LMS Economatic
By Kevin Zobrist

The "Economatic" is a spreadsheet-based economic and financial analysis companion program for the Landscape Management System (LMS). LMS is a free software package that integrates forest growth, visualization, and spatial models in a user-friendly environment. LMS enables landowners to simulate management alternatives for their forest and evaluate projected outcomes through tables, charts, and computer-rendered images. Economatic takes management simulation data directly from LMS and automatically computes a variety of economic values such as discounted cash flow, soil expectation value, and internal rate of return. The interface is easy to use, and users can completely customize costs, prices, tax rates, and other input parameters. Results are summarized at both the stand and landscape level in a series of useful tables and charts.

Rural Technology Initiative

Economatic Inputs

A number of economic analysis programs are available for forest landowners. Economatic is unique in that it is integrated with growth and treatment models through LMS. This allows for harvest inputs to be supplied internally by the model rather than requiring external estimates. Once a management simulation has been run in LMS, Economatic can be opened as an output table and harvest information will be automatically loaded into the spreadsheet.
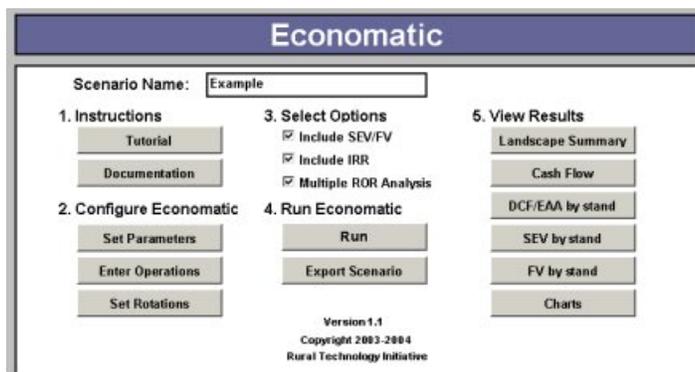

Figure 1: The navigation menu guides users through configuring and running Economatic.

Once Economatic is loaded, the navigation menu guides users through configuring other input parameters. The most important parameter is the target rate of return. Economatic can calculate values at a fixed rate and also across a range of rates at specified increments. Management cost parameters are divided between annual expenses (overhead, etc.) and periodic expenses (regeneration, stocking control, etc.). Up to three annual and six periodic costs (or revenues) can be defined. Periodic costs are then applied to the management scenario by filling in a grid of stands and years.

Log prices are not configured by Economatic but are defined by log sort tables in LMS. However, these log sort tables can be fully customized before running Economatic by using another companion program called the Sort Table Wizard. Economatic can work with both stumpage and delivered prices. If stumpage prices are used, logging costs can be set to zero. Otherwise, a logging

cost schedule can be defined that allows differentiation by average cut diameter, ground versus cable operations, and thinning versus clear-cut harvests. The appropriate costs are applied by Economatic based on harvest parameters imported from LMS for each stand.

Other input parameters that can be configured include across-the-board adjustments of log prices and harvest volumes to allow for sensitivity analysis of different conditions. The log price adjustment can be used to explore results under different market conditions, while the harvest volume adjustment can be used to simulate the impacts of productivity or regulatory changes. Several tax rates can also be defined if desired, including a yield tax and both federal and state income taxes on ordinary income and capital gains.

Economatic Outputs

Once the input parameters have been configured, Economatic can compute several values. Basic analysis includes calculation of cash flow for each stand over time along with the total and average cash flow for the entire landscape. A discounted cash flow (DCF) is then computed in which the nominal cash flows are discounted to the present at the defined rate of return and the net present value (NPV) computed on a total and per acre basis. Equivalent Annual Annuity (EAA) is also included, which equates the DCF with an annual revenue stream.

Advanced users can include soil expectation value (SEV), forest value (FV), or internal rate of return (IRR) in the analysis. SEV (also called bare land value) represents the underlying economic value of the land based on the NPV for a complete forest rotation (planting to harvest) repeated in perpetuity. Forest value is the total economic value of the forest including SEV along with the economic value of any currently standing timber. IRR is the rate of return at which SEV becomes equal to zero (i.e. present value of expected revenues is equal to the present value of expected costs). These figures can be included for even-aged management simulations that include at least one complete rotation from planting to harvest. SEV and FV are calculated on a per acre and total basis at both the stand and landscape level, while IRR is calculated for the total landscape. All three figures are useful for comparing the performance of different forest management strategies.

Along with stand and landscape tabular summaries, output values can also be plotted across multiple rate of return. An additional tool included with Economatic called the Scenario Analyzer allows users to compare summary results from up to eight different Economatic runs, allowing for easy comparisons across multiple management simulations.

Getting Economatic

Both the Economatic and the LMS program itself are available for free download. Free CD-ROMs are also available from RTI upon request. Economatic works on computers running Microsoft Windows 98 or later. Microsoft Excel 2000 or later is also required. A tutorial is included that covers every aspect of the program in detail.

Download the Economatic: http://lms.cfr.washington.edu/lmseconomatic.html

Download the LMS program: http://lms.cfr.washington.edu/lmsdownload.php

Contacts: For more information visit the RTI website at www.ruraltech.org or contact Kevin Zobrist, Rural Technology Initiative, University of Washington (206) 543-0827.

University of Washington
College of Forest Resources

WASHINGTON STATE UNIVERSITY

USDA-FS
Cooperative Forestry