

FOREST DECISION-MAKING IN AN UNCERTAIN WORLD

Forest management decisions are based on predictions of future values of economic and biological parameters. Many forestry economics models, including the well-known Faustmann model, assume that future parameter values are the same as the current values, or change in a predictable fashion. Unfortunately, these assumptions often are not supported by observed parameter values. Some parameters, most notably stumpage prices, fluctuate unpredictably over time.

Over the last decade, there have been numerous papers published with models that incorporate unpredictable future parameter values. These models usually replace the assumption of predictable parameter values with the assumption that future values of some parameter vary with a known probability distribution. A key structural innovation of these models is that they allow land owners or forest managers to modify current or planned decisions as parameter values are revealed. This approach requires that "closed loop" techniques such as stochastic, dynamic programming are used rather "open loop" calculus-based techniques.

This explosion of papers with models that incorporate unpredictable future parameter values has changed how we answer fundamental questions in forestry economics, including the classic problem: when should a landowner optimally harvest a stand? For example, under a wide range of conditions optimal harvest decisions depend on the current value of the stumpage prices. Under similar conditions forest investments may be more valuable than previously thought. Such insights not only refine our understanding of landowner and manager behavior, but also change our evaluation of government policy choices for the forestry sector.

Of the research that has been completed to date, three distinct approaches are identifiable. The first approach uses dynamic programming to allow land owners to vary harvesting decisions in response to fluctuating stumpage prices. The second approach treats harvesting decisions as financial options. The third approach considers investment decisions to be partially or fully irreversible, and describes the optimal timing of investment decisions.

Previous research has also opened up a rich set of additional topics that need further investigation. An incomplete list includes:

- i) More focused evaluations of standard forest policy measures including taxes, planting/management subsidies, and trade restrictions.
- ii) A widening of the scope of the theoretical analysis to include other economic and biological parameters beyond stumpage price.

- iii) More accurately and more completely incorporating the patterns of uncertainty for specific markets and species.
- iv) The role of innovative funding mechanisms in fostering forest investment.
- v) Financial measurement of risk and diversification and pooling methods for incorporating it in forest investments.

To encourage analysis of these and other related questions, the *Journal of Forest Economics* is devoting a special issue to the incorporation of risk and uncertainty into forest economics models. Richard Brazee and David H. Newman will be the guest co-editors of this special issue. Submissions that address any economic aspect of forest decision making under risk or uncertainty are encouraged.

In addition, the University of Georgia, the U.S. Department of Agriculture Forest Service, and the *Journal of Forest Economics* are sponsoring an associated conference, "Forestry Decision-Making in an Uncertain World." The conference will be held in Savannah, Georgia, USA in March of 1998. (The final date is still being negotiated). For those wishing to present papers at this conference, abstracts should be mailed to one of the conference organizers, Richard J. Brazee or David H. Newman, by December 1, 1997. Authors intending to submit manuscripts for consideration in the special issue of the *Journal of Forest Economics* are encouraged to present their manuscripts at this conference.

For more information regarding manuscript submission for the special issue of the *Journal of Forest Economics* or for the conference, "Forestry Decision-Making in an Uncertain World," please contact:

Richard J. Brazee
Department of Natural Resources and Environmental Sciences
University of Illinois at Urbana-Champaign
Urbana, IL 61801, USA
phone: 1-217-333-6271
e-mail: r-brazee@uiuc.edu

or

David H. Newman
Warnell School of Forest Resources
University of Georgia
Athens, Georgia 30602-2152, USA
phone: 1-706-542-7649
e-mail: newman@uga.cc.uga.edu

Richard J. Brazee and David H. Newman/ associate editors