money is recovered, still have something more coming.

Q: Some insurance company loans have a penalty clause for a quick payoff. Is that typical in these long-term timber loans?

MOISE: Some long-term loans have the option of doubling retirement in each year without penalty, so that the loan may be paid off in just half the length of time without premium. The redemption features of long-term loans are matters of negotiation, frequently of hard negotiation, because the insurance company is always wearing two different hats. It wants to know that it can get its money back, but if the loan is good it is happy to have it stay. The insurance companies, now that they have some experience in these loans, and that interest rates are at historically high levels, are doing all they can to hold on to these loans and they are, for example, making them either non-callable for five years, or ten years, or making them financially non-callable. You cannot refund the loan using money borrowed someplace else for the first ten years, or sometimes for the entire life of the loan.

Q: Could you tell us the dividing line between long-term and short-term debt?

MOISE: "Short-term" debt is due in less than one year. "Term" debt is usually three to ten years. "Long-term" debt is from ten to thirty or more years. Banks will make the generalized statement: "We do not make loans longer than 5 years." Then they may be pushed out toward 10 years, depending on how badly they want to make the loan. In most big banks there are loans of 10 years. It also depends somewhat upon the tightness of money. Today a 10-year bank loan would be unusual, but they will go to seven. When they have more funds to lend than they have good applications for loans, they will go to 10 years for a good customer.

## ATTRACTING EQUITY AND BORROWED CAPITAL

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The insurance companies go to 20 or 25 years, depending upon their confidence in the projected ability to repay the loan. An insurance company does not want to find it necessary to exercise its rights under a loan contract. They do not like to get mixed up in foreclosures, so they create a set of positive and negative covenants to which the borrower agrees. Such covenants are used as warning signals so that management can take corrective measures well in advance of any default.

**Q:** Should the liability created by long-term leases appear on a balance sheet?

**MOISE:** That is a subject of discussion in the accounting profession at the present time. There was published by Harvard Business Review in April 1959 an article entitled "Illusion in Lease Financing." It showed for whole industries, in particular the merchandising industry and, surprisingly enough, the big oil companies, the extent to which by the lease device they had built up enormous obligations that were in no way reflected on their balance sheets, and in many cases, were not even shown as rental payments on their profit and loss statement. The accounting fraternity and the banks know that this is going on. I would guess that within another two or three years, the American Institute of Public Accountants will have devised some recommended formula for a uniform practice that will account for these lease obligations. It is an important item and should be shown in some way in the balance sheet so that a normal reader can understand it.

**Q:** What will be the attitude of investors toward timber investment when money demands 7 to 8 percent?

**MOISE:** The cost of money is part of the cost of borrowing, and you have to consider it when you sit down and figure how it can be paid back. Obviously, the higher the interest rate goes the more you must earn. Nobody seems to know to what extent a high interest rate encourages or increases the quantity of savings or to what extent it impedes or reduces the quantity of corporate expansion with borrowed money. The effect over the years has always been so slow.

**Q:** What is the reason that third parties are interested in acquiring forest lands, such as a third party buying the timberlands to furnish wood to a big paper company? What is their interest in investment in timberlands, if it gives such a low rate of return?

**MOISE:** They would work out a cutting program, for which the paper company takes full responsibility, so that the loan that is undertaken by the timberland company will be paid off probably in twenty years. During that

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period the **timberland** company ,will have received a return, sufficient to pay the interest on its loan and sufficient to give it an interest return on the equity part of its investment. At the end of that twenty-year period the timberland company will have the land plus some timber left on the land, and it will have its money back. During the present generation, they will have earned just about as good a return as they could if they had put it in some good bonds, and their heirs will then have a property left to them which will have a real value and an excellent potential. Looking a long way ahead, I think it is attractive.



# EARNING CAPACITIES AND GROWTH RATES OF SELECTED WOOD-USING INDUSTRIES FOR THE PERIOD 1945 THROUGH 1958

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IN AN effort to establish a satisfactory basis for deciding on profit ratios to be used in stumpage price determinations and on interest rates to be used in forest valuation problems, I compared the financial statements of 37 wood-using industries published in a series of Moody's Industrial Manuals. This report summarizes the findings and gives a brief description of the major characteristics without attempting to go into a detailed analysis. Much of the interpretation must necessarily be left to the reader, who may be interested in one segment or another. The companies studied were listed primarily in the section of *The Lumberman* entitled *Forest Products Stocks*. The following tabulation separates the individual companies into four industry groups according to their major line of product, and includes a notation of length of the financial record and the code initials by which each is identified in the subsequent tables. The "integrated" group includes those companies which have more than one major line of product, for example pulp-paper and lumber.

The allocation of some of the companies to a specific group is subject to change. For example, Powell River probably could be better classified as a lumber company, although it has interests in pulp and paper manufacture. Crown-Zellerbach, St. Regis, and Union Bag-Camp could well be placed in the integrated group, since each of them has acquired substantial interests in lines other than pulp and paper.

A number of the companies, especially in the lumber group, appear only for a few years in the record, since they have been sold to larger companies in recent years. The records for wholly-owned subsidiaries are seldom given in sufficient detail for the purposes of this analysis.

Four valuation ratios have been selected for the purpose of comparing the companies. These ratios were based on the items of :

1. Total sales (TS)
2. Operating profit (OP)
3. Depreciation, depletion and amortization (D)
4. Net income (NI)
5. Total assets (TA)

## FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

<i>Code</i>	<i>Record dates</i>
A. Lumber companies (Tables I-A and I-B)	
B E. L. Bruce	1945-1958
BC Boise-Cascade	1953-1958 partial
BS Brooks-Scanlon	1953-1958 partial
CM Chicago Mill and Lbr.	1945-1958
ChR Cherry River Boom and Lbr.	1950-1957 partial
D Dierks	1948-1958 partial
H Hines	1945-1958
K Kirby	1945-1958 partial
LB Longbell	1945-1954
M Medford Corp.	1945-1958
Pi Pickering	1945-1958
PT Pope and Talbot	1950-1958 partial
SW Southwest Lbr. Mills	1945-1958
U Union Lbr. Co. (Cal.)	1947-1958
B. Pulp and Paper companies (Tables II-A and II-B)	
Ch Champion	1945-1958
CZ Crown-Zellerbach	1945-1958
GN Great Northern (Maine)	1950-1958
H I-Iudson	1945-1958
IP International Paper	1945-1958
KC Kimberly Clark	1945-1958
LF Longview Fibre	1947-1958 partial
PS Puget Sound	1945-1958
R Rayonier	1945-1958
SR St. Regis	1945-1958
Sc Scott Paper	1945-1958
UB-C Union Bag-Camp Paper	1945-1958
C. Plywood companies (Table III)	
A Atlas	1945-1958
C Cascades	1945-1958
HP Harbor Plywood	1945-1958
RP Roddis Plywood	1950-1958
US United States Plywood	1945-1958
D. Integrated companies (Table IV)	
C Crossett	1950-1958
GP Georgia-Pacific	1946-1958
MB MacMillan-Bloedel (Canada)	1950-1958
PR Powell River (Canada)	1945-1958 partial
P Potlatch	1951-1958 partial
W Weyerhaeuser	1945-1958

## EARNING CAPACITIES AND GROWTH RATES

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Operating profit is found by deducting from total sales such items as cost of goods sold, expense of selling, administrative and general expense, depletion, depreciation, amortization, and taxes other than income tax. Net income is obtained by adding "other miscellaneous income" and subtracting contributions, interest, debt expense, and federal and state income tax. The depreciation item was not always fully explained in the statements; at times, depletion or amortization were specially noted, in others they were not mentioned. Total assets include borrowed capital.

The four ratios are as follows:

1. Operating profit / total sales, to show the number of cents of operating profit per sales dollar as a general measure of operating efficiency;
2. Net income / total sales, to show the number of cents per sales dollar of final net profit after all costs, adjustments and income tax;
3. Net income / total assets, to show the number of cents of final net profit per dollar of capital investment;
4. Depreciation, etc. / total assets, to show the number of cents per dollar of capital investment contributed to cash flow by depreciation, depletion and amortization.

The first two ratios can be converted to a cost basis rather than total sales by dividing the ratio by (100 - the ratio). Thus if  $OP/TS = 20$ , then  $OP/Total\ cost = 20/(100-20) = 25$ . In all the tables, ratios are shown in cents per dollar, the equivalent of percent.

In the second part of this report, parts of the same financial statistics are used again to estimate the growth rates of the individual companies and groups during the record period. This is done by dividing the sum of the dollar values for the last three years of record by the sum of the first three years (omitting year 1945). Three-year periods were used purposely to get away from the temporary peculiarities of a single year. The following comparisons are shown in Table V :

1. Total assets of the last three years / total assets of the first three years, to show the approximate increase in capital investment;
2. Total sales of last three years / total sales of first three years, to show the increase in sales as a result, in part at least, of the increase in capital investment;
3. Total operating profit of last three years / total operating profit of first three years, to show the concomitant increase in operating profit;
4. Total net income of last three years / total net income of first three years, to show the final resultant increase in net profit.

## FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

TABLE I-A. COMPARISON OF EARNING RATES OF SELECTED LUMBER COMPANIES

<i>Date</i>	<i>Ratio of Operating Profits to Total Sales-Percent</i>													
	<i>B</i>	<i>Be</i>	<i>BS</i>	<i>CM</i>	<i>ChR</i>	<i>D</i>	<i>H</i>	<i>K</i>	<i>LB</i>	<i>M</i>	<i>Pi</i>	<i>PT</i>	<i>SW</i>	<i>U</i>
1958	1.0	5.4	13.0				4.1			17.6	8.6	6.1	-1.2	14.2
1957	4.2	4.2	18.9				5.5			21.6	18.7	4.0	8.0	12.1
1956	9.8						9.5			22.7	34.5	9.5	9.8	6.8
1955	9.6						11.2			24.8	24.7	11.3	0.9	16.6
1954	5.6						9.7		5.5	24.1	38.8	8.4	1.8	13.3
1953	5.5						10.0		6.7	19.7	34.3	6.7	0.5	13.7
1952	5.9						10.4		9.5	21.4	40.8	4.9	-0.4	13.4
1951	16.8						13.7		16.5	21.6			15.8	29.4
1950	10.5						13.1		18.0	27.9			16.2	25.3
1949	7.8						10.1		12.6	25.3	36.1			
1948	14.8						14.2		21.6	39.7	36.3			
1947	13.4						13.2		23.3	41.8	14.1		29.5	
1946	5.3						11.5		15.3	23.9	-3.1		14.8	
1945	8.7						4.8		10.6	11.3	10.4		-3.0	
Wgtd.														
Ave.	9.8	4.9	16.1				10.2		14.2	25.2	24.3	7.2	6.9	15.6
<i>Ratio of Net Income to Total Sales-Percent</i>														
1958	0.4	4.2	10.4				3.3	12.5		14.5	6.0	4.4	-1.2	11.7
1957	2.1	4.0	13.0		-4.4		3.5	12.0		17.0	13.5	3.0	5.3	10.3
1956	4.6	3.4	14.4		2.7		5.9	16.7		16.0	21.6	5.7	9.8	7.8
1955	4.0	4.4	14.6		2.6		6.1	3.4		16.6	19.4	7.3	2.0	14.2
1954	2.6	3.9			-7.0		5.1	7.7	4.3	15.8	22.4	1.9	-1.3	11.5
1953	3.1	2.9			0.8		5.0	11.5	6.0	13.2	21.2	3.2	0.2	10.9
1952	4.6				-5.7		5.4	8.7	6.7	14.0	23.3	6.5	0.0	12.2
1951	5.9				5.0		6.1	23.0	8.7	17.7	27.8	6.6	6.4	17.5
1950	6.0				4.5		7.1	22.5	10.8	17.0	21.6	6.5	7.4	16.3
1949	5.3				3.2		6.7	18.6	8.7	16.5	24.2		0.3	17.5
1948	8.4				12.6		8.5	28.0	13.4	24.7	22.1		3.6	22.7
1947	8.2						7.7	28.7	15.2	26.0	17.7		6.6	20.4
1946	3.1						8.3	20.2	10.3	15.7	18.6		8.7	
1945	3.0						4.2	9.3	4.3	6.9	10.4		-5.0	
Wgtd.														
Ave.	4.9	3.9	12.9		2.1		5.8	17.3	9.0	16.8	20.1	5.0	3.3	13.6

### COMMENTS

Ratios, such as those given, are subject to variation and they are distorted by atypical performance or by management decisions such as those involving major non-recurring items of cost or return. However they can reveal a general pattern or situation if there is substantial agreement in the ratios for several companies.

## EARNING CAPACITIES AND GROWTH RATES

TABLE 1-B. COMPARISON OF EARNING RATES OF SELECTED LUMBER COMPANIES, CONTINUED

<i>Date</i>	<i>Ratio of Net Income to Total Assets-Percent</i>													
	<i>B</i>	<i>BC</i>	<i>BS</i>	<i>CM</i>	<i>ChR</i>	<i>D</i>	<i>H</i>	<i>K</i>	<i>LB</i>	<i>M</i>	<i>Pi</i>	<i>PT</i>	<i>SW</i>	<i>U</i>
1958	0.6	5.3	5.3	6.5		7.2	5.0	3.6		7.4	3.4	4.2	-0.7	6.7
1957	3.5	5.0	8.4	6.7	-3.0	7.5	5.9	3.5		9.6	4.9	3.8	3.0	5.8
1956	9.1			6.2	2.0	11.4	11.2	4.2		9.6	13.7	5.1	4.1	5.3
1955	7.5			4.9	1.5	8.8	12.7	0.6		10.3	10.6	6.8	1.5	12.4
1954	4.7			4.9	-3.5	2.6	9.0		4.2	10.1	17.5	1.8	-1.0	9.6
1953	5.7			8.3	0.5	7.0	9.7	4.3	6.3	9.0	17.4	3.4	0.2	8.8
1952	8.2			7.6	4.2	8.0	11.1	4.4	7.8	9.4	19.0	7.2	0.0	8.8
1951	12.4			12.5	4.3	9.1	13.4	12.1	12.0	11.7	19.7		2.5	15.2
1950	11.5			13.3	3.7	11.9	15.6	13.6	16.3	11.5	13.4		7.5	15.2
1949	12.0			4.9		5.1	13.3	11.7	11.4	10.4	13.8		2.2	11.0
1948	18.4			15.0		7.0	21.3	24.3	21.7	16.4	12.0		2.9	19.1
1947	14.4			23.3			17.1	23.5	25.4	19.5	3.1		5.2	
1946	4.4			7.4			12.9	13.8	13.0	9.1	-3.4		6.9	
1945	6.0			6.3			6.0	4.4	4.9	5.5	2.9		-2.4	
Wgtd.														
Ave.	9.5	5.1	6.8	8.6	0.3	7.9	11.5	7.9	11.6	9.6	10.8	4.7	2.4	9.8

<i>Date</i>	<i>Ratio of Depreciation, Depletion &amp; Amortization to Total Assets-Percent</i>													
	<i>B</i>	<i>BC</i>	<i>BS</i>	<i>CM</i>	<i>ChR</i>	<i>D</i>	<i>H</i>	<i>K</i>	<i>LB</i>	<i>M</i>	<i>Pi</i>	<i>PT</i>	<i>SW</i>	<i>U</i>
1958	3.8	4.1	6.0	3.5		7.3	3.7	3.1		2.3	9.8		6.0	4.5
1957	3.4	4.2	4.2	3.0	5.6	4.4	4.2	3.0		2.7	5.5		4.8	5.1
1956	2.6			3.4	4.8		4.2	3.3		4.4	7.9		4.8	4.4
1955	2.7			3.2	5.3	4.1	4.9	4.8		3.7	6.5		4.6	5.4
1954	3.0			4.1	4.8	2.6	4.0		5.8	4.7	8.0		4.5	4.5
1953	2.8			4.6	5.2	3.1	4.3		6.6	4.7	9.4		4.5	3.1
1952	2.6			4.3	4.4	3.2	4.5		6.2	4.1	8.1		7.3	5.2
1951					4.8	2.3	4.4		6.1	4.7	5.9		4.1	4.5
1950					4.2	2.7	4.2	0.5	5.3	4.0	6.8		12.9	4.1
1949				4.2		3.5	4.1	0.7	6.1	3.9	8.2		7.3	3.4
1948				5.6		3.8	3.8	1.1	6.9	2.6	7.4		8.0	4.1
1947				5.9			4.2	1.0	7.6	3.3	3.3		6.2	
1946				8.4			3.9	1.9	6.7	3.8	2.9		6.1	
1945				6.5			2.7	1.5	6.3	3.5	6.3		5.2	
Wgtd.														
Ave.	2.8	4.1	5.1	4.5	4.9	4.0	4.3	2.0	6.3	3.4	6.9		6.0	4.5

Evaluation of the above records by statistical methods is out of the question: first, because of the subjective choice of the companies and, second, because of incompleteness of the record and general lack of balance. It is more practical to place reliance on personal interpretation of the general agreements or disagreements and to use approximate averages instead of finely calculated values. The record is of interest for study of the history of earnings over the

## FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

TABLE II-A. COMPARISON OF EARNING RATES OF SELECTED PULP AND PAPER COMPANIES

<i>Date</i>	<i>Ratio O/ Operating Profit to Total Sales-Percent</i>											
	<i>Gh</i>	<i>GZ</i>	<i>GN</i>	<i>H</i>	<i>IP</i>	<i>KG</i>	<i>LF</i>	<i>PS</i>	<i>R</i>	<i>SR</i>	<i>Sc</i>	<i>UB-G</i>
1958	14.1	13.3	4.6	10.0	15.2	14.6	27.4	25.0	9.8	10.4	15.6	19.6
1957	21.5	14.3	8.7	11.8	15.9	15.7	28.2	25.9	12.4	12.1	15.5	21.6
1956	17.5	18.3	16.4	13.3	17.9	16.6	30.2	26.8	20.6	14.0	15.9	25.0
1955	14.7	19.3	18.1	10.8	21.8	14.4	35.4	28.4	23.6	15.2	17.0	23.5
1954	17.4	18.9	19.6	11.5	20.0	14.6		30.0	27.4	14.0	16.5	21.0
1953	18.1	17.9	19.8	12.5	20.6	12.3		30.2	27.9	13.6	16.3	20.8
1952	22.8	17.6	22.6	13.7	22.7	16.1		31.6	31.4	13.4	17.7	23.7
1951	19.4	22.9	29.6	20.3	26.4	16.0		43.9	31.8	18.5	18.4	34.2
195°	16.6	23.2	21.3	13.3	25.4	13.5		32.8	<b>30.4</b>	13.2	15.0	25.2
1949	21.2	21.0		15.5	21.2	12.8		15.2	20.3	6.7	11.5	19.0
1948	21.8	20.5		27.4	21.6	12.5		44.2	27.8	14.9	8.5	29.7
1947	18.1	19.5		23.1	25.4	13.0			28.0	16.3	5.4	32.1
1946	10.6	12.9		9.7	19.0	10.5		29.4	9.6	10.5	5.4	20.1
1945	15.3	13.6		8.9	12.8	8.6		12.7	14.6	8.0	7.7	22.2
Wgtd. Ave.	18.0	17.8	16.9	13.7	20.1	14.4	28.5	31.0	23.0	13.4	15.1	23.8

