Break-even Analysis

Chapter 13

Unit 3

Performance Objectives:

You will work together to solve several sample break-even problems and then calculate your own break-even analysis in Microsoft® Excel.

Evaluation Criteria:

Successful completion of this chapter requires you to:

- Read about the purpose of break-even.
- Solve four practice break-even problems.
- Determine which method you will use to calculate a break-even for your business.
- Calculate a break-even for your business.

Task 1: About Break-evens

Read the information below about break-evens.

You've already completed your income statement for your business. Another important component of your business financials is the "break-even analysis." **In business, the break-even point is either the amount of sales (in dollars) that you need to make *OR* the number of items you need to sell to just break-even**. If you sell less than this point, you will lose money and if you sell more, you will make a profit.

The break-even point is either **the amount of sales** (in dollars) that you need to make ***OR*** the **number of items** you need to sell to just break-even (no profit and no loss - you just recoup your costs).

Think of this very simple example:

It costs you $250 to run your new lawn care business per month. If you charge $25 per lawn, you need to mow ten lawns each month to break-even. Ten lawns is your break-even point. Once you mow your eleventh lawn, you start making profit.

It's very important to know your break-even point. Even though your company may be making sales, if you continually sell less than your break-even point, your business will eventually fail.

There are two ways to calculate a break-even depending on the financial information you have available. Examine the formulas below. One formula uses fixed and variable costs. The other uses operating expense and gross margin. You will use one of these formulas to calculate a break-even point for several practice exercises and eventually for your own business, depending on the type of business you have and the financial information you have available.

Below are two simple examples of how to calculate a break-even point. At the end of this benchmark you will use your income statement to calculate a break-even point for your business.

Task 2: Sample Break-evens

Read through the sample problems below.

Follow this example of total sales calculation of the break-even point. The first example uses fixed and variable costs and the second set of examples use gross margin and operating expenses.

Problem 1: Appalachian Herbal Essentials

Appalachian Herbal Essentials
Break-even Analysis
For Month Ended June 30, 2010

Fixed Costs (Operating Expenses)	$ 962
Variable Costs (Cost of Goods Sold)	3,680
Break-even in Sales = **Fixed Costs + Variable Costs** =	**$4,642**

Appalachian Herbal needs to sell $4,642 in June to cover costs for the month of June. All sales after that will be considered profit!

It's that simple! All you have to do is add your fixed and variable costs. That total is the total amount in sales you need to make to break-even.

Definitions

Fixed Costs: These are expenses that do not fluctuate in relation to the amount of sales. They can be considered operating expenses. Examples of fixed costs are monthly phone bill, insurance payments, rent, etc.

Variable Costs: These expenses vary. (If these expenses contribute directly to the production of a business's service or product, then they can be considered Costs of Goods Sold as well.) Some examples are supplies, wages, etc.

Problem 2: Sue's Day Care

Seeing a need for childcare in her community, Sue decided to launch her own daycare service. Her service needed to be affordable, so she decided to watch each child for $12 a day. After doing her homework, Sue came up with the following financial information:

Selling Price (per child per day)	**$12**
Operating Expenses (per month)	
Insurance	400
Rent	200
Total Operating Expenses	**$600**
Costs of goods sold	**$4.00 per unit**
Meals	2 @ $1.50 (breakfast & lunch)
Snacks	2 @ $0.50
Gross Margin (per unit)	**Selling Price – Cost of Goods Sold**
	$12.00 – $4.00 = **$8.00 per unit**

The month of June has 20 workdays, Monday through Friday for four weeks. How many children will Sue need to take care of just to break-even in her new business?

Break-evens are calculated using the following formula:

Break-even = Operating Expenses ÷ Gross Margin per unit

Break-even = Operating Expenses ÷ ($12.00 - $4.00)

Break-even = $600 ÷ $8.00

Break-even = 75 units (children) in June

Since there are 20 days in June, Sue must watch 75 ÷ 20 = 3.75 kids! Or four children every day. Right from the start, Sue knows that she must take care of at least four kids every day to start to make a profit.

