

# SOLUTIONS MANUAL



## ACCOUNTING

INFORMATION FOR BUSINESS DECISIONS



SEVENTH EDITION, ACCOUNTING

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10TH EDITION

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# Chapter 1

## Introduction to business, accounting and the role of professional skills

The questions in this chapter are divided into three sections:

- **Testing your knowledge:** these questions are straightforward and are designed to help students assess their basic knowledge of a particular topic.
- **Applying your knowledge:** these questions ask students to use their basic knowledge to solve a particular problem.
- **Making evaluations:** these questions are more complex and ask students to integrate their knowledge of a particular topic or topics to make decisions.

We have included the 'Content analysis' below to help instructors decide which **applying your knowledge** questions to assign. It briefly summarises the content of each question. We did not provide a content analysis for the **making evaluations** questions because of their lack of uniformity, and because of the multiple topics included in them.

### Content analysis for applying your knowledge questions

- 1.28 Service and Manufacturing Businesses.** Explain how two businesses are examples of a service business and a manufacturing business.
- 1.29 Cash Flows.** Explain how knowledge of a business's cash receipts and payments would help a bank make a loan decision. Determine which financial statement the bank would request for help making the decision.
- 1.30 Business Organisation.** List factors involved in deciding whether to operate as a sole proprietorship, a partnership, or a business.
- 1.31 Business Location.** List questions a business should ask before opening a factory in a new location.
- 1.32 International Business Location.** Referring to 1.31, list questions a business should ask before opening an international branch. Compare questions with 1.31.
- 1.33 Internal and External Users.** List examples of business information useful to both internal and external users.
- 1.34 Management Information.** Give examples of information that would be useful in the management activities of planning, operating, and evaluating.
- 1.35 GAAP.** Explain what generally accepted accounting principles means and how they affect business reports. Explain why new proposals would concern business owners.
- 1.36 Financial statements.** Describe financial statements, list the major financial statements, and explain what each financial statement includes.

- 1.37 Ethics.** Explain how codes of ethics help businesspeople make decisions.
- 1.38 Forming Arguments.** Consider two sides of an issue and develop arguments to support both sides.
- 1.39 Argument Presentation.** Develop alternative methods for presenting an argument to a boss while considering possible rebuttals from the boss.
- 1.40 Evaluating Opportunities.** Develop questions to ask a boss concerning a new job offer.
- 1.41 Evaluating Loan Customers.** Determine what information is needed to evaluate a loan applicant and how this information could affect the loan decision.
- 1.42 Evaluating Accounting Information.** Referring to 1.41, determine what could be added to accounting information to make it more useful in the loan decision.
- 1.43 Critical Thinking and Problem Solving.** Develop a list of ideas to solve an office problem.
- 1.44 Logical Application of Knowledge and Reasoning.** Determine the flaw in a co-worker's reasoning.

## Testing your knowledge

- 1.1 Private enterprise refers to an economic system in which individuals, rather than government, own and operate businesses.
- 1.2 A service business is different from a manufacturing or merchandising business because it sells services, rather than goods or physical products to customers.
- 1.3 Both merchandising and manufacturing businesses sell products to their customers. The difference between the two is that a manufacturing business makes the products it sells. A merchandising business buys products that are ready to be sold (often from a manufacturing business) and then sells those products to its customers.
- 1.4 Entrepreneurship refers to a situation in which an individual with an idea for a business willingly risks the loss of both time and money to obtain capital to use in the production and sale of goods or services.
- 1.5 As an entrepreneur in need of resources, you might go to a bank for a loan or invest your own money. If you need equipment, machinery, or furniture, you might finance the purchase of these items through the seller or lease them. Entrepreneurs also can obtain capital from individuals who have money to invest.
- 1.6 The first factor affecting the business environment is easy access to a vast amount of information which allows businesses to make decisions using timely information. The only drawback is that managers must be able to sort through the information to find that which is most relevant and timely.

The second factor is technological advancement. Technology has extended the work day and allowed quick communication over vast distances. It also has allowed access to up-to-date information and enabled production lines to work without human intervention. This development has made the world more competitive.

The third factor affecting the business environment is the globalisation of business activities. Globalisation creates a larger, more diverse marketplace. The challenge is to market the same product to different cultures using different languages and currencies.

The fourth factor is the increasing number of regulations which a business must follow. As a business chooses to operate in different countries, the number of regulations that it must follow may increase. Businesses may be affected by politically arranged, economic, or trade agreements between countries.

The fifth factor is the many different ways to conduct business. The numerous different types of business transactions affect the business environment by allowing businesses alternative ways to finance activities, invest cash, and compensate employees. E-commerce allows businesses to conduct business with other businesses and consumers more conveniently than in the past.

The sixth factor is the many different ways in which businesses can be formed. The changing forms of business allow owners to choose an organisational form (each with unique advantages and disadvantages) that most closely meets the needs of the business.

**1.7** A business organised as a company is considered a separate legal entity, which means that it can own property, enter into contracts, issue stock, and be taxed. Neither sole proprietorships nor partnerships are considered legal entities. The result is that when these types of businesses have property, it is considered the property of the individual owners. Any profits earned by a sole proprietorship or partnership are considered income of the individual owners who must pay the income tax on those profits. Additionally, the individual owners of these types of business organisations are liable for any debts of the business.

**1.8** There are four types of regulations with which a business must comply. Those regulations may change depending on where the business chooses to operate.

Local regulations are those set by either the city or council in which the business operates. Local regulations may include pollution control measures, health permits, and zoning regulations. Because these regulations are created by city and local authorities, there may be differences between different cities or counties in the same state.

State regulations, as the name indicates, are those set by state governments. Many state regulations require businesses to pay state income taxes, franchise taxes, and state unemployment taxes. State regulations also can require businesses to collect different taxes e.g. sales tax. States also regulate the types of businesses that can operate in the state and the licensing of professionals. State regulations can vary from state to state.

Federal regulations apply to businesses regardless of where in the country they choose to operate. For example, businesses must comply with Australian Taxation Office (ATO) rules of paying income taxes, and all business withhold federal income taxes from employee's pay and pay goods and services (GST) tax. There are also regulations monitoring safety, competition, and workplace discrimination.

If a business chooses to operate outside of its home country, it also must abide by the laws and regulations of the country in which it chooses to operate.

**1.9** Accounting is a system of recording and reporting economic information about the resources and activities of a particular entity and conveying that information to interested parties.

**1.10** Both management accounting and financial accounting use accounting information to generate reports about the resources and activities of a business. These reports help communicate information to users to help in decision-making.

The main difference between management accounting and financial accounting is the intended users and their different information needs. Management accounting focuses on users within the business (managers) and helps them with their planning, operating and evaluating activities. Financial accounting focuses on users external to the business (investors/stockholders and creditors) and helps them decide whether or not to engage in some activity with the business.

**1.11** Management accounting reports help managers in planning activities by identifying the activities and resources needed to achieve the goals of the business. These reports also can help managers analyse planned activities and alternative actions by providing revenue and cost estimates.

Management accounting reports help managers in operating activities by providing timely economic information about how alternative actions will affect the profit and solvency of the business. Managers use this information to make day-to-day decisions about which activities will best achieve the goals of the business.

Management accounting reports also help managers in evaluating activities. Managers use revenue and cost estimates generated in the planning process as a benchmark and then compare actual revenues and costs against that benchmark.

**1.12** Generally accepted accounting principles (GAAP) are a set of principles, procedures, and practices that businesses use for financial accounting and reporting. These 'rules' are developed by professional organisations and all accountants are required to follow the 'rules' when maintaining books of account for a business.

**1.13** Financial accounting reports help external users by revealing information about a business's ability to generate cash to pay its bills, and about a business's ability to earn a profit. This information helps external users such as creditors and investors analyse a business's potential credit risk and possible return on investment.

**1.14** Today's business environment is one in which many people face complicated ethical situations where the distinction between wrong and right is not clear. Business groups have established ethical codes to help members work through difficult issues. Ethical



codes also help reassure the public that the work done by members of the group is performed in an ethical environment and is reliable.

- 1.15** A sustainable business is one that is strategic and makes sure that all processes, products and activities, while generating a profit, address concerns about corporate social responsibility and environmental management. Business sustainability refers to the fact that the business must operate efficiently and productively in order to remain profitable and allow the business to grow.
- 1.16** Internal control involves the procedures needed to control, or minimise, a business's risks (of losses, earnings drops, fraud, fines, scandal, and so forth), to safeguard a business' economic resources, and to promote the efficient and effective operation of its accounting system.
- 1.17** In order to be prepared to enter the profession of accountancy, a graduate needs a set of skills to apply the accounting knowledge learned. These skills include the abilities to communicate, to perform research, to analyse and organise information, to understand and apply knowledge from diverse areas, and to use judgment. In addition, employers and professional bodies recommend that these individuals possess functional, personal, and broad business perspective competencies. Functional competencies relate to the technical competencies, which are most closely aligned with the value contributed by accounting professionals i.e. knowledge and ability to apply skills. Personal competencies relate to the attitudes and behaviours of individuals preparing to enter the accounting profession such as self management. Developing these personal competencies will enhance the way professional relationships are handled and facilitate individual learning and personal improvement. Broad business perspective competencies relate to the context in which accounting professionals perform their services. Individuals preparing to enter the accounting profession should consider both the internal and external business environments and how their interactions determine success or failure. They must be conversant with the overall realities of the business environment.
- 1.18** Auditing is a part of a business's control procedures. Internal audits review the business's operations to ensure that all employees are following the required procedures. External audits are conducted annually to ensure the business is complying with GAAP in accordance with accounting standards. Auditing involves the examination, by an independent CPA, of a business's accounting records and financial statements, and the business's internal control over its financial reporting. Based upon the sample evidence gathered in the auditing process, the CPA expresses a professional, unbiased opinion about (or attests to) the fairness of the accounting

information in the business's financial statements and the effectiveness of the business's internal controls.

**1.19** Three professional organisations of accountants exist in Australia including the Institute of Chartered Accountants (ICA), the Certified Practising Accountants (CPA), the National Institute of Accountants (NIA). Similar organisations exist in New Zealand including the New Zealand Institute of Chartered Accountants (NZICA).

**1.20** The business environment is constantly evolving due to the changing factors that affect it. Some example of factors not mentioned in the chapter are as follows:

- The ATM card is an example of a technological innovation that has affected the business environment. ATM cards have effectively extended banking hours and may eventually replace cash and checks as a widely used form of payment.
- The change in televisions from analogue to digital is an example of a technological innovation which may affect the business environment in the future. This innovation may allow TVs to function as computers which would increase accessibility to computers, and allow more people the option of telecommuting.
- The increase in the minimum wage is an example of a regulation that will affect the business environment. The increase may affect selling prices as businesses try to compensate for the increase in labour costs.
- The mapping of human genes is an example of a discovery that may affect the business environment. Some people fear that this type of information may lead to a new type of hiring discrimination. People with a genetic predisposition for certain diseases may find it difficult to find and keep jobs. The result may be an increase in unemployment or an increase in the number of entrepreneurs and small businesses. On the other hand, this knowledge of genes might eliminate some illnesses, or allow physicians to recognise illnesses earlier than in the past, perhaps generating higher cure rates. This would result in a healthier workforce and lower health-related costs for businesses.
- A unique example of a discovery (technological innovation) that may affect the business environment is the use of animals to produce drugs. For example, some genetically altered goats are being used to produce protein drugs. The drugs come from the goat milk and are harvested more cheaply than traditional laboratory methods. This discovery/innovation will lower drug business costs and the prices of many expensive treatments of serious diseases. This discovery/innovation will also make 'farming' a more profitable and attractive career.

**1.21** The broad skills necessary for practicing accountancy and effectively conducting business are:

- communication skills (written and verbal),
- interpersonal skills (including the abilities to lead and influence others, to motivate others, to withstand and resolve conflict, and to organise and delegate tasks),
- intellectual skills (creative and critical thinking), and
- a knowledge base necessary to support intellectual skills (including general knowledge, organisational and business knowledge, and accounting and auditing knowledge).

**1.22** There is a difference between thinking and critical thinking. Thinking is a natural function for human beings. Critical thinking, however, requires practice as well as an awareness and monitoring of the thought process. A critical thinker must be aware of the assumptions made and be able to judge whether there is sufficient evidence to support those assumptions. A critical thinker also must be aware of his or her own biases and be able to keep those biases from affecting the thought process.

**1.23** Independence refers to the critical thinker's use of others beliefs and ideas. To be independent, the critical thinker does not accept the beliefs of others without questioning the source of those beliefs and the evidence supporting them.

Objectivity, refers to the critical thinker's own beliefs and ideas. To be objective, the critical thinker must be aware of his or her own biases and prejudices and try to eliminate them from his or her thinking when evaluating ideas.

**1.24** It is important to evaluate the credibility of a source of information because of the possibility that the information is faulty or biased. If the source is not credible, what is the probability that the information is good? The credibility of information sources must be evaluated to ensure that decisions are made based on accurate information.

**1.25** Because general knowledge encompasses knowledge of history and of various cultures, it provides a vast background that may help critical thinkers evaluate ideas and make value judgements about solutions. It also helps critical thinkers 'see' other points of view.

Organisational and business knowledge includes knowledge of how businesses work and of how various factors affect businesses. This knowledge helps creative thinkers develop ideas and implement them in a particular business environment. It also helps critical thinkers evaluate alternatives and better understand the effects of solutions to problems.

**1.26** The first stage of problem-solving is recognising and defining the problem. In this stage, the problem solver defines the problem, gathers facts surrounding the problem, and identifies the objectives that would be achieved by solving the problem. The major pitfall in this stage is the possibility of incorrectly identifying the problem. Solving the wrong problem could lead to new problems, make the problem worse, and lead to an unproductive course of action.

The second stage is identifying alternative solutions. In this stage, the problem solver uses both creative and critical thinking to generate and identify workable solutions. A pitfall that the problem solver might encounter in this stage would be an inability to arrive at solutions that are workable. If the problem is not defined clearly, it may be difficult for the problem solver to determine which solutions fit the criteria or solve the posed problem.

The third stage is weighing the advantages and disadvantages of each solution. In this stage, the problem solver evaluates potential solutions by examining the different effects of each. A pitfall that might be encountered in this stage could be an incorrect understanding of the effects of potential solutions. This could occur if the information used is interpreted incorrectly or if a solution is formulated based on incorrect information. Also, if the problem solver relies on numbers alone, he or she may not identify some of the more subtle advantages or disadvantages of the proposed solutions.

The fourth and final stage is choosing a solution. In this stage the problem solver looks at the evaluation of advantages and disadvantages from the previous stage and decides the best course of action. A pitfall the problem solver may encounter in this stage is the choice of a solution which does not solve the problem or which is not the

'best' solution. This pitfall could occur in a number of different circumstances. This could occur if the problem solver misunderstands the criteria necessary to solve the problem, if the circumstances surrounding the problem change during the process of finding a solution (the defined problem and the criteria for solving it may no longer be valid), or if the problem solver has a difficult time comparing the advantages and disadvantages of each solution (due to the different weights of each).

The pitfalls for each stage can be interrelated. For example, if the problem solver misidentifies the problem in stage one, the actions of each stage will be affected. Also, if the problem solver quits too soon in stage two, it is possible that the best solution will never be identified. Finally, however thorough the problem solver is, unanticipated future events may cause the chosen solution not to work.

- 1.27** Accounting information is used in each stage of problem solving. In the first stage, accounting information (information on costs, pricing, etc.) is examined to help identify the problem. In the second stage, accounting information can be used to determine whether or not potential solutions are workable (if we have already borrowed as much as we can, are there other sources of cash?). In the third stage, accounting information is used to determine the economic effects of each solution including determination of costs, profits, timing of cash receipts and payments, and effects on income taxes. In the fourth stage, the problem solver uses accounting information specified for each solution in stage three and decides, based on that information, which solution will be the best (which solution provides the greatest benefit at the least cost).

## Applying your knowledge

- 1.28** When you buy a ticket from Qantas Airlines, you are purchasing the right to sit on an airplane as it travels from one place to another. You are buying transportation. Because transportation is something intangible, it is considered to be a service. Because Qantas Airlines is in the business of providing transportation (the peanuts are incidental), it is considered to be a service business.

When you visit your local Toyota dealer to purchase a car, you also are buying transportation. The difference between the purchase of the airline ticket and the purchase of the car is that the car is a means of transportation. It is a very tangible product which will be driven as well as parked in your garage or driveway. Because the Toyota Motor Business is in the business of making cars and selling them to dealers (as opposed to selling and providing transportation), it is considered to be a manufacturing business.

- 1.29** When a bank makes credit decisions, its main concern is that the borrower be able to make the monthly loan payments on time. One way for the bank to determine a business' ability to repay the loan is to examine the business's receipts and payments of cash. The first place a loan officer might go to examine a business's liquidity (ability to pay bills and make loan payments) is the business's cash flow statement. This statement would show the cash receipts and cash payments for operating, investing, and financing activities.

- 1.30** In deciding what type of organisation to use to run your business, you would consider factors such as differences in the way each organisation is taxed, your ability to raise capital, your business knowledge, and the level of risk you are willing to accept.

Factors you would consider about organising your business as a company rather than a sole trader or partnership are: (1) As a company income taxes on the profits are paid by the business instead of by the individual owners; and (2) a company tends to be less risky because it, instead of the individual owners, is liable for any debts of the business.

One of the positive factors of operating as a sole proprietor is that it allows flexibility in running the business. As the sole owner, you would be able to make decisions regarding the operations of the business and the use of its capital. The difficulties would be that you would have to be able to raise enough capital on your own to start the business, and that you would retain all the risk if the business fails.

If you are not able to raise enough capital on your own, or want to share the risk, or are lacking in some area of expertise, you may consider organising the business as a

partnership. A partner can bring special skills and expertise or additional capital into a business to help make it successful.

**1.31** In deciding whether or not to open a new factory and sales office in Queensland, here are a few questions you might want to consider:

- Is there a market for the chocolate in Queensland? If not, it would be a waste of your time and money to locate there.
- Are there suppliers close to the intended location to help minimise freight costs?
- How high will salaries have to be to attract good employees? (i.e., how is the labour market in that area? If there is low unemployment, you will have to pay higher salaries to attract employees.)
- How strong is the economy in the intended location? (If the economy is unstable, the business will have to worry about the frequency of recessionary periods in which chocolate sales will most likely decline)
- Are there any regulations unique to the state of Queensland that would affect business operations? Regulations that might affect the business range from rules for making food products to rules requiring the business to pay unusual taxes or comply with unusual regulations.

**1.32** When considering opening a new factory and sales office in Tokyo - in addition to the questions listed above in question 1.31 - you might ask questions such as the following:

- What regulations (taxes, health, etc.) will affect the business?
- What cultural differences will affect the demand for the product (maybe Japanese people don't eat much chocolate)?
- What cultural differences will affect the work force or labour costs? What kind of benefits and time schedules must be offered to employees?
- Will the chocolate have to be reformulated to the limited availability of ingredients? (usual ingredients may not be readily available or cost effective in a foreign country)?
- Will the chocolate have to be reformulated to better meet the Japanese consumer's taste (Japanese consumers may have a more subtle sweet tooth)?
- How many competitive chocolate suppliers are there in Japan already?

**1.33** One example of information about a business in which both internal and external users have an interest is the costs of products sold. Managers within the business use cost information to help determine appropriate pricing for the products sold. External parties use the same information to help analyse the business's performance and ability to generate profit. Another example of information useful to both internal and external users is data about the sales of products. Managers use this information to help determine necessary purchases. External users want to know about product sales to look at profitability and to help analyse future cash flows.

Both internal and external users are interested in the profits of the business. External parties use this information to evaluate their decisions to invest in the business. Managers use this information to assess the effectiveness of business goals and operations.

Both internal and external parties want to know about the resources available for use in operations. Managers use this information to determine the best way to allocate resources within the business. External parties use this information to evaluate the business's financial position and ability to continue operating.

