

## Chapter 2 – Developing a Business Plan: Cost–Volume–Profit Analysis

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### COMPLETION

1. Instead of rushing into a business right away, it is wise to develop a \_\_\_\_\_.

ANS: business plan

PTS: 1                      DIF: Easy                      TOP: Planning in a new business

2. A \_\_\_\_\_ describes a business' goals and its plans for achieving those goals.

ANS: business plan

PTS: 1                      DIF: Easy                      TOP: Planning in a new business

3. \_\_\_\_\_ refers to the uncertainty about the future operations of a business.

ANS: Risk

PTS: 1                      DIF: Easy                      TOP: Planning in a new business

4. The \_\_\_\_\_ is money that investors will receive back from their investment and credit decisions.

ANS: return

PTS: 1                      DIF: Easy                      TOP: Planning in a new business

5. The \_\_\_\_\_ shows how the business will make sales and how it will influence and respond to market conditions.

ANS: marketing plan

PTS: 1                      DIF: Easy                      TOP: Marketing plan

6. The \_\_\_\_\_ describes how the business will promote, price and distribute the product.

ANS: marketing strategy

PTS: 1                      DIF: Easy                      TOP: Marketing plan

7. The \_\_\_\_\_ describes the predicted growth, market share and sales of the business' products by period.

ANS: sales forecast

PTS: 1                      DIF: Easy                      TOP: Marketing plan



16. \_\_\_\_\_ shows how profit is affected by changes in sales volume, selling price of products and the various costs of the business.

ANS: Cost–volume–profit analysis

PTS: 1                      DIF: Difficult                      TOP: Cost–volume–profit analysis

17. The \_\_\_\_\_ is the difference between the total sales revenue and total variable costs.

ANS: total contribution margin

PTS: 1                      DIF: Difficult                      TOP: Contribution margin

18. The \_\_\_\_\_ is the difference between the sales revenue per unit and the variable costs per unit.

ANS: contribution margin per unit

PTS: 1                      DIF: Moderate                      TOP: Contribution margin

19. [Selling price per unit – variable cost per unit] x volume = \_\_\_\_\_.

ANS: total contribution margin

PTS: 1                      DIF: Moderate                      TOP: Contribution margin

20. A desired level of overall profit for a business is called \_\_\_\_\_.

ANS: target profit

PTS: 1                      DIF: Moderate                      TOP: Target profit

## TRUE/FALSE

1. The first step in starting a business is to develop a business plan.

ANS: T                      PTS: 1                      DIF: Easy                      TOP: Planning in a new business

2. The first step in starting a business is to set up a corporation.

ANS: F                      PTS: 1                      DIF: Easy                      TOP: Planning in a new business

3. A business plan is a static document. Once created it should not need to be updated.

ANS: F                      PTS: 1                      DIF: Easy                      TOP: Planning in a new business

4. A business plan typically includes a description of the business, a marketing plan, an operating plan, an environmental management plan and a financial plan.

ANS: T                      PTS: 1                      DIF: Moderate                      TOP: Planning in a new business

5. A business plan should be viewed as an opportunity to identify mistakes before they could happen.

ANS: T                      PTS: 1                      DIF: Moderate                      TOP: Planning in a new business

6. In cost behaviour, activity affects the way costs behave.

ANS: T                      PTS: 1                      DIF: Moderate                      TOP: Cost behaviour

7. In cost behaviour, profit affects the way costs behave.

ANS: F                      PTS: 1                      DIF: Moderate                      TOP: Cost behaviour

8. Fixed costs per unit will remain constant as activity changes.

ANS: F                      PTS: 1                      DIF: Moderate                      TOP: Fixed costs

9. A fixed cost does not respond to changes in an activity such as sales volume.

ANS: T                      PTS: 1                      DIF: Moderate                      TOP: Fixed costs

10. A fixed cost responds directly to changes in an activity such as sales volume.

ANS: F                      PTS: 1                      DIF: Moderate                      TOP: Fixed costs

11. Fixed costs per unit will change as activity changes.

ANS: T                      PTS: 1                      DIF: Moderate                      TOP: Fixed costs

12. Variable costs will remain constant per unit as activity changes.

ANS: T                      PTS: 1                      DIF: Moderate                      TOP: Variable costs

13. Variable costs per unit will change as activity changes.

ANS: F                      PTS: 1                      DIF: Moderate                      TOP: Variable costs

14. A variable cost responds directly to changes in an activity such as sales volume.

ANS: T                      PTS: 1                      DIF: Moderate                      TOP: Variable costs

15. Total costs are the sum of the fixed costs and variable costs.

ANS: T                      PTS: 1                      DIF: Moderate                      TOP: Total costs

16. Contribution margin is the amount left over after a sale to cover the fixed costs, which then contributes toward profit.

