

BREAKEVEN ANALYSIS & SENSITIVITY ANALYSIS



Breakeven Analysis

- Estimates the minimum performance a manager needs to cover the costs of an enterprise
- Main types:
 - Breakeven Quantity Sold
 - Breakeven Selling Price/Unit



Personal Breakevens

- You have living expenses of \$500/month
 - Your job pays \$10/hour (take-home)
 - You only have 40 hours/month that you can work
- What is the minimum number of hours you need to work to cover your living expenses ("breakeven quantity")?
 - $\$500/\text{month} / \$10/\text{hr} = 50 \text{ hours/month}$
 - But you can only work 40 hours/month - uh oh!



Personal Breakevens

- You have living expenses of \$500/month
 - Your job pays \$10/hour (take-home)
 - You only have 40 hours/month that you can work
- What is the minimum take-home wage that you must earn to cover your living expenses ("breakeven price")?
 - $\$500/\text{month} / 40 \text{ hrs/month} = \$12.50/\text{hour}$
 - You need a higher paying job to meet your needs!



Using Breakevens

- Compare your breakeven estimates to your planned sales quantity or price
 - If your breakeven is **less** than your planned - Good!
 - You are covering your expenses with money left over
 - If your breakeven is **higher** than your planned - Bad!
 - You need to make changes to improve your profits
 - Personal example:
 - You planned on \$10/hr but you NEED to earn \$12.50/hr
 - You planned on 40 hrs/month, but you need to work 50 hrs/month



Short Run vs Long Run

- Short Run
 - Refers to the next year or so
 - Only consider the **operating** expenses!
- Long Run
 - Refers to a long term decision (> 5 yrs)
 - Consider **total** expenses



Short Run Breakeven Quantity

- aka "SR Breakeven Yield"
- Use your enterprise budget
 - Assume the only thing that changes is quantity sold
 - Everything else stays the same
- SR BE Quantity
 - $\text{Total Operating Expenses} / \text{Selling Price/Unit}$
 - You need to sell this amount to cover your operating expenses



Lawn Care Example

- Short Run Breakeven Quantity
 - $\text{Total Operating Expenses} / \text{Selling Price/Lawn}$
 - $\$19,814/\text{year} / \$100/\text{lawn} = 198 \text{ lawns/year}$
 - You need to mow at least 198 lawns/year to cover your operating expenses
 - You plan to mow 750 lawns/year – good sign!
 - Assumes the total operating expenses will be \$19,814/yr
 - Assumes you've purchased most of the operating inputs already



Long Run Breakeven Quantity

- aka "LR Breakeven Yield"
- Use your enterprise budget
 - Assume the only thing that changes is quantity sold
 - Everything else stays the same
- LR BE Quantity
 - $\text{Total Expenses} / \text{Selling Price/Unit}$
 - You need to sell this amount to cover your total expenses



Lawn Care Example

- Long Run Breakeven Quantity
 - $\text{Total Expenses} / \text{Selling Price/Lawn}$
 - $\$61,315/\text{year} / \$100/\text{lawn} = 613 \text{ lawns/year}$
 - You need to mow at least 613 lawns/year to cover your total expenses
 - You plan to mow 750 lawns/year – good sign!



Short Run Breakeven Price

- aka "Breakeven Selling Price"
- Use your enterprise budget
 - Assume the only thing that changes is selling price
 - Everything else stays the same
- SR BE Price
 - $\text{Total Operating Expenses} / \text{Quantity Sold}$
 - You need to charge this price to cover your operating expenses
 - Assumes the quantity sold stays the same



Lawn Care Example

- Short Run Breakeven Price
 - $\text{Total Operating Expenses} / \text{Lawns/year}$
 - $\$19,814/\text{year} / 750 \text{ lawns} = \$26.40/\text{lawn}$
 - You need to charge at least \$26.40/lawn to cover your operating expenses
 - You plan to charge \$100/lawn – good sign!



Long Run Breakeven Price

- aka "LR Breakeven Selling Price"
- Use your enterprise budget
 - Assume the only thing that changes is selling price
 - Everything else stays the same
- LR BE Price
 - Total Expenses / Quantity Sold
 - You need to charge this price to cover your total expenses
 - Assumes the quantity sold stays the same



Lawn Care Example

- Long Run Breakeven Price
 - Total Expenses / Lawns/year
 - \$61,315/year / 750 lawns = \$81.75/lawn
 - You need to charge at least \$81.75/lawn to cover your total expenses
 - You plan to charge \$100/lawn – good sign!



Know Your Breakevens!

- Every manager needs to have a good idea about the breakeven price and quantity
 - Helps make better decisions
 - Helps identify problems before it's too late
 - Helps get a loan from a lender



Sensitivity Analysis

- Looking at changes in profits due to changes in key areas of an enterprise
 - Selling price
 - Quantity sold
 - Input prices
- Look at changes of 10-25%
 - Individually, not everything at once!



Lawn Care Example

- Look at a 10% decrease in selling price
 - Currently charging \$100/lawn
- 10% decrease
 - $\$100 - (\$100 \times 10\%) = \$90/\text{lawn}$
 - Or $\$100 \times (100\% - 10\%) = \$90/\text{lawn}$
- At 750 lawns/year
 - Revenue = $\$90/\text{lawn} \times 750 \text{ lawns} = \$67,500$
 - A decrease of \$7,500 per year!



Lawn Care Example

- Impact on gross margin (RAOC)
 - Decreases from \$55,185 to \$47,685
 - Decrease of \$7,500
 - Simply due to charging a lower price/lawn
- But!
 - Will you gain more customers by charging a lower price?



Using the Spreadsheet

- Look at the Lawn Mowing Business enterprise budget
- Change the selling price from \$100 to \$90
 - Move your cursor to cell "F5"
 - Type in 90
- The spreadsheet automatically does the calculations
 - Revenue drops to \$67,500
 - Return Above Operating Costs drops to \$47,685



Other Sensitivity Analysis

- Reset the price to \$100/lawn
- Let's look at a 10% increase in the number of lawns mowed
 - You get 10% more customers than you planned!
- Move the cursor to cell "D5"
 - Enter 900 for the number of lawns mowed
 - Look at the impact on revenues and RAOC

