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Lars Lönnstedt and Björn Rosenquist (eds.)

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Forest owners' divestment and investment strategies

*Kari Hyytiäinen and Markku Penttinen**

Abstract

Forest owners' optimal harvesting and investment strategies are studied at the forest holding level by including individual forest stands in an asset class portfolio. The forest owner has an option either to clearcut the mature stands and to invest the capital in financial or real asset classes (bank deposits, government bonds, stocks, apartments) or to postpone clearcutting and retain capital in standing trees. Forest inventory data, simulation-optimisation programme Mela and statistics of timber prices are utilised to compute the return series for forest stands. Numerical results show that the optimum level of clearcutting decreases markedly with initial non-forest wealth, particular at low risk-free rates of interest. This suggests that it is rational for non-industrial private forest owners to employ shorter rotations than institutional investors that possess diversified portfolios. Increasing the variety of stand structures by planting different species is not likely to bring substantial benefits due to the correlation between returns from forest stands. The value growth of forest stands can be used to estimate annual returns only for those stands that are soon to be mature. An alternative method for computing the returns for stands at any development phase is proposed based on the net present value of the stand adjusted with fluctuations in forest land prices. This method applies to cases where selling forest stands in the forest land market is considered as an option. Even if selling is not an option, the ratio of maximised net present value to value at immediate harvest can be used as a 'maturity index' for ranking the stands for portfolio optimisation.

Keywords: clearcutting, efficient frontier, forest management planning, portfolio optimisation, risk-neutral

