United States
Department of
Agriculture

Forest Service

**Northeastern Forest
Experiment Station**

Research Paper
NE-556

1985

Capital Gains Treatment of Timber Income: An Economic Assessment

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Abstract

Concern over government budget deficits has brought our tax system under closer scrutiny. Provisions for capital gains taxation in general, but particularly those pertaining to income from the sale of timber, have been controversial. This paper outlines criteria used to evaluate tax systems and examines how capital gains and the ordinary income tax perform within these criteria. Implications for social welfare and impact on timber supply are also discussed.

A Historical Perspective

Our permanent system of income taxation began with enactment of the 1913 Revenue Act. Soon afterward, Congress, recognizing the nation's dependence on private investment for economic growth, decided to give preferential tax treatment to income received from the sale of long-term capital assets. Since then timber has been recognized as one of many capital assets and, as such, eligible for capital gains treatment when sold.

Prior to 1944, capital gains treatment was permitted for income from timber sold in a lump-sum transaction, provided the timber was not held for sale in the ordinary course of business. Capital gains treatment was denied if an owner cut timber himself for later sale or use in his business or (as stated in Bureau of Internal Revenue Field Procedure Memorandum 249, Feb., 1943) if proceeds received were computed on a unit of volume removed basis, as opposed to a lump-sum sale (Siegel 1978). Thus, landowners who disposed of timber under a contract where marked trees were cut and paid for on a unit basis (retained economic interest), or who managed the forest but cut trees for use in their own business, were discriminated against. Congress, under political pressure stemming from increased timber demand during World War II and recognizing the negative impacts on timber supply this disparity might cause, moved to correct this situation. With minor modifications over the years, today's tax treatment of timber income resulted.

The relevant sections of the tax code are 631(a), 631(b), 1221, and 1231. Basically, section 631(a) accords capital gains treatment to taxpayers who cut timber for sale or use in their trade or business and 631(b) to taxpayers selling timber under a contract by virtue of which the owner retains an economic interest in the timber. Sections 1221 and 1231 outline certain conditions under which the gain from timber sold outright (without a retained economic interest) can still qualify for capital gains treatment. These sections deny capital gains treatment only when timber considered to be inventory or property held for sale in the ordinary course of business is sold outright. In most situations, capital gains treatment is accorded to income from the sale of timber.

Under the current statutes, 60 percent of long-term (held more than 1 year) capital gains income is excluded from taxation and the remaining 40 percent is taxed at the ordinary tax rate for individuals. For corporations, the long-term capital gains tax rate is 28 percent, compared to 46 percent for ordinary income. Thus, capital gains treatment is of considerable benefit to individuals and corporations.

Some perceive these savings as a government revenue loss. Over the years, capital gains provisions in general, and particularly those pertaining to timber, have been controversial. There have been many attacks and proposed changes, but Congress has continually reaffirmed its 1943 position. However, it is likely that controversy will continue. This paper outlines criteria used to evaluate tax systems and examines how capital gains and the ordinary income tax perform within these criteria.

Criteria for Evaluating Tax Systems

The following criteria may be used to evaluate tax systems:

1. Economic efficiency—A tax should interfere as little as possible with attainment of optimal resource allocation. Whenever possible, it should assist in attaining this optimum (Gregory 1972).
2. Equity—fairness of a tax. Both vertical and horizontal equity should be considered. Vertical equity is a comparison of the tax burden between different types of businesses and incomes; horizontal equity refers to fairness in the tax treatment of businesses or investments in assets of similar nature (Niemi 1978).
3. Operability—costs of administering the tax, to both government and taxpayers, should be kept to a minimum.
4. Revenue adequacy—A tax must raise the necessary revenues.

Economic Efficiency

Economic efficiency is achieved when resources are allocated so that no activity can be increased without cutting back on some other activity. Deciding which efficient solution is optimal requires knowledge of the social welfare function. Without this knowledge, other criteria for judging optimality must be used. Neutrality, with respect to optimal management decisions, is sometimes used to measure economic efficiency. Jackson (1980) states that "because efficiency in production is one necessary condition for the attainment of maximal social welfare (Bator 1957), any tax which reduces the level of economic efficiency by misallocating scarce productive factors supersedes the attainment of the optimal production frontier."

