EFFECT OF THE 1986 TAX REFORM ACT ON
FOREST INCOME AND VALUES

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ABSTRACT: A preliminary assessment was made of the effect the 1986 Tax
Reform Act will have on the forest-based sector of a state economy, using
Arkansas as a sample state. The results indicate that net timber income
to private forest owners and forest land values both can be expected to
decline under the Act, by an estimated 10.8 percent. This equates to
approximately $28.8 million per year statewide in income losses and
$402.9 million—nearly $30 per forested acre—in land value losses.
Losses of this magnitude represent a marked decline in the ability of
timber production to compete with other investments. Among owners who
actively manage their timber the losses will militate for simpler
management plans and shorter rotation lengths. Owners who do not manage
may feel compelled to mine their timber or entirely liquidate their
forest investment. Combined, these effects will result in an overall
decline in the size and quality of timber products, increased harvesting
and processing costs, the offering for sale of substantial acreages of
forest land, and as-yet undefined changes in forest ownership and use
patterns.

INTRODUCTION

The provisions of the 1986 Tax Reform Act (P.L. 99–514) have profound
implications for timber producers and managers. The most significant change
the Act brought is in the treatment of long-term capital gains. Income from
timber and other long-term investments will no longer receive preferential
treatment, but will be taxed at the same rate as ordinary income. In other
provisions the Act lowered and simplified the tax rate structure for both
corporations and individuals, abolished income averaging, and for owners
classified as passive investors, disallowed expensing of annual management
costs. The Act retained the limited reforestation tax credit and amortization
of reforestation expenses afforded by the 1980 Reforestation Tax Incentive Act
(P.L. 96–451), but eliminated other investment tax credits and the accelerated
depreciation of capital investments.

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Other studies have analyzed the effects the Act will have on returns from newly established even-aged timber stands. Banzhaf & Company (1985) estimated that the internal rate of return for forest management investments would decrease under the Act, from a low of 38 percent on stands owned by forest industry to a high of 46 percent on stands in small nonindustrial holdings. Milliken (1986) predicted catastrophic declines in the investment value of forest land, ranging from 54 percent for stands in noncorporate forest industry holdings to 79 percent for actively managed stands held by nonindustrial owners. Considering only industry holdings, Guertin and Rideout (1987) forecast declines in land expectation values ranging from $25 to $50 per acre on loblolly pine stands in the Southeast and from $4 to $64 per acre on Douglas-fir stands in the Pacific Northwest.

The objective of this study was broader in scope: to estimate the overall effect the Tax Reform Act can be expected to have on the forest-based sector of a state economy, using Arkansas as a sample state. The approach taken was to model the changes in net aggregate timber income and in mean forest land value that each of several classes of forest owners would experience under the Act, assuming other aspects of the timber products market remained unchanged (ceteris paribus). Because the objective mandated an aggregate approach, it was anticipated that this study would yield lower estimates of change than were found in the studies cited above. By its nature the aggregate information used to develop and drive such an analysis averages out extremes. As a result, estimates obtained using an aggregate modeling approach must be considered conservative.

PROCEDURE

The Study Model

A computer model was developed to handle the many computations required for the assessment, and to make it adaptable to differing starting assumptions. A logic flowchart is presented in Figure 1. The model takes as input the total volume of timber that flows from a state's forest lands, unit product prices, and investment discount rates for the various forest ownership classes. In its first segment, the model apportions the total annual harvest among products and owner classes using factors derived from Arkansas Forestry Commission severance tax records (AFC Special Revenues Department 1986) and USDA Forest Service Forest Survey data (Personal communication, Willem W. S. vanHees, Southern Forest Experiment Station, 1980).

The model accommodates four types of timber products and five forest ownership classes. The product types--pine and hardwood pulpwood, and pine and hardwood sawtimber--are the same as were used in the Forest Survey. The ownership classes are public forests, forest industry, and three categories of nonindustrial woodlands. Since income to public forests is not subject to tax, this ownership class is not considered further in the model. Nonindustrial woodlands were divided into three categories to reflect the differing income tax rates paid and different levels of forest management investments made by this diverse ownership group. Unpublished research data indicate that the classes used--owners in high tax brackets with high management investments, owners in high brackets with low investments, and owners in low brackets with
Figure 1. Flow chart of model logic.
low investments—each hold approximately one-third of the nonindustrial woodland acreage in Arkansas.