<i>Date</i>	<i>Rate O/ Net Income to Total Sales-Percent</i>											
	<i>Gh</i>	<i>GZ</i>	<i>GN</i>	<i>H</i>	<i>IP</i>	<i>KG</i>	<i>LF</i>	<i>PS</i>	<i>R</i>	<i>SR</i>	<i>Sc</i>	<i>UB-G</i>
1958	6.8	7.1	1.2	4.5	7.8	7.4	14.3	13.0	3.3	5.6	7.7	<b>11.0</b>
1957	10.3	8.2	4.4	5.3	8.3	8.0	14.6	12.3	5.2	5.9	7.9	11.3
1956	8.5	12.1	8.9	6.3	8.9	8.5	15.4	12.9	10.2	6.8	8.3	13.2
1955	7.6	10.8	9.0	5.2	10.4	7.3	15.8	14.3	11.2	7.4	8.6	11.7
1954	7.4	10.7	9.1	5.3	10.8	6.3	13.6	15.1	13.7	7.4	8.2	10.3
1953	7.5	9.0	10.4	4.6	<b>9.4</b>	5.3	11.3	14.0	14.4	8.2	7.1	9.3
1952	8.1	8.7	10.8	6.5	8.2	7.4	12.1	13.9	14.0	7.0	7.3	11.6
1951	9.1	9.3	11.8	9.9	8.8	8.5	12.0	15.5	13.1	8.6	7.3	11.7
195°	8.0	11.3	12.5	7.9	13.1	9.7	16.7	24.3	18.5	7.5	7.4	13.2
1949	12.4	12.5		9.1	12.3	7.7	17.3	11.3	12.3	4.3	6.7	11.5
1948	7.6	12.8		17.0	10.5	7.1	17.6	29.0	16.2	9.2	5.2	17.8
1947	8.0	11.8		14.4	10.4	7.9	21.2	31.6	17.0	10.1	5.1	18.6
1946	4.3	7.6		6.0	10.6	6.5		18.4	5.6	6.8	4.3	11.6
1945	3.7	7.1		5.3	3.5	4.2		9.6	6.9	4.2	4.8	3.9
Wgtd. Ave.	8.2	9.9	8.3	7.0	9.3	7.4	14.9	16.4	11.1	7.1	7.5	11.8

course of time and for the determination of group characteristics and the behavior of single units within the industry groups.

The general progress of profit ratios over the years for the entire group appears to be somewhat as follows:

The release from wartime conditions brought a rapid increase in profits in 1946, followed by a further improvement in 1947 and 1948. 1949 witnessed a temporary set-back, but was followed by a strong recovery in 1950 and 1951, reaching the highest level of the I4-year period under investigation. There was

## EARNING CAPACITIES AND GROWTH RATES

TABLE II-B. COMPARISON OF EARNING RATES OF SELECTED PULP  
AND PAPER COMPANIES, CONTINUED

<i>Date</i>	<i>Ratio of Net Income to Total Assets—Percent</i>											
	<i>Ch</i>	<i>CZ</i>	<i>GN</i>	<i>H</i>	<i>IP</i>	<i>KC</i>	<i>LF</i>	<i>PS</i>	<i>R</i>	<i>SR</i>	<i>Sc</i>	<i>UB-C</i>
1958	6.9	6.1	0.5	4.1	8.5	8.2	11.4	7.4	1.8	5.4	7.2	8.4
1957	8.8	7.1	2.3	4.4	9.8	9.4	12.7	8.0	3.0	9.3	6.9	11.0
1956	9.8	9.6	5.3	5.6	11.3	9.5	13.3	8.4	7.2	7.5	7.5	15.4
1955	8.2	7.4	4.5	4.3	13.4	8.1	13.6	9.5	9.0	7.4	9.4	14.4
1954	8.0	9.8	4.0	5.6	13.4	7.3		9.7	6.9	6.9	9.8	11.2
1953	8.0	8.5	5.7	5.7	12.6	5.9		9.8	9.0	8.4	9.3	10.8
1952	9.8	9.0	7.0	5.8	11.0	7.6		10.1	9.9	6.5	9.0	12.4
1951	11.4	10.3	7.8	8.5	12.7	8.6		13.6	10.5	8.2	11.8	16.9
1950	10.8	12.7	8.0	7.1	16.3			17.4	17.7	6.3	14.0	18.5
1949	12.4	12.7	9.3	10.1	14.9	7.2		6.4	9.3	3.5	13.1	14.3
1948	8.6	12.6	9.0	21.1	15.0	6.6		26.2	15.9	9.5	10.7	27.4
1947	9.0	12.8	9.1	12.7	15.2	7.2		29.2	13.6	11.1	8.6	27.8
1946	4.0	7.0	5.5	4.3	12.3	5.7		10.7	3.8	5.6	7.0	18.5
1945	3.5	6.7	2.0	6.8	3.4	3.8		5.7	5.0	3.2	6.8	7.3
Wgtd. Ave.	8.6	9.0	5.1	6.9	11.7	7.5	12.7	11.4	7.6	6.8	8.6	11.8

<i>Date</i>	<i>Ratio of Depreciation, Depletion &amp; Amortization to Total Assets—Percent</i>											
	<i>Ch</i>	<i>CZ</i>	<i>GN</i>	<i>H</i>	<i>IP</i>	<i>KC</i>	<i>LF</i>	<i>PS</i>	<i>R</i>	<i>SR</i>	<i>Sc</i>	<i>UB-C</i>
1958	4.2	4.0	5.6		5.6	3.5	5.4	2.7	5.8	5.4	3.9	4.6
1957	3.9	3.6	4.8		6.3	3.6	4.6	2.4	5.0	5.1	3.6	5.5
1956	4.3	3.1	5.1	5.6	6.2	3.4	4.6		5.8	5.4	3.8	6.4
1955	4.0	2.6	4.6	5.7	6.1	4.2	3.5		6.4	5.3	4.3	7.5
1954	3.9	3.4	2.9	7.2	5.8	4.4		2.3	3.1	5.6	4.7	7.1
1953	3.5	4.1	3.0	7.0	5.0	4.3		2.4	4.0	5.9	3.4	6.1
1952	3.4	3.3	3.1	6.1	4.6	4.0		2.5	3.9	4.2	3.2	3.7
1951	3.3	3.0	2.9	2.6	4.6	4.0		2.4	4.0	3.4	3.9	4.0
1950	3.4	3.2	2.8	3.3	4.0			3.0	5.2	3.1	4.1	4.6
1949	3.1	3.2	2.7	3.7	4.2	4.4		3.1	4.6	3.6	4.2	4.0
1948	3.3	3.6	2.7	3.0	4.1	2.5		2.3	4.8	2.9	4.5	3.6
1947	4.4	3.8	3.0		4.4	2.1		2.8	3.3	2.2	4.2	2.8
1946	4.3	3.3	3.2		4.7	2.4		1.9	3.6	1.8	4.2	3.9
1945	4.2	4.6	3.1		5.0	2.7		4.5	6.4	2.7	4.2	
Wgtd. Ave.	3.8	3.4	3.8	5.2	5.3	3.5	4.4	2.6	4.9	4.5	3.9	5.5

a dropping off in 1952 through 1954, a recovery to good profits in 1955 and 1956, a slight drop in 1957, followed by a major decrease in 1958. On the whole, the 1950 decade evidenced a steady downward trend in the profit ratios. On this general theme, many variations are played. The pulp and paper group and the integrated group had the steadiest record, while the plywood group seemed to show the most decided reactions.

The weighted averages of the 14-year records of Tables I through IV can

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TABLE III. COMPARISON OF EARNING RATES OF SELECTED PLYWOOD COMPANIES

<i>Date</i>	<i>Ratio of Operating Profit to Total Sales—Percent</i>					<i>Ratio of Net Income to Total Sales—Percent</i>				
	<i>A</i>	<i>C</i>	<i>HP</i>	<i>RP</i>	<i>US</i>	<i>A</i>	<i>C</i>	<i>HP</i>	<i>RP</i>	<i>US</i>
1958	-4.4	8.5	-1.6	2.5	5.6	-3.6	10.1	0.2	1.8	3.1
1957	-7.9	10.0	4.1	1.4	7.1	-19.8	8.6	3.0	0.6	4.1
1956	1.7	12.4	9.6	4.5	10.5	0.7	12.7	5.7	2.5	5.6
1955	2.8	18.3	8.4	5.9	9.2	1.2	13.1	5.7	2.8	5.0
1954	2.6	15.8	5.5	4.1	6.8	1.3	11.4	4.3	2.4	3.8
1953	6.1	17.5	6.6	4.7	8.7	3.2	11.3	4.1	2.2	5.0
1952	1.7	16.4	9.4	3.7	10.5	1.0	11.2	6.2	1.9	5.6
1951	14.7	25.1	19.0	14.5	18.7	8.0	12.9	8.5	6.3	8.3
1950	8.0	22.0	19.3	14.1	9.7	6.2	15.4	8.9	6.5	6.5
1949	11.5	19.9	-3.8		15.5	5.5	14.3	-2.7	2.6	9.4
1948	18.3	23.7	12.4		19.4	11.8	17.3	7.6	7.8	12.2
1947	22.2	22.9	8.8		20.4	13.3	15.0	8.8	7.8	12.4
1946	19.0	23.6	14.6		14.4	9.5	15.7	9.1		5.9
1945	27.6	9.1	4.3		17.5	7.2	5.4	2.8		4.2
Wgtd. Ave.	6.2	17.9	9.3	5.5	10.7	1.3	12.7	5.4	3.2	5.6

	<i>Ratio of Net Income to Total Assets—Percent</i>					<i>Ratio of Depr., Depl. &amp; Amort. to Total Assets—Percent</i>				
1958	-3.9	8.3	0.1	2.9	4.1	2.2	5.2	2.5		3.6
1957	-40.0	6.2	3.2	4.0	5.3	4.6	3.3	6.2		3.3
1956	1.1	12.6	6.2	4.6	7.9	3.6	4.6	6.7		3.3
1955	1.6	15.6	5.6	5.4	6.1	4.6	5.1	5.9		2.7
1954	1.7	12.6		4.2	5.6	3.8	4.3			3.6
1953	4.6	14.8	4.2	3.3	7.5	4.3	3.8	5.4		4.0
1952	1.3	14.7	6.6	3.0	8.7	4.5	2.8	6.1		3.5
1951	12.0	18.5	9.2	9.7	14.5	6.1	1.8	5.9		3.4
1950	6.9	22.3	11.5	12.0	9.7	5.7	1.6	6.5		4.4
1949	7.0	18.1	-2.5		13.7	5.9	1.9	6.5		3.3
1948	16.5	25.2	7.8		17.9	5.6	2.1	7.8		2.4
1947	17.9	17.0	8.0		17.9	1.3	2.0	7.4		3.2
1946	13.0	17.4	12.8		7.3	1.7	2.0	7.2		1.8
1945	9.3		4.5		7.4	1.4		8.7		3.0
Wgtd. Ave.	1.9	14.7	5.3	4.6	8.0	4.1	3.3	6.5		3.4



## EARNING CAPACITIES AND GROWTH RATES

TABLE IV. COMPARISON OF EARNING RATES OF SELECTED INTEGRATED COMPANIES

<i>Date</i>	<i>Ratio of Operating Profit to Total Sales-Percent</i>						<i>Ratio of Net Income to Total Sales-Percent</i>					
	<i>C</i>	<i>GP</i>	<i>MB</i>	<i>PR</i>	<i>W</i>	<i>P</i>	<i>C</i>	<i>GP</i>	<i>MB</i>	<i>PR</i>	<i>W</i>	<i>P</i>
1958	18.1	12.8	10.5		17.6	11.7	10.2	6.6	5.0	13.7	12.1	6.7
1957	19.6	11.9	12.3		18.2	13.0	10.7	5.8	6.0	11.7	12.7	7.7
1956	19.4	11.1	19.9		21.5		10.7	6.4	10.6	15.1	15.8	7.7
1955	24.9	11.9	20.1		23.0		12.9	7.2	10.7	17.1	15.5	9.9
1954	26.3	5.0	17.6		20.0		13.9	2.8	9.0		13.5	9.6
1953	23.5	3.3	17.7		20.5		14.4	2.0	8.9		13.3	8.8
1952	26.1	5.5	19.9		22.4		12.8	3.5	8.6		14.1	10.8
1951	30.0	11.7	23.1		30.8		14.4	6.5	11.4		18.8	13.7
1950	23.3	17.0	13.4		26.9		15.6	7.3	8.3		18.6	
1949		2.8			21.5			0.9	7.6		15.8	
1948		16.7			30.0			7.7	10.6		21.2	
1947		13.6			31.8			7.9			22.5	
1946		9.4			21.0			5.7			16.2	
1945					16.4			1.1			11.3	
Wgtd. Ave.	22.6	10.7	15.7		22.8	12.3	12.5	5.5	8.8	14.5	15.5	8.9

<i>Date</i>	<i>Ratio O/ Net Income to Total Assets-Percent</i>						<i>Ratio O/ Depr., Depl. &amp; Amort. to Total Assets-Percent</i>					
	<i>C</i>	<i>GP</i>	<i>MB</i>	<i>PR</i>	<i>W</i>	<i>P</i>	<i>C</i>	<i>GP</i>	<i>MB</i>	<i>PR</i>	<i>W</i>	<i>P</i>
1958	6.9	4.8	4.2	9.9	9.2	5.2		9.0		6.5	7.3	5.0
1957	7.6	4.0	5.3	10.2	10.2	6.5		9.1		8.9	7.2	5.2
1956	8.0	3.6	11.6	13.2	12.7			4.4	6.2	7.2	6.0	
1955	7.9	10.7	13.0	16.0	13.2			9.5	6.3	7.0	6.0	
1954	9.4	4.4	10.1	18.0	10.5		3.4	8.7	6.2	7.2	5.3	
1953	9.3	3.4	9.6	16.6	11.5		3.1	8.4	7.1	7.2	5.6	
1952	10.7	5.2	12.4	13.8	11.5		3.5	6.1	6.5	7.2	4.5	
1951	10.7	7.2	21.6	10.7	13.3		3.4	4.1	6.2	3.9	4.2	
1950		17.1	12.7	14.0	12.4		3.5	6.8	7.7	3.1	3.9	
1949		1.9		11.9	9.9			4.8			4.3	
1948		18.2		11.5	12.5			4.7			3.2	
1947		11.4		10.9	14.2			1.8		2.8	3.2	
1946		11.1		12.9	8.1			2.8		2.7	3.6	
1945				4.7	5.4					2.7	3.6	
Wgtd. Ave.	8.2	5.4	9.9	12.3	11.1	5.7	3.3	7.3	6.6	5.7	5.3	5.1

be reduced to a simple table, as shown below, listing the effective range of ratios, with a few extreme values discarded, and an approximate central value or working average, all expressed in cents per dollar or percent.

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<i>Ratio</i>	<i>Lumber group</i>		<i>Pulp and paper group</i>		<i>Plywood group</i>		<i>Integrated group</i>	
	<i>Range</i>	<i>Ave.</i>	<i>Range</i>	<i>Ave.</i>	<i>Range</i>	<i>Ave.</i>	<i>Range</i>	<i>Ave.</i>
OP/TS	7-25	14	13-31	18	6-18	8	11-23	18
NI/TS	3-17	9	7-16	10	1-13	6	5-16	11
NI/TA	2-12	8	5-13	9	2-15	7	5-12	9
D/TA	2-7	4	3-6	4	3-6	4	3-7	5

In the return per sales dollar (OP/TS), the pulp and paper group and the integrated group each have a ratio of 18, followed by the lumber group with 14. The plywood group lags far behind with an 8 in this comparison. In final net income per dollar of sales (NI/TS), the three previous leaders are close together, with the plywood group still behind, but relatively less so. As is obvious, the difference between the gross and net returns per sales dollar is accounted for mainly by federal income tax, which would make the most reduction in the largest earnings. The pulp and paper group is reduced 8 cents, the plywood group 2 cents. In net return per dollar of total assets, the plywood industry gains an advantage because of its high sales-dollar turnover and the profit ratios become substantially of the same order, ranging from 7 to 9 cents. The addition to cash flow furnished by depletion, depreciation and amortization per dollar of total assets shows no significant difference between the groups, all yielding about 4 cents per dollar of total assets.

These between-group comparisons do not describe the group differences in their entirety, since the internal group behavior over the years and between the companies are obviously of interest. The pulp and paper group as well as the integrated group are outstanding for their consistent performance. The plywood group stands at the other extreme with the lumber group not much more consistent. For the latter two groups the variations from poor to good profit years are more extreme than with the first two groups and the differences between the over-all records of individual companies also appear to present greater variation. The plywood group is at substantial variance with the other three groups in that the last five years show unusually low profit levels; thus this group apparently feels the decadal decline more strongly than the other industry groups.

Table V, which is designed to show the change in total assets, total sales, net operating profit and net income from the beginning three years of the record (1945 excluded) to the terminating three years is of particular significance as a test of the thesis that an increase in assets should be accompanied by at least a proportionate increase in total sales and profits. Only in a very few cases is this thesis proven and the usual situation is somewhat the reverse.

## EARNING CAPACITIES AND GROWTH RATES

Total sales expand fairly well with increase in total assets, but operating profit and final net income tend to lag for behind. No attempt will be made here to analyze the cause for this situation, since it is a highly complex matter, **but** it may well raise the question whether or not there is a limit to "bigness" in forest industries.