ANS: T                      PTS: 1                      DIF: Moderate                      TOP: Contribution margin

17. Sales less fixed costs equal contribution margin.  
ANS: F                      PTS: 1                      DIF: Moderate                      TOP: Contribution margin
18. Sales less variable costs equal contribution margin.  
ANS: T                      PTS: 1                      DIF: Moderate                      TOP: Contribution margin
19. All contribution margin created past the break-even point will contribute towards profit.  
ANS: T                      PTS: 1                      DIF: Moderate                      TOP: Contribution margin
20. All contribution margin created prior to the break-even point will contribute towards covering fixed costs.  
ANS: T                      PTS: 1                      DIF: Moderate                      TOP: Contribution margin
21. All contribution margin created prior to the break-even point will contribute towards profit.  
ANS: F                      PTS: 1                      DIF: Moderate                      TOP: Contribution margin
22. Only fixed costs are deducted from the selling price per unit, with the result then taken times sales volume in the profit equation for determination of profit.  
ANS: F                      PTS: 1                      DIF: Moderate                      TOP: Finding the unit sales volume to achieve a target profit
23. The break-even point is the point that total revenues equal total costs.  
ANS: T                      PTS: 1                      DIF: Moderate                      TOP: Finding the break-even point
24. The break-even point is the point that total revenues exceed total costs.  
ANS: F                      PTS: 1                      DIF: Moderate                      TOP: Finding the break-even point
25. The break-even point is the point that total revenues are less than total costs.  
ANS: F                      PTS: 1                      DIF: Moderate                      TOP: Finding the break-even point
26. The break-even point is the point that total revenues equal target profit.  
ANS: F                      PTS: 1                      DIF: Moderate                      TOP: Finding the break-even point
27. If a business were concerned about raising the price of their goods, CVP analysis would help determine the impact on profits and the resulting changes in costs.  
ANS: T                      PTS: 1                      DIF: Difficult                      TOP: Cost–volume–profit analysis

28. CVP can be an absolute decision-making tool. Faced with a change in costs or prices, one need look only to the CVP results to make a complete decision.

ANS: F                      PTS: 1                      DIF: Difficult                      TOP: Cost–volume–profit analysis

29. CVP is not an absolute decision-making tool. Faced with a change in costs or prices, one should also consider the impact on customers as well as the CVP results to make a complete decision.

ANS: T                      PTS: 1                      DIF: Difficult                      TOP: Cost–volume–profit analysis

30. When analysing an alternative set of plans, CVP is but one tool. The impact on customers should also be considered.

ANS: T                      PTS: 1                      DIF: Difficult                      TOP: Cost–volume–profit analysis

### MULTIPLE CHOICE

1. I. The first step in starting a business is to develop a business plan.  
II. The first step in starting a business is to set up a corporation.  
III. A business plan is a static document that if done right will not need updating.  
IV. A business plan should be viewed as an opportunity to identify mistakes before they occur.

Which of the above is correct?

- a. I. only.
- b. I. and II only.
- c. II and III only.
- d. I and IV only.
- e. I, II, III and IV.

ANS: D                      PTS: 1                      DIF: Moderate                      TOP: Planning in a new business

2. Which of the following would NOT be included in a typical business plan:
  - a. The marketing plan.
  - b. The financial plan.
  - c. The weekly sales plan.
  - d. The operating plan.

ANS: C                      PTS: 1                      DIF: Easy                      TOP: Planning in a new business

3. The primary concern of creditors and investors is:
  - a. risk.
  - b. return.
  - c. both of the options given.

ANS: C                      PTS: 1                      DIF: Easy                      TOP: Planning in a new business

4. Fixed costs:
  - a. **In the short term do not respond to changes in volume.**

- b. respond in the opposite direction of changes in volume.
- c. change in proportion with changes in volume.
- d. will always be the same from one period to the next.