**1.34** In planning activities, managers need to be able to determine future sales and costs. To help determine potential sales in the upcoming year, information that would be useful includes data on last year's sock sales, projections of growth in population (if the population is growing, it is possible that sock sales will grow as well), and information on the economic well-being of the area. If the area is growing economically and people have more money to spend, they might spend that money on more new socks. To help predict the costs of product sales for the upcoming year, you could use information on last year's sales, projected sales for the upcoming year, any inflationary trends, and projections of changes in suppliers' prices.

In operating activities, you might need information on daily sales figures broken down by type of sock or by sock supplier. This information would let you know which socks are selling best and what kind of socks you should continue to buy to increase the profitability of the store. You would also need to know sales figures and inventory levels to help determine how often to order socks from suppliers and how many socks you should order at one time.

In evaluating activities, you would want to compare your predicted costs of sales with the actual costs of sales. This would help you identify major differences between projections and actual results and determine whether performance was good or whether it needs to improve.

**1.35** Generally accepted accounting principles (GAAP) are the 'rules' that direct the accounting practices of business in Australia and New Zealand that sell goods and



services to the public. Businesses that follow GAAP must be able to keep up with any changes in GAAP that affect their accounting and reporting. Because it takes time to review information published on new principles, there is a cost of staying informed. When GAAP does change, there is a cost of changing accounting systems, changing reports, and informing employees.

The owner(s) of a business that is affected by a proposed new accounting principle is concerned about the cost of changing the business's accounting system and about the increased paperwork and time that may be required. The owner(s) is also concerned about any reporting changes that could reduce the amount of profit the business generates. If a new principle makes a business's performance appear less profitable, the owner may be concerned that the business would have trouble raising capital and attracting investors. For example in Australia the debate about carbon tax accounting.

**1.36** Financial statements are reports that communicate accounting information about a business to managers and external parties, such as creditors and investors. The major financial statements are the income statement, the balance sheet, and the cash flow statement.

The income statement helps users evaluate a business's operations over a period of time by showing revenues, expenses, and net income. Revenues are the total amount that the business charged its customers for the goods or services it provided during a specific time period. Expenses are the business's costs of providing those goods and services, and net income is the difference between revenues and expenses.

The balance sheet helps users evaluate a business's financial position on a particular date by showing the business' assets, liabilities and owner's equity. A business's assets are resources such as cash, products available for sale to customers, and land, buildings and equipment owned by the business. Liabilities are the business's obligations such as loans to be paid back to banks and amounts owed to suppliers and employees. The owner's equity section of the balance sheet shows the amount invested in the business by its owner(s), and the business's cumulative earnings.

The cash flow statement helps users evaluate a business's liquidity by showing its cash receipts and payments from operating, investing and financing activities for a specific time period. Cash flows from operating activities are cash received for providing goods or services and cash paid to suppliers or employees to enable the business to produce goods and provide services. Cash flows from investing activities are cash paid for assets like equipment or land, and cash received when those assets are sold. Cash flows from financing activities are cash received when the business

obtains loans or receives cash from the sale of stock, and cash paid out when the business makes loan payments or pays dividends or drawings to owners.

**1.37** Business people may face many situations in which the ethical issues are complicated and the line between right and wrong is fuzzy at best. To help business people make ethically sound decisions in these complex situations, a code of ethics makes statements about acceptable ethical behaviour. These statements can be considered guidelines which can be applied to various situations to help in the decision-making process.

**1.38** Upon considering the following opposing sides of an issue:

- a. The main support for requiring all businesses to follow GAAP is that it would ease financial statement comparison of businesses all over the world.
- b. Some reasons why all businesses should not be required to follow GAAP are as follows:
  - Different countries have different cultures and different economic concerns which make unique reporting requirements necessary (examples include communist countries where information on production would be more important than information on profit).
  - It would be difficult to agree on which accounting standards should be GAAP although IFRS (International Financial Reporting Standards) have overcome this problem.
  - Some businesses report to few, if any, outsiders. GAAP, therefore, would not be important since the information contained in reports would be for internal use only.

**1.39**

- a. Alternative ways you could approach your boss include:
  - (i) agreeing with her assessment, and promising to do better (but, only if you agree with her assessment;
  - (ii) complaining about how unfair your workload is (this is not a very convincing approach, however), or,
  - (iii) logically persuading her that your workload is unreasonable.
- b. Some of the information you could use to approach your boss to support your point of view might include:
  - an explanation of your difficulty in meeting deadlines,
  - a comparison of your workload with standard industry workloads,
  - proof of your past outstanding performance, and
  - an outline of a way of rearranging the workload within your department.

It is important that with other information presented to your boss you should be able to bring concrete examples of how your workload has increased. Regardless of the evidence you use to show support your point of view, it is important that the approach used is as objective and professional as possible. It is important that your boss understand that you are presenting a serious problem and not whining.

The following are examples of support your boss might have for her point of view and responses you might use to refute her point of view:

- The current workload is the same as that expected from all employees at your level. If this is the case, you may want to request additional training or have the boss show you where you could cut time from your work and still deliver a quality performance.
- The business is currently cutting costs and needs employees to work harder to get the business through a temporary crisis. Your response to this argument may be that your inability to meet your deadlines may create greater problems for the business.
- The harder work schedule is temporary-during the busy season only. Again, your response might be that the business may have problems due to your inability to meet deadlines during the 'busy season.'
- The boss sees you spending time kibitzing during the day or spending too much time on the telephone. If this is the argument of your boss, then you must be able to provide evidence that those times when you were not working occurred because you were being held up by someone else, or that there is some other logical explanation for why you were not working.
- The boss is being pressured by higher level managers. If this is the case, then your boss may recognise that you are working too hard and may be amenable to implementing any solutions that you help identify.

Your own arguments should address the reasons, information, and evidence used by your boss.

**1.40** Examples of questions you would want answered (and places where you might go for answers) might include the following:

- When must a decision be made? The amount of time you have to develop your opinion will affect the kinds of information you are able to collect. You would go to your boss for the answer to this question.
- What are the expectations of a new branch? If you know what the expectations are, you will be able to determine the potential of the new branch to meet those expectations. To determine business expectations, you could use business

proposals, goals, and other criteria for new branches (assuming that information is formally written) or you could get this information from your boss.

- How will performance be measured? Again, it is necessary to know the measures of performance before you can determine the ability of a new branch to perform well. This question can be answered through discussions with your boss and through research of branches in other locations.
- What kinds of gourmet food (if any) would people in El Paso want and how much would they be willing to pay for it? This information would help you determine the profitability of opening a branch in the proposed location. Marketing surveys and focus groups could be used to determine both the kinds of food people in El Paso would be interested in and the amount they would be willing to pay.
- What is the economic climate in El Paso? You would want to know if El Paso is an economically strong community. If not, during a period of recession, few people would purchase gourmet food. Statistical information about the area would help you analyse the economic climate.
- Will various costs (labour, warehouse rental, transportation, and distribution) be more expensive in the El Paso area? This information will help you determine the potential profitability of the new branch. Research of statistical information about unemployment and wages, and estimates from prospective suppliers will help answer this question.
- How long will it take to make a profit? This information will help you evaluate the ability of a new branch to meet expectations. Sales and costs estimates can be used to develop profitability projections.
- How much capital will be required to run the proposed branch effectively? Again, this information will help determine the profitability of the branch. By examining the capital requirements of other branches, you should be able to develop an estimate of needed capital.

**1.41** First, you should be aware that a loan to family member can be a very sensitive issue, particularly if he can't pay you back. Before you decide to take a risk on the family member who tormented you throughout your early years (but who you love anyway), make sure you have carefully examined information about The Last Custard Stand. Some examples of information you may want to analyse before you make your decision include:

- The financial position of the business--you should use accounting information to determine the level of debt your brother currently has. If he already has a number of debts outstanding, you may be the lowest lender on the totem pole. (Be aware that your brother may consider payment to non-familial creditors more important than paying you.) If this is the case, you may decide not to lend him the money (another

sensitive issue) or you may decide to lend him only a small amount. By looking at the financial position of the business, you will also be able to analyse the business' liquidity (ability to repay loans).

- The profitability of the business--you will want to know if the business has been making a profit, and accounting information will help you evaluate the business's ability to generate income. Certainly, you will be more willing to give your brother a loan if you know that the business has been making money. If it is not, this will give you the opportunity to ask your brother why it has not been making money.
- The purpose of the loan--you will want to know if the proceeds of the loan will be used for expansion or if it is for use in the day to day operations of the business. If the money is for use in the day to day operations, then it is likely that the business is not doing well, regardless of what your brother says. The business should be able to generate enough cash to support its own operations and if it can't, then it is not likely that the business will be able to generate enough cash to repay the loan. If this is the case, you may not want to loan your brother the money. On the other hand, if the money is going to be used to expand the business, chances are that the business is doing very well. If this is the case, then your brother should have accounting information such as projections and budgets that will help you analyse the potential profitability of the expansion. If the projections look good and reflect a continuation of the success of the current business, you will be more likely to give your brother the loan.

**1.42** Although this information will be helpful and it shows that The Last Custard Stand made a profit in 2011, this information could be augmented to make it more helpful. This information on profit would be more helpful if it showed data for more than just one year. You would want to be able to see trend data. Trend information would allow you to determine if the \$15 000 profit earned in 2008 is normal (The Last Custard Stand earns approximately \$15 000 every year). If the \$15 000 profit is on par with all previous years, you might conclude that The Last Custard Stand, although not necessarily a growing business, is at least a stable business in which you would be willing to invest your money. The trend information might show that the business has been making a successively higher profit each year. If this is the case you might infer that the Last Custard Stand is a growing and profitable business and that you should lend your brother the money. Finally, if the trend information shows that the \$15 000 profit is a fluke (the business rarely makes a profit) or that profit has been steadily declining, you may be hesitant to invest in the business.

The profit information also would be more helpful if it showed the details of The Last Custard Stand's revenues and expenses. A detailed list of expenses, for example, could help you understand how the business uses its resources to help it make a

profit. This list, combined with trend information could help you notice which particular expenses are increasing, decreasing, or remaining stable, and which may be short-term or temporary expenses.