TABLE V. TEN-YEAR GROWTH OR DECLINE OF SELECTED WOOD-USING COMPANIES AS INDICATED BY A COMPARISON OF 1956-1958 PERIOD TO THE 1946-1948 PERIOD, EXCEPT WHERE OTHERWISE NOTED

<i>Ten-year in:</i>	<i>Integrated companies</i>											
	<b>C*</b>	<i>GP</i>		<i>MB*</i>		<i>PR</i>		<i>W</i>				
Total assets	1.91	15.09		2.27		1.45		2.80				
Total sales	1.72	4.09		1.35		3.32		2.21				
Operating profit	1.31	4.25		1.00		2.02*		2.20				
Net income	1.27	4.33		1.01		1.61		2.20				
<i>Lumber companies</i>												
	<i>Bt</i>	<i>CM</i>	<i>ChRt</i>	<i>Dt</i>	<i>H</i>	<i>K</i>	<i>LBt</i>	<i>M</i>	<i>Pi</i>	<i>SW</i>	<i>Ut</i>	
Total assets	1.91	1.25	0.91	1.82	2.11	2.19	2.09	1.59	1.48	2.04	1.99	
Total sales	1.80		0.98		1.68	0.75	1.59	1.32	2.49	1.70	1.93	
Operating profit	0.62	0.34	Neg.	1.63	0.82	0.93	0.64	0.74	2.09	0.54	0.57	
Net income	0.64	0.48	Neg.	1.86	0.88	0.39	0.80	0.90	1.77	1.35	1.22	
<i>Pulp companies</i>												
	<i>Ch</i>	<i>CZ</i>	<i>GN</i>	<i>H</i>	<i>IP</i>	<i>KC</i>	<i>LF‡</i>	<i>PS</i>	<i>R</i>	<i>SR</i>	<i>Sc</i>	<i>UB-C</i>
Total assets	2.47	4.05	2.41	4.37	2.82	2.64		2.39	3.62	2.51	9.42	4.09
Total sales	2.27	4.90		<b>3.81</b>	2.43	3.26	2.11	1.86	2.59	2.74	4.69	2.60
Operating profit	2.22	3.06	1.03	1.91	1.78	4.15		<b>1.27‡</b>	1.57	2.29	11.01	2.04
Net income	2.76	2.99	0.80	<b>1.41</b>	1.94	3.58	1.67	0.81	1.17	1.84	7.60	4.09
<i>Plywood companies</i>												
	<i>A</i>		<i>C</i>		<i>HP</i>		<i>RP§</i>		<i>US</i>			
Total assets	1.70		<b>1.47</b>		<b>1.84</b>		1.64		4.88			
Total sales	1.97		1.33		<b>1.44</b>		2.70		4.56			
Operating profit	Neg.		0.58		0.45		0.46		1.89			
Net income	Neg.		0.86		0.54		0.73		1.79			

\* C 1956-1958 compared to **1950-1952**; MB 1956-1958 compared to **1950-1952**; PR Gross profit, not operating profit.

† B 1954-1956 compared to 1946-1948; ChR Assets, 1955-1957 compared to **1950-1952**; D 1956-1958 compared to 1948-1950; LB 1953-1954 compared to 1945-1947; U Sales and net income, 1956-1958 compared to 1947-1949, Assets, 1956-1958 compared to 1948-1949, Ope profit, 1956-1958 compared to **1950-1952**; Neg.-Negligible.

‡ LF 1956-1958 compared to 1947-1949; PS Ope profit, doubtful ratio.

§ RP Assets and Ope profit, 1956-1958 compared to **1950-1953**; Sales and net income, 1956-1958 compared to 1947-1949.

## INCOME TAX PROBLEMS OF LARGE FOREST PROPERTIES

Meade Whitaker, Attorney  
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I AM here today under the pretense of giving you solutions to your forestry tax problems. The assumption that there are solutions presupposes the existence of tax problems in the management of timberlands and that some one is responsible for achieving a solution. There is some significance, it seems to me, in the fact that three professions are represented here today-forestry, accountancy and law. The answer, of course, is that we three have a joint responsibility, along with all of the other divisions of business management.

It is only by the cooperative effort of all of the management group with the accountants and the lawyers that it is possible to achieve anything resembling peaceful existence under today's tax complexities.

It is not our purpose here to try to make tax experts of you. That is not necessary, and with all due respect it is probably impossible, unless you should choose to give up forestry as your prime endeavor. What we can hope to contribute to, however, is your understanding of taxation so that you may more readily perceive tax problems when they arise and then better assist your tax accountants and lawyers in finding the right answer.

One of the difficulties in any cooperative endeavor between professions is the lack of understanding of the techniques, language, function and purpose of each. To work successfully together, the forester, the accountant and the lawyer must be able to understand each other. It is in your management of woodlands that the tax problems arise, but it is also in the same management that they must be solved. Our responsibility as well as yours, therefore, begins when the tree is planted, not merely when the revenue agent knocks on your door. It never ends. And to do the job with the most efficiency, we must each know enough about the other's work to communicate intelligibly.

While we are on generalities, a question that is frequently asked members of both the legal and the accounting professions is the delineation of the areas of responsibility of each. More concretely from your standpoint, when should you call on the accountant for assistance and when should you call on the lawyer? Particularly in the tax field, the best answer is that the sooner both are called

## INCOME TAX PROBLEMS OF FOREST PROPERTIES

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in, the better. I will come later to a brief discussion of a recent tax case which should illustrate the truth of this statement.

Obviously, any tax controversy will be initiated by a visit from a revenue agent. The agent has already examined the tax return which is his starting point. He is concerned with verifying income and expenses as reported, and then ascertaining whether or not particular items have been treated in a correct manner. It is the accountant who is primarily responsible for proper recording of transactions on the books and the tax returns. Therefore, he may be the first one whose help is required. However, the recording of a transaction will often involve not only putting the right figures in the right column, but the application of legal principles and the interpretation of the Internal Revenue Code and Regulations. It is at that point that the lawyer's training can and should be used. I cannot emphasize to you too strongly the desirability of bringing both your accountants and your lawyers into your tax problems as early as practicable. The time to seek advice is before a transaction is consummated. The most satisfactory way of solving an argument with a revenue agent is to keep it from arising. I am sure Mr. Barclay will agree with me that it is much more satisfying to us to help our clients avoid tax controversies than to try to extricate them after the revenue agent has had his turn.

Comment might also be appropriately made here on one particular tax problem which both the lawyer and the accountant often encounter but cannot readily solve. This is the relationship between the revenue agent and the client. We must **always** realize that revenue agents, after all, are human beings like ourselves, trying to do the best job that they can under the circumstances. Just as your job and ours is to minimize the tax bill, theirs is to get the full measure. More progress can be made by maintaining pleasant and friendly relations with the Revenue Service than otherwise. No matter how wrong a revenue agent may appear to you to be, nor how unreasonable his attitude or demands, your interest is not served by an unfriendly attitude and obvious road blocks. Since the revenue agent can, one way or the other, get what he wants, it is usually better to give him your cooperation.

By the same token, when you have called in the accountant or the lawyer or both, let them exercise the responsibility which you pay them to assume. Do not tell them what you think they ought to know, but present all the facts, good, bad and indifferent. Make sure that the handling of the tax controversy is a fully cooperative venture. Settle your differences with your tax advisors outside the presence of the revenue agent, and let the lawyer or the accountant conduct the conferences with him. Do not interrupt a conference and **"take**

## FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

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the ball away" since your doing so will probably confuse, if not hinder, successful solution of the controversy.

With these general remarks behind us, I have divided the balance of my presentation into three general topics: capital gains; deduction and capitalization of particular expenditures; and long-term contractual arrangements for timber and timberlands.

Expressing my own personal view, I think it is fair to say that there is no business in this country which has more favorable tax treatment under the Internal Revenue laws than the timber industry. True, many of you are quite unhappy today because you feel that the Internal Revenue Service has unfairly pursued you. It may be that the operators of timberlands have more tax problems and controversies than they used to have, and in many instances are paying greater taxes. The explanation is not, however, that this industry is being singled out for harassment. On the contrary, I think you should realize that you may have been allowed in the past to pay a lower federal tax bill than provided for by law. With a very strict adherence to the law, you still have an extremely favorable tax situation. There is to my knowledge no other area of the business world in which, with relatively little inconvenience, the tax on income is limited to 25 percent.

There are several capital gain sections of the Internal Revenue Code. It is important to keep in mind certain basic distinctions. Most of you are employed by industry and the successful acquisition of sufficient logs to keep your businesses rolling requires procurement, both from your own forests and from private or nonowned timber holdings. Thus the capital gain opportunities and pitfalls on both sides are important to you.

Sections 1221 and 1231 of the Internal Revenue Code function in the sale of capital assets. Standing timber is obviously of that category. Section 1221 is limited to what might be called investment property owned, for example, by the individual who invests his money in timberlands instead of securities. But it is by no means limited to an individual. Businesses often can qualify. Section 1231, on the other hand, applies to property used in the taxpayer's trade or business. In this context we think of timberlands owned by a sawmill or a paper mill to provide the raw material for the plant. Both sections limit the tax on the profit from the disposition to a maximum of 25%. At the same time both sections exclude from their coverage the taxpayer who holds timber for sale to customers in the ordinary course of business.

Usually the question of whether Section 1221 or Section 1231 applies is not too difficult to determine. But there has been a great deal of controversy

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as to whether or not either will apply because both exclude capital assets actually being held for sale to customers in the ordinary course of business. The owner who sells timber for a lump sum on the stump at substantial intervals, that is, who makes a sale at ten- or twenty-year intervals, is unquestionably entitled to capital gain treatment on the proceeds under Section 1221. Similar sales by the sawmill or paper mill of unneeded timber, as in the liquidation of holdings, qualify under Section 1231. There is, however, real danger inherent in reliance by industry on either 1221 or 1231. The difference between sale of a capital asset and an inventory asset hinges really on the degree of frequency of the transaction. It is easy to distinguish between the automobile dealer whose profit from sales of cars is ordinary income and the person who sells a worn-out personal automobile or a business car. If, however, the business or the individual acquires and sells a new car once a week or several times a year, he begins to look more like an automobile dealer. The selling activity begins to look like a business. Thus, if a manufacturing company, with substantial timber holdings and relatively little use for the merchantable timber, sells selected timber for a fixed sum every year or every two or three years, an opportunity is presented for the contention that the timber is being held for sale to customers in the ordinary course of trade.

I merely warn you that this is a potential avenue of attack by revenue agents. Since there is a very simple solution, which will assure capital gain treatment, it may be worth while to revise business practices slightly.

This brings us directly to Section 631 and more particularly to subsection (b). Any disposition of timber in which an economic interest is retained qualifies for capital gain treatment under Section 631 (b) irrespective of the business activities or purpose of the owner. In other words, a broker is just as much entitled to capital gain treatment under Section 631 (b) as those taxpayers who come within the scope of Sections 1221 or 1231. The key provision is that there must be a retained economic interest. Although somewhat of an oversimplification, basically this means that income must be derived in relation to the ultimate disposition of the timber. For example, I can sell all of my standing timber for a cash sum. That is my gross income whether the purchaser is able to cut a million feet or ten million feet, and I have parted with my ownership of an economic interest in the timber. On the other hand, I can sell my timber on the basis of an agreed unit value, with the number of units to be determined when the logs have been cut and scaled. My gross income is then dependent on the actual realization from the standing trees. I, therefore, am considered to have retained an economic interest in the timber. This is the

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classic pay-as-cut contract. Proper use of it assures treatment of the income at capital gain rates.

There is the usual capital gain requirement under this section that the timber must have been held for six months before the disposition, but it is the date of cutting, not the date of the contract that determines the date of disposal. Thus, timber can be acquired and disposed of within a six-months period and the profit recognized as a capital gain if the actual cutting is more than six months from the date of acquisition. There is also a special election to treat the date of payment as the date of disposition where payment is made in advance of cutting. Since this is an election, it creates the possibility of getting use of the sale proceeds free of tax for a period of time if advance payments are made.

Section 631 (a) is intended to provide equivalent treatment for the owner of timber who cuts and consumes it himself. It simply gives to the consumer the right to carve out of the gross income realized from a manufactured product that part referable to gain on the consumed timber by creating a theoretical sale by the consumer to himself of the standing timber. The only catch to this provision is that the minimum holding period is six months prior to the beginning of the taxable year. The timber cut during a year is given a market value as of the beginning of the year, and if owned more than six months prior to that, the difference between cost (the adjusted base for depletion) and the market value goes into the taxpayer's income tax return at the capital gain rate. This has the effect of increasing the cost of the timber which is consumed in the manufacturing process from the depletion basis to the fair market value, thus reducing the income from the manufactured product that is taxed at ordinary income rates.

It remains to point out that under Section 631, the owner may be not only the landowner but anyone who has acquired an economic interest in the timber, such as under a cutting contract. Hence a landowner, a timber-broker and a sawmill operator can all get capital gain treatment with respect to their profits on the same timber, the first two under Section 631 (b) and the third under Section 631 (a). However, many timber buyers have had a rude awakening under the tax laws because too strict limitations were put in the cutting contract, making the buyer merely an employed logger or a commission agent instead of a purchaser.

The basic principles of deduction versus capitalization are relatively simple. Expenditures, with almost no exceptions, have to be classified for tax purposes between those which must be capitalized and recovered through depletion or



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depreciation and those which must be deducted in the year incurred. There has been, and probably will continue to be, some controversy **with** respect to the cost of cruises, surveys, roads, fire lanes and similar items. As a rule of thumb, such costs **which** are necessary and essential elements of either a sale or purchase of timber or timberlands, or are for permanent improvements, are capital items, while those which are incurred in normal management of timberlands should be expensed. The answer is an application of the rule of reason. If the forestry owner keeps a crew regularly in the woods, blazing lines, clearing fire lanes, cruising, etc., these are constant, normal and annual expenses and are recognized as deductible. If, on the other hand, a sale of timber is made and in that connection boundaries have to be determined or the timber cruised, that cost is part of the cost of the sale or purchase.

The real area of controversy today lies in the various reforestation costs, including planting and hardwood control. It is also largely in this area that taxpayers seem to feel that they are being discriminated against by the Internal Revenue Service. It is true that in the past many timberland owners were able to deduct planting costs as an annual expense. But forest management has developed to such an extent and the money devoted to timber stand improvement has become such a large item that the Service has been directed to apply the law more strictly. There is very little doubt today that planting costs must be capitalized and recovered through depletion. Hardwood control costs, at least in the Southeast, are still the subject of some argument.

The position of the Service is that the cost of girdling or destroying hardwood as part of the preparation for the planting of pine trees must be capitalized. However, as far as I know, the national office has not changed its position that periodic hardwood control, unrelated to pine tree handling, is an expense item. Some agents have recently tried to require taxpayers to capitalize hardwood control costs of this latter type, but I am advised that they have been successfully backed off from that position without litigation.

It is perhaps pertinent to note here that there has been considerable discussion within the industry about attempting to get Congress to change the rules on planting costs. There is a great deal to be said in theory for deductibility. But as long as the proceeds from the sale of timber receive capital gain treatment, there is sound reasoning for contending, as the Revenue Service has done before Congress, that *all* costs incident to the production of the standing timber should be capitalized or deducted directly from the proceeds of the sale of timber, not from ordinary income.

It is my suggestion that you complain of the capitalization of planting costs

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only to yourselves, because any successful reversal of the position of the Service may be accompanied either by loss of the capital gains privilege altogether or the limitation that planting costs may be deducted only if the taxpayer elects to treat the proceeds from sale of timber as ordinary income. At the same time, other currently deductible costs might receive the same treatment. I don't mean to be unsympathetic with the position that planting costs are more like an expense than a capital item. At the same time I urge you to face the danger of opening up this controversy before Congress.

My final topic is the long-term contract for the acquisition of timber. The variety of these contracts is limited only by human ingenuity but they may be classified generally into four types: the ordinary land lease, the output or requirement agreement, the management contract and the long-term timber purchase agreement. Excluded from this discussion is the arrangement which was frequently encountered many years ago, which was a sale of timber for a lump sum with a period of years in which to cut it off.

Obviously, the purpose of all of these contracts is to tie down a source of timber for a period of years. From the point of view of the timber consumer, the logging company or the paper mill, they serve two functions: the conservation of capital required to acquire ownership of lands and the acquisition of a source of timber which would not be available as a land purchase.

Probably the simplest arrangement is the ordinary land lease in which the right to the use of the land surface for a long period of time is transferred from the owner to the industry. The term, of course, has to be sufficiently long to justify the planting and woodlands management. That would mean in the Southeast a minimum of twenty to twenty-five years, although usually a much longer period. It is a fairly common arrangement in the Southeast.

Generally, the lease provides an annual fixed rental payment, and depending on the condition of the timber stand, there may or may not be an initial cash payment representing the value of standing merchantable timber. In this form, the receipt by the landowner of the rental payments is conceded to be ordinary income. The receipts from the sale of the existing stand of timber should be treated as capital gain under Section 1221 or perhaps in certain circumstances under Section 1231. The industry has always considered the rental payments, as well as taxes and other like costs, to be ordinary expense deductions and the payment for the standing timber to be a capital expenditure and recoverable through depletion. However, this situation is somewhat doubtful at the moment. There is a pending case involving *Union Bag-Camp Paper Corporation* in which the Internal Revenue Service is contending that the rental pay-

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ments, ad valorem taxes, fire protection, etc., must be capitalized and added to the depletion basis. The government's position appears to be that the purpose of the arrangement from the industry standpoint is the acquisition of land to grow timber, and all costs are to be placed in the same category as planting costs. The case has been pending before the Court of Claims for several years. In the meantime, unfortunately, the existence of the unsolved tax controversy makes planning somewhat difficult.

I might comment in passing that if the government is successful in requiring the industry to capitalize the rental payments, then by the same token, the landowner should be able to treat the receipts as proceeds from the sale of timber at the capital gain rate. However, I am sure the Service would not voluntarily take that position. This litigation should be won by the taxpayer, and I hope that it will be. In the meantime, leases are not nearly as attractive to industry as they were, particularly where the lease is coupled with a purchase option and is used to conserve capital as a deferred purchase. It is much safer to enter into a purchase with a mortgage back in which event the interest on the unpaid purchase price, roughly equivalent to rental payments, is clearly a deductible expense along with taxes, fire protection and management costs.

In the output or requirement situation, the consumer on the one hand and the landowner on the other simply agree that merchantable wood will be sold to the one and purchased by the other in certain fixed quantities over a period of years. The actual management of the timber and the logging may be handled by either party or perhaps contracted out to third parties. There are many difficulties involved in drafting a satisfactory contract of this kind covering a long period of time, not the least of which is working out some formula for the determination of price. The tax consequences on the other hand are fairly simple. The landowner is paid in terms of units cut and he retains an economic interest. Depending on whether he does the cutting himself or has contracted it out to the consumer or to some third party, he can elect capital gains treatment under Section 631 (b) or Section 631 (a). The industry has simply bought cords of pulpwood or board feet of lumber, the purchase price of which becomes part of the cost of goods in the manufacturing process, or it has acquired cutting rights over a period of time which will permit the use of either Section 631 (a) or Section 631 (b). This can be a very useful arrangement for a paper mill or a lumber manufacturer which needs an assured source of supply which cannot be otherwise procured and it gives the landowner an assured market.