Pursuing this logic, we will examine the neutrality of various taxes in this section. Such an examination can be conducted within the framework of a model used to analyze the rotation age and management intensity decisions when a perpetual series of rotations is considered. The basic model, which is an extension of the familiar Faustmann (1849) formula is:

$$PDV(t,E) = \frac{P * V(t,E) * \exp(-ht) - WE}{1-\exp(-ht)} \quad [1]$$

where PDV(t,E) = present discounted value of a perpetual series of t-year rotations, with management effort E;
P = stumpage price;
V(t,E) = volume at age t, with effort E;
exp = inverse of the natural log function;
h = discount rate;
t = age of forest at rotation;
W = cost per unit of management;
E = level of management intensity.

To simplify the analysis all management effort is assumed to occur at the time of establishment. The first order conditions (FOC) for maximization of equation [1] are:

$$P * V'(t)-[h * (PV-WE)]/[1-\exp(-ht)] = 0 \quad [2]$$

$$P * V'(E) * \exp(-ht) - W = 0 \quad [3]$$

where V'(t) and V'(E) are the first partial derivatives of V with respect to t and E. These conditions equate marginal cost with marginal revenue. Equation [2] indicates that if E is held constant, the stand should be left to grow until the increase in value equals the opportunity cost of delaying the current and perpetual series of harvests. Equation [3] shows that, holding rotation age constant, management effort should be applied only to the point where the present value of the resultant volume increase equals the cost of an additional unit of input. The optimal rotation age and management effort to maximize present value are determined by solving equations [2] and [3] simultaneously.

To determine the neutrality characteristics of a capital gains tax equation [1] may be modified as follows:

$$PDV(t,E) = \frac{(1-T) * PV * \exp(-ht) + TWE * \exp(-ht)-WE}{1-\exp(-ht)} \quad [4]$$

where T = capital gains tax rate. The FOC simplify to:

$$P * V'(t)-[h * (PV-WE)]/[1-\exp(-ht)] = 0 \quad [5]$$

$$(1-T) * P * V'(E) * \exp(-ht)-W[1-T * \exp(-ht)] = 0 \quad [6]$$

Equation [5] indicates that if management intensity is held constant, the capital gains tax is neutral. However, equation [6] indicates that the optimal management intensity is influenced by the capital gains tax. This new value of E will change the optimal rotation age in equation [5]. Thus, a capital gains tax influences the optimal rotation age decision when management costs are incurred and are influenced by imposition of the tax.

The model can also be modified to include an ordinary income tax.

$$PDV(t,E) = \frac{(1-T) * [PV * \exp(-ht) - WE]}{1-\exp(-ht)} \quad [7]$$

where T = ordinary income tax rate.

The FOC simplify to:

$$P * V'(t)-[h * (PV-WE)]/[1-\exp(-ht)] = 0 \quad [8]$$

$$P * V'(E) * \exp(-ht) - W = 0 \quad [9]$$

and indicate that the ordinary income tax is neutral with respect to both rotation age and management intensity.

However, an important shortcoming of the above model is its failure to consider nontimber forest values (Hartman 1976). When these values are introduced, the ordinary income tax is no longer neutral. This is demonstrated by modifying Hartman's model to include an ordinary income tax and examining the FOC

$$PDV(t,E) = \frac{(1-T) * [PV * \exp(-ht) - WE] + \int_0^t F(x)\exp(-hx)dx}{1-\exp(-ht)} \qquad [10]$$

where F(x) = the value of nontimber benefits accruing to the landowner in year x.

The FOC with respect to rotation age is:

$$(1-T) * [P * V'(t) - [h * (PV-WE)]/[1-\exp(-ht)]] \qquad [11]$$

$$+ F(t)-h\int_0^t F(x)\exp(-hx)dx/[1-\exp(-ht)] = 0$$

Hartman shows that it may be optimal never to harvest the forest. Increased taxes reduce timber values relative to nontimber values. Because the tax on capital gains is lower, the no-harvest decision will be optimal less frequently than with an ordinary income tax.

The basic difference between the two taxes, with respect to neutrality, is the timing of the tax deduction for regeneration costs. Tax incentives for reforestation improve the economic efficiency of the capital gains tax (Dennis 1983). Reforestation expenses (up to $10,000 annually) now can be amortized over the first 7 years, thus bringing the timing of the deduction closer under the two systems. However, this difference is of little consequence to large landowners for whom reforestation costs are far in excess of $10,000 or where other capitalized management costs (not subject to amortization) are substantial.