The second model segment calculates the change in net timber income to each private ownership class that can be expected to result from the Tax Reform Act, and the consequent change in forest land values. The change in income is determined by calculating net annual after-tax harvest receipts to each owner class under both the old and new tax laws. Allowance is made for the portion of gross timber income that represents recovery of investment basis (Personal communication, James H. Francis and John W. Gann, nonindustrial woodland owners, Kenneth McDougal, Potlatch Corporation, and Bruce M. Pierce, Weyerhaeuser Company, 1987). For high tax/high investment individuals, who as active investors remain eligible to expense annual forest management costs, adjustments also are made for the effect of the costs on net income and on tax. The difference between the income figures for each owner class represents the change in net timber income.

Change in forest land value is determined by dividing net timber income to each owner class under each law by the group's investment discount rate, that is, calculating its land expectation value. Again, the difference between the land expectation values for each owner class represents the change in forest land value.

In its final segment, the model sums the calculated figures, yielding state totals for change in net timber income and change in forest land value. It produces as output printed tables showing all results on a total, per-acre, and percent change basis, by ownership class and statewide.

Input Values

This analysis was made using 1987 values for Arkansas. Converted to common units and combined, the volume of products harvested totaled 620.0 million cubic feet (AFC Special Revenues Department 1988). Timber product prices were 12-month averages of prices reported in Timbermart-South (Data Resources, Inc. 1987). The specific prices used were: $12.71 per cord for pine pulpwood, $3.39 per cord for hardwood pulpwood, $140.42 per thousand board feet (Doyle scale) for pine sawtimber, and $93.54 per thousand board feet (Doyle scale) for hardwood sawtimber.

An 8 percent discount rate was used in the land expectation value calculations for forest industry and high tax/high investment individuals, and a 6 percent rate for high tax/low investment and low tax/low investment individuals. These rates were selected to reflect the real differences in long-term objectives that owners in the various classes hold for their forest land.

RESULTS

The results of the assessment are summarized in Table 1. They indicate that net timber income to private forest owners in Arkansas should decline by some 10.6 percent under the Tax Reform Act, or $28.8 million annually. Income losses to forest industry are estimated at $9.8 million (7.1%) per year. Combined income losses to nonindustrial woodland owners are estimated at $19.0
Table 1. Estimated losses in net annual timber income and forest land values to private forest owners in Arkansas attributable to the 1986 Tax Reform Act.*

<table>
<thead>
<tr>
<th>Ownership Class</th>
<th>Acres</th>
<th>Loss in Net Annual Income x 1000</th>
<th>Total Loss in Land Value</th>
<th>Land Value Loss/Acre</th>
<th>Pct Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Industry</td>
<td>4,322.6</td>
<td>$9,818.5</td>
<td>$122,730.9</td>
<td>$28.39</td>
<td>7.1%</td>
</tr>
<tr>
<td>Nonindustrial Woodlands</td>
<td>9,713.0</td>
<td>18,971.3</td>
<td>280,157.9</td>
<td>28.84</td>
<td>14.1%</td>
</tr>
<tr>
<td>High Tax/High Investment</td>
<td>3,237.7</td>
<td>8,647.3</td>
<td>108,090.7</td>
<td>33.39</td>
<td>17.0%</td>
</tr>
<tr>
<td>High Tax/Low Investment</td>
<td>3,237.7</td>
<td>6,986.2</td>
<td>116,436.5</td>
<td>35.96</td>
<td>17.5%</td>
</tr>
<tr>
<td>Low Tax/Low Investment</td>
<td>3,237.7</td>
<td>3,337.8</td>
<td>55,630.7</td>
<td>17.88</td>
<td>8.1%</td>
</tr>
<tr>
<td>State Total</td>
<td>14,035.6</td>
<td>$28,789.8</td>
<td>$402,888.7</td>
<td>$28.70</td>
<td>10.6%</td>
</tr>
</tbody>
</table>

* Calculations assume an 8% investment discount rate for forest industry and high tax/high investment forest owners, and a 6% discount rate for high tax/low investment and low tax/low investment owners.

million per year. Individuals in the new 28 percent tax bracket are the hardest hit: high tax/high investment owners face annual losses of $8.6 million (17.0%), while high tax/low investment owners face losses of $7.0 million (17.5%). Low tax/low investment owners are buffered from the full effect of the tax law changes by their lower tax rate (Table 1).

Since the investment value of forest land is tied to its ability to produce regular timber income, declines in income cause parallel losses in land value. The value of forest land in Arkansas should fall under the Tax Reform Act by an estimated $402.9 million, or $28.70 per acre. Land value losses to forest industry are estimated at $122.7 million ($28.39/acre). Land value losses to the nonindustrial ownership classes should total $280.2 million and range from $55.6 million ($17.88/acre) for low tax/low investment owners to $116.4 million ($35.96/acre) for high tax/low investment owners (Table 1).

