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## Flora, Time Discounting by Certain Forest Landowners

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# ***Time Discounting by Certain Forest Landowners***

By

DONALD F. FLORA

New Haven: Yale University Press,

School of Forestry,

Bulletin No. 69. 1966.

Pp. 55, \$1.50 (soft cover)

One of the most bothersome aspects of capital theory is the role of subjective time preference and its relation to rates of return on capital. In forestry, characterized as it is by extraordinarily long investment periods, this is a critical issue. Yet time preference has hitherto been most inadequately dealt with (or more often ignored) in the literature on forest economics. In this study, Donald Flora sets out to clarify the role of subjective time preference in influencing the decisions of investors and its relationship to alternative rates of return on capital. He attempts also to determine empirically the strength of time preference governing the behavior of a sample of New England forest owners.

The first part of Flora's study summarizes the work of Irving Fisher and others relating to economic choices involving time, given the objective of maximizing investors' satisfaction (as distinct from the maximization of present worth). This is perhaps the most valuable part of the study for readers interested in the management of natural resources. While sometimes laboriously detailed and over-diagrammed, the presentation of the theoretical analysis is clear, and in terms much easier to understand than the esoteric original literature on the subject which has appeared in economic journals. The discussion demonstrates that whenever imperfections exist in the market for capital (which must be recognized as a pervasive problem among small forest owners) an adequate understanding of investors' behavior involves more than the traditional concept of maximizing present worth.

But Flora's interpretation of the theory seems to involve a confusion about the role of time preference, which has serious implications for the rest of his study. It follows from his Fisherian model that investors will always follow the dictates of their time preference, and in a perfect borrowing and lending market they will equalize their marginal rates of time preference and the rates of return available in comparable market opportunities. To the extent that

they do not, in fact, achieve this equality, market imperfections are implied.

But Flora, after satisfying himself that some of his sampled forest owners reported time-valuations that follow patterns consistent with compound interest, concluded that in these cases it is not time preference at all but market rates of interest that influence the owner's decisions.<sup>1</sup> This is clearly a non sequitur. The fact that marginal rates of time preference correspond to interest rates is in no way inconsistent with the Fisherian principle that time preference is always the governing force, and that market imperfections explain any divergencies between the two rates.

Flora's empirical investigation raises serious questions about its relevance to the theoretical question he poses, and hence also about the validity of his conclusions. His sample of forest owners was, as he admits, small and atypical, but this is not serious for his purposes. Much more critical is the fact that he draws conclusions about the economic behavior of a group of forest owners whose objectives are non-economic. Of his sample of 50 owners, 15 were pursuing aesthetic objectives, 9 were seeking deferred income or increases in real estate values associated with recreation, and others were attempting to enhance the "atmosphere" surrounding their business, inherited the woodland with a farm or mill, or held the forest "because of a lack of opportunity to sell the land."<sup>2</sup> In view of this sample, it is perhaps no wonder that risk considerations apparently played so insignificant a role, and that owners' expressed investment criteria varied so greatly and diverged so frequently from present-worth maximizing rules. There is no convincing evidence that such owners' investment decisions were dominated by economic considerations, and hence there seems little justification for using their information to establish the forces governing economic behavior.

Where commercial timber is only one of several products (recreation and aesthetics, for example, are others) simultaneously produced by the forest, we are faced with a joint-product problem. The owner's decision-making will be aimed at maximizing the aggregate gain he derives from all products combined. It is obviously impossible to draw many conclusions about the way in which decisions are made about the production of one product from observations about behavior in pursuit of a group of interrelated products of unspecified value.

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1. P. 48.

2. P. 47.

There are, in addition, one or two statements of theory that are incorrect in the light of recent work in capital theory and forest economics. It is not true, for example, that the rotation to maximize present worth is determined by holding the timber until its rate of value growth declines "to the rate of return offered by the best alternative investment in the same risk class,"<sup>3</sup> because this criterion ignores the cost of holding the land under the existing crop of trees. Nor is it correct, for purely mathematical reasons, to contend that "[i]f the objective is maximum discounted net value of the total system, then the proper criterion is internal rate of return."<sup>4</sup> The evidence that some forest owners have a planning horizon of only a year or two<sup>5</sup> seems difficult to reconcile with the fact that they are engaged in growing timber crops. Fortunately, these and several other errors of theory or interpretation do not seriously affect the main discussion.

Some interesting questions of policy are raised by this inquiry which the author obviously considered as beyond the scope of his study. Even if forest owners did equate their marginal rates of time preferences to market opportunity rates, would this be desirable from a social point of view? What is the appropriate public policy in the face of high (or low) rates of time preference on the part of private resource owners? To what extent and under what circumstances is it rational to sacrifice rates of return in favor of "steady yield" to feed an integrated utilization plant?

In spite of the shortcomings noted above, Flora has nevertheless made a useful contribution to the literature of forest economics by bringing a neglected but relevant body of theory to the attention of foresters.

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3. P. 16.

4. P. 17.

5. P. 37.

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