**1.43** There are a surprising number of uses for broken copiers. Here are some examples of uses for the old machine:

- sell the old machine for scrap
- sell the insides and use the shell as a plant stand or planter in the lobby
- take it to the dump
- pay someone to take it away
- paint it various colours and put it in the lunch room where it can serve as a conversation piece or table
- put it on wheels and roll it out to the parking lot where it can be used to reserve the CEO's favourite parking space
- store paper in it for the new copier
- chain it to the business yacht where it could serve as anchor
- use as a cornerstone for a new building
- use it as a fish tank/aquarium
- sell chances to take a sledgehammer to it, either to get out all staff aggressions or to raise money for charity
- use it as a trash can or recycle bin
- convert the insides so that it could be used as a microwave or popcorn popper
- use it as a business safe (what thief looking for corporate secrets would look inside a copier)

**1.44** The statement focuses on the attire that is worn on Friday but makes no statement about what attire is appropriate during the rest of the week. It is possible that jeans could be worn on any day of the week. Also, the co-worker makes no observations of Jan's usual attire. It is possible that Jan wears jeans every day of the week, or that Jan has been recruited to help move the copier (from problem 1.43) and other office furniture and equipment.

## Making evaluations

- 1.45** While you often may hear restaurants referred to as service businesses, you would probably tell Vito that his restaurant would be in the position of a manufacturer that sells products directly to the final customer. Although Vito's cooking is more like an artistic production than an assembly line, the restaurant basically purchases ingredients (food) from suppliers (grocery stores, restaurant supply stores, farmers, etc.) and uses those ingredients to produce a tangible good (a meal) which it sells to customers.
- 1.46** Before you and Harvey begin business, you would want to iron out many details. For example, you probably would want the partnership agreement to address how much each of you will contribute to the partnership (either cash or tools). You also would want to know who is responsible for what (i.e., who will be doing the physical labour), and whether each partner will receive a salary for participation in the business and if so, how much. You would want to know if each partner will be equally liable for any debts of the partnership. You would want to know how the profits and losses of the partnership will be shared between the two partners. Finally, you would want to know how the resources of the business will be divided should you ever decide to dissolve the partnership.
- 1.47** You should have no trouble finding support for the need for business codes of ethics. Some articles may illustrate the need for a code of ethics to provide a basic set of values in business. Evidence or support may include instances of embezzlement, fraud, insider trading, leaks of corporate secrets, telemarketing schemes that target the elderly, and credit card fraud, just to name a few. A business code of ethics may help a business change the focus of its business operations to include honesty and fairness.
- A business code of ethics also is needed to help a business follow the right path when the issues are more complex. Some examples of situations you may read about where a business may need a business code of ethics to act as a guideline may include:
- discriminatory hiring and promotion policies,
  - production of defective products (safety precautions are curtailed to minimise costs), and
  - purchasing goods from foreign suppliers (who may or may not use child labour) to reduce costs.

In each of these instances, a business may not be conscious of any harmful effects its actions caused. A business code of ethics might help a business recognise situations in which it has a responsibility to act with care and fairness.

**1.48** Your answer to this question will depend on a number of different factors including the type of image you want to project, the people you will be meeting with, the purpose of the meeting, and even the area of the country in which you work. Assuming that the business meeting is a traditional one in which you want to appear professional and in a location in which business suits are appropriate, your response may be similar to the following:

“Yes, a suit is the most appropriate article of clothing to wear to a business meeting. A suit projects an image of confidence and professionalism. I have been to business meetings in which some people were wearing suits and some were not. It was evident that those wearing suits were taken more seriously and their comments were given more weight than those not wearing suits. Also, in the book *Dress for Success*, author John Malloy states that people wearing suits appear to be more authoritative, successful and professional than people not wearing suits.”

Certainly, your response might be significantly different if the business meeting is between athletic coaches or creative artists, if it is a meeting of architects and contractors on a construction site, if it is to take place at a fishing lodge, ski resort, or golf club, or if it is to take place in another country where customs dictate a more appropriate dress code.

This question should generate some interesting responses from students, many based on their assumptions about the business world. It may (hopefully) generate more questions than it does answers. (It is difficult to answer the question without more information.) They may bring up some of the following questions, plus a few more.

- What is meant by ‘most appropriate?’ Is this in terms of physical safety, job security, promotability, or conservatism?
- Where will the meeting take place? (If it's on a construction site, a business suit may ‘get in the way of’ safety.)
- Has a mode of dress been established for the meeting? (If this is a business retreat where attendees have been told that ‘business casual’ is the expected dress, a business suit would not be appropriate.)



- Who will be attending the meeting? Bankers? Construction workers? Graphic artists? Given the conservative nature of the banking industry, jeans probably would not be appropriate at a formal meeting of bankers. However, they may be appropriate at a meeting of construction workers. (This may be a good time to ask students what they would wear to a meeting of graphic artists.)
- What would be the relationship of the wearer of the business suit to the other people attending the meeting? If the wearer is a presenter, a business suit may be the most appropriate dress regardless what the other attendees are wearing. If the wearer (with a teammate) is going to demonstrate synchronised swimming to the Olympic Committee, perhaps another kind of suit would be in order.

The most important aspect of this problem is how the students support their answers, regardless which answers they choose. You will probably hear sources such as Leticia Baldrige (hopefully from her business etiquette book) and John T. Malloy (*Dress for Success*) as well as work experience, war stories from parents, and, of course, opinion. It is important to emphasise that opinion is not enough. Opinion must be supported by evidence or logical reasoning.

If you turn this question into a class discussion, the class should arrive at a consensus that the answer to this question depends on numerous factors. Of course, this is the nature of most business decisions.

**1.49** There are two alternative solutions to this question. The first solution focuses on nonmonetary issues; the second focuses on monetary issues.

#### **Alternative solution 1**

**(i)** The first option is to produce only the Empty Decadence candy bar.

The advantages associated with this option are:

- there is a high projected sales volume of 100 000 which indicates that the candy bars will be accepted in the marketplace
- retraining employees to produce this candy bar will not be too difficult
- the factory can be reconfigured
- the demand for this candy bar is expected to increase over the next ten years.

The disadvantages associated with this option are:

- these candy bars yield a lower amount of profit per unit than the Decadent Thunderbolt candy bar
- the factory must be reconfigured and employees retrained
- the market for the Empty Decadence candy bar has not been proven.

**(ii)** The second option is to produce only the Decadent Thunderbolt candy bar.

The advantages associated with this option are:

- the business knows that there is currently a demand for this product
- this candy bar yields a higher profit per unit
- the choice of this option will save money in that no factory reconfiguration or retraining will be necessary.

The disadvantages associated with this option are:

- there is a lower projected demand for the Decadent Thunderbolt candy bar
- demand for this candy bar will be decreasing.

**(iii)** The third option is to produce both the Empty Decadence and the Decadent Thunderbolt candy bars.

The advantages of this option are:

- there will be a higher total sales volume than will occur in either option A or B
- the resources necessary for this option are available
- the factory can be used to produce both
- the market for the Decadent Thunderbolt candy bars will decrease as the market for the Empty Decadence candy bar increases (factory space can gradually change from one candy bar to the other).

The disadvantages associated with this option are:

- more marketing effort will be required to market both candy bars effectively
- the candy bars may be competing for the same customers
- there will be costs associated with retraining employees and reconfiguring the factory.

**(iv)** The final option is to not produce either candy bar.

The advantages are:

- no resources would be used
- the business could rent out the factory space to generate revenue.

The disadvantages of this option are:

- no revenue would be generated from candy bar sales
- this option ignores the fact there is a market for each candy bar
- employees would have to be retrained for work elsewhere in the business or they would have to be fired
- the business could lose customer loyalty and then future sales of other candy bars.

Additional information that would help in the analysis of the options are as follows:

- specific cost and profit information or estimates for each option,

- more specific sales projections,
- a determination of whether or not financing is necessary,
- information about what other candy bars are currently being sold, their forecasted sales, and their profitability.

The choice of the option which will be most beneficial to the business will depend on the weight attached to the advantages and disadvantages of each and on the goals of the business. Other alternatives not considered might be renting or building a separate factory for producing the Empty Decadence candy bar, or test marketing the Empty Decadence candy bar initially to get a more definite determination of the market acceptance for the candy bar.

### **Alternative solution 2**

- (i) The first alternative is to sell only Empty Decadence candy bars, dropping the Decadent Thunderbolt product line. The marketing department predicted that, in the first year, Unlimited Decadence could sell 100 000 Empty Decadence candy bars if Unlimited Decadence drops the sales of Decadent Thunderbolt candy bars. (Unlimited Decadence could have sold 80 000 Decadent Thunderbolt candy bars instead.) With this alternative, since the profit from the sale of Empty Decadence candy bars is \$0.10 less per candy bar than the profit from the sale of Decadent Thunderbolt candy bars, the sale of the first 80 000 Empty Decadence candy bars will bring in \$8 000 less profit (80 000 x \$0.10 difference in candy bar profits) than would have been earned by the entire predicted sales of the Decadent Thunderbolt candy bars. That means that for this alternative to be more profitable than producing and selling only the Decadent Thunderbolt candy bar, the remaining predicted sales of 20 000 Empty Decadence candy bars must generate more than \$8 000 in profit, or more than \$0.40 per candy bar. Otherwise, Unlimited Decadence will lose more by dropping the Decadent Thunderbolt candy bars than it will gain by selling only Empty Decadence candy bars, even though it can sell more Empty Decadence candy bars than Decadent Thunderbolt candy bars.
- (ii) The second alternative is to continue to produce the Decadent Thunderbolt line of candy bars and not to produce the new Empty Decadence product line. The analysis of this alternative is similar to the analysis of the first alternative. The marketing department predicted that, in the first year, Unlimited Decadence can sell 80 000 Decadent Thunderbolt candy bars if it chooses not to sell Empty Decadence candy bars. Sale of all the predicted Decadent Thunderbolt candy bars will generate \$8 000 more profit than the sale of the first 80 000 Empty Decadence candy bars. In order for this alternative to be a better choice than the

first alternative, Empty Decadence candy bars would have had to have a projected profit of less than \$0.40 per candy bar. In other words, in order to overcome the \$8 000 advantage that the sale of Decadent Thunderbolt candy bars has over the sale of the first 80 000 Empty Decadence candy bars (\$8 000), the sale of the other 20 000 Empty Decadence candy bars would have to earn a profit greater than \$8 000. This means that the profit per Empty Decadence candy bar would have to be greater than \$0.40 per candy bar ( $\$8\ 000/20\ 000$  candy bars).