Examination of Table 1 reveals several apparent anomalies. Like changes in net timber income or land value between ownership classes sometimes result in quite different percentage changes. This occurs because the investment value of forest land is not constant from class to class, but varies according to management intensity, discount rate, and tax status. Active management increases the value of forest land by capturing more of its productive capacity in marketable products. Conversely, a high investment discount rate or a high tax rate lowers land value, the first by severely discounting future returns and the second by reducing net timber income.
DISCUSSION

Effects of Income Losses

How the losses in net timber income forecast by this assessment will affect forest owners depends primarily on whether or not they manage their holdings. Active forest managers (forest industry and high tax/high investment individuals) will find that fewer management practices appear profitable than before the Tax Reform Act, and that value accrues to their timber more slowly. Financial necessity will require these owners to simplify their forest management plans, shorten rotation lengths, and seek low-cost alternatives to traditional silvicultural practices. A related point important to forest industry is that the same factors that make active forest management less attractive an internal investment also will make forest-based firms less attractive to outside investors and lenders. The internal and external capital released by these effects probably will be invested in non-forest management alternatives.

For forest industry firms that make internal transfers of timber between woodlands and manufacturing divisions, the full effect of the 6 percent tax increase on long-term timber capital gains—from a 28 percent effective rate to 34 percent—will be offset to some extent by the 12 percent decrease in the marginal corporate tax rate—from 46 percent to 34 percent. Given the abolition of accelerated depreciation schedules and investment tax credits, few if any forest industry firms will pay less tax. But the tax-induced shift in the relative profitability of their forest and manufacturing operations will further influence integrated firms to favor milling investments over forest management investments in their planning.

The effect that income losses will have on high tax/low investment and low tax/low investment individuals is more problematic. As they are defined by a low level of management activity, owners in these classes cannot respond to the losses by simplifying management plans or replacing traditional practices with low-cost alternatives. Low tax/low investment owners' options are further constrained by their habit of selling timber for small products as soon as it becomes merchantable (Duerr 1948). Attempts by these owners to replace lost returns by increasing the volume of timber harvested would constitute timber mining.

Many owners in the high tax/low investment class have passively profited from the natural growth of their timber into larger sizes and more valuable products, combined with preferential tax treatment for long-term timber capital gains. These owners may respond in one of two ways to the large net income losses they face with loss of preferential tax treatment. Some will be motivated to seek the advantages of higher income and greater flexibility afforded by active management, and will move into the high tax/high investment class. Others will choose to liquidate their forest investments in favor of shorter term, more stable alternatives.

The abolition of income averaging under the Tax Reform Act will affect all nonindustrial woodland owners, in that they will no longer be able to spread their tax on the pulse of income resulting from a timber harvest over several years. Under the old, sharply progressive tax rate structure, averaging large changes in income over three years resulted in a lower total tax. The new two-
tiered structure for individuals obviated this benefit for owners already in the higher bracket. But many low tax/low investment owners who could have retained their position in the lower bracket with income averaging will find at least a portion of their timber receipts taxed at the higher marginal rate under the Act. This effect could not be accurately modeled, and will result in net income and land value losses for this owner class that are over and above those shown in Table 1.

Effects of Land Value Losses

As with timber income, how the losses in the investment value of forest land will effect forest owners varies with ownership class. Small changes in forest land value occur constantly; land expectation value is driven by net timber income, and the timber market is noted for its volatile nature. Forest owners can disregard much of this constant fluctuation. Since their timber continues to grow in size and value, they can hold it off the market for considerable periods, waiting for prices to improve, at little economic cost. But land value losses cannot safely be ignored when they are large or occur as the result of a change in long-term public policy rather than market fluctuation.

The land value losses will affect active managers (forest industry and high tax/high investment individuals) by making previously marginal forest land financially inoperable. That is, land that by reason of location or productivity had previously earned barely acceptable returns will earn unacceptably low returns under the Tax Reform Act, rendering it infeasible to manage. It is reasonable to expect that forest industry and the more financially oriented high tax/high investment owners will seek to divest themselves of these submarginal lands. Forest industry firms engaged in just such a practice during the early 1980s, selling outlying holdings and less productive acres as falling timber product prices reduced their value.