Further examination of the FOC reveals that a capital gains tax decreases optimal management intensity. The ordinary income tax is neutral but this distinction breaks down if nontimber values are introduced. Also, neutrality differences between the capital gains and ordinary income tax are reduced by amortization of reforestation costs.

The above discussion has considered tax-induced changes in the allocation of productive factors. Misallocation of resources also can result from externalities—interactions among economic agents that are not adequately reflected in markets. An externality exists when the activities of one agent directly affect the utility of another. If externalities are present, profit-maximizing behavior will not necessarily lead to an efficient allocation of resources, because the producer is not responding to the true social price (Varian 1978). A traditional remedy, first advanced by Pigou (1946), is to alter the tax structure to bring social and private costs into agreement.

Forests produce benefits that are not priced in the market. One justification for preferential tax treatment of timber income is to bring the social and market prices of timber into closer agreement. If the producer receives the true social price, then socially optimal decisions should result. Because capital gains preference, as compared to an ordinary income tax, lessens the gap between the social and market price of timber, it will influence decisions toward the social optimum.

Equity

Long-term investments in capital assets clearly receive preferential treatment. Deleting capital gains provisions from the tax code would remove this inequity. Income, regardless of source, would be taxed at ordinary income rates. However, because income from an entire rotation is taxed in the year of harvest, the total tax liability is significantly greater than if the same income were spread over many years. Our progressive income tax is biased against forestry or other investments characterized by sporadic income receipts. Provisions for income averaging relieve this problem somewhat, but the bias remains. Some form of vertical inequity exists under each tax system but capital gains taxation, because of the 60 percent exclusion for individuals, reduces the bias against sporadic large income receipts in the ordinary income tax.

Since public agencies do not pay taxes, any tax levied on the private sector may be viewed as horizontally inequitable. Capital gains treatment, because of the exclusion for individuals and low rate for corporations, reduces this inequity for timber investment.

If horizontal equity is to be considered, proposed changes in the tax code must affect investments of similar nature in the same way. Denying capital gains treatment to timber income while retaining it for other capital investments clearly introduces horizontal inequity.

Operability

Both the ordinary income tax and capital gains tax provisions are presently operable. Treating all income as ordinary would simplify the tax code and make reporting slightly easier. Historically, complexities in the tax code that strengthen performance with respect to other criteria have been accepted.

Revenue Adequacy

Since determining a measure of "necessary" revenue is beyond the scope of this study, I will concentrate on differences in revenue receipts. Capital gains taxation, because of the 60 percent exclusion for individuals and low corporate rates, reduces Treasury receipts. In some arguments against capital gains taxation, figures that purport to measure government revenue loss or the benefit received by taxpayers are quoted. Frequently, these figures estimate differences in tax revenue that would occur if no behavioral changes resulted from the proposed changes in the tax system. Because behavioral changes *do* occur, these figures generally overestimate the impact of tax changes and should be used with caution. The change in Treasury receipts is dependent upon the elasticities of supply and demand and, of course, the magnitude of the tax rate change.

Impacts on Timber Supply and Social Welfare

The influence of taxes on timber supply is illustrated in Figure 1. Without taxes, supply and demand are in equilibrium at price P1 and quantity Q1. A tax on timber output shifts the supply curve up by the amount of the tax to S2. Initially, the price received by suppliers is reduced by the amount of the tax. However, at this price supply and demand are not in equilibrium. The after-tax equilibrium becomes (Q2, P2). The price increase is less than the amount of the tax because the increased price has induced consumers to demand less, and the smaller amount can be produced at a lower marginal cost (Varian 1978).

The reduction in output (Q1 less Q2) resulting from the tax is caused by changes in management intensity and rotation age, and by land shifting out of timber production into other uses. Because the price increase is less than the tax, the net price received by the timber grower is reduced. This is reflected in lower soil rents for timberland. Forestland initially at the margin may shift into competing uses. Because rates are significantly lower, a capital gains tax reduces timber supply less than an ordinary income tax.

Figure 1 also aids in examining welfare implications. Consumer surplus is the difference between the total value consumers receive from consumption and the total amount they pay for the good. Before the tax, consumer surplus is indicated by area AP1G. Imposition of the tax reduces consumer surplus to BP2G. Producer surplus is a measure of profit plus rent and is expressed as total revenue less the area beneath the supply curve. The difference between the revenue received by the government and the loss in consumer and producer surplus is called the deadweight loss. Area ABC indicates the deadweight loss of taxation. Its amount is determined by the elasticities of supply and demand and the magnitude of the tax. Less deadweight loss is associated with a capital gains tax than with an ordinary income tax—the tax-induced supply shift is less, because the tax rate is lower.