ANS: A                      PTS: 1                      DIF: Moderate                      TOP: Fixed costs

5. Barney's Brick Co. has high fixed costs such as building, machinery and salaries. Barney desires to minimise the impact of these fixed costs. A strategy for Barney would be?
- a. To produce and sell as many units as possible.
  - b. To downsize.
  - c. Sell the business to someone else.
  - d. Lay off the salary employees.

ANS: A                      PTS: 1                      DIF: Moderate                      TOP: Planning in a new business

6. Which of the following best represents an example of a fixed cost?
- a. Equipment.
  - b. Cost of products sold to customers.
  - c. Salary plus commission employees.
  - d. Telephone usage.

ANS: A                      PTS: 1                      DIF: Difficult                      TOP: Fixed costs

7. **Total variable** costs:
- a. do not respond to changes in volume.
  - b. respond in the opposite direction to changes in volume.
  - c. change in proportion with changes in volume.
  - d. will always be the same from one period to the next.

ANS: C                      PTS: 1                      DIF: Moderate                      TOP: Variable costs

8. Which of the following best represents an example of a variable cost?
- a. Equipment.
  - b. Cost of products sold to customers.
  - c. Salary plus commission employees.
  - d. Telephone usage.

ANS: B                      PTS: 1                      DIF: Difficult                      TOP: Variable costs

9. Which of the following costs change is in direct proportion to the volume?
- a. Fixed costs and variable costs.
  - b. **Total variable** costs.
  - c. None of the options given.
  - d. Fixed costs.

ANS: B                      PTS: 1                      DIF: Moderate                      TOP: Variable costs

10. The definition of contribution margin per unit is:
- a. Selling price per unit – variable cost per unit.
  - b. Selling price per unit – fixed costs.
  - c. Selling price per unit – total costs.
  - d. None of the above.

ANS: A                      PTS: 1                      DIF: Easy                      TOP: Contribution margin

11. The unit sales volume at which a business earns zero profit is called:
- Zero-profit point.
  - Total costs.
  - Contribution margin per unit.
  - Break-even point.

ANS: D                      PTS: 1                      DIF: Easy                      TOP: Break-even point

12. The profit equation for a given sales volume is:
- $[\text{Selling price per unit} \times \text{volume}] + [\text{variable cost per unit} \times \text{volume}] - \text{total fixed costs.}$
  - $[\text{Selling price per unit} \times \text{volume}] - [\text{break even point}] - \text{total fixed costs.}$
  - $[\text{Selling price per unit} \times \text{volume}] + [\text{break even point}] + \text{total fixed costs.}$
  - $[\text{Selling price per unit} \times \text{volume}] - [\text{variable cost per unit} \times \text{volume}] - \text{total fixed costs.}$

ANS: D                      PTS: 1                      DIF: Moderate                      TOP: Profit equation

13. Barb's Best Pies sells a meat pie for \$5.00. Variable costs are \$3.00 per unit and fixed costs for the period are \$4000. The profit on the 2001st pie sold is:
- \$2.00.
  - \$5.00.
  - \$3.00.
  - \$ - 0 -.

ANS: A                      PTS: 1                      DIF: Difficult                      TOP: Profit calculation

14. Widget World makes a widget that is sells for \$10 per unit. The variable costs are \$7 per unit. Assuming the business has normal fixed costs, and the break-even point is 350 units, what are the total costs at break even?
- \$4500.
  - \$3500.
  - \$12 000.
  - \$7500.

ANS: B                      PTS: 1                      DIF: Difficult                      TOP: Finding the break-even point

### Example 2.1

The information below is used for the following problems.

Leslie's Soccer Balls sells soccer balls for \$20 each and incurs variable costs of \$15 per ball. Leslie's break-even point is 40 000 units.

15. Refer to Example 2.1. What is the total of Leslie's fixed costs?
- \$2000.
  - \$8000.
  - \$200 000.
  - None of the options given.

ANS: C                      PTS: 1                      DIF: Difficult                      TOP: Fixed costs

16. Refer to Example 2.1. What is Leslie's profit when 50 000 units are sold?
- \$50 000.
  - \$250 000.
  - \$1 000 000.



d. None of the options given.

ANS: A                      PTS: 1                      DIF: Moderate                      TOP: Finding the unit sales volume to achieve a target profit

17. Refer to Example 2.1. What is Leslie's profit when 25 000 units are sold?

- a. \$500 000.
- b. \$125 000.
- c. \$75 000 loss.
- d. None of the options given.