The land value losses to low tax/low investment individuals are the smallest of any ownership class, but they are substantial and should result in some land sales. It seems unlikely, however, that many of these owners have the financial and forestry expertise to quickly determine which of their acres are now submarginal. These land sales may be delayed for a period while the owners develop the answer intuitively. Conversely, the large land value losses to high tax/low investment individuals should motivate many in this class to immediately sell forest land. Lacking the ties to the land evidenced by active management, substantial numbers of these owners may elect to dispose of their forest land entirely. The result would be more land for sale than might otherwise be expected.

OTHER EFFECTS

Effects on the Forest Resource

The simplified forest management plans, shortened rotation lengths, and low-cost alternative practices to be anticipated on even the best managed lands as a result of the Tax Reform Act will adversely affect costs and quality in every processing step, from forest to finished product. Timber products of every type will be smaller and of poorer quality at financial maturity.

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Harvesting and handling costs increase exponentially with decreasing timber size, as does processing waste. Additionally, the younger timber will have a greater proportion of juvenile wood, which has been shown to be inferior to mature wood as a raw material for solid and composite products alike.

An attendant problem is that most low-cost alternatives to traditional silvicultural practices entail use of chemical herbicides as a substitute for mechanical treatments. While chemical registration and user licensing minimize any hazards to the environment, herbicide use remains a sensitive public relations issue for all classes of forest ownership, particularly forest industry.

Apart from these effects lies the question of forest land as a basic productive resource. The large number of forest acres expected to be offered for sale as a result of the Tax Reform Act presents a problem of disposition. Each of the traditional ownership classes will be attempting to sell rather than buy forest land. Even should they seek to buy land, capital insufficiency and cash flow problems resulting from recent weak markets make consolidation of large blocks of land by forest industry unlikely. And the available investment capital in the nonindustrial classes is fragmented among thousands of individuals. The way seems open for other groups, with other ownership objectives, to enter the landholding arena.

It is difficult, however, to identify prospective buyers. While it is rural, the bulk of forest land is unsuitable for field crops. Combined with the depressed state of the farm sector of the economy, this makes agriculture a poor candidate. Indeed, since the inception of the Conservation Reserve Program in 1986, many areas are experiencing a reversion of cropland acres to forest (Personal communication, James E. Neal, Cooperative Extension Service, 1987). Property values in nonrural areas have continued to rise over time, but again, the rural nature of forest land limits its short-term potential for conversion to nonrural uses. Thus, the future status of a substantial portion of the forest resource appears to be in question.

Effects on the State Economy

Beyond its consequences for forest land and forest owners, the Tax Reform Act can be expected to reduce tax receipts to state and local governments, and diminish the level of economic activity statewide. State income tax receipts should be little affected, since the Act changes net rather than gross timber income. But the losses in net income will cause proportionate decreases in spending, resulting in lower state and local sales tax revenues. The land value losses eventually will be reflected in lower property assessments and property tax receipts. The most heavily forested counties will suffer the greatest loss.

Considerably more serious is the ripple effect that timber income losses will have in the state economy. Each dollar of timber income generates additional dollars of cash flow before out-of-state spending, savings, or federal tax remove it from circulation. Arkansas, with an income multiplier of 2.27 (Troutman et al. 1981), should experience a total negative impact of $65.4 million per year in the state economy.
CONCLUSIONS

The outlook for timber production and management under 1986 Tax Reform Act is less than bright. Immediate consequences of the Act forecast for Arkansas include: losses of an estimated 10.6 percent in net timber income to private forest owners, and equivalent losses in forest land values. This equates to approximately $28.8 million per year statewide in income losses and $402.9 million—nearly $30 per forested acre—in land value losses. As anticipated, these estimates are low compared to those obtained in the even-aged stand studies, and must be considered conservative.

Losses of this magnitude represent a marked decline in the ability of timber production to compete with other types of investments. The income losses will compel active forest managers to simplify their management plans, shorten rotation lengths, and seek low-cost alternatives to traditional practices. The effect of income losses on owners who do not manage is more problematic. Some may be motivated to begin managing their forest holdings. Others may be induced to mine their timber or to entirely liquidate their forest investment. The land value losses will render a portion of the land held by each forest ownership class financially inoperable. Combined, these effects will result in an overall decline in the size and quality of timber products, increased harvesting and processing costs, the offering for sale of substantial acreages of forest land, and as-yet undefined changes in forest ownership and use patterns.

The losses also can be expected to cause reductions in sales and property tax receipts to state and local governments. More importantly, they will cause ripple effect (multiplier) losses in the state economy estimated at over $63.4 million per year. Thus, while they bear most heavily on private forest owners, the negative effects of the Tax Reform Act discussed in this paper will be felt throughout the economy.

LITERATURE CITED