Example courtesy of Peggy Jenkins, Nelsonville-York High School, Nelsonville, OH

Problem 3: Joe's T-Shirts

Fill in as much information in this table as you can from the information below the table, then use it to calculate the break-even.

Selling Price
Cost of Goods Sold (per unit)
Gross Margin per unit
Operating Expenses
Total Operating Expenses

- For the month of June, he sold 30 t-shirts at $10 each.
- He paid $5 for each t-shirt and $.80 per shirt for personalizing art materials.
- He pays $25 a month on his loan for a t-shirt printing machine.
- His monthly phone bill is $35.

Use the following formula to calculate the break-even point:

Break-even = Operating Expenses ÷ Gross Margin per unit

Break-even =

Break-even =

Problem 4: Jessica's Bracelets

Read the following case study and calculate the break-even point:

Jessica wanted to start her own company instead of working for someone else. She had been thinking about different low-risk ventures she can start with minimal capital.

She realized that she has always enjoyed making jewelry. Her friends loved the bracelets she made for them. She thought, "There are so many people doing the same thing, what will make my bracelets special?"

After talking to some local craftspeople, she came up with the idea of a woven horsehair bracelet with a bead of recycled glass in the center. She can get the beads from a local artist ($20 for 100 beads), horsehair from her uncle's farm for free, and gift boxes cost 25¢ each. She recently bought a weaving loom with a bank loan for $500 and is making monthly payments of $25 to the bank. Jessica's sister has agreed to help her weave the bracelets at a cost of 50¢ per bracelet made. Jessica's rent is $250 per month and she pays $40 per month for phone and Internet charges.

After pricing similar bracelets, she decided she could sell the bracelets to the retail shops in her town (a vacation spot for tourists) for $6.50 each, a 400% markup over her cost. She figures the retailers can sell the bracelets for $12.50 each.

Use the following formula to determine how many bracelets Jessica needs to make in order to break even. Show all of your work below.

Break-even Point (units) = Operating Expenses ÷ Gross Margin per unit

Task 3: Calculating Your Break-even

Use either formula below to calculate the break-even for your business. Show all your work.

Break-even = Fixed Costs (Operating Expenses) + Variable Costs (COGS)

OR

Break-even = Operating Expenses ÷ Gross Margin per unit

Task 4: Calculating a Break-even Using Projected Revenue

Follow along with your instructor as s/he goes through this calculation step by step. Find a partner and then calculate Dairy Valley's break-even for July.

Below is the income statement for Dairy Valley Hot Dog Sauce. Dairy Valley expects sales next month in July to double to $1,920. Because they were projecting double sales, they ordered double quantities of ingredients. This qualified them for a large discount from their wholesaler. This meant that COGS will increase only to $425. Fixed costs will, of course, remain the same at $271. At what point (in dollar sales) will they break even for the month of July?

Dairy Valley Hot Dog Sauce
Income Statement
For Month Ended June 30, 2010

Sales		
		960
Total Sales		960
Cost of Goods Sold (Variable Costs)		285
Gross Margin		675
Operating Expenses		
	Rent – production space	80
	Rent – wet room	112
	Rent – storage (4 x 4 x 6 space)	25
	Rent – freezer space	13
	Cell phone	40
Total Expenses (Fixed Costs)		271
Net Profit Pretax		$404

They can use this formula, along with their projected sales figures, to calculate the break-even for July.

NOTE: This formula used to calculate break-even in this example is different than the formulas used to calculate break-even earlier in this chapter. There are several ways to calculate break-even. The first examples were intentionally simpler to teach the concept. The current example requires sales projection, which is more difficult. We hope by the end of this chapter you understand both methods.

Break-even for June:

S = 271 + (285/960) x S

S = 271 + (.3 x S)

1S = 271 + (.3S)
-.3S - (.3S)

.7S = 271

.7S = 271
.7 .7

S = 387.14

Therefore, in June, Dairy Valley needs to make $387.14 to break even.

Break-even for July

(Break-even) Sales = Fixed Costs + (Variable Costs / Estimated Revenues) x Sales

Therefore, in July, Dairy Valley needs to make $_____ to break even.

Notes: