

Title: Optimal continuous natural resource extraction with increasing risk in prices and stock dynamics

Dr. Peter Lohmander

Professor of Forest Management and Economic Optimization
Swedish University of Agricultural Sciences, SLU
Sweden

Abstract

Bioenergy is based on the dynamic utilization of natural resources. The dynamic supply of such energy resources is of fundamental importance to the success of bioenergy. This analysis concerns the optimal present extraction of a natural resource and how this is affected by different kinds of future risk. The objective function is the expected present value of all operations over time. The analysis is performed via general function multi dimensional analytical optimization and comparative dynamics analysis in discrete time. First, the price and/or cost risk in the next period increases. The direction of optimal adjustment of the present extraction level is found to be a function of the third order derivatives of the profit functions in later time periods with respect to the extraction levels. In the second section, the optimal present extraction level is studied under the influence of increasing risk in the growth process. Again, the direction of optimal adjustment of the present extraction is found to be a function of the third order derivatives of the profit functions in later time periods with respect to the extraction levels. In the third section, the resource contains different species, growing together. Furthermore, the total harvest in each period is constrained. The directions of adjustments of the present extraction levels are functions of the third order derivatives, if the price or cost risk of one of the species increases.

Biography

Peter Lohmander obtained his MSc exam with thesis in mathematical statistics, in 1981. He defended his doctor of forestry thesis in forest economics, SLU, 1987, and became acting professor in forest economics, SLU, 1990. He was declared as competent, and as the most competent of three competent applicants, for professorship (by all the three referees) in forest economics, SLU, 1990. He became associate professor of forest economics, SLU, 1995 and was declared competent for professorship (by all the three referees) in forest planning, forest management, SLU, 1995. Peter Lohmander was appointed professor of forest management and economic optimization, SLU, faculty of forest sciences, 2000. Furthermore, he was declared competent (by all the three referees) for professorship in industrial economics, SLU, 2009. Peter Lohmander has chaired many international conferences. Peter Lohmanders website: <http://www.lohmander.com/>