ANS: C                      PTS: 1                      DIF: Easy                      TOP: Finding the unit sales volume to achieve a target profit

### Example 2.2

The information below is used for the following problems.

Garrison's Gaskets has variable costs of \$2 per unit and fixed costs of \$40 000. Garrison's selling price is \$5 per unit.

18. Refer to Example 2.2. What is Garrison's break-even point?

- a. 8000 units.
- b. 20 000 units.
- c. 13 333 units.
- d. None of the options given.

ANS: C                      PTS: 1                      DIF: Moderate                      TOP: Finding the break-even point

19. Refer to Example 2.2. How many units will Garrison's have to sell in order to earn a profit of \$100 000?

- a. 33 333 units.
- b. 46 667 units.
- c. 20 000 units.
- d. 28 000 units.

ANS: B                      PTS: 1                      DIF: Moderate                      TOP: Finding the unit sales volume to achieve a target profit

20. Refer to Example 2.2. How much profit will Garrison's earn if it cuts its selling price to \$3 per unit, and sells 100 000 units?

- a. \$300 000.
- b. \$100 000.
- c. \$60 000.
- d. None of the options given.

ANS: C                      PTS: 1                      DIF: Moderate                      TOP: Finding the unit sales volume to achieve a target profit

### SHORT ANSWER

1. What are the three main purposes of a business plan? Discuss each of the three purposes.

ANS:

First, the business plan helps the entrepreneur visualise and organise the business and its operations. It helps to evaluate the plan, develop new ideas, and refine the plan. Mistakes may be identified and corrected prior to implementing the plan.

Second, the business plan serves as a 'benchmark' for measuring the actual performance of the business. Plans for future activities can then be modified.

Third, the business plan helps the business obtain financing. The business plan helps creditors and investors assess the expected risk and return associated with the business.

PTS: 1                      DIF: Moderate                      TOP: Planning in a new business

2. What are the two primary concerns of investors? Discuss each.

ANS:

One concern is the level of risk associated with the investment. Risk refers to the uncertainty existing about the future operations of the business. The other concern is return. Return refers to the money that the investor will receive back from their investment and credit decisions.

PTS: 1                      DIF: Moderate                      TOP: Planning in a new business

3. What are the five parts of the business plan? Discuss each.

ANS:

The five parts of the business plan are a description of the business, a marketing plan, an operating plan, an environmental management plan and a financial plan.

The description of the business discloses the type of business and product. It describes how the business is organised. It discloses where the business is located. The objectives of the business are listed, along with potential customers.

The marketing plan shows how the business will influence and respond to market conditions. It provides evidence of the demand for the business' product or services. It describes the current and expected competition in the market and relevant government regulations.

The operating plan includes a description of the relationships between the business, its suppliers, and its customers, along with a description of how the business will develop, service, protect and support its products or services. It also includes any other influences on the operations of the business.

The environmental management plan looks at the financial and environmental performance of business through the development and implementation of accounting systems and practices that reduce the environmental impacts of business activities.

The financial plan discloses the capital requirements and sources of capital, and describes the business' projected financial performance.

PTS: 1                      DIF: Difficult                      TOP: Planning in a new business

4. What is the purpose of the description of the business section of the business plan?

ANS:

The description of business section of the business plan discloses the type of business and product. It describes how the business is organised. It discloses where the business is located. The objectives of the business are listed, along with potential customers. The organisation of a business and its personnel can have a major impact on the success of the business. The investors need to be able to evaluate the items contained in this part of the business plan in order to assess the long-term potential of the business.

PTS: 1                      DIF: Moderate                      TOP: Planning in a new business

5. What is the purpose of the marketing plan section of the business plan?

ANS:

The marketing section of the business plan shows how the business will influence and respond to market conditions. It provides evidence of the demand for the business' product or services. It describes the current and expected competition in the market and relevant government regulations. This section receives considerable attention from creditors and investors, as the marketing of a product is critical to the long-term success of a business. This information helps the manager think about the business' activities related to sales. It shows investors and creditors how well the manager has thought about the business' sales potential and how the business will attract and sell to customers.