The management contract is an arrangement under which one party with

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forestry know-how relieves the landowner of the burden of looking after his timberlands. The fee paid by the landowner would be a deduction from current income and ordinary income to the manager. Its utilization lies again in the tying up of a source of standing timber. The paper mill or sawmill or professional forester probably can handle the management as part of its own operations more cheaply than the landowner. The contractual arrangement can give industry an inside track for the purchase of saleable standing timber. This can be formalized somewhat more by the addition of a contractual provision giving the manager the right of refusal for merchantable timber, but without any fixed obligation either to sell or to buy. Of course, the tax consequences are dependent entirely on how the actual sale of the timber is worked out. There are no special consequences.

The final contractual agreement is the long-term timber purchase agreement used extensively in the Southeast by St. Regis Paper Company and is often referred to as the St. Regis type of contract. It is a long-term agreement, usually 60 years, during which the landowner agrees that he will sell and the purchaser agrees that he will buy the timber growth each year. The entire land management responsibility is imposed on the purchaser. It is designed for the development and the operation of a perpetual-cut forest. From the tax standpoint, this arrangement is intended to give the landowner the benefit of the capital gain provisions. The payments are made in terms of timber growth on an agreed unit price. Thus, the landowner's income will vary with all the factors having to do with timber growth, as distinguished from the lease situation which provides an annual fixed-rental payment. Contracts of this kind have been in use in the Southeast for twelve to fifteen years. To date, as far as I have been able to determine, no landowner has been denied capital gain treatment, at least as to payments made for timber grown subsequent to the beginning of the contractual relationship. In a recent case, the Tax Court volunteered a similar comment. There is also the possibility that the contract will be treated as an annuity for federal estate-tax purposes, but that can perhaps be obviated by special contractual provisions. Only time will determine the final outcome.

From the standpoint of the purchaser, there is not much doubt that the payments made for the timber, in terms of cords of pulpwood, become the cost of standing timber purchased and are recoverable as depletion. Expenses incurred in management of the lands and in timber-stand improvement should receive the same treatment which they would have in connection with owned lands or leased lands, subject perhaps to ramifications of the *Union Bag-Camp* case.

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Certainly the attractiveness to industry of either this type of arrangement or the land lease will be lessened if the government is successful in requiring capitalization of such costs.

I referred earlier to the desirability of tax advice at the beginning of a transaction instead of after the revenue agent has put the taxpayer on notice. The case of *Estate of Jones M. Lawton* 33 TC #6 (1959), illustrates this clearly. It involves a contract with Union Bag-Camp, called a lease, with an annual rental of \$1.75 per acre and many limitations on the amount of timber cut, etc. I do not know what the parties actually intended, and it does not matter. The taxpayer tried to take capital gain treatment and lost, and, in the process, the Tax Court made some quite irrelevant observations that may cause trouble in the future. The point is that the original arrangement should have been worked out differently so as to assure capital gain, with a greater after-tax return to the owner.

It is particularly true in considering long-term contractual arrangements that the tax situation will have a very marked effect on the type of arrangement. Often the same economic result can be achieved in several different ways, and tax consequences should guide the choice. The tax consequences may also be varied or perhaps clarified by clearly separating, in the contractual arrangements, various functions such as land management and landowning expenses and the sale and purchase of standing timber. It may be better to assure capital gain treatment for some parts only of the arrangement by rephrasing the contract than to cast doubt on the tax consequences of the entire transaction. By way of illustration, from the landowner's standpoint there might be some advantage in buying management services substantially at cost and separately fixing a sales price for timber grown and to be grown instead of covering both management and sales by a lower sale price on standing timber. Similarly a long-term arrangement might provide for a small annual rental for the bare land with additional payments for timber when and as grown. It may be necessary also for the landowner to retain some of the economic risks and hazards and for the industry to accept a less certain future pricing arrangement, in order to provide for both parties the full benefit of the present tax laws.

The over-all conclusion is that as foresters, you have a unique situation in the business world. By careful attention to detail, you can provide management with valuable revenue at capital gain rates. At the same time, since you are responsible for assuring a continual source of timber from non-owned lands, you should be conversant with the private owner's tax situation and alert to

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protect him in it. Often a smaller return at capital gain rates is more attractive than more dollars at ordinary income rates.

But may I caution you to remember the old saying: "A little knowledge is a dangerous thing." Recognize the tax problems but do not expect to give detailed tax advice. You would not ask a lawyer or an accountant to prepare a forest management plan.

# THE TAX EFFECTS OF THE FORM OF OWNERSHIP OF TIMBERLANDS AND CHANGES IN THE FORM OF OWNERSHIP

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**A**LTHOUGH timberlands may be owned by any conceivable entity, this discussion will be limited to consideration and comparison of the income tax effects of ownership by (1) corporations, (2) electing small business operations, (3) partnerships and (4) individual proprietorships.

The computation of the amount of income from the sale or exchange of timber (including the cutting thereof for sale or use in the taxpayer's trade or business) is the same regardless of the form of ownership; likewise the character of the resulting gain or loss is not controlled or influenced by the form of ownership. The circumstances under which the gain or loss to one partner on sale or exchange of timber owned by a partnership may differ from that to another partner will be discussed subsequently.

The federal income tax "bite(s)" taken from the net income from the operation of a timber property until it reaches a status of "after-tax" income in the hands of a stockholder or partner-proprietor may vary widely depending on the form of ownership although the original disposition of timber qualifies for the favorable capital gains treatment under IRC 631, 1221 and/or 1231. Some of the factors which produce these variances are:

## AS TO CORPORATIONS

- (1) The double taxation of the income distributed to stockholders as dividends;
- (2) Loss of identity of capital gains upon distribution to stockholders;
- (3) Denial of deduction of net ordinary losses from net long-term capital gains for the purpose of computing the capital gains tax.

## AS TO ELECTING SMALL BUSINESS CORPORATIONS

- (4) Elimination of double taxation of income;
- (5) Long-term capital gains "pass-through" to stockholders;

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(6) Application of ordinary losses and expenses as reduction of net long-term capital gains where net long-term capital gains exceed taxable income of the year.

### AS TO PARTNERSHIPS

(7) Partners' bases versus partnership basis for property;

(8) Recognition by partners of partnership income or losses according to their character.

Prior to the Revenue Act of 1943, the cutting of timber by its owner, or the owner of a contract right to cut, and the disposal of timber under a cutting contract resulted in ordinary income or loss. Section 117(k) (I) of the Revenue Act of 1943 made available to electing taxpayers capital gain and loss treatment on the cutting of timber which had been owned, or with respect to which a right to cut had been owned, for a period of more than six months prior to the beginning of the year in which the cutting took place. Section 117 (k) (2) made available capital gain and loss treatment to disposals of timber held more than six months before disposal under a contract by virtue of which the owner retains an economic interest in the timber. Sections 631 (a) and 631 (b) are the 1954 Code counterparts of Section 117(k) (I) and 117(k) (2) of the 1943 Code.

#### 1. *Corporations*

The taxing of income from the cutting or other disposal of timber as long-term capital gain materially reduces the tax burden of corporate owners in some instances and has reduced somewhat the inequity which existed prior to 1943 between such owner and an individual owner selling for a lump sum and obtaining capital gain treatment. However, except to the extent that federal income taxes of the corporate owner are reduced by the capital gain treatment of the income from the cutting or other disposal of timber and earnings available for distribution are thereby increased, the benefits do not extend beyond the corporate level; the income remaining after imposition of the corporate tax is ordinary income in the hands of the stockholder when received by him as a dividend.

The benefits of the capital gain treatment of the income from cutting or disposal of timber by a corporate owner often are not as great as one might expect since the capital gain tax rate is applicable to the total net long-term capital gain without reduction for ordinary expenses or losses. This may be illustrated by examples, as follows:



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Assume a corporate timber owner utilizing its timber primarily in a lumber manufacturing operation, but also selling, pole, piling and pulpwood stumpage, has elected to have the cutting of timber subject to Section 631 (a). The excess of fair market value as of the beginning of the fiscal year over the basis for depletion of the timber cut during the year totals \$500,000 and the Section 631 (b) gains on other sales of stumpage to others amount to \$200,000 or a total long-term capital gain of \$700,000. Assume for the purpose of example A below that the manufacturing operations produce a profit sufficient only to absorb the ordinary expenses of managing, protecting and carrying the timber properties, which expenses are not deductible in computing the gain under Section 631 (a), so that no ordinary income or loss results; and for the purpose of examples B and C that ordinary losses from these operations are \$300,000 and \$400,000 respectively. The taxable income and corporate tax would be as follows:

	<i>Example</i>		
	<i>A</i>	<i>B</i>	<i>C</i>
Long-term capital gains	\$700,000	\$700,000	\$700,000
Ordinary income or (loss)	—	(300,000)	(400,000)
Net income before taxes	\$700,000	\$400,000	\$300,000
Tax: at ordinary rates	\$358,500	\$202,500	\$150,500
Alternative tax —25% of net long-term capital gains	\$175,000	\$175,000	\$175,000
Percent of smallest tax to net income	25%	43.75%	50.16%

In example A the maximum tax benefit is obtained from capital gain treatment and by comparison with the tax computed at ordinary rates, the tax bill is reduced \$183,500; in example B the alternative tax is less than at ordinary rates but by only \$27,500 and in example C no tax benefit is derived from the capital gain treatment.

Distributions of the corporation's income after taxes to its stockholders represent dividend income taxable at the prevailing ordinary rates but subject to reduction for the dividend credit. The tax payable by the individual stockholder would depend, of course, upon his applicable tax bracket. For the purposes of example only, assume that the entire income of the corporation after taxes shown in the above example is distributed to its stockholders and subject in their hands to an average tax of 40% after the dividend credit. The portion of the income remaining to the stockholders after the corporate and individual taxes have been paid would be as follows:

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	<i>Example</i>		
	<u>A</u>	<u>B</u>	<u>C</u>
Income before taxes	\$700,000	\$400,000	\$300,000
Corporate income tax	<u>175,000</u>	<u>175,000</u>	<u>150,500</u>
Corporate income after taxes	\$525,000	\$225,000	\$149,500
Individual income taxes at assumed 40% average rate-net	<u>210,000</u>	<u>90,000</u>	<u>59,800</u>
Income after corporate and individual taxes	\$315,000	\$135,000	\$ 89,700
Percent of original net income	45%	33.75%	29.9%

It is not unusual for the amounts retained by the stockholders to represent lesser percentages of the original income than those shown in the above examples.

If the income shown in the above examples was earned by an individual proprietor his federal income tax would be as follows:

	<i>Example</i>		
	<u>A</u>	<u>B</u>	<u>C</u>
Long-term capital gains	\$700,000	\$700,000	\$700,000
Less capital gain deduction	<u>350,000</u>	<u>350,000</u>	<u>350,000</u>
Includable portion of capital gains	\$350,000	\$350,000	\$350,000
Less ordinary losses	-	300,000	400,000
Taxable income or (loss)	<u>\$350,000</u>	<u>\$ 50,000</u>	<u>\$(50,000)</u>
<i>Federal Income Tax</i>			
(A) At capital gains rate	\$175,000		
(B) At ordinary rates— assuming joint return		\$ 20,240	none
Net income after federal income taxes	\$525,000	\$379,760	\$300,000

The income of the individual owner after income taxes under each of these assumed income conditions is compared with that of the corporate owners in the prior example as follows:

	<i>Example</i>		
	<u>A</u>	<u>B</u>	<u>C</u>
Income after federal income taxes:			
Individual owner	\$525,000	\$379,760	\$300,000
Corporate owner	<u>315,000</u>	<u>135,000</u>	<u>89,700</u>
Excess of net income to individual owner	\$210,000	\$244,760	\$210,300

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The foregoing comparison of the net income of the individual owner and the corporate owner after income taxes demonstrates the material income tax advantage of individual ownership by comparison with the corporate ownership of timberlands. The effect of double taxation of corporate profits distributed to stockholders, the loss of identity of long-term capital gains and the inability to reduce net long-term capital gains by net ordinary losses make the corporate form of ownership the most expensive from an income tax standpoint. These disadvantages have prompted some corporate owners to seek a greater "after-tax" return on their investment either through sale of their properties, merger with another or by operation under a form of ownership with a lesser income tax cost.

Unfortunately, change from corporate ownership to that of a partnership or proprietorship, which are more favorably treated with respect to the taxation of income from the sale or other disposal of timber is too often impractical unless the corporation's stock is held by relatively few owners. Also the investor not actively engaged in management normally prefers corporate ownership to that of a partnership for limitation of liability, centralization of management and perpetuation of existence. He might also be reluctant to own timberlands individually because of the specialized management required to accomplish maximum return on investment and protection and preservation of property. However, professional timberland management services are becoming more generally available at reasonable cost, and purchasers of timber on long-term contracts often assume the management function. This tends to overcome some of the objections to individual ownership.

In those cases where it is practical to have the lands of a corporation distributed to its owners, an income tax price-tag might be attached, in that the liquidation of a corporation and distribution of its assets will usually result in a gain or loss to the stockholders. The amount and character of the gain or loss to be recognized by the shareholders will be controlled by the applicability of IRC Section 331 or the elective Section 333. Unless election as to recognition of gain on liquidation is made as provided in Section 333, the amounts distributed in liquidation will be treated under Section 331 as full payment in exchange for the stock. In such cases the amount of gain generally will be the excess of the cash and fair market value of the property received in payment, over the cost basis of the stock. This gain would be taxed as a capital gain, subject to a maximum effective rate of 25 %.

For the purpose of measuring the tax impact of a liquidation under this general rule, let us suppose that a corporation which has timberlands worth

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\$12,000,000 and other net assets of \$2,000,000 is owned by stockholders whose basis for their stock totals \$4,000,000. Liquidation of this corporation under Section 331 would result in a capital gains tax of 25 % of \$10,000,000 or \$2,500,000. This is a high price but the fair market value used in establishing the gain would be the new cost basis of the property as transferred to the individual stockholders, so that subsequent sales would not result in gain except to the extent that the sale price exceeded the new cost basis, and that growth on the timber is realized. If this liquidation was of our corporation in example A, which would otherwise pay annual income taxes of \$175,000 and whose stockholders would pay \$210,000 on the remainder of the annual profit, a total of \$385,000, the price of liquidation could be paid from the income-tax savings of approximately seven years, after which full enjoyment of the tax advantages of individual ownership and of the remaining increased basis would be obtained.

The prepayment of income taxes on the enhanced value of *timber* may not be too unpalatable since the increased cost basis may be recovered tax-free on subsequent sale or cutting of the timber; but the fair market value of the *land* must also be recognized in measuring the gain and tax. If the individual owner does not sell or transfer the land prior to his death, at which time a new basis is established for estate-tax purposes, he will not recover the increased basis of the land and the tax paid thereon at the liquidation of the corporation will represent a net cost.

The incurring of income tax on a liquidation, measured in relation to the fair market value of the property distributed, also involves risk that the owner's death may occur before the tax paid on liquidation has been offset by subsequent tax reductions, as described above and avoidance of the double taxation of income, in which case a net tax cost rather than advantage would result from the liquidation.

The alternative method of recognizing the gain on liquidation provided in Section 333 is often advantageous. Under this procedure the earnings of the corporation accumulated after March 1, 1913 are taxed to the non-corporate stockholders as an ordinary dividend and any excess of the cash and certain securities distributed over the accumulated earnings is recognized as capital gain. The fair market value of the property received is not involved in measuring the tax on such liquidation and its basis for the new owner is not increased to the fair market value. The excess of the basis of the shareholders' stock plus the gain recognized on liquidation over the cash received represents the basis to the stockholder of the property other than cash received.

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This alternative method often permits liquidation of a corporation with a minimum immediate outlay of cash and, since the tax cost of liquidation is not determined in relation to the fair market value of the property distributed, the risk is minimized that the death of a stockholder soon after liquidation would result in a net tax cost due to the liquidation.

If the corporation's earnings accumulated subsequent to March 1, 1913 amounted to \$2,000,000 that represents the income taxable to the stockholders upon liquidation and if that amount were subject to an average 50 percent tax to the stockholders, a tax cost of \$1,000,000 would result from the liquidation. Subsequent sales of appreciated property for amounts in excess of the basis allocated thereto as a result of the liquidation, would result in gain taxable at the time of such sales.

One advantage of this latter procedure for liquidation of a corporation is that, usually, the taxable income resulting therefrom can be forecast with reasonable accuracy. In the case of a liquidation in which the gain is measured by the fair market value of the property distributed, accurate forecasting of the total gain might not be so easy due to the possible differences of opinion between the distributee and the Treasury Department representatives as to the fair market value of the property distributed. In such cases the ultimate tax cost of the liquidation may not be known for a number of years thereafter, depending on whether agreement is reached at the first level of examination or is ultimately resolved by litigation.

### *II. Electing Small Business Corporations*

The Technical Changes Act of 1958 afforded some relief from the double taxation of corporate income by permitting the taxation of the income of "electing small business corporations" directly to their stockholders, whether distributed to them or not and exempting such corporation from income tax. The term "small business corporation" appears somewhat misleading in that neither the size of the business nor the value of its assets has any bearing on its qualifications as such for federal income tax purposes. Such corporations are defined in IRC Section 1371 (a) as: a domestic corporation **which** is not a member of an affiliated group (as defined in Section 15<sup>o</sup>4) and which has ten or fewer shareholders, each of whom is an individual or estate; does not have a non-resident alien shareholder; and has only one class of stock.

An electing small business corporation is a corporation meeting the definition set forth in IRC Section 1371 (a) which has made the election under Section 1372 (a) to which all of its shareholders consented. A detailed study of

## FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

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the "electing small business corporation" is purposely avoided herein and consideration is given only to those aspects of this type of organization as a timberland owner which appear pertinent to comparison with other forms of ownership.

Not only does the income of an electing small business corporation avoid a corporate tax but if its operations for a year during which it is so qualified result in a net ordinary loss the stockholder may deduct his proportionate share of the corporation's loss (computed on a daily basis pro rata to his ownership of the corporation's shares on each day of the taxable year). He may not deduct an amount in excess of his adjusted basis for the corporation's stock owned plus the adjusted basis of any indebtedness of the corporation to the stockholder determined as of the close of the taxable year of the corporation.