- (iii)** The third alternative is to produce and sell both the Decadent Thunderbolt candy bar and the Empty Decadence candy bar. If Unlimited Decadence chooses this alternative, the marketing department predicts that customers will buy 70 000 Empty Decadence candy bars and 65 000 Decadent Thunderbolt candy bars.

A comparison of this alternative with the first alternative (where only Empty Decadence candy bars are produced and sold) indicates that Unlimited Decadence would lose sales of 30 000 Empty Decadence candy bars (100 000 candy bars in the first alternative - 70 000 candy bars in this alternative), but gain sales of 65 000 Decadent Thunderbolt candy bars. The profit lost by losing the 30 000 sales of the Empty Decadence candy bars would be more than 'made up' by the sale of the first 30 000 Decadent Thunderbolt candy bars. In fact, the sale of these candy bars will earn \$3 000 more profit than the sale of the Empty Decadence candy bars (30 000 candy bars  $\times$  \$0.10 additional profit per candy bar) because they earn \$0.10 more profit each than do the Empty Decadence candy bars. Since total predicted sales of Decadent Thunderbolt candy bars in this alternative is 65 000 candy bars, Unlimited Decadence stands to earn even more profit under this alternative than the \$3 000 extra profit earned by the sale of the first 30 000 Decadent Thunderbolt candy bars.

A comparison of this alternative with the second alternative (where only Decadent Thunderbolt candy bars are produced and sold) indicates that Unlimited Decadence would lose sales of 15 000 Decadent Thunderbolt candy bars (80 000 candy bars in the second alternative - 65 000 candy bars in this alternative), but gain sales of 70 000 Empty Decadence candy bars. By losing sales of 15 000 Decadent Thunderbolt candy bars and replacing them with sales of 15 000 Empty Decadence candy bars, Unlimited Decadence would lose \$1 500 in profit ( $\$0.10$  extra profit per Decadent Thunderbolt candy bars  $\times$  15 000 candy bars). In order for this alternative to be a better choice than the second alternative, the remaining sales of 55 000 Empty Decadence candy bars would have to earn more than the \$1 500 lost by losing the sales of 15 000 Decadent Thunderbolt candy bars and replacing them with sales of 15 000 Empty Decadence candy bars. That means

that the remaining Empty Decadence candy bars would have to earn a profit greater than \$0.027 each (\$1 500/55 000 candy bars).

- (iv)** The last alternative is to sell neither the Empty Decadence candy bar nor the Decadent Thunderbolt candy bar. Since the sale of either of these candy bars earns a profit (assuming the sale of Empty Decadence does earn a profit), the decision to sell neither candy bar would cause Unlimited Decadence to lose profits. Loss of profits makes this alternative an undesirable choice.

The first alternative will be better than the second alternative if the profit earned by selling each Empty Decadence candy bar will be greater than \$0.40. The third alternative is better than the first alternative because it will earn a higher total profit than the first alternative. The third alternative is better than the second alternative if the Empty Decadence candy bars will earn a profit greater than \$.027 each.

At this point, it looks like the best solution will be either the second alternative or the third alternative. Of course, more information would be desirable for making a choice between the two alternatives. What is the projected profit for each candy bar? Does Unlimited Decadence sell other candy bars? How will the sale of Empty Decadence candy bars affect the sale of the other candy bars? If both candy bars will be sold, new employees will have to be hired to increase total production of candy bars. How will their salaries affect profit?

Other alternative solutions might include selling Empty Decadence candy bars in some geographical areas and Decadent Thunderbolt candy bars in other geographical areas, or changing the mix of Empty Decadence and Decadent Thunderbolt candy bars in different geographical areas. Management also could consider changing the selling prices of the two kinds of candy bars, noting the effect of the changes on projected sales and on the anticipated profit for each kind of candy bar.

**1.50** The changing business environment will provide many new opportunities. Rapidly changing technology will create job opportunities for people who can understand and use new technology. Globalisation will create opportunities for people who understand foreign languages and cultures. The information explosion will provide opportunities for people who can synthesise and filter information. These opportunities will result in personal benefit and growth for those who are able to take advantage of them.

To prepare for these opportunities, it is important that employees develop not just skills to perform certain tasks, but creative and critical thinking skills. The most valuable employees (those most able to take advantage of opportunities) will be those who continue to learn regardless of job requirements.

**1.51** The following is an example of a response which students might write:

Dear Lucky,

I'm afraid it is time for you to pick up the phone, call your boyfriend, and admit that you were in error. Your boyfriend is correct; there is an important difference between being just lucky and being both lucky and prepared. It is true that successful business people often are in the right place at the right time. That is luck. However, it is possible to be in the right place at the right time and not be successful.

For example, suppose that you are the manager of a retail clothing outlet that has stores all over the country. Let's say that on your way to the yearly manager's meeting in Las Vegas you happen to be seated on the plane next to the regional manager. That is lucky. But just being seated next to the regional manager will not make you successful in the business. This is your opportunity to wow your boss's boss with all your fantastic ideas about the business. If you are prepared, you might impress the regional manager and he or she may keep you in mind for promotion. If you have not thought much about the business, and can't answer the questions the regional manager asks about the outlet you run, you may not destroy your chances for promotion, but you probably won't be the first person considered.

I hope this example helps illustrate the difference between being lucky and being prepared.

Sincerely,

Dr. Decisive

# Chapter 2

## Developing a business plan: Cost-volume-profit analysis

The questions in this chapter are divided into three sections:

- **Testing your knowledge:** these questions are straightforward and are designed to help students assess their basic knowledge of a particular topic.
- **Applying your knowledge:** these questions ask students to use their basic knowledge to solve a particular problem.
- **Making evaluations:** these questions are more complex and ask students to integrate their knowledge of a particular topic or topics to make decisions.

We have included the 'Content analysis' below to help instructors decide which **applying your knowledge** questions to assign. It briefly summarises the content of each question. We did not provide a content analysis for the **making evaluations** questions because of their lack of uniformity, and because of the multiple topics included in them.

### Content analysis for applying your knowledge questions

- 2.17 Business Planning.** Determine the name for a new business as well as its product or service, the price for the product or service, and possible fixed and variable costs.
- 2.18 Identifying Financial Information.** Using *Moody's* or *Standard & Poor's*, identify what information could help to prepare projected financial statements for a business.
- 2.19 Cost-Volume-Profit Analysis.** Draw a graph showing a business' total revenues and costs. Determine the profit equation and the break-even point.
- 2.20 Cost-Volume-Profit Analysis.** Determine the profit equation and break-even point for a business. Graph the contribution margin and fixed costs. Compute total profit and sales volume under two scenarios
- 2.21 Cost-Volume-Profit Analysis.** Determine a business' break-even point, required sales volume, and total profit under several scenarios.
- 2.22 Expected Profit.** Compute the expected profit for a business and the sales volume required to meet its profit goals. Evaluate the business' pricing and advertising strategy.
- 2.23 Cost-Volume-Profit Analysis.** Compute a business' contribution margin, break-even point, profit, and sales volume under several scenarios. Prepare and use a graph to evaluate.

- 2.24 Cost-Volume-Profit Analysis.** Prepare and use a graph to identify total costs, fixed costs, sales revenue, and contribution margin. Compute the break-even point, sales volume, and total profit. Evaluate a buying option.
- 2.25 Sales Volume.** Compute a business' break-even point and total profit under several scenarios.
- 2.26 Cost Equations.** Determine 3 cost equations, graph the equations, and evaluate the cost plans under several scenarios.
- 2.27 Cost-Volume-Profit Analysis.** Determine and graph a business' profit equation. Compute the break-even point, total profit, and required sales to reach a target profit.
- 2.28 Cost-Volume-Profit Analysis.** Compute a business' contribution margin, total profit, and required sales volume to reach a target profit.
- 2.29 Cost-Volume-Profit Analysis.** Compute a business' break-even point, required sales volume, and total profit under two scenarios.
- 2.30 Cost-Volume-Profit Analysis.** Compute a business' break-even point, required sales volume, and total profit under two scenarios
- 2.31 Cost-Volume-Profit Analysis.** Compute a university's break-even point, required number of attendees for a profit, and minimum number required



## Testing your knowledge

**2.1** Even though circumstances are likely to change, it is important to plan. Planning helps the owners and managers of a business to recognise potential problems. If the managers and owners are aware of possible problems before they occur, they can be better prepared to deal with those problems.

**2.2** A business plan has three main functions.

- A business plan helps the entrepreneur visualise and organise the business and its operations.
- A business plan sets a benchmark, or standard, which the entrepreneur will use to measure the performance of the business.
- By presenting goals, projections, and information about a new business, a business plan helps the entrepreneur obtain financing that the business needs.

**2.3** There typically are four components of a business plan. They are:

- the description of the business, which includes information about the organisation of the business, its product or service, its current and potential customers, its location, its objectives, and where it conducts its business
- a marketing plan, which shows how the business will make sales and how it will influence and respond to market conditions
- an operating plan, which includes how the business will develop and enhance its products or services, describes relationships between the business, its suppliers, and its customers, and discusses anything else that could influence operations such as regulations, concerns of special interest groups, or availability of employees
- a financial plan, which identifies the business' capital requirements and sources of capital, and provides details about the business' projected financial performance, including information about the its 'start-up' costs.