PTS: 1                      DIF: Moderate                      TOP: Marketing plan

6. Doggie Donuts sells treats for pets for \$5 per box. The variable costs per box are \$3. Doggie Donuts' fixed costs total \$20 000.
- Calculate the contribution margin per box.
  - Calculate the break-even point in boxes.
  - Calculate the profit that Doggie would earn if sales total 30,000 units.

ANS:

- $\$2 = \$5 - \$3$
- $10\,000 \text{ units} = \$20\,000 / \$2 \text{ per unit}$
- $\$40\,000 = \$2 \text{ per unit} \times 30\,000 \text{ units} - \$20\,000$

PTS: 1                      DIF: Difficult                      TOP: Finding the break-even point

7. Bill produces a miracle tool. His variable costs are \$20 per unit and his fixed costs are \$25 000. His break-even point is 30 000 units.
- What is Bill's selling price per unit?
  - What is Bill's profit at 50 000 units of sales?
  - What would Bill's profits at 50 000 units of sales be if Bill were able to reduce his variable costs by \$5 per unit?

ANS:

- $30\,000 \text{ units} = \$25\,000 / \text{contribution margin per unit}$   
Contribution margin per unit = \$0.83  
Selling price per unit – \$20 = \$0.83  
Selling price per unit = \$20.83
- $(\$0.83 \times 50\,000) - \$25\,000 = \$16\,500$
- $[(\$20.83 - \$15.00) \times 50\,000] - \$25\,000 = \$266\,500$

PTS: 1                    DIF: Difficult                    TOP: Finding the break-even point

8. If variable costs increase, and fixed costs and the selling price remain constant, what will happen to the break-even point? What will happen to profits?

ANS:

If variable costs rise, the contribution margin will fall. This will cause the break-even point to rise. The same level of profit will be attained with higher unit sales.

PTS: 1                    DIF: Difficult                    TOP: Cost–volume–profit analysis

9. If fixed costs increase, variable costs and the selling price remain constant, what will happen to the break-even point? What will happen to profits?

ANS:

If fixed costs increase, it will take more unit sales to break even. More units will have to be sold to attain a profit.

PTS: 1                    DIF: Moderate                    TOP: Cost–volume–profit analysis

10. Suppose that your business profits are less than the desired amount. What actions might you take to raise profits, if you do not want to change products?

ANS:

There are only a few actions that a business might take. The following are some of the possible alternatives. If the business can raise prices without hurting the sales volume in units, the contribution margin per unit would rise, resulting in higher profits. The business might consider investing in a new automated production facility, which would lower variable costs. If the increased contribution margin per unit more than offsets the increased fixed costs, profits will rise. If the business increases advertising, fixed costs will rise. If the advertising results in an increased sales volume, the increased total contribution margin may increase more than the increased fixed costs. This would result in an increase in profits.

PTS: 1                    DIF: Moderate                    TOP: Cost–volume–profit analysis

## PROBLEMS

1. Bob's variable costs are \$7 per unit. His selling price is \$9 per unit. His break-even point is 25 000 units.
- What is the amount of Bob's fixed costs?
  - What is Bob's profit when he sells 30 000 units?
  - What would Bob's profit be if he were able to raise prices to \$10 per unit and had sales of 40 000 units?

ANS:

- $25\,000 = \text{fixed costs}/(\$9 - \$7)$   
Fixed costs = \$50 000
- $(\$9 \times 30\,000) - \$50\,000 = \$10\,000$
- $(\$10 \times 40\,000) - \$50\,000 = \$70\,000$

PTS: 1                    DIF: Difficult                    TOP: Finding the break-even point

2. Following from Problem 1 above, suppose that Bob is able to make some changes to his business by increasing his selling price by \$0.50 per unit, decreasing his variable costs by \$0.50 per unit and increasing his fixed costs by \$10 000.
- What is Bob's new break-even point in units?
  - What is Bob's profit when he sells 30 000 units?
  - Should Bob make the changes to his business?

ANS:

- $$\text{BEP} = \text{Fixed costs} / \text{CM per unit} = \$60\,000 / (9.50 - 6.50)$$
$$= \$60\,000 / \$3 = 20\,000 \text{ units}$$
- $$(\$3 \times 30\,000) - \$60\,000 = \$30\,000$$
- Yes, he will make an additional \$20 000 of profit compared to his original situation.

PTS: 1

DIF: Difficult

TOP: Finding the break-even point