How do operating and ownership costs differ?

How are ownership costs calculated?

How do cash and noncash costs differ?

How do fixed and variable costs differ?

How do sunk costs affect decisions?
Operating Costs (variable)

- Cost of goods or services that are used up in one production cycle
- Seed, fertilizer, fuel, wages, rent, repairs, feed, veterinary, etc.
Ownership Costs

Costs of goods that last more than one production cycle

- Machinery
- Equipment
- Breeding livestock
- Land
- Buildings

Capital Assets
Ownership Costs (fixed costs)

- **Depreciation**: loss in value due to wearout or obsolescence
- **Interest** on investment: cost of a loan or opportunity cost on your own capital
- **Insurance**: casualty, theft, etc.
- **Taxes**: property (on some items)
- **Repairs** and maintenance: just buildings
  They are an operating cost for machinery.
Machinery Example (pages 403-405)

Current Year Costs

- Current value of tractor = $50,000
- Depreciation: take 10% of current value
  \[ \text{\$50,000 x 10\%} = \text{\$5,000} \]
- Interest: current value x interest rate
  \[ \text{\$50,000 x 7\%} = \text{\$3,500 / year} \]
- Insurance and taxes: est. 1% of current value
  \[ \text{\$50,000 x 1\%} = \text{\$500 per year} \]
- Total ownership cost = $9,000
What Interest Rate to Use?

- Use weighted average cost of capital
- Example:
  - $30,000 is owed on the tractor, at 9% interest (60% debt capital)
  - $20,000 of equity capital that could earn 4% in a savings account (40% equity)
- Cost of capital = \((0.60 \times 9\%) + (0.40 \times 4\%)
  = 5.4\% + 1.6\% = 7.0\%\)
- 7% x $50,000 = $3,500
Interest Cost on Capital Assets

- Or:
  - Loan: $30,000 x 9% = $2,700
  - Equity: $20,000 x 4% = 800
  - Total interest = $3,500
Building Ownership Costs
Estimated value of building is $60,000

- Interest (on current value)
  \[7\% \times \$60,000 = \$4,200 \text{ / year}\]

- Depreciation
  \[5\% \times \$60,000 = \$3,000\]

- Taxes and insurance (current)
  \[1\% \times \$60,000 = \$600\]

- Repairs.& maintenance: 2 - 4% of value
  \[3\% \times \$60,000 = \$3,000\]

- Total ownership costs = \$10,800 per year
Average Ownership Costs over the Entire Ownership Period

- Depreciation =
  \[(\text{purchase cost} - \text{salvage value}) / \text{years owned}\]

See page 399 for estimated salvage values for machinery.

Tractor: salvage value after 10 years is 32% of original list price
Tractor Example—Average Costs

- New value = $75,000
- Salvage value = 32% x 75,000 = $24,000
- Depreciation is:
  \[
  \frac{(75,000 - 24,000)}{10\text{ years}} = $5,100 / \text{ year}
  \]
Interest Expense

- Interest is based on average of new value and salvage value

Average value = \((75,000 + 24,000) / 2 = 49,500\)

Interest = \(7\% \times 49,500 = 3,465\) per year

Insurance & taxes = \(1\% \times 49,500 = 495\)

Total = \(5,100 + 3,465 + 495 = 9,060\)
Ownership Costs Over Ownership Life for Tractor

- **Depreciation**
- **Interest**
- **Ins & txs**
Sunk Costs

- As the production cycle progresses, more and more costs become sunk.
- Sunk costs no longer affect decision making in the short run (within the production cycle)
Sunk Costs

- Should you harvest a poor crop even if you expect to not cover total costs?
Economic Principle

- If gross revenue exceeds variable costs, profit will be increased (or losses decreased) by producing.
- That is, when gross margin > 0 go ahead and produce.
Example: Finishing Feeder Pigs

Variable costs:

- feeder pig: $40.00
- feed: 50.00
- operating: 10.00
- labor: 3.00

= total variable costs: $103.00

Fixed costs (bldg, equip): $13.00

Total costs: $116.00
## Profit (250 lb. pig)

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<th>Price</th>
<th>Revenue</th>
<th>Produce</th>
<th>Do not</th>
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<td>$19</td>
<td>-$13</td>
</tr>
<tr>
<td>$.40</td>
<td>$108</td>
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</tr>
<tr>
<td>$.30</td>
<td>$81</td>
<td>-$35</td>
<td>-$13</td>
</tr>
</tbody>
</table>

Variable cost breakeven = $103 / 270 lb.  
= $.38 per lb.
Higher Cost Facilities, Perm. Labor

Variable costs:
- feeder pig $40.00
- feed $45.00
- operating + labor $8.00
- total v.c. $103.00

Fixed costs (bldg, equip) $23.00

Total costs $116.00

V.C. breakeven = $93 / 270 lb. = $.34
Economic Principle

If a higher proportion of a farm’s costs are fixed, it will continue to produce even at a lower price.
In the long run all costs are variable.

- Before an investment is made
- Fixed resources could be sold
Cash and Noncash Costs

**Cash Costs**
- Seed, fertilizer, pesticides
- Fuel and repairs
- Hired labor
- Cash rent
- Interest on loans
- Etc.

**Noncash Costs**
- Depreciation
- Opportunity Costs
  - unpaid labor
  - net worth capital
  - feed produced on the farm