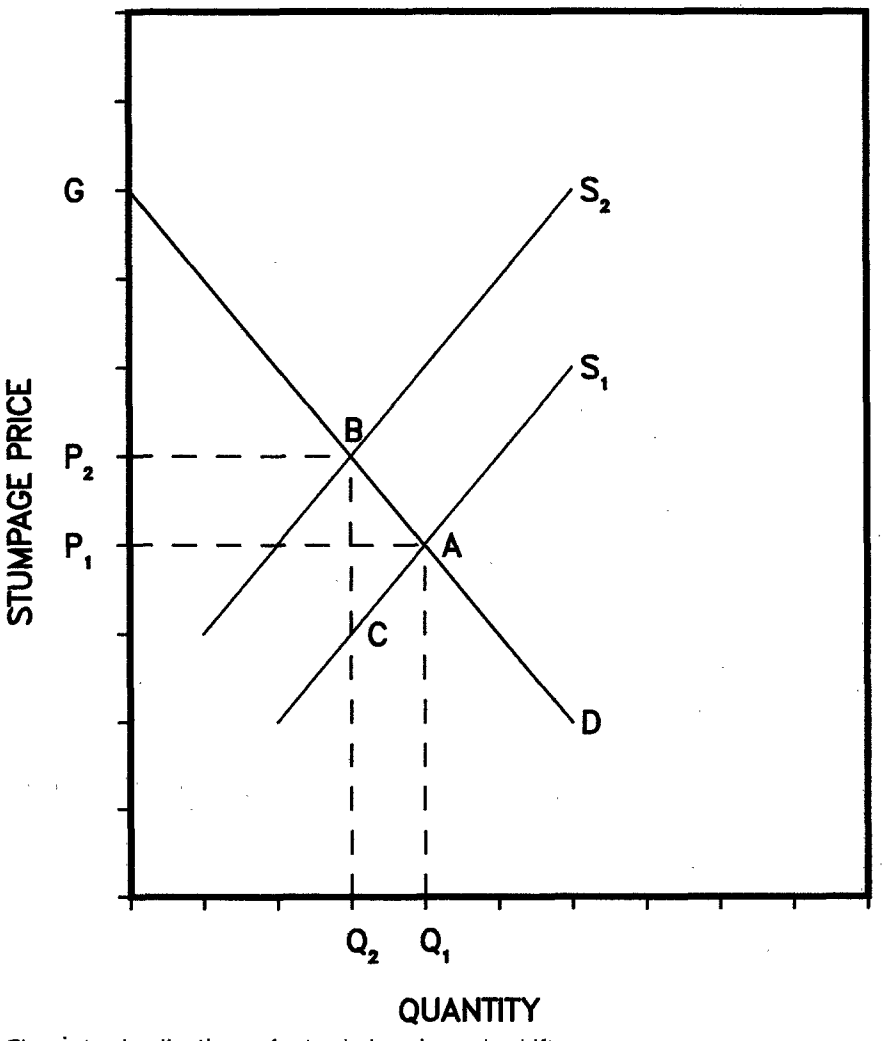

Figure 1.—Implications of a tax-induced supply shift.

Conclusion

The present controversy is about eliminating capital gains provisions in favor of ordinary income tax treatment for timber income. If that is done, soil rents for timberland will decline, causing some land to shift out of timber production. This reduction in soil rent will effectively be a lump-sum loss to timberland owners, which is particularly inequitable if capital gains treatment is retained for other long-term investments. This inequity alone is a substantial argument for retaining capital gains. Increased taxes will reduce output on much land that remains in timber production, particularly where multiple-use management is employed, because timber returns decline in relation to other values. Taxing timber at a higher rate would widen the gap between the social and market prices of timber, cause significant inequities for present timberland owners, and have negative impacts on timber supply.

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Treating timber income as capital gains meets the criteria used to evaluate tax systems better than treating it as ordinary income. Social welfare implications and impact on timber supply also favor such treatment.

ODC 950

Keywords: Taxation; capital gains

☆ U.S. GOVERNMENT PRINTING OFFICE: 1985—505-028/540

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