As has been stated previously, capital gain income of the corporation subject to the federal income tax loses its identity in the usual case and becomes ordinary income to the stockholder when received as a dividend. Such is not the case with respect to the long-term capital gains of "electing small business corporations." IRC Section 1375 (a) (1) provides in part as follows:

"The amount includable in the gross income of a shareholder as dividends . . . from an electing small business corporation during any taxable year of the corporation, to the extent that such amount is a distribution of property out of earnings and profits of the taxable year . . . , shall be treated as a long-term capital gain to the extent of the shareholder's pro rata share of the excess of the corporation's net long-term capital gain over its net short-term capital loss for such taxable year. For the purpose of this paragraph such excess shall be deemed not to exceed the corporation's taxable income . . . "

The portion of the income of an electing small business corporation arising from the cutting or other disposal of timber, which qualifies as a long-term capital gain under IRC Section 631 (a), 631 (b), 1231 and/or 1221, "passes through" the corporation to the stockholder, as such. If the distributable income of such corporation consists of both net long-term capital gain and net ordinary income the stockholder recognizes his proportionate share of each class. However, if the net long-term capital gain exceeds the total distributable income for the year, the excess of ordinary deductions over ordinary income reduces the net-long-term capital gain as provided in the last sentence of Section 1375 (2) (1) , in part, above. We have seen in a prior example that, in the case of a corporation taxable on its income, such an ordinary loss is not deductible against its long-term capital gain for the purposes of computing the tax at capital-gain rates and that, if the tax on the total long-term capital gain at

## TAX EFFECTS AND CHANGES IN FORM OF OWNERSHIP

the alternative rate of 25% is less than the tax on the corporation's net income from all sources computed at the normal and surtax rates, the ordinary loss does not accomplish a reduction in its income taxes. It would appear reasonable that a corporation taxable on its income *should* be accorded the same treatment of a net ordinary loss as a reduction against its net long-term capital gain as permitted in the case of the electing small business corporation, but the statute does not so provide. It is unlikely that changes in the Code will be enacted to permit this.

For the purpose of illustrating the income tax advantage of the electing small business corporation, the total of the corporate and individual income taxes computed previously in connection with the taxability of the corporate income is compared with the maximum tax payable by the stockholders of an electing small business corporation on identical incomes as follows:

	<i>Example</i>		
	<i>A</i>	<i>B</i>	<i>C</i>
Long-term capital gains assumed	\$700,000	\$700,000	\$700,000
Ordinary loss	—	(300,000)	(400,000)
Net income before taxes	<u>\$700,000</u>	<u>\$400,000</u>	<u>\$300,000</u>
Corporate income tax	\$175,000	\$175,000	\$150,500
Individual income taxes at assume 40% rate	<u>210,000</u>	<u>90,000</u>	<u>59,800</u>
Total corporate and individual taxes	<u>\$385,000</u>	<u>\$265,000</u>	<u>\$210,300</u>
Minimum federal tax payable by stockholders of an electing small business corporation on the same assumed net incomes would be as follows:			
A-50% x 50% (\$700,000)	175,000		
B-50% x 50% (\$400,000)		100,000	
C-50% x 50% (\$300,000)			<u>75,000</u>
Tax advantage	<u>\$210,000</u>	<u>\$165,000</u>	<u>\$135,300</u>

The relationship of ordinary losses and/or deductions to capital gains assumed in examples B and C above are admittedly extreme but such results have been known to obtain.

In those cases where the corporation has reached the point of distributing all of its net income after taxes the election as a small business corporation presents real opportunities for tax savings. Likewise, when long-term capital gains are a significant part of the corporation's net income, the election as a small business corporation presents opportunities for substantial savings due

to the preservation of the character of this income and due to the application of any net ordinary losses as a reduction of long-term capital gains.

The definition of a small business corporation limits the opportunities for election to utilize this form of organization. A broadening of the definition which would permit its more extensive use would be most advantageous.

The electing small business corporation presents some opportunities for partial liquidation with minimum tax consequences not available in the case of the usual corporation. There is the example of a lumber manufacturing company, cutting on leased timber, which, over a period of years, has acquired a fairly large acreage of cutover timberlands at a very low cost, the value of which has appreciated substantially. It is contemplated that its timber contract will expire in the very near future, that the manufacturing operations will be discontinued, and the mill and village sold at a gain subject to tax under Section 1231. Retention of the timberlands without payment of income tax on the enhancement in value is desired. Liquidation under IRC Section 333 would be prohibitively expensive because of the amount of accumulated earnings, now largely invested in the timberlands. A major portion of the company's net income for the two years of its operations as an electing small business corporation has been capital gain under Section 631 (a) on which its stockholders have paid a minimum tax and the income for the next year during which it will close the manufacturing operation will probably be all capital gain. It appears that withdrawal of all the profits of the period for which the election will be effective, including that on the sale of the mill and village, will permit the partial liquidation of this company with minimum tax consequences.

My avoidance of a detailed discussion of many other aspects of the electing small business corporation is not intended to convey the impression that there are no disadvantages to this form of organization, or that retaining this status is as easy as making a valid election. Such is not the case and extreme care must be exercised to retain the status.

### III. *Partnerships and Individuals*

Although the computation of the amount of income resulting from the sale or other disposal of timber and the character thereof is the same regardless of the form of ownership, the recognition of long-term capital gain from such sales or other disposal is different in the case of individuals and individual partners who are permitted a deduction of 50% of the long-term capital gain, the remainder of which in an individual return is subject to tax at the appli-



## TAX EFFECTS AND CHANGES IN FORM OF OWNERSHIP

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cable brackets or to a maximum 50% rate, whichever results in the lesser tax. Net ordinary losses, ordinary deductions and exemptions are deducted from the long-term capital gain in computing the amount subject to tax, unless the maximum 50% rate applied to the net long-term gain without such reduction produces the lesser tax. Thus, on an individual's tax return, one dollar of net ordinary loss or deduction offsets two dollars of the long-term capital gain before reduction for the capital gain deduction. We have seen that such net ordinary losses and deductions may not be applied to reduce long-term capital gains of corporations, but that they may be applied dollar for dollar to reduce the net long-term capital gain of an electing small business corporation.

Inasmuch as many of the expenses and costs involved in operation of a timber property represent ordinary deductions, such as ad valorem taxes, patrolling, fire protection, etc., the treatment accorded them in the case of individuals is usually most advantageous.

In the case of a partnership, the character of its income, that is, its status as long-term capital gain, dividends, ordinary income or loss, is retained in the distribution of income to the partners and in the case of an individual partner the tax treatment is the same as though the income or deductions originated with the individual.

One partner's basis for determining gain or loss with respect to a partnership asset may be different from that of the partnership or of the other partners. For instance, assume that a partner in a timberland-owning partnership dies and his estate continues as a partner. The estate's basis for the partnership interest would be determined in relation to the fair market value of the assets of the partnership at the date of death and, if the value of the timber and the lands at that date exceeded the cost basis to the partnership, his basis for his partnership interest would be correspondingly greater than the partnership's basis for the assets. Upon sale or exchange of such timber or lands the partnership would compute gain or loss with reference to its cost basis and in such a case the income attributable to the estate's interest would be greater than if the gain had been computed with reference to the fair market value of the timber and *lor* lands at the date of death. Considerable hardship might be imposed in such circumstances if it were not for a provision in the Code permitting, upon proper election of the partnership, a basis adjustment to the partnership with respect to the decedent's interest in such assets.

The layman is generally of the opinion that the effects of conducting business through a partnership are identical in all respects to that of an individual but such is not the case. The Internal Revenue Code of 1954 made extensive

## FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

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changes in the law affecting partnerships particularly with respect to the recognition and character of income resulting from liquidation. Maximum care must be exercised with respect to contributing property to a partnership or dissolving a partnership and the advice of tax counsel should be sought for the most advantageous solution to these problems of ownership.

# CONSIDERATIONS IN TIMBERLAND INVESTMENTS IN THE SOUTHEAST

C. G. McLaren, Vice-President  
Owens-Illinois, Toledo, Ohio

## I. INTRODUCTION

I have been asked to speak to you about financial management procedures in Owens-Illinois as they relate to our timberland investments and forestry practices. Obviously, the range and manifold nature of this subject are much too large and complicated to be completely covered during this short session. The limited time we have available could easily be devoted to profitable discussions on any one of its many important aspects. It is necessary, therefore, that I restrict this formal presentation to a review of a few representative timberland situations requiring financial decision on a substantial management level.

Neither finance nor forestry is an exact science and, obviously, there is little certainty in financial management. In this respect, the financial management of timberlands does not differ greatly from most, if not all, lines of business endeavor. But, I think it is generally agreed that the very nature of timberland assets makes it considerably more difficult to form an accurate and realistic financial translation. In business applications, neither financial management nor forestry can be reduced to a mere collection of tables and formulae. This is certainly more true of our present combination than when each is taken separately. If this were not true, there would be some possibility that our entire executive management function in decision-making could be more adequately handled by electronic computers, providing they could be fed an accurate and completely adequate data complex. Financial decision in timberland management is always between forecast alternatives, and it is important that the differences between these alternatives be determined as specifically as possible. These differences, however, can never be fully defined over the broad time range financially significant to management. Here again, timberland situations present financial problems that are unique. We seldom have the opportunity of making financial decisions concerning investments in a fully-developed, "going concern" state of timberland management. Normally our investments are made on the basis of deferred returns from anticipated production under planned management regimes, and each investment must be

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appraised on the basis of its ultimate effect on our total profit picture. Since such investment alternatives can, at best, be only partially defined in terms of facts in existence at the time a decision must be made, the final verdict must always be made on the basis of sound, informed business judgment.

Financial decisions in modern timberland management have their roots firmly locked in the soil of technical forestry. All other things being equal, it is likely that our financial decisions will be as good or as bad as the technical information upon which they are based. The first and fundamentally important step in handling any business dealing with the financial management of timberland properties is to acquire an adequate factual and technical background from which a realistic statistical model of that situation can be built. This action normally takes the form of fact-finding and physical inventories expressly designed for valuation purposes. I think it can be fairly stated that the science of forestry is quite capable of providing us with fully adequate physical inventories on a static basis. This has always been the most reliable component of any factual foundation being constructed for financial decision. In the projection of timberland volumes and values under various management regimes, however, we first come face to face with some of the fundamental differences between the financial management of timberland assets and those of other industrial resources. Under management, timberland assets are not only dynamic, but the production processes for individual units are substantially longer than for any other major industrial commodity I can name. While our forestry science is gradually equipping us with improved means of forecasting timber production potentials associated with variations in management levels, it is important to bear in mind that our entire projection is always more or less an approximation.

Once a timber production schedule has been established as a physical basis, it requires that we employ accepted accounting and valuation methods in reducing values, may be generated. The methods available to us in financial analysis are many and varied, and while their relative merits have been argued, their relative appropriateness is beyond the scope of my discussion. We feel that each kind of valuation and economic analysis has its proper place and is capable of providing guidance to an effective financial management, depending upon the particular situation at hand. What is most important, however, is that the answers they provide be fully understood for what they are. Whatever method or combination of methods are employed must yield consistent and comparable

## CONSIDERATIONS OF INVESTMENTS IN SOUTHEAST

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results that are meaningful to our management. Suffice it to say that in making many financial decisions of the comparative valuation type, a capitalized basis would be selected as the most informative, especially if the alternatives involve receipts and disbursements on differing time patterns. Other, and perhaps equally common, situations can often be most effectively diagnosed on the basis of annual cost and income comparisons just as they would appear in our timberland accounts.

Whenever capital investments are made in timberlands, as a result of financial decision (regardless of the basis of that decision), an accounting of the actual results of that investment is immediately begun according to our prescribed system of timberland accounting. One of the major purposes of such a timberland accounting system is to determine the financial efficiency of our timberlands, and the ultimate verdict as to whether a given investment was good or poor is always based upon the facts these accounting records reveal. In forecasting a proposed timberland investment, it is most important, therefore, that both the cost and income factors involved agree as nearly as possible with those of our timberland accounting records; otherwise, there can be little chance of any substantial agreement in the outcome of the investment.

In Owens-Illinois, timberland management is wholly integrated with paper-board manufacture to the extent that, in the final analysis, it is impractical to consider our timber investments without relating them to their effects on the over-all profitability of our manufacturing operation. While our timberland assets do have a primary function in providing a controlled wood supply to our mill operations, they are also capable of generating additional profits and, on a long-range basis, offer a satisfactory return on invested capital.

### II. DETERMINATION OF LONG-RANGE TIMBER SUPPLY

One of the more important problems confronting our management is that of meeting the growing demand for paper products and forecasting its impact upon our available wood supply. While it is common knowledge to people associated with the paper industry that any expansion of manufacturing capacity involves consideration of many production factors other than the timber supply alone, we are here today to consider the financial management of timberland assets. With this in mind, we will assume that the full range of all other economic and engineering factors has been satisfied and deal only with the timber supply aspects of the situation. In essence, such a problem may be reduced to a long-range pulpwood availability survey, insofar as physical

## FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

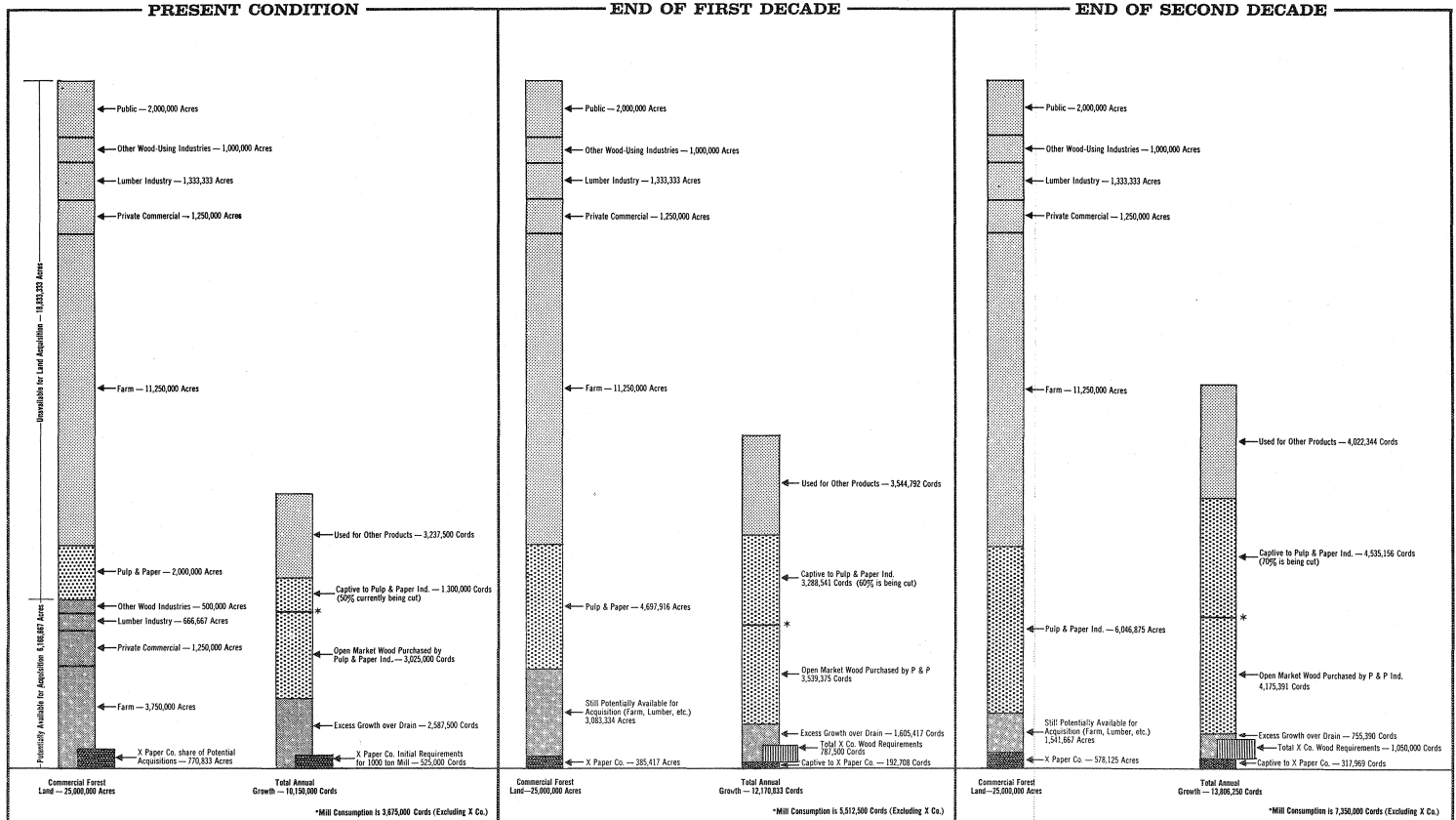
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volumes and the valuation of supply alternatives are concerned. The first step necessary in any pulpwood availability study is the collection and analysis of forest survey data on the selected timbershed. This would include private surveys if they are necessary.

Once this basic information has been compiled, it must be presented in a suitable form for executive decision. As an example of how this can be accomplished, I have had Figure 1 prepared to illustrate a pulpwood supply situation as it might exist on a proposed pulp mill timbershed in the South. This chart depicts a present and forecast pulpwood situation based on all available existing information, and the forecast has been extended through two full decades. Since both timberland acreages and the volumes available therefrom must be considered, each period is represented by two bars, one showing the distribution of commercial timberland in relation to availability and ownership composition, and another showing corresponding timber volumes available from growth. There are obviously only two possible sources of pulpwood for a mill: that from timberlands owned or controlled and that produced from non-company timberlands and purchased either as stumpage or as manufactured pulpwood or chips. Such a chart can be used to guide timberland investments in at least three ways. First, it can be employed to determine the present and forecast pulpwood supply status of an existing paper mill. Second, it can be used to appraise the short- and long-range timber supply situation in relation to any expansion program. Third, it can be employed to appraise the pulpwood supply condition facing the construction of an entirely new mill.

Under any of these circumstances, an immediate consideration is the determination of the proportion of present forecast pulpwood consumption which it is necessary, or possible, for the pulp mill to control. Here we are faced with making decisions between alternative sources of supply to the extent our survey shows they exist. We must consider the forecast price and long-range availability of open-market pulpwood, as against the cost or profitability of producing wood from company-owned or controlled timberlands. Part of such a consideration is to determine the most profitable combinations of company-produced wood and open-market wood supplies available under both present and forecast conditions. Because today's timberland prices generally reflect the high stumpage prices of timber, there are usually no immediate savings available from owning and managing new timberland purchases. As the length of ownership increases, however, the superior technical resources and management of a large company, devoted to the mass production of timber as an industrial crop, will generate an increasingly smaller

# TIMBERSHED SURVEY



## CONSIDERATIONS OF INVESTMENTS IN SOUTHEAST

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cost and larger profit margin in favor of company-produced timber. In addition to production superiority, there are other factors such as rapidly inflating timberland and stumpage prices, which must be given weight in realistic appraisals for long-range planning. It is probably true that timber and timberlands can be purchased cheaper now than at any time in the foreseeable future.

The relative cost of company-produced versus open-market wood represents only a single phase of a complex supply and demand situation. Figure 1 clearly reveals an even more important factor that must be considered in timberland investment planning. This is the current and forecast availability of open-market pulpwood for consumption by the aggregate pulp and paper industry. While the chart shows an increase in timber growth over the years, competing wood-using industries can be expected to increase their demands as well. A current appraisal of the timber supply situation in this timbershed shows the indigenous paper industry to be expanding rapidly and exerting a correspondingly aggressive pressure in timberland acquisition. Competitive pressures are also building up for the control and purchase of open-market pulpwood, due to the fact that the surplus growth is being constantly reduced to the vanishing point.

To summarize the major conclusions that may be reached as a result of interpreting this timber supply situation, it is immediately apparent that, although timberland ownership and/or control is not essential at the outset, the supply position rapidly becomes unfavorable unless a competitive acquisition program is pursued from the beginning. Timber and timberlands become economically available for acquisition in an irregular manner and must be acquired as they become available. As a practical matter, there is no such thing as accumulating a "backlog" of either open-market pulpwood or timberlands for subsequent acquisition whenever it is more desirable. These commodities are extremely ephemeral and must be acquired as they become available or be lost permanently to a more ready competition. It is apparent, therefore, that any planned program for timberland acquisition or open-market pulpwood control must always function within the limits of current availability, taking full advantage of favorable conditions as they occur.

Once the necessity of timberland ownership has been established in a given mill situation, it becomes necessary to plan and activate an adequate acquisition program that is adapted to both present and forecast economic environments. One of the more important factors to be appraised is that of the ownership pattern of the timberlands from which these acquisitions will be made.



## FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

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Each class of timberland ownerships has its own characteristics of availability for acquisition in terms of such factors as cost, time of availability, condition, size and distribution, and management potential. Figure 1 shows the ownership composition of the timbershed which, together with historical data on past acquisitions, permits certain useful deductions upon which a plan for future acquisitions can be predicated. Patterns of timberland availability that have become established over many years are not subject to sudden and radical changes, even though predictable trends may be derived. For example, the timberlands owned by lumber and other wood-using industries are subject to irregular periodic release to the timberland market and in generally larger blocks than the average. The two largest classes of ownership from which the paper industry can derive its acquisitions are those of farm and "other private" woodlands. As a group, these lands are not as well managed as others and consequently produce far less wood currently than they are capable of doing under a scientific industrial management program.

### III. APPRAISAL OR VALUATION OF TIMBERLANDS FOR ACQUISITION

Having determined that a certain level of timberland ownership is both necessary and profitable to our mill operation, comparable and consistent methods of appraisals must be employed as a guide to our investments. The financial decisions regarding the acquisition of timberlands are among the most important which a woodlands manager must make. The results of erroneous decision in this area can deprive his operations of essential and often irreplaceable timber production on the one hand, or burden them with excessively high competitive wood costs on the other. In the long run, each can be equally disastrous to the success of competitive mill operation and the decisions, once made, are more or less irrevocable.

Timberland property being appraised for acquisition is first "cruised" or inventoried in the field in such a manner as to provide all the data necessary to complete its valuation. In addition to the usual merchantable timber tallies and maps, it is essential that accurate appraisals be made of timber growing potential, the condition of restocking, logging and regeneration conditions, and any other factors influencing investment value.

With a physical inventory of the entire range of property assets provided in a cruise report, the forecast results of applying an acceptable management regime can be converted into terms of net present worth through the familiar principle of discounting future costs and income. While it is fully realized

## CONSIDERATIONS OF INVESTMENTS IN SOUTHEAST

that this valuation procedure does not determine the actual "market price" that must be paid to acquire timberlands, such valuation practices have long been accepted as the standard approach to appraisal of the economic value of all production facilities and equipment in plant operation. Through such methods, a relatively narrow price range can be established above which the price would be too high for an acceptable return on the investment, even when due consideration is given to the status of future timberland availability. Employing this valuation approach as a guide, it is possible to develop allowable price limits within which the actual purchase price of a given property can be established by negotiation. It is my feeling that the capacity of a timberland property to produce both immediate and future net incomes is a most important factor in determining its present market value and constitutes a valid check on

TABLE I. SAMPLE CALCULATION OF PRESENT WORTH OF A TIMBERLAND PROPERTY FOR ACQUISITION APPRAISAL AT 5% INTEREST RATE  
*Forecast Income and Cost Factors and Valuation*

	<i>Present Worth of Income or (Cost) Factor*</i>
<i>Income Factors</i>	
<b>INITIAL DEVELOPMENT OR LIQUIDATION PHASE; years 1 through 4:</b>	
Forecast management cut of 1.0 cords/gross property acre/year for a period of 3 years beginning 1-year after acquisition. Stumpage value set at \$8.00/standard rough cord net of all direct costs.	
$\$8.00 \left( \frac{(1.05)^3 - 1}{0.05 (1.05)^4} \right)$	\$ 20.75
<b>SECOND STAGE OF DEVELOPMENT; years 5 through 20:</b>	
Forecast net income (of all direct costs) from calculated allowable cuts mounting from 0.25 cords/acre/year @ \$8.00 in 5th year of ownership to 1.0 cords/acre/year @ \$12.00 at 20th year.	
$\$2.00 \left( \frac{(1.05)^{15} - 1}{0.05 (1.05)^{19}} \right) + \frac{\$0.715}{0.05} \left( \frac{(1.05)^{15} - 1}{0.05 (1.05)^{19}} - \frac{15}{(1.05)^{19}} \right)$	54.32
<b>FINAL STABILIZED, REGULATED PRODUCTION AND HARVEST; from 21st year on:</b>	
Continuous allowable cut of 1.0 cords/acre/year @ \$12.00 net of all direct costs.	
$\frac{\$12.00}{0.05 (1.05)^{19}}$	94.98
<b>ALTERNATIVE DETERMINATION OF PRESENT WORTH OF COMBINED ITEMS 2 &amp; 3:</b>	
$\frac{1}{(1.05)^4} \left( \frac{\$2.00}{0.05} + \frac{\$0.715}{(0.05)^2} \right) \left( 1 - (1.05)^{-14} \right)$	<u>149.30</u>
<b>Net Present Worth of Total Forecast Managed Income</b>	<b>\$170.05</b>

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### *Cost Factors*

#### INITIAL SITE PREPARATION AND PLANTING:

For years 1 through 5, inclusive. At \$15.00/acre or 28% of total property acreage = \$4.20/gross acre, or \$0.84/gross acre/year.

$$\$0.84 \left( \frac{(1.05)^5 - 1}{0.05 (1.05)^5} \right) \quad \$ ( 3.64)$$

#### MAINTENANCE SITE PREPARATION AND PLANTING:

For years 6 through 19, inclusive at \$0.50/gross acre/year.

$$\$0.50 \left( \frac{(1.05)^{14} - 1}{0.05 (1.05)^{19}} \right) \quad (3.88)$$

#### MAINTENANCE SITE PREPARATION AND PLANTING:

From 20th year of ownership, at \$0.37/gross acre/year.

$$\frac{\$0.37}{0.05 (1.05)^{20}} \quad (2.79)$$

#### FIXED ANNUAL MANAGEMENT EXPENSES:

Fixed annual management expenses beginning at \$1.50/gross acre/year and increasing to a maintained level of \$2.00/gross/acre/year in year 20.

$$\frac{\$1.50}{0.05} + \frac{\$0.0263}{(0.05)^2} \left( 1 - (1.05)^{-19} \right) \quad (36.35)$$

Present Worth of Total Forecast Production Costs \$( 46.66)

Net Present Worth (before taxes†) of Land and Growing Stock \$123.39  
Per Gross Property Acre

\* Slide-rule approximations.

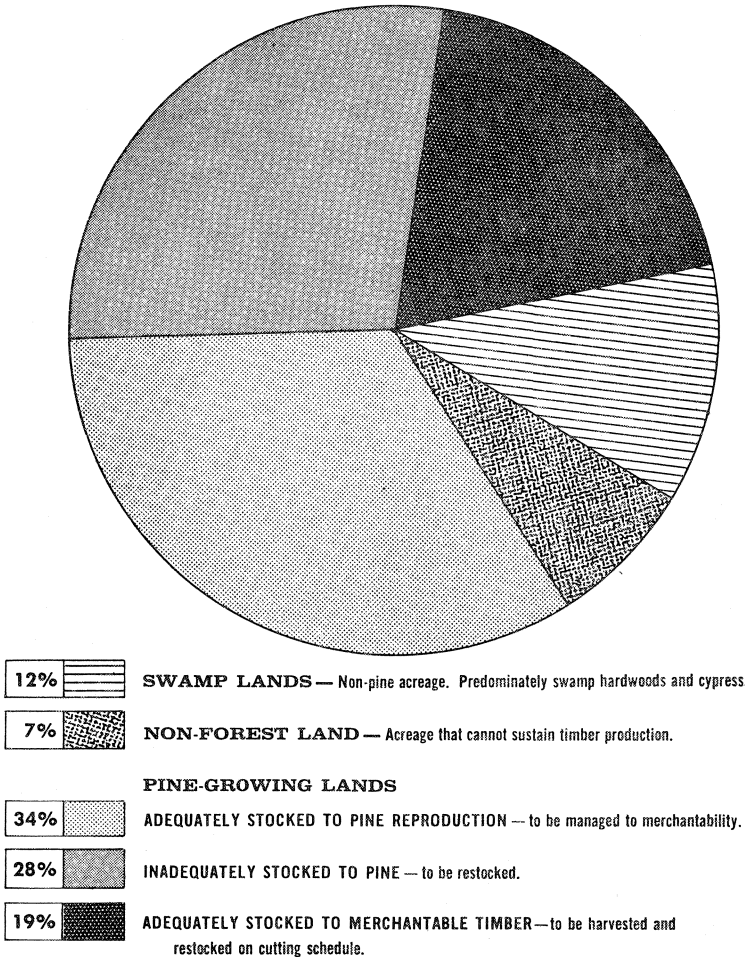
† After-tax valuation approximation may be arrived at by reducing the present worth of forecast managed income by 25% of forecast capital gain as well as reducing the effective (after tax) cost of the Fixed Annual Management expenses on the assumption that a calculated part of them can be expensed against a forecast net profit.

the current market price. We know of no omnibus valuation formula that will tell us exactly what price we can or cannot pay for a given property and, in the final analysis, "management judgment" must be the deciding factor.

Table I presents a simplified example of how a discount method may be applied to the appraisal of a sample property. Figure 2 shows the composition of this property which supports some six cords of merchantable pine volume per gross property acre. The chart shows that 12 percent of the area is made up of swamp timberlands supporting hardwood-cypress stands that have no present direct value to our operation. Seven percent of the acreage is non-forest area, consisting of water, roads, rights-of-way, etc. Thirty-four percent of the area is adequately stocked to pine reproduction of various ages that will

Figure 2

**DISTRIBUTION OF TIMBERLAND CLASSES ON A SAMPLE SOUTHERN PINE MANAGEMENT AREA**



be managed as it stands and finally harvested. Twenty-eight percent of the property acreage is pine producing land, but inadequately stocked to the extent that whatever salvageable volume it supports will have to be cut, planting sites prepared and the area planted. The remaining nineteen percent of the property

## FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

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is adequately stocked to merchantable pine stands and is thus available for harvest on a planned cutting schedule. In Table I it is shown in the property development plan that three cords of the original six cords per gross acre are scheduled for immediate cutting in a so-called liquidation period, which will start approximately one year from the date of acquisition. This liquidation volume is to be removed over a three-year period and is assigned a stumpage value of \$8.00. In the particular management regime scheduled for this property, the so-called development phase follows the liquidation period, although actual property development begins immediately upon acquisition. During this period, beginning with the fifth year of ownership and continuing through to the twentieth, the allowable annual cut per gross property acre will of the area is adequately stocked to pine reproduction of various ages that will increase steadily from one-quarter cord per acre per year to a stabilized and regulated production of one cord per acre per year. In addition, a stumpage value adjustment is made on this projected allowable cut, starting with \$8.00 per cord and increasing to \$12.00 per cord at stabilized production. These stumpage values and cost factors have been estimated merely to set up the example.

This illustrates a simple and rather orthodox valuation for purchase as we would apply it. As soon as a property is acquired, however, it is set up in our timber accounts according to our formulae for the allocation of property cost values to the items of land, merchantable timber and sub-merchantable re-stocking, and the records of costs and returns are maintained on that basis.

#### IV. FINANCIAL CONSIDERATIONS IN THE MANAGEMENT OF COMPANY TIMBERLANDS

There is no investment logic in the purchase of timberlands to support our mill production process unless they are managed on a level that will generate a reasonable return on the total invested capital outlay. While there are product production alternatives, our primary concern is in securing a reliable and competitively priced pulpwood supply for our mills. The outside sale of timber products, such as sawlogs, poles, etc., from the timberlands of a paper-board mill presumes the availability of non-owned pulpwood at favorable alternative or replacement costs. This is not always the case, however, and continues to be less of a possible alternative as the available sizes of pulpwood and sawtimber blend and their competitive prices merge.

Table II outlines a sample appraisal of some cost and income factors that

## CONSIDERATIONS OF INVESTMENTS IN SOUTHEAST

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should be considered in selling company stumpage. This is a sawtimber sale example and presumes that the stumpage is not excess, i.e., that it must be replaced through outside purchase. Both the replacement cost factors and their values vary with every situation, but the ones employed can be quite realistic in a practical situation. Stumpage sale on the Doyle Rule basis represents an extremely unfavorable comparison. Although this Rule is commonly used in the South, I doubt if any paper company should employ it as a practical matter. The Scribner Rule example is undoubtedly more realistic, but even here the sawtimber sale alternative may not be favorable financially on the basis of equivalent fiber cost.

Because of the continuously mounting demand for southern pine pulpwood, the industrial forest production programs generated by these long-range supply pressures are definitely stressing a shorter rotation type of management than has previously been accepted in our business. Figure 3 shows a forecast sample volume yield in terms of cords of rough wood at selected rotation ages as they might be produced through intensive southern pine plantation management. A maximum cord volume production occurs at approximately 33 years with an average tree diameter of 10 inches on this particular site. Since rough cord volume is certainly not the best criterion for pulpwood, Figure 4 has been prepared on the same volume production basis to show the yield in pounds of green solid wood at these same selected rotation ages. As would be expected, a somewhat different production pattern is revealed and a first conclusion might be to lengthen the rotation since there are apparent yield increases up to about 50 years of age, when the average stand diameter is 14 inches. However, the increased fiber yield beyond the thirty-three year rotation is subject to the inaccuracies of forecasting and this, combined with the fact that the increase is not substantial, would make it difficult to justify tying up and risking the additional capital investment needed for a rotation of over thirty-three years, especially if the production was urgently needed by the mill. Perhaps the most important single conclusion that might be drawn from this particular example is that although something in the neighborhood of a thirty-three year rotation is acceptable financially, the yield pattern permits holding this timber for a considerably longer period without reduction in average annual fiber yield. Naturally, a great number of such relationships may be generated through the many existing combinations of production factors. Under most conditions, however, we find that financial yields based on fiber production exhibit a fairly broad culmination zone in regard to the length of rotation and make it possible for us to defer final timber harvest beyond a selected minimum age. This can

TABLE II. SAMPLE ANALYSIS OF SAWTIMBER SALE VS. PULPWOOD UTILIZATION FROM COMPANY TIMBERLANDS

	<i>DOYLE RULE</i>		<i>SCRIBNER RULE</i>	
	<i>Income From Sale</i>	<i>Replacement Cost Equivalents</i>	<i>Income From Sale</i>	<i>Replacement Cost Equivalents</i>
Southern Pine Sawtimber Average 12" dbh @ \$40.00 per MBF Stumpage	\$40.00		\$40.00	
<i>Pulpwood Replacement Costs on Equivalent Basis</i>				
1. Average 8" dbh pulpwood stumpage at \$8.00 per cord Equivalents: 5.0 cds. per MBF Doyle and 2.8 cds. per MBF Scribner		\$40.00		\$22.40
2. Yield loss of 8% because of smaller timber		3.48		1.95
3. Additional freight cost, average \$4.00 per cord		20.00		11.20
4. Additional procurement cost, average \$1.00 per cord		5.00		2.80
5. Additional pulpwood logging costs, average \$0.50 per cord		2.50		1.40
Total replacement costs per MBF sold		\$70.98		\$39.75

Figure 3

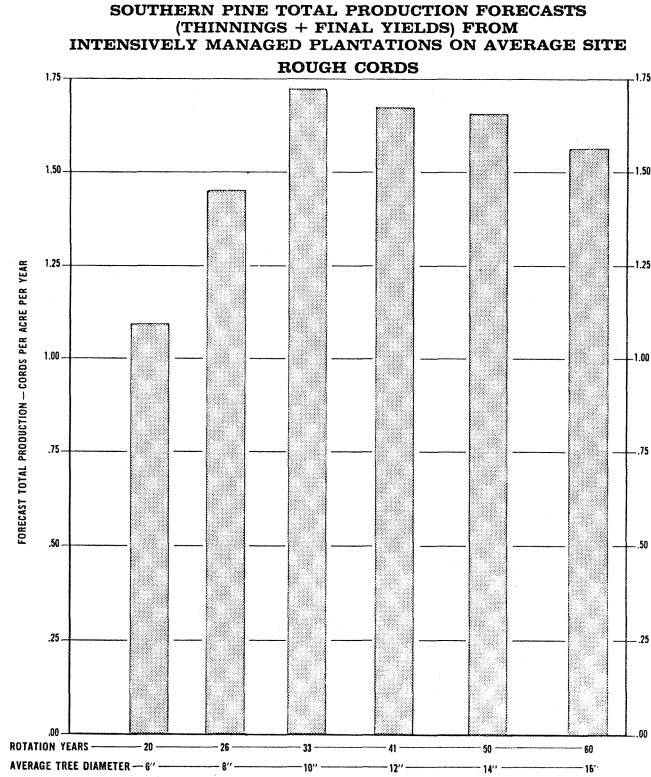
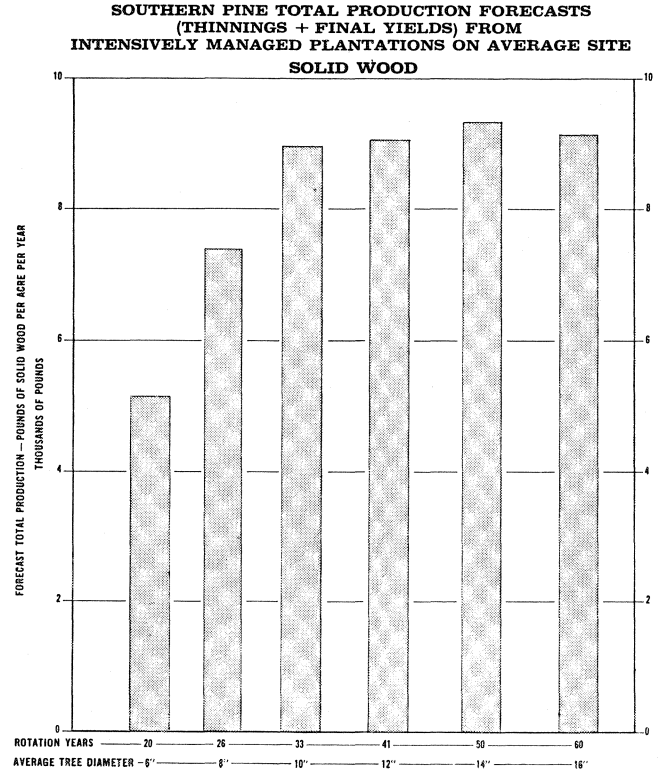