A business plan helps an entrepreneur work through the specific details of how the business idea will become a reality. The owner or manager must make decisions about what kind of products to sell, which customers to target, where to locate the business, and how to price and promote the products. The owner also must work through relationships with suppliers, potential sources of capital, and projections of cash receipts and payments. The business plan helps the entrepreneur make decisions about how the business will work.

The business plan also helps external users make investing and lending decisions about the business. The business plan includes information about factors that will affect the business' future success such as the organisation of the business and its

personnel, the business' marketing strategy and ability to implement that strategy, and specific details about the operations of the business. Investors also use the business plan to determine the potential profitability of the business. Lenders can use it to help determine the amount of risk associated with loaning money to the business.

**2.4** It is important for business' to have an environmental management plan as both society and government expect businesses to behave environmentally friendly. The plan helps them in the following ways: increase material efficiency, reduce environmental impact and risk, and reduce costs of environmental protection.

A list of possible environmental costs for a cereal manufacturing business:

- materials used
- percentage of material input that is recycled
- direct energy consumption
- energy saved due to efficiency improvements
- initiatives around energy-efficient or renewable energy usage
- volume of water recycled
- habitats protected or restored
- total direct and indirect greenhouse gas emissions
- amount of hazardous waste products
- environmental impact of transporting products.

**2.5** A cash buffer is necessary for a business because projections of cash payments and receipts are not guarantees. If actual cash inflows are less than projected or if an unforeseen problem arises, the buffer will protect the business. A cash buffer also can be used to take advantage of unexpected opportunities that require cash.

**2.6** There are two steps an entrepreneur should take to determine a business' capital requirements. The first step is to determine the amount of capital needed to acquire the resources (such as buildings, equipment, and furniture) necessary for running the business. The entrepreneur can estimate the amount of capital by obtaining cost quotations, appraisals, and sales agreements. The second step is to analyse the business' projected cash receipts and payments to see if the business will have enough cash to buy the resources or if it will have to borrow the funds.

**2.7** As the names imply, the difference between short-term and long-term capital has to do with timing. Short-term capital includes credit from suppliers or commercial loans which must be repaid within a year or less. Long-term capital (often obtained from commercial banks, friends and relatives, leasing businesses, and the state's

economic-development agency) will be repaid to creditors or returned to investors after more than a year.

**2.8** Cost-volume-profit analysis is a tool (based on a simple profit computation involving revenues and costs) which managers use to study the ways in which a business' profits will be affected by alternative sales volumes, sales prices, and costs. Managers can use this analysis to help them determine the number of units that must be sold for the business to break even (sometimes referred to as 'break-even analysis') or to earn a desired profit.

During the planning process cost-volume-profit analysis helps entrepreneurs think through their businesses' business plans and select alternatives by showing how various alternatives will affect profits.

**2.9** Variable costs, in total, change in proportion to changes in volume. Fixed costs, on the other hand, are constant in total. Therefore, you can distinguish between the two by examining the effect of changes in volume on the total cost.

**2.10** Relevant range is the range of activity levels over which the particular cost behaviour pattern (fixed) remains valid.

**2.11** A contribution margin is the difference between estimated sales revenue and variable costs and can be computed either on a per unit basis or in total. The per unit computation is the difference between the estimated sales revenue per unit and the variable costs per unit. The total contribution margin is the difference between the estimated total sales revenue and total variable costs.

**2.12** Break-even refers to the point at which a business makes zero profit. In this instance, the sales revenue is exactly enough for the business to 'cover' all its fixed and variable costs.

**2.13** The effect that each of the situations on break-even unit sales is:

- a.** There is not enough information to know how this change will affect the number of units that need to be sold to break even. You need to know if there is a difference between the price of the tags and the stickers. Most likely, there will not be a significant difference in cost, in which case this will have no effect.
- b.** By leasing more retail space, the store's fixed costs will increase and the break-even unit sales will increase as well.
- c.** Additional advertising expense will increase the bakery's fixed costs and the result will be an increase in the break-even unit sales.
- d.** There is not enough information to know the effect on break-even unit sales. If the price increases, this means that the product will have a higher contribution margin per unit and the break-even unit sales will decrease. If the sales commission increases, the variable cost per unit increases, the contribution margin per unit will decrease, and the break-even unit sales will increase. In this case, you need to know to what extent the increase in variable cost will offset the increase in sales price per unit. It is possible that there will be no effect.
- e.** The increase in billing rates is basically an increase in unit price. The increase will result in a higher contribution margin per unit and a decrease in the break-even unit sales.
- f.** The lower cost of inventory represents a decrease in the variable cost per unit. The result will be a higher contribution margin per unit and a decrease in the break-even unit sales.
- g.** The installation of air conditioners in the dormitories will likely increase the utilities expense of the university (fixed costs). The increase in fixed costs will result in an increase in the break-even unit sales.
- h.** There is not enough information to know what the effect on break-even unit sales will be. The reduction in advertising expense is a decrease in fixed costs which would result in a decrease in the number of units that need to be sold to break even. The increase in sales commission, however, represents an increase in the variable cost per unit, a decrease in the contribution margin per unit, and an increase in the break-even unit sales. The total effect on break-even unit sales depends upon the extent to which the two changes offset each other.
- i.** There is not enough information to know what the effect on break-even unit sales will be. You need to know if it is more or less expensive to hire a cleaning crew or to use a cleaning service.

- 2.14** If the total variable cost per unit increases while everything else remains constant, total variable costs would increase, contribution margin per unit would decrease, profit would decrease, and the break-even point would increase (i.e. more units would need to be sold for the business to break-even).
- 2.15** If total fixed costs increase while everything else remains constant, profit would decrease and the break-even point would increase (i.e. more units would need to be sold for the business to break-even).
- 2.16** The income statement in Exhibit 2.8 helps internal decision makers perform cost-volume-profit analysis by separating variable costs and fixed costs.

## Applying your knowledge

**2.17** Before you decide what kind of business to start, you would need to decide what needs currently exist in the location where you choose to do business. You would also want to analyse the amount of competition in that area.

The name that you choose for your business should be easy for potential customers to remember and should help indicate the type of service or products provided. For example a dry cleaning business with the name 'Wilson Brothers' might attract business if it has been around long enough for people in the area to know what the Wilson Brothers do. However, a name that might better identify the business with the service it provides would be 'Wilson Brothers' Cleaners.'

Before you decide on a price for your product or service, you need to know your business' fixed and variable costs, and the prices of similar products and services in the area. In considering a specific price, you should determine the number of units that could be sold at that price. This will help you determine whether or not you will be able to make a profit.

An example of a business you would start might be called Sunny Day Ice Cream Service, which is in the business of selling various kinds of ice cream from an ice cream truck. The price for a scoop of ice cream might be, say, \$0.10 over the total cost per unit (fixed costs divided by the number of units, plus the variable cost per unit). This price would be low enough to attract many customers (hopefully) and high enough to cover costs and allow the business to compete in the local ice cream market and make a modest profit. The variable costs incurred by this business would be the cost of the ice cream, the cost of gas and oil for the truck, and perhaps the salary for the ice cream truck driver. The fixed costs would include the lease payment on the truck and any rental costs for office space and other equipment rental.

**2.18** There is an immense amount of information in the reference section. Before you start looking, you should be aware that much of this information is 'industry' information. Therefore, for this information to be useful, you need to know which industry your sports equipment business fits into. The *Standard Industrial Classification Manual* is a reference which lists information about businesses including their Standard Industry Code (SIC). The easiest way to find the appropriate SIC is to look in the alphabetical index for the goods or services you plan to sell. For your business, you would look up sporting goods stores-retail.

Once you know the industry, a reference such as *Standard & Poor's Industry Reports*, or *Moody's Handbook*, can provide information that might help you prepare projected financial statements. (Be careful -- the name used for an industry may vary

slightly across different references. For example, Miscellaneous Retail is the same as Retail - Specialty.) These references contain industry averages of specific ratios (ratios are a means of analysing a business' performance and structure). Operating margin, for example, is a ratio (computed as operating income before depreciation divided by sales revenue) which could help in the preparation of the income statement. This ratio tells you approximately how much income from operations is generated by each dollar of sales revenue. The debt to equity ratio (computed as long-term debt divided by owner's equity) could help in the preparation of the balance sheet. If you know the amount of capital needed to run the business, this ratio will tell you approximately how much you should plan on investing yourself (equity) and how much capital you might want to obtain through a loan. Other ratios may be helpful, and each reference explains how the ratios are computed.

