Notes for Thursday, February 12, 2004

Announcements

By today you should have read through Chapter 7, Section 4
  - For Tuesday you should finish all of Chapter 7.
  - No Study Questions for Tuesday.

Review for Exam
  - Test will be held during lab hours next week.
  - Can go longer than regular lab period, if needed.
  - Bring a study sheet: 2 sides, write anything you want.
  - Calculators are essential.

Catch Up: How do the LEV and the optimal rotation vary with changes in P, E, r, and A?

Forest Value
  - Definition
  - How does the forest value generalize the LEV?

Example
  - Harvest Immediately
Definition of the Forest Value

The **Forest Value** is the present value, per unit area of forest, of the projected costs and revenues from the current stand and from an infinite series of identical future forest rotations which will begin when the current stand is harvested. The forest value includes the value of both the trees and the land.

In the simplest case, it is assumed that:

i) the current stand will be harvested, either now or at some point in the future, and

ii) it will be replaced with a new stand, and

iii) all future rotations (after the current one) will be identical, with rotations of equal length and identical net revenue streams within a rotation.

How does the forest value generalize the LEV?

L Generalizes the LEV by applying to forested properties at any stage of development, not just at the beginning of the rotation.

L Includes the value of both the land and the trees.
The Forest Value

Example

You are planning to purchase a timbered tract that you plan to harvest immediately, with the intention of regenerating the stand for future timber crops.

- The tract is a northern hardwood stand,
- ...with 18 mbf of sawtimber and 14 cords of pulpwood per acre.
- Current northern hardwood stumpage prices are $325/mbf and $7/cord.

L How much can you afford to pay for this tract?
L What is the value of the timber on the tract?
L Should the timber be cut now?

If cut now, the timber is worth:

\[
\text{Timber Value} = 18\text{mbf} \times \$325/\text{mbf} + 14\text{cd} \times \$7/\text{cd} = \$5948
\]

But the tract consists of both land and timber, so we also need to know the value of the land...
Calculating the Value of the Land

Example (continued)

Some additional information is needed regarding the future management of the stand:

- You plan to regenerate the stand naturally.
- A timber stand improvement cut will be made in 30 years,
  - yielding about 12 c.d's of hardwood pulpwood.
- In another 30 years (i.e., at age 60), you expect to clearcut the stand again,
  - yielding 13 mbf of sawtimmer and 25 cords of pulpwood.
- Annual taxes on the property are $5 per acre.
- All of your cost estimates are in current dollars, and you expect real stumpage prices and management costs to remain constant.
- You want to earn a real rate of return on your investment of at least 5%.

Calculate the LEV

\[
FV_1 = 12 \times 7 \times (1.05)^{30} + 13 \times 325 + 25 \times 7 = 4,763.04
\]

\[
LEV = \frac{FV_1}{(1 + r)^R - 1} - \frac{tax}{r} = \frac{4,763}{(1.05)^{60} - 1} - \frac{5}{0.05} = 169.42
\]
Thus, the forest value of the stand, if it is cut now, is:

\[
\text{Forest Value}_{\text{cut now}} = 5948 + 169.42 = 6117.42
\]