Figure 4

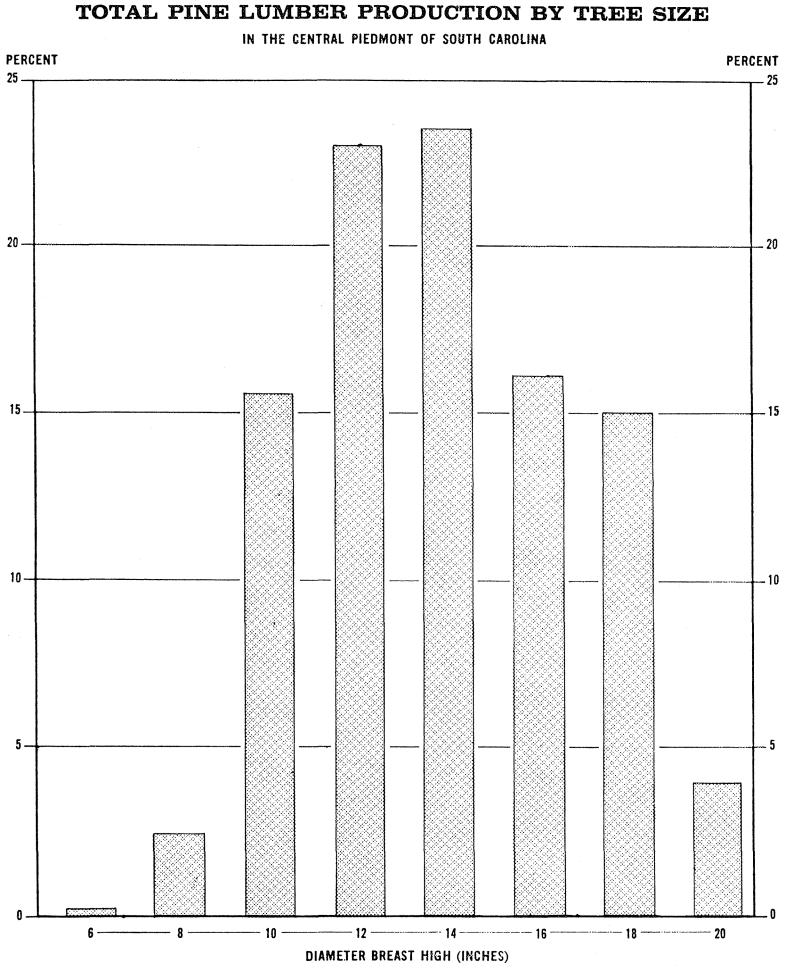




# FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

be an important factor of flexibility in industrial timberland management where total timber requirements are subject to fluctuation in themselves and where attractive but temporary alternative sources of stumpage often become available.

Figure 5



Source: U. S. Department of Agriculture — Forest Service

## CONSIDERATIONS OF INVESTMENTS IN SOUTHEAST

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This trend toward shorter rotations and smaller diameter trees in southern pine management has been borne out by numerous studies on management objectives, as well as surveys describing lumber production trends in terms of tree sizes. Figure 5 is provided as an illustration of this latter trend toward small sawlogs.

In managing timberlands for profit, many factors must be considered. One of the more important is the income tax benefit accruing from the 27-percent tax saving on timber profits versus ordinary income taxes, which is a significant factor in return on capital invested in timber. Figure 6 shows the forecast annual return after tax on a new timberland purchase. In this example, the merchantable timber was purchased at the going market value for stumpage and the total purchase price included a sizeable investment in future growth, reproduction and land.

The profits and appreciation, as forecast in this example in Figure 6, include projected increases in stumpage values and expenses. Profits for the first ten years are nominal, due to the liquidation of the high-priced stumpage which was present at the time of acquisition. Later years show a marked improvement in profits, due to the interaction of a reduced cost basis and increased growth. The profit increment due to the tax treatment as capital gain is readily apparent.

This chart also indicates the potential net gain if the property is sold. I realize that the gain on disposal is a matter of some conjecture, due to the possibility of depressing the market with a sizeable offering for sale; however, the fact still remains that there is a tremendous value increment generated through growth and appreciation in a timberland investment.

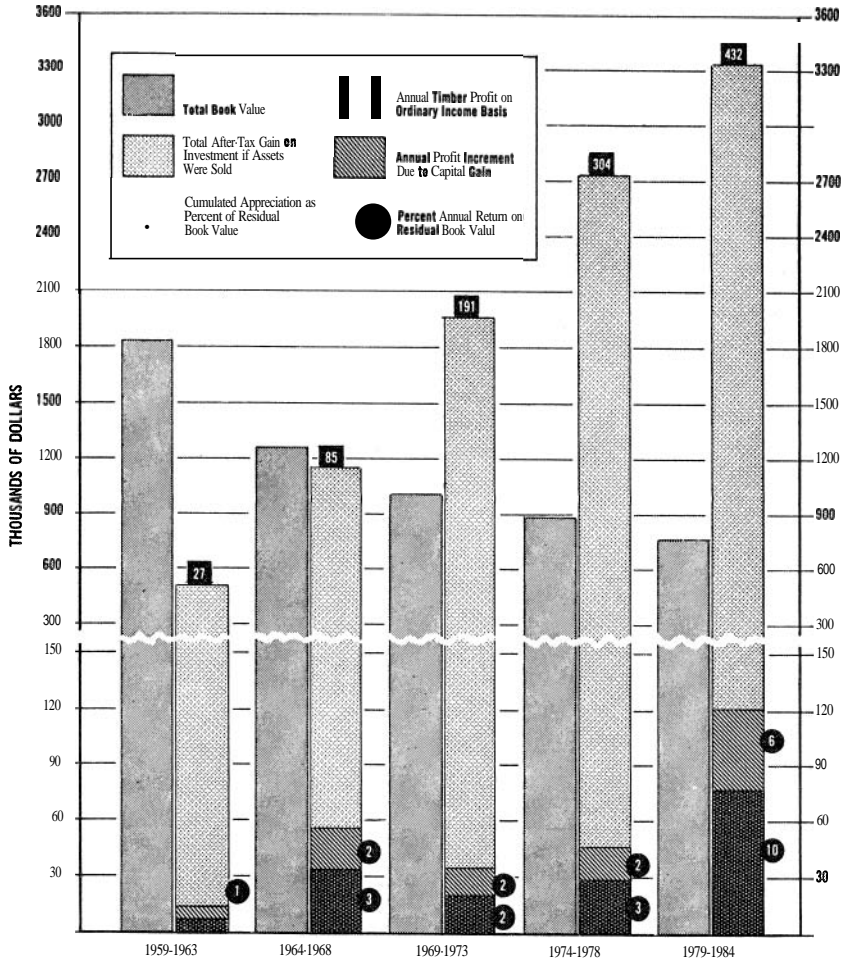
Figure 7 is a rather emphatic illustration of the situation facing the southern paperboard industry. The trend in pulpwood prices in the South over the last twenty years has risen steadily, reflecting the influence of both inflation and increased demand. Since 1938, wood prices have increased over 300 percent and there is no indication of any leveling in the immediate future.

Once we have committed ourselves to the acquisition of our own company timberlands, it becomes necessary to activate a plan of development and management. From the viewpoint of financial management, investments in timberland development must always be evaluated and ranked in terms of returns on each investment, both individually and as each contributes to the success of an entire management program. In approaching this problem of timberland management from the financial or investment position, one is first confronted with determining the most profitable level or levels of management. Each level

# FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

Figure 6

## FORECAST AVERAGE ANNUAL RETURN AFTER TAX ON A TIMBERLAND INVESTMENT AND CUMULATIVE AFTER-TAX APPRECIATION OF INVESTMENT

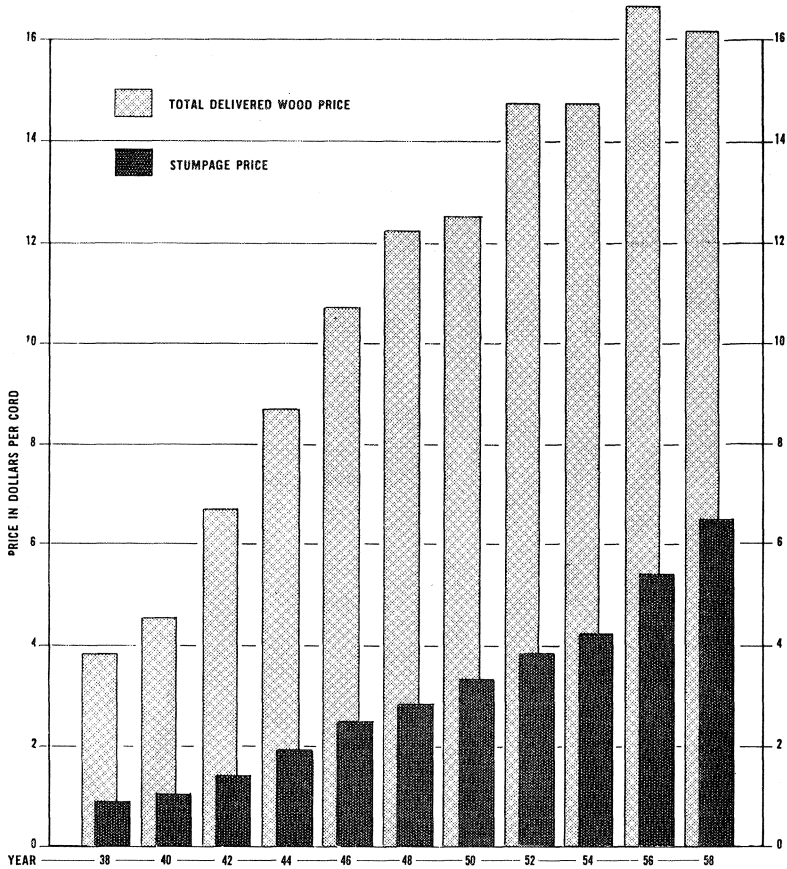


NOTE: All figures are averaged for period.

# CONSIDERATIONS OF INVESTMENTS IN SOUTHEAST

Figure 7

## TRENDS IN PINE PULPWOOD PRICES IN THE SOUTHEAST



obviously has its own combinations of investment and return which, while they may not be determinable with any exactitude, can be approximated close enough for planning purposes. It is also important to recognize that different management levels will eventually reflect a different timing of yield levels in terms of available pulpwood volumes at any projected date. Consideration must also be given to the fact that timberland is not homogeneous in terms of

## FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

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productivity on capital investments, either from the standpoint of innate soil fertility or in the condition of the present growing-stock. All these factors and many others must be dealt with as a technical background to intelligent financial decision. The degree to which they are appraised and given management consideration is, of course, directly geared to the particular development or investment level selected for each class. In its simplest terms, each recognized class of timberland productivity has its own "threshold" level of development investment, below which no appreciable returns will be generated on the investment. There exists, in theory at least, a corresponding maximum investment where the marginal return is too low if other available development and wood supply alternatives are considered.

While the business of forestry demands long-range programming in the financial management of our timberland investments, we recognize the need for a planned flexibility. Future conditions are seldom accurately forecast, and constant readjustment must be made to the changing technical and economic climates of our free-enterprise system, in which we compete for profits through superior management of all the resources available to us, including that of *time*.

# FINANCIAL MANAGEMENT IN ACTION

J. A. Segur, Vice-President  
Riegel Paper Corporation  
New York, New York

## I. PROTECTION OF INVESTMENT

### *Meaning of Protection*

In his paper Mr. Moise pointed out that the annual income return on investment of all the commercial timberland and timber in the United States is only 2.5 percent to 3.5 percent, based on current market value. He further stated that willingness to accept such a low return could be attributed in the main to the need of industry to protect and insure a permanent supply of timber for multi-million dollar plants making forest products.

There are three principal ways in which our captive forests provide protection to our industrial investment :

1. Protection against intermittent plant shutdowns due to spot shortages caused by weather, labor, and other temporary area conditions.
2. Protection against extended plant shutdowns at some time in the future due to a basic supply deficiency.
3. Protection against runaway prices of market pulpwood.

There is a definite limit to such a protective policy, of course, which is reached when the cost of protection equals or exceeds the cost of the hazard. The over-all return in the paper industry is not so good as to be able to carry a constantly increasing timberland subsidy. As long as low-cost woodlands were available, ownership of 25-50 percent of needs (as measured by the ratio of annual growth to annual consumption) did not represent a heavy investment, and the low return on woodlands investment did not materially dilute the return on the total investment. However, as we build our forests towards 100 percent protection at today's prices and the value invested in timberlands approaches the value invested in the asset which is being protected, the dilution in earnings may become serious and the problem of making woodlands economically self-sufficient becomes extremely important.

The question has been raised as to whether the low return on timberlands is really dilution, or is a matter of bookkeeping. Current market prices for pulpwood and sawtimber could conceivably be much higher if there were no

## FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

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captive timberlands to serve as a market balance wheel. On this basis, it has been pointed out, it is misleading to judge the timberlands return on the basis of market value of wood alone; rather, we should consider that if captive timberlands were eliminated the return on plant investment might well be less than the current combined return on plant and timberlands.

The disturbing thing here, of course, is that this is a choice between poor and poorer. In both cases, the return on investments is less than it should be and neither can be classed as "protecting the investment." Stated differently, the prospective returns of the paper industry are not good enough to carry either the increased burden of additional timberlands or the sharp price increases for market pulpwood which might eventuate without such timberlands. Even when the industry was earning a 10 percent return on its total investment, as it was several years ago, it should be remembered that this rate reflected *neither 100 percent protection nor today's value for timberlands.*

### *Riegel as a Case Study*

These are problems we all face, and it might be interesting to look at Riegel as a case study in the middle Southeast area. Riegel has an investment in its southern pulp and board plant of about \$75,000 per daily ton of capacity, excluding timberlands. We believe this plant must earn at least 10 percent on its investment, after taxes, because that is what it costs us to raise capital; and we believe that such a rate is attainable, if we exclude the cost of carrying timberlands.

Let us assume that we decide 100 percent protection is necessary (that is, that we must have sufficient timberlands to produce annual growth equal to 100 percent of our wood consumption, in perpetuity). Based on average mixed-age timberlands which have been available since World War II, it would require about 1,250 acres of pine land producing one-half cord per acre per year to provide raw material sufficient to produce each daily ton of pine pulp for one year. At today's prices this land and timber would cost \$75,000. Since it provides 100 percent protection for one daily ton of pulp capacity, the investment in timberlands would be about equal to the basic investment in plant of \$75,000 per daily ton. If the yield on the forest investment is only 2.5 percent, the return on the main investment is seriously diluted thereby, and the combined return of the two is only 5.75 percent.

The problem resolves into three questions:

1. Is 100 percent protection necessary?

## FINANCIAL MANAGEMENT IN ACTION

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2. Can the cost of protection be reduced?
3. Can the return on investment be improved?

### *Is 100 Percent Protection Necessary?*

Riegel today has annual total growth equal to about 26 percent of its annual total consumption. Both growth and consumption are divided approximately 70 percent pine and 30 percent hardwood. Although we own 350 acres per daily ton of capacity, many of our forests are immature or understocked. Consequently, we purchase 85 percent of our requirements from the open market and supply 15 percent from our own lands through dealer contracts. In 1959, about one-half was forced cutting necessary to maintain a steady flow of work to our dealer organization; or because other areas were inoperative due to wet weather.

If present market conditions continue, our present forests are probably adequate (with exceptions in a few areas) since their principal function is to provide a living standby inventory as insurance against occasional shutdown. Since a shutdown of our southern plant due to lack of wood would entail a loss of income of \$50,000 per day, such insurance is essential. For this type of protection, our present stands could theoretically provide against four years of supply interruptions.

This type of protection is not enough, however, as market pulpwood supply is diminishing and, for the long run, the emphasis must be on sustained protection rather than on spot protection. Five years ago pine growth exceeded cutting in our procurement areas by perhaps 35 percent; today cutting is probably equal to growth in this area but cutting is predicted to increase 35 percent by 1975. The increase in growth by that date is so uncertain that we must, therefore, be prepared to cut additional captive wood in 1975 equal to the projected 35 percent increase in demand, bringing the total rate of captive cutting in 1975 to 50 percent of our use.

Since a 50 percent rate is double our present growth, such a cutting program would cannibalize our forests unless our growth is doubled, either through increase in holdings or improvement in growth or a combination thereof. These figures assume no improvement in growth on market timberlands, but we cannot afford to guess.

Beyond 1975 the conditions of both wood supply and demand are extremely uncertain. Since it takes thirty years or more on the average to produce a pine pulpwood tree in our area, our pulpwood supply by 1990 may depend on our decisions today. This is too long a period to gamble on. Any number of things



## FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

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could reasonably happen in the next 30 years which could absorb the free market wood in the Southeast Plain: pulp expansion, new competitive uses for land arising out of population explosion, new uses for wood, area destruction.

It is too soon to decide whether 100 percent total sustained protection is needed. However, in making the decision we must make today as to 1990, we feel we must provide 100 percent of our requirements in that year; and as we plan our timber maturities 30 years ahead, it seems probable we will continue to provide 100 percent for each subsequent year. This program does not produce immediate 100 percent protection, but is a planned progression towards 100 percent protection which will be consummated when each of 30 years ahead has been provided for. This is a program which can be arrested or re-directed as conditions may dictate.

The above discussion in the main, has referred to 100 percent pine protection for 100 percent pine pulp. The hardwood situation in the Southeast Plain is somewhat different. Although hardwood consumption has increased 120 percent in the last eight years (vs. 35 percent for pine) and is expected to increase another 100 percent by 1975 (vs. 35 percent for pine), growth should continue to equal or exceed consumption. Again, however, the pattern of usage and the availability of hardwood 30 years from now is only an estimate and it is our conviction that our progressions starting in 30 years should provide annual cutting from captive land sufficient to equal total annual consumption of hardwood and softwood combined, even though disparities occur if measured separately. These disparities may be adjusted as we progress by the pattern of our plantings, by purchases and by trading.