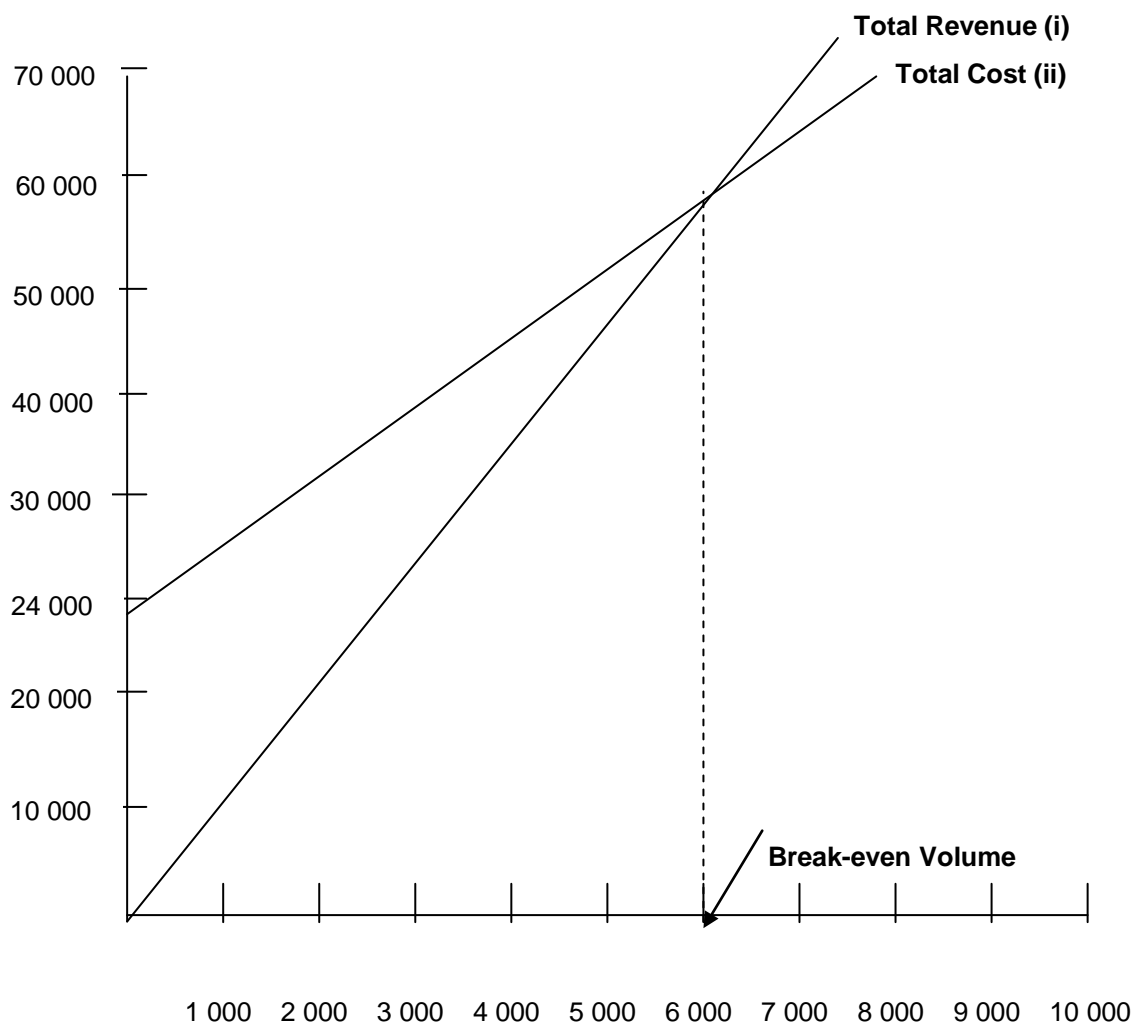
Other resources which might be helpful in the preparation of projected financial statements are:

- the financial statements of other businesses in the same industry (to illustrate the accounting methods typically used),
- quotes from suppliers (to determine the value of assets to be used as well as cost information),
- demographic information (to help determine potential sales volume).

2.19

a. (i) Total revenue =  $\$10x$  ( $x$  = the number of units sold)

(ii) Total costs =  $\$6x + \$24\,000$





**b.** Profit = Total revenue - Total variable costs - Total fixed costs  
 = \$10x - \$6x - \$24 000 (x = the number of units sold)

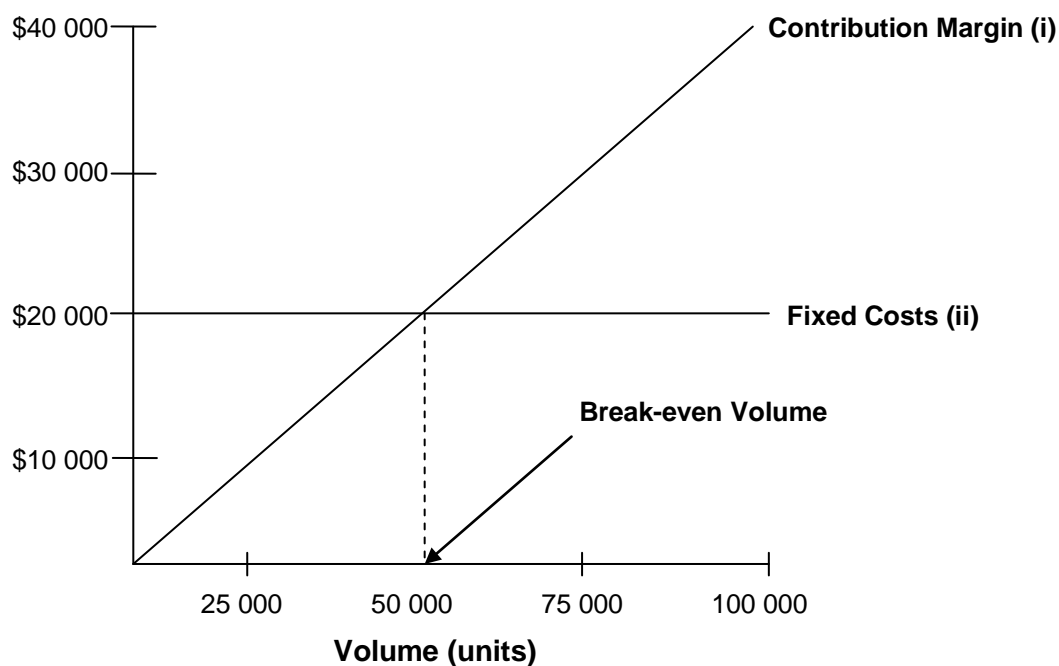
**c.** 
$$\text{Break-even} = \frac{\text{Total fixed costs}}{\text{Contribution margin per unit}}$$

$$\begin{aligned} &= \frac{\$24\,000}{\$4} \\ &= 6\,000 \text{ units} \end{aligned}$$

**2.20**

**a.** Profit = Total revenue - Total variable costs - Total fixed costs  
 = \$1.60x - \$1.20x - \$20 000 (x = the number of boxes sold)

- b.** (i) Total contribution margin = \$0.4x (x = the number of units sold)  
 (ii) Total fixed costs = \$20 000



c. Total fixed costs

Break-even point = Contribution margin per unit

$$\frac{\$20\,000}{(\$1.60 - \$1.20)}$$

$$= \frac{\$20\,000}{\$0.40}$$

$$= 50\,000 \text{ units}$$

d. Profit = Contribution margin x Number of units sold - Fixed cost

$$= \$0.40(500\,000) - \$20\,000$$

$$= \$200\,000 - \$20\,000$$

$$= \$180\,000$$

e. Sales volume for Total fixed costs + Desired profit

\$50 000 profit = Contribution margin per unit

$$= \frac{\$20\,000 + \$50\,000}{\$0.40}$$

$$= \frac{\$70\,000}{\$0.40}$$

$$= 175\,000 \text{ boxes}$$

2.21

a. Total fixed costs

Break-even point = Contribution margin per unit

$$= \frac{\$110\,000}{\$5}$$

$$= 22\,000 \text{ kits}$$

b. Sales volume for  $\frac{\text{Total fixed costs} + \text{Desired profit}}$

\$70 000 profit = Contribution margin per unit

$$\frac{\$110\,000 + \$70\,000}{\$5}$$

$$= \frac{\$180\,000}{\$5}$$

$$= 36\,000 \text{ kits}$$

c. If the total fixed cost increases to \$160 000:

(i) Break-even point =  $\frac{\$160\,000}{\$5}$

$$= 32\,000 \text{ kits}$$

(ii) Loss =  $\$5(30\,000) - \$160\,000$   
 =  $\$150\,000 - \$160\,000$   
 =  $\$(10\,000)$

(iii) Sales volume for  $\frac{\$160\,000 + \$70\,000}{\$5}$   
 \$70 000 profit =  $\$5$

$$= \frac{\$230\,000}{\$5}$$

$$= 46\,000 \text{ kits}$$

## 2.22

a.	Sales revenue (1 800 @ \$30)	\$ 54 000
	Less variable costs (1 800 x \$10)	<u>(18 000)</u>
	Contribution margin	\$ 36 000
	Less fixed costs	<u>(25 400)</u>
	Profit	<u>\$ 10 600</u>

**b.** Sales volume for  $\frac{\text{Total fixed costs} + \text{Desired profit}}{\text{Contribution margin per unit}}$   
 $\$12\,000$  profit =  $\frac{\$25\,400 + \$8\,000}{\$20}$   
 =  $\frac{\$33\,400}{\$20}$   
 = 1 670 mufflers

**c.** Silencer's decision appears to be a good one. Even though fixed costs rise and sales volume decreases by 200 mufflers, Silencer still expects to sell more mufflers next year than necessary to meet last year's profit. So next year's profit will rise.

**2.23**

**a. (i)** Contribution margin = Sales price per unit - Variable cost per unit  
 =  $\$4 - \$3 = \underline{\$1}$

**(ii)** Break-even point  $\frac{\text{Total fixed costs}}{\text{Contribution margin per unit}}$   
 =  $\frac{\$6\,000}{\$1}$   
 = 6 000 bottles

**(iii)** Profit = (Contribution margin per unit x Units sold) - Total fixed costs  
 =  $\$1(25\,000) - \$6\,000$   
 = \$19 000

$$\begin{aligned} \text{(iv) Sales volume for} & \quad \text{Total fixed costs + Desired profit} \\ \$16\,000 \text{ profit} & = \text{Contribution margin per unit} \end{aligned}$$

$$\begin{aligned} & \quad \frac{\$6\,000 + \$16\,000}{\$1} \\ & = \frac{\$22\,000}{\$1} \\ & = \underline{22\,000 \text{ bottles}} \end{aligned}$$

b. (i) Contribution margin =  $\$5 - \$3 = \underline{\$2}$

$$\underline{\$8\,000}$$

(ii) Break-even point =  $\$2$

$$= \underline{4\,000 \text{ bottles}}$$

(iii) Profit =  $\$2(25\,000) - \$8\,000$   
=  $\$50\,000 - \$8\,000$   
=  $\$42\,000$

