Empirical Studies of Nonindustrial Private Forest Management: A Critical Review

Subhrendu K. Pattanayak
Robert H. Beach
Robert C. Abt
Brian C. Murray
Jui-Chen Yang

Abstract

Forest policies and management increasingly rely on economic simulation models to explain behaviors of landowners with respect to market, owner and resource characteristics and to project forest product outputs, inventories, and land use. These economic simulation models in turn rely on econometric models to test hypotheses about assumed behaviors and provide behavioral parameters for projections. Unfortunately, existing econometric studies suffer from a variety of problems including, but not limited to, (a) piecemeal or individual models of forestry decisions, (b) omitted factors and variables, (c) inadequate characterization of owner-manager's objectives and preferences, and (d) parameters transferred from other sites and studies. Characterizing the motives and preferences of non-industrial private forest (NIPF) landowners, who own approximately two-thirds of the forest land base, is particular challenging. In this paper, we conduct a thorough and systematic review of the empirical econometric literature on private forest management, published in the last 20 years, and identify the determinants of forest management within an economic framework. Based on the criteria of (a) statistical analysis of landowner data and (b) focus on forest management, we limit our comparative analysis to about 25 studies. These studies primarily address reforestation (about 18 studies), but a small subset addresses silvicultural treatments (5 studies). We confirm four factors as determinants of management: economic drivers, policy variables, owner characteristics and plot/resource conditions. We discuss the direction of influence for variables in each category. Based on our findings, we propose an equation system approach towards empirically modeling forest management and discuss details of a data structure for North Carolina's forests that can be used to test our proposed empirical strategy. We also discuss the use of the estimated parameters in timber supply projection models such as the Subregional Timber Supply (SRTS) to further evaluate the empirical implications of such a system-based modeling approach.

1 Research Triangle Institute (RTI)
2 North Carolina State University