



Lecture 21. More marginal analysis and comparing projects

FOR 2022. Financial Analysis for Natural Resources.



School of Forest Resources



Marginal analysis examples

- Case 1: New activity
- Case 2: Different levels of an activity
- Case 3: A new activity with different timing of returns
- Cannot compare directly two projects with different time horizons
 - If repeatable, use EAA (EAE) or SEV to “normalize” for time.
 - Otherwise, you must “manually” adjust for time.



Examples of marginal analysis – case 1

| Project A | | | Project B | | |
|-----------|----------------------|------------|-----------|----------------------|------------|
| Year(s) | Activity | Cash Flow | Year(s) | Activity | Cash Flow |
| 0 | Site prep | (\$15,000) | (0) | Site prep | (\$15,000) |
| 1 | Planting | (\$6,500) | 1 | Planting | (\$6,500) |
| 15 | Thinning | \$25,000 | 15 | Thinning | \$25,000 |
| 22 | Thinning | \$75,000 | 22 | Thinning | \$75,000 |
| | | | 23 | Fertilization | (\$11,000) |
| 30 | Regeneration felling | \$350,000 | 30 | Regeneration felling | \$400,000 |





Examples of marginal analysis – case 2

| Project A | | | Project B | | |
|-----------|----------------------|------------|-----------|----------------------|------------|
| Year(s) | Activity | Cash Flow | Year(s) | Activity | Cash Flow |
| 0 | Site prep | (\$15,000) | 0 | Site prep | (\$25,000) |
| 1 | Planting | (\$6,500) | 1 | Planting | (\$6,500) |
| 15 | Thinning | \$25,000 | 15 | Thinning | \$32,000 |
| 22 | Thinning | \$75,000 | 22 | Thinning | \$100,000 |
| 30 | Regeneration felling | \$320,000 | 30 | Regeneration felling | \$420,000 |





Example of marginal analysis – case 3

| Project A | | | Project B | | |
|-----------|----------------------|-----------|-----------|----------------------|-----------|
| Year(s) | Activity | Cash Flow | Year(s) | Activity | Cash Flow |
| 0 | Site prep and plant | (\$175) | 0 | Site prep and plant | (\$175) |
| 1-31 | Net annual income | \$1.75 | 1-27 | Net annual income | \$1.75 |
| 15 | Thinning | \$280 | 15 | Thinning | \$280 |
| | | | 16 | Fertilize | (\$100) |
| 22 | Thinning | \$500 | 21 | Thinning | \$600 |
| 31 | Regeneration felling | \$3800 | 29 | Regeneration felling | \$4500 |






Marginal increments

| Project A | | | Project B | | | Project C | | |
|-----------|---------------|-----------|-----------|---------------|-----------|-----------|---------------|-----------|
| Year(s) | Activity | Cash Flow | Year(s) | Activity | Cash Flow | Year(s) | Activity | Cash Flow |
| 0 | Site prep | (\$125) | 0 | Site prep | (\$125) | 0 | Site prep | (\$125) |
| 1 | Plant | (\$65) | 1 | Plant | (\$65) | 1 | Plant | (\$65) |
| | | | 10 | Herbicide | (\$100) | 10 | Herbicide | (\$100) |
| 15 | Thin | \$150 | 15 | Thin | \$250 | 15 | Thin | \$250 |
| | | | | | | 16 | Fertilize | (\$100) |
| 22 | Thin | \$400 | 22 | Thin | \$500 | 22 | Thin | \$700 |
| 31 | Regen felling | \$3,500 | 31 | Regen felling | \$3,700 | 31 | Regen felling | \$4,200 |






Normalizing two non-repeatable projects

| Project S | | Project L | |
|-----------|------------|-----------|------------|
| Year | Cash Flow | Year | Cash Flow |
| 0 | (\$10,000) | 0 | (\$10,000) |
| 12 | \$39,000 | 17 | \$69,000 |

Which project is best if your best alternative rate of return is 9%?

Case 1: Assume projects are repeatable

Case 2: Assume projects are NOT repeatable



Economic activity / marginal analysis process

NTLS

- Conduct NPV analysis for all projects to ensure total project benefits greater than total project costs (economic efficiency criteria #1). If the projects are of different lengths, use EAE, SEV, or normalization criteria to equate time factor.
- Are there a separate, identifiable marginal components? If so, separate the marginal costs and benefits and conduct a NPV analysis on the components.
- Evaluate all aspects of project to ensure best technology / lowest cost technology used in all projects.



Next lecture...

Inflation, real dollars,
nominal dollars