### *Can the Cost of Production be Reduced?*

Earlier we said that 100 percent protection for Riegel's plant investment would require 1,250 acres per daily ton costing, at today's prices, \$75,000 per daily ton of capacity and returning 2.5 percent on the investment. This assumed timberlands of mixed age having a relatively well-stocked stand of six or more cords per acre growing one-half cord per acre per year.

If, through better management, the mixed-age stand could be increased to a stand of 12 to 14 cords per acre producing a sustained yield of one cord per annum, the number of acres would be reduced to 625 acres per daily ton at a cost, at today's prices, of about \$62,500. In our experience, there is little of

## FINANCIAL MANAGEMENT IN ACTION

such land now available and to build up such stocking on average land would require minimum cutting for at least 15 years ahead during a period when demand for cutting may be expected to be very heavy. Even if such land were available, this is still a tremendous investment yielding a return on investment of only 3.9 percent, with a resultant heavy dilution of total earnings.

To obtain the cheapest cost of 100 percent protection, we are convinced that it will be necessary in our situation to convert our timberlands to plantations. Assuming that such plantations are located on selected growing land of relatively high site index, such forests should be capable of producing 50 cords per acre per 30-year rotation, requiring an initial investment of \$65 per acre. The initial investment for such a plantation, as compared with the alternatives mentioned would be:

	<i>Acres Per Ton Capacity</i>	<i>Growth in Cords Per Acre Per Year</i>	<i>Initial Investment Per Ton of Mill Capacity</i>
Average natural stands	1,250	0.5	\$75,000
Improved natural stands	625	1.0	62,500
Selected land plantations	375	1.67	25,000

On the minus side, selected land plantations, of course, provide only protection for the future. Even if started today, they provide no contribution for at least 15 years. Their even-age stands invite more damage from fire and blight than do the natural stands and for best control should probably be planted in small plots at the risk of higher costs of management. As a practical matter, however, we have little choice in our situation since the plots which are available to us which will meet the quality requirements for plantations are generally small and scattered.

The investment figures shown are "initial." The fact that "average natural" and "improved natural" stands allow some immediate cutting at a rate equal to growth, while at least a 13-year wait after investment is involved in the case of plantations, must be taken into account in comparison of return on investment.

### *Can the Return on Investment Be Improved?*

Assuming a pulpwood price of \$5.50 per cord and management costs of \$1.50 per acre for natural stands and \$1.75 per acre for plantations, the return on investment, after tax, compares as follows:

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	<i>Initial Investment Per Daily Ton</i>	<i>Investment Return of Woodlands(A.T.)</i>	<i>Investment Return Total*</i>
Average natural stands	\$75,000	2.5%	6.2%
Improved natural stands	62,500	3.9%	7.2%
Selected land plantations	25,000	4.5%†	8.6%

\* The average of (a) plant investment of \$75,000 per daily ton at 10 percent return and (b) the investment in woodlands shown, with its respective return after tax.

† Value of future crop, after return of planting costs and maintenance, expressed as compounding annual income after tax.

Selected plantations show a higher yield than do natural forests, but the dilution of the main investment is still appreciable. The above returns, however, do not reflect the major saving to be expected from cheaper harvesting in plantations. Although a stumpage value of \$5.50 per cord was assumed above, the total cost, without freight, is close to \$16, allowing an estimated \$10.50 for cutting and yarding cost. The principle reason for the high cutting cost is the small volume of the cutting (3 cords average per acre). Under the plantation program described, 35 cords of the 50 expected per rotation would be removed in the final cut, permitting mechanized logging and a considerable reduction in cost. Assuming the cost of cutting were thereby cut in half, yielding \$10.50 stumpage return to the owner vs. \$5.50 for natural stands, the return on investment in selected plantations would be increased to 7 percent, giving an over-all return of 9.25 percent.

This cost advantage in the harvesting of plantations should increase if present trends continue. It is conceivable that the future price of standing pulpwood timber may very well approach that of sawtimber today (\$14-\$16 per cord) as pulpwood becomes more a prime objective and less a by-product. At the same time, it is also probable that labor costs in the woods will increase at a rate considerably greater than the rest of the economy. Because of the plantation's lower labor factor in harvesting, it seems probable that the net of these two price movements will be much more in favor of the plantation than the natural stand.

### *Conclusion—100 Percent Protection*

We have decided that we must provide 100 percent protection for our mill by a yearly progression culminating in 1990 and that this can best be accomplished with the least dilution in over-all earnings objectives by plantations on selected lands. To meet the growing needs for protection during the interim period 1960-1990 we are prepared to sacrifice our entire present natural

## FINANCIAL MANAGEMENT IN ACTION

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stands to meet demands as they may arise. Together with thinnings from the plantation progressions we believe that by such sacrifice cutting we can meet any foreseeable deficiencies in that period. As the better lands are clearcut during this period, they in turn will be reforested as plantations and by 1990 the first 30-year cycle of plantations will have been completed and the first planting will be ready for final harvest.

### II. THE PLANTING PROGRAM

#### *Changeover Problems*

The process of changing from natural stands to plantations, as may be expected, raises many new problems. As previously noted, better quality land appears to be an absolute must if the plantation is to produce a satisfactory return on investment. Less than 40 percent of our present land will meet our test of better quality, although it is at least average for the area. We therefore, have these problems:

1. To establish a method of determining and evaluating better quality lands.
2. To finance the purchase of the new land necessary.
3. To gear our acquisition and planting organization to the job.

#### *Evaluation of Better Quality Land*

To accomplish this objective, we first established correlations between site index and the yield of plantations in a 30-year pine pulpwood rotation. The correlations are based heavily on the study by Schumacher and Coile<sup>1</sup> of yields of even-age natural stands of pine for site indices 70-110 in the Southeast Plain, but incorporate also our own experience with plantations over the last 15 years.

In general, these studies indicate yields ranging from .66 cords per acre per year for 60 site to 3 or more cords per acre per year for 120 site. These studies established clearly that the lower sites would not justify the planting cost and demonstrated the desirability of concentrating on better quality land.

To use these tools in the purchase of land and in the evaluation of land for planting it is necessary that the site index of all land to be acquired and/or

<sup>1</sup> Schumacher, F. X. and T. S. Coile. 1959. *Growth and Yields of Natural Stands of the Southern Pines*. 115 pp. T. S. Coile, Inc., Durham, N.C.

## FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

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planted be known. This we are accomplishing by a regular program of field tests.

### *Financing the Purchase of New Land*

Based on the figures presented earlier we will require for 100 percent protection 375 acres of selected land plantations per ton of capacity, or a total of 285,000 acres for our present 750-ton mill. Following the 30-year progression, this means we must acquire and/or plant 9,500 acres per year.

At the start of this program four years ago, we had sufficient land (of a quality to meet the high standards we have set) to meet the planting requirements of about half the total needed. However, much of this land has timber which is needed for standby inventory and cannot be planted for at least 10 years.

Our initial step, therefore, is the acquiring and planting of roughly 120,000 acres of new land, to be followed by the clear-cutting and planting of another 160,000 acres already owned. This represents a considerable financial program to a company of our size.

We have arranged to finance the new-land purchases by means of a lease arrangement which will be described later in detail. By means of the lease we have been able to minimize our current capital expenditures and to make the program self-financing (on paper at least). As pointed out in the protection program described in the first section, we plan a certain amount of sacrifice cutting to meet increasing needs in the next 13 years. The proceeds of such cuttings after taxes are estimated to meet the capital requirements for planting and land rentals during that period. During the following 17 years, the thinnings from the new plantations and the income from clear-cutting the remainder of our lands will be sufficient to meet costs of planting and land rent during that period while producing a satisfactory return on investment. At the end of 30 years, the plantations become 100 percent effective on a self-financing basis.

### *Acquisition and Planting Program*

We have entered this program without reservations. We have built the organization to do the job, have built a nursery to produce 15 million seedlings per year, are intensely studying methods of improving growth and quality and are working hard at cheaper and more efficient methods of clearing and planting.

## FINANCIAL MANAGEMENT IN ACTION

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### III. LAND LEASING

#### *Description of the Lease*

The land lease has an important place in the program just described. To understand why we prefer it to fee ownership or other methods of financing, it is necessary to understand its provisions.

The form of lease on which we are concentrating is quite different from most leases in the field. *First*, we sell and lease the bare land only; at all times the timber is owned by Riegel. *Second*, the leases are written with only one or two companies for simplicity in administration and negotiation. To effect this simplicity Riegel first purchases the land, accumulating 10,000 to 15,000 acres, which are then resold to the ultimate owner and lessor. *Third*, the land under lease is directed entirely to our long-term program, usually high-grade land with a thin timber stand, which we clear and then plant with stock from our nursery. *Fourth*, the leases are for terms slightly in excess of 60 years, allowing time for at least two planting cycles. *Fifth*, we have the option to purchase the land at termination at the then market price.

Perhaps the terms of the Riegel lease can best be illustrated by comparison with the typical growth lease with which most of you are familiar.

- |                            |  |
|----------------------------|--|
| 1. Lessor:                 | (G)* Individual private owners with varying conditions and terms.  |
|                            | (R)† An institution, such as a pension fund foundation or insurance company, employing one basic lease form.   |
| 2. What is Leased:         | (G) Land and timber, as a unit.  |
|                            | (R) Bare land only.  |
| 3. Basis of Rental:        | (G) Based on (1) growth with minimum annual payment and (2) current value of pulpwood, with provision for upward adjustment according to various price indices.  |
|                            | (R) 6-8 percent of initial value of bare land for the first 30 years, reducing to 2-3 percent thereafter.  |
| 4. Income Tax:<br>(Lessor) | (G) Rent received is capital gain income since he retains economic interest.   |
|                            | (R) Rent received is ordinary income; if lessor is tax exempt entirely, there is, of course, no tax.   |
| 5. Income Tax<br>(Lessee)  | (G) Rent payments against growth are considered as prepayment for cutting rights and capitalized to be deducted as depletion <i>in the year cut</i> against capital gain income.                                   |
|                            | (R) Rent payments of bare land are deductible <i>in the year accrued against ordinary income</i> . Planting costs are capitalized, however, and deducted as depletion in the year cut against capital gain income. |

## FINANCIAL MANAGEMENT OF FOREST OWNERSHIPS

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|--------------------------------|-----|--|
| 6. Term of Lease:              | (G) | 30-99 years.   |
|                                | (R) | 36 years with option to renew 30 years plus option for an additional 10 years for uncompleted crops.                                 |
| 7. Ownership of Timber         | (G) | Timber belongs at all times to lessor, subject only to cutting rights as they may exist from time to time under the growth contract. |
|                                | (R) | All timber in all forms belongs at all times to Riegel. Bare land only deliverable at termination.                                   |
| 8. Maintenance and Local Taxes | (G) | May be paid by lessor or lessee according to deal; usually paid by lessee.   |
|                                | (R) | Paid by lessee.  |
| 9. Termination Rights          | (G) | Varies; usually none.  |
|                                | (R) | Lessee has option to purchase at the then market price.  |

\* (G = Growth Lease)

† (R = Riegel Lease)

### *Definition and Evaluation of Bare Land*

A number of problems are self-evident. The Riegel lease is a lease of bare land, but how is bare land defined and how is it evaluated for the purpose of sale and for the purpose of establishing a rental basis?

In this conception, bare land is defined as land with no merchantable timber or plantations or concentrated reproduction. The value of the bare land is determined by deducting from the total market value of a tract of timberland the market values of the merchantable timber, concentrated reproduction or plantations thereon. It is the price we would be willing to pay for a piece of land stripped of trees and ready for planting, which is exactly what we do with it, as we have indicated in the discussion of protection and long-term policy.

The price we are willing to pay for bare land, or on which we are willing to base our rental, however, is limited by the income we believe it can produce, which in turn varies with its site index.

Based on the site index—yield correlations we have established for plantations (as previously described) and based on today's pulpwood prices, theoretical land values have been computed, which we refer to as Base Land Valuations. These computations are based on an old forestry principle which says that the value of land today is the discounted value of the land and plantation at maturity, after applicable taxes, less the discounted amount of all present and future costs to produce that crop, after applicable tax credit. "Discounted Value," of course, means a value today which is less than the

## FINANCIAL MANAGEMENT IN ACTION

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future value by the amount needed to pay for the cost of money during the waiting period, compounded annually.

The Base Land Valuations assume ideal conditions. To adjust to actual conditions, we defined and evaluated various types of Necessary Costs such as drainage, road construction and other items under various conditions; and we established applicable tax treatment for each.

The maximum price we are willing to pay, therefore, for a given tract of land is the net of its Base Valuation based on site index less Necessary Costs. For instance, when the rate of discount assumed is 4.5 percent after tax, the Net Valuations range from minus \$10 per acre for site 60 land needing little work to \$40 per acre for site 90 land needing a lot of work.

In general, the Net Valuations so determined are competitive in our land market when the discount rate used is 4 to 6 percent after taxes, within the range of sites 80 to 100 in which we are interested. This is the basis for our assumption of an average 4.5 percent return on investment in Selected Land Plantations.

### *Comparison of Lease with Other Methods of Financing*

Let us assume we have the following choices in financing the purchase of a tract of land:

- (a) Equity: sell additional stock or reinvest earnings.
- (b) Debt: borrow at 5 percent interest, principal to be repaid in 30 years, annual payments of interest and principal to be a constant of 6.5 percent.
- (c) Sale-leaseback: resell land at purchase price and lease at 6.88 percent annual rental for 30 years with option to renew at 2.5 percent for 30 years. This rental will return principal to the lessor in 30 years at 5.5 percent interest.

To compare these methods properly, we should consider carrying cost, use of equity, effect on borrowing capacity and appreciation in value.

### *Carrying Cost*

Equity is relatively high-risk and expensive capital. At least 10 percent return is needed to attract and satisfy equity capital in the long run.

Debt and lease obligations are relatively low-risk capital, the carrying cost of which is correspondingly lower than equity and which, in addition, may be deducted from ordinary income as an expense.

Carrying costs, therefore, compare as follows when based on corporation income tax of 52 percent:



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Equity		10.00%
Debt	5% x 48%	2.40%
Lease	6.88% x 48%	3.24% 1st 30 years
	2.50% x 48%	1.20% 2nd 30 years

### *Use of Equity*

If land is purchased with equity, 100 percent of the purchase price must be provided from earnings or the sale of stock. As stated above, this capital must be considered as costing 10 percent.

If the land purchase is financed initially with debt or by lease, equity must still be provided, but at a later date; that is, both debt and lease obligations are temporary financing which eventually must be replaced with equity. In the case of debt, this takes place gradually as the annual amortization payments are made. In the case of the lease, no equity is required until the land is repurchased at termination.

In any year the true cost of investment in the land is a combination of the equity in use, at 10 percent, and the carrying cost of the temporary financing still outstanding. For instance, in the 15th year, 32 percent of the debt will have been repaid with equity, and the true cost of investment in that year is:

Equity	32% @ 10% return	=	3.20%
Interest on Balance	68% @ 2.40% return	=	1.63%
Total cost of Investment			4.83%

Over the 60-year period, the total cost of investment of each of the methods, at five year intervals, compares as follows:

Year	<i>Total Cost of Investment with Equity at 10%</i>		
	<i>100% Equity</i>	<i>Debt + Equity</i>	<i>Lease + Equity</i>
1	10%	2.40%	3.24%
5	10	3.10	3.24
10	10	3.85	3.24
15	10	4.83	3.24
20	10	6.20	3.24
25	10	7.87	3.24
30	10	10.00	3.24
40	10	10.00	1.20
50	10	10.00	1.20
60	10	10.00	1.20
61	10	10.00	10.00

### *Effect on Borrowing Capacity or Credit*

The borrowing capacity of a corporation is limited by prudence and by the lenders. Therefore, the advantage of debt over equity is available only until

the limit of borrowing is reached. Thereafter, all financing must be by equity.

Although it is contended by many that the lease does not and should not affect borrowing capacity, we will assume that the lease is a form of borrowing which is limited by the company's credit in the same manner as debt.

Debt and lease financing must, therefore, compete for the limited borrowing capacity available, and their respective investment costs are comparable only if the two methods use the same amount of borrowing capacity, both initially and in each successive year.

Since the principal amounts, term, and basis of amortization of both the debt and lease under review are the same, it appears safe to say that their effect on credit is the same both initially and in each successive year. Therefore the investment costs in the table above are directly comparable.

If we assume, on the other hand, that a lease obligation does not affect credit, either at all or in the same degree as debt, the advantage of the lease would be correspondingly increased, since the debt limit would then be measurably higher.

### *Appreciation in Value*

Over a 60-year period, land may be expected to appreciate in value. Assuming steady appreciation of prices during the 60-year period, at the rate of 3 percent compounded annually, the cost of land in 60 years could increase 500 percent.

In this event, the lease method is at a disadvantage, of course. However, if this 500 percent is expressed as an annual cost, calculated at 10 percent value of money, the effect on the lease costs would be to increase the lease rates shown in the above table by only .16 percent. That is, the cost in the first thirty years increases from 3.24 percent to 3.40 percent; and in the second thirty years from 1.20 percent to 1.36 percent.

### *Lease Financing-Land vs. Plant*

A strong reaction has taken place against lease financing in recent years, following a rash of indiscriminate sale-leasebacks of industrial plants. Most of the reaction is directed against the claims by sale-leaseback proponents that lease obligations are not debt and do not affect borrowing capacity since they do not appear on the balance sheet. The reactionists show that the lease is debt and that it is usually more expensive in the end than more conventional forms of debt financing.

We concur generally with the lease critics when the lease relates to de-

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preciable property and the term is less than 30 years. When the property is depreciable, the tax recovery is often **sufficient** to meet the amortization requirements and no new equity is needed. However, when the property is non-depreciable and the term is over 30 years, we believe the lease form to be of definite advantage, as stated. We do not believe that a lease should be considered an obligation *of the same degree* as other debt forms but this is a very debatable issue and for the purposes of this paper we have assumed the lease to be fully equal in liability to "balance sheet" debt.

### *Conclusion*

On the basis of the above, we feel that the long-term lease for given situations is an acceptable, desirable instrument which is well worth consideration in financial planning. Its economics, when applied to long-term land projects such as forest plantations, indicate an over-all advantage running between 15 and 30 percent, depending upon appreciation. In addition, it offers certain other possible advantages:

1. There are only a few restrictive covenants such as debt, dividends, and mergers.
2. The instrument is attractive to certain institutional investors and in a period of tight money, as now, may be easier to sell than other types of debt.

**End of Document**