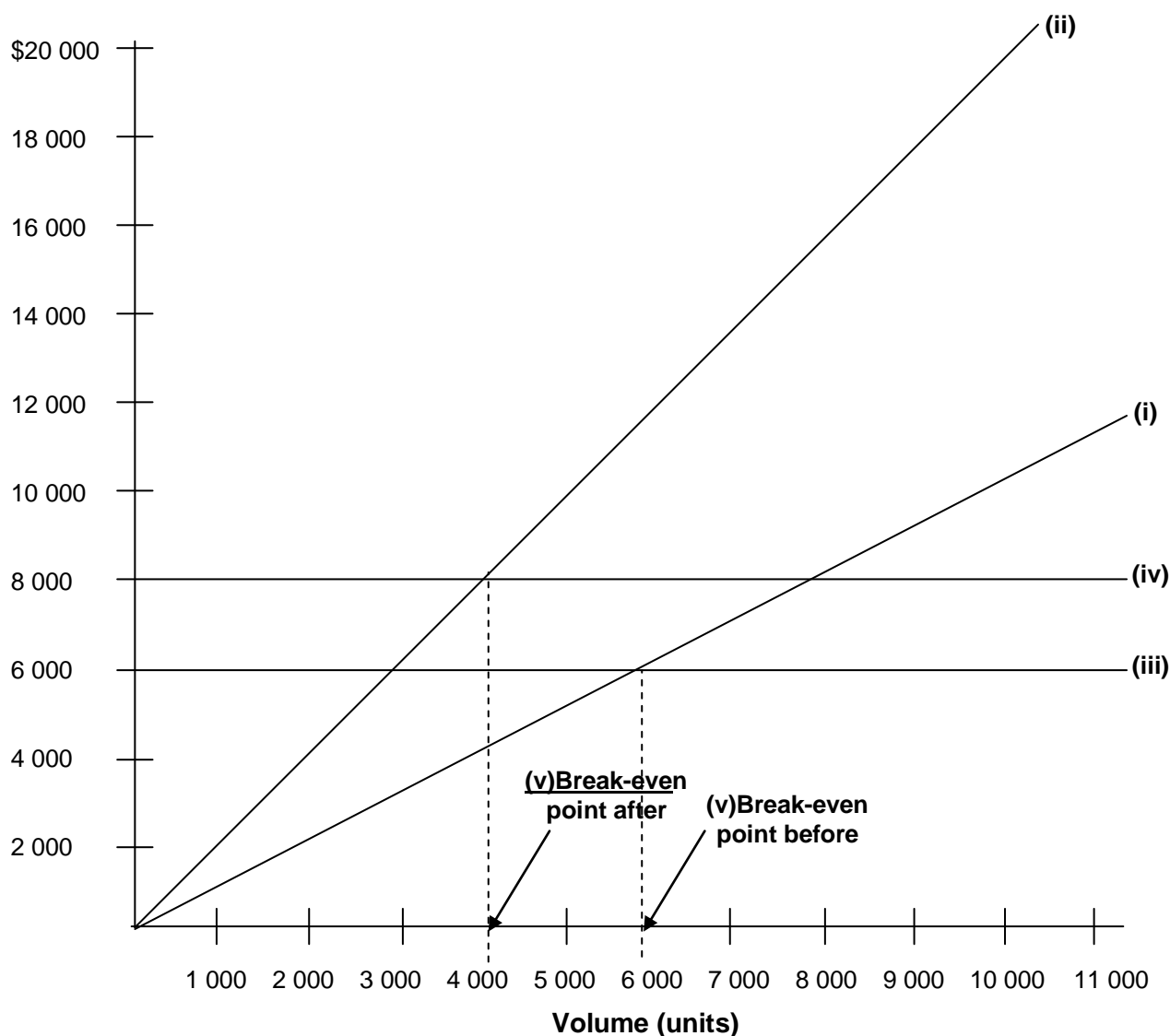
(iv) Sales volume for  $\frac{\$8\,000 + \$16\,000}{\$2}$   
\$16 000 profit =  $\$2$

$$\begin{aligned} & \quad \$24\,000 \\ & = \$2 \end{aligned}$$

$$= \underline{12\,000 \text{ bottles}}$$

As long as the price increase does not reduce Rapunzel's sales volume below 12,000 bottles, this is a good decision. The higher contribution margin means that Rapunzel will make a higher profit by selling the same number of bottles.

**c.**

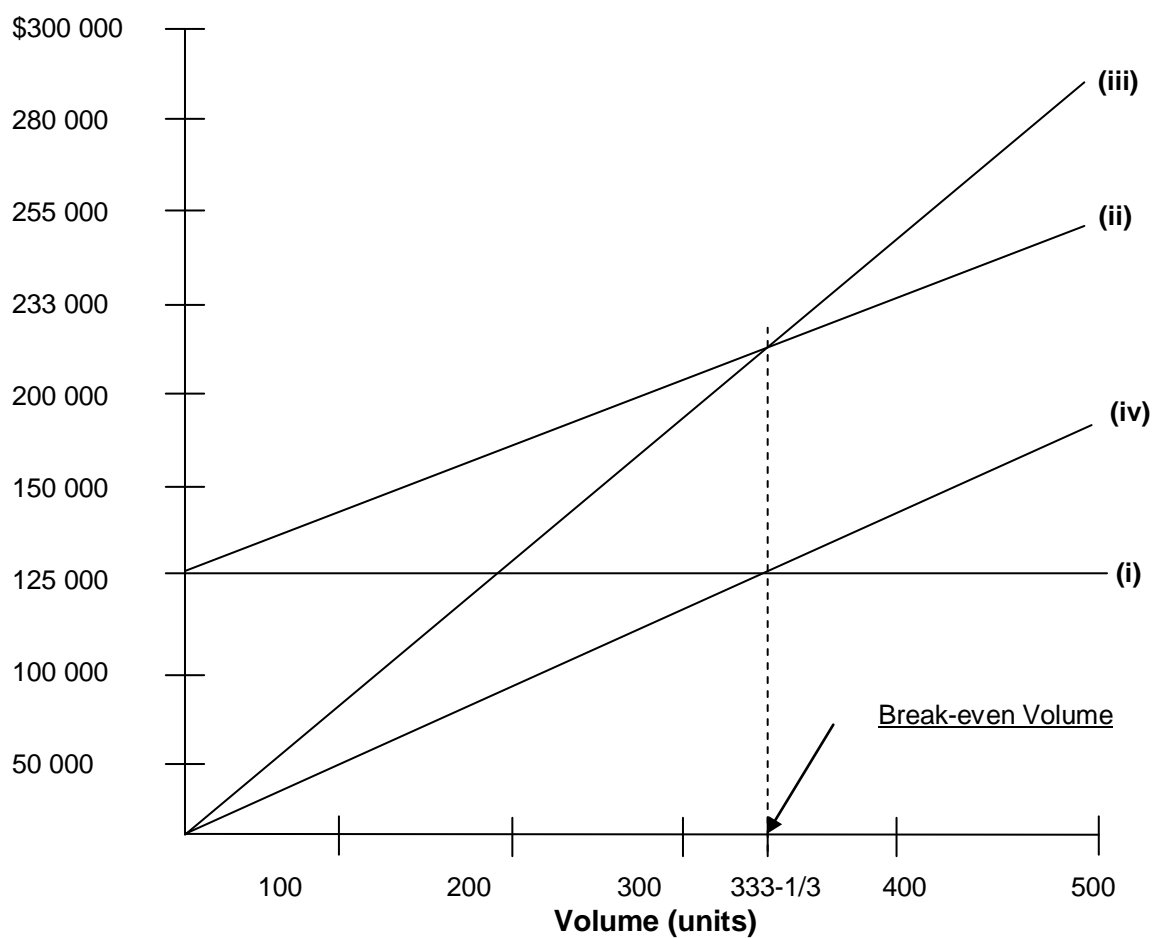


- (i) Total contribution margin at \$4 selling price =  $\$1x$  ( $x$  = The number of bottles sold).
- (ii) Total contribution margin at \$5 selling price =  $\$2x$ .
- (iii) Total fixed cost = \$6 000.
- (iv) Total fixed cost = \$8 000.
- (v) Breakeven \$6 000 before, Breakeven \$4 000 after.

**d.** As the graph shows, the higher total fixed cost is more than offset by the higher contribution margin. The result is that more profit is earned for each bottle, and the break-even point is a lower sales volume after the change in price and fixed cost.

**a.**

**Dollars**



**(i)** Total fixed cost = \$125 000.

**(ii)** Total cost =  $\$325x + \$125\ 000$ .

**(iii)** Total sales revenue =  $\$700x$ .

**(iv)** Total contribution margin =  $\$375x$ .

Total fixed costs

**b.** Break-even point = Contribution margin per unit

$$\begin{aligned} & \frac{\$125\,000}{\$700 - \$325} \end{aligned}$$

$$= \frac{\$125\,000}{\$375}$$

$$= \underline{334^* \text{ machines}}$$

\* (rounded up because you cannot sell a partly made machine)

**c.** Sales volume for  $\frac{\text{Total fixed costs} + \text{Desired profit}}{\text{Contribution margin per unit}}$   
 \$30 000 profit =

$$\begin{aligned} & \frac{\$125\,000 + \$30\,000}{\$375} \\ & = \$375 \end{aligned}$$

$$= \frac{\$155\,000}{\$375}$$

$$= \underline{414^* \text{ machines}}$$

\* (rounded up as above)

**d.** Sales volume =  $\frac{\$420\,000}{\$700}$

$$= \underline{600 \text{ machines}}$$

$$\begin{aligned} \text{Profit} &= (\text{Contribution margin per unit} \times \text{Units sold}) - \text{Total fixed costs} \\ &= \$375 (600) - \$125\,000 \\ &= \$225\,000 - \$125\,000 \\ &= \underline{\$100\,000} \end{aligned}$$



$$\text{e. Break-even point} = \frac{\$125\,000 + \$6\,000}{\$375}$$

$$= \frac{\$131\,000}{\$375}$$

$$= \frac{350 \text{ machines}}{\text{* (as above)}}$$

So the business must sell an additional 16 machines [350 - 334 (from Requirement b)] to cover the cost of this effort.

## 2.25

$$\text{a. (i) Break-even point} = \frac{\text{Total fixed costs}}{\text{Contribution margin}}$$

$$= \frac{\$3\,600}{\$6}$$

$$= \underline{600 \text{ bottles}}$$

(ii) At a lowered selling price of \$8 per unit

$$\text{Contribution margin} = \$8 - \$4 = \$4$$

$$\text{Break-even point} = \frac{\$3\,600}{\$4}$$

$$= \underline{900 \text{ bottles}}$$

At a raised selling price of \$12 per unit

$$\text{Contribution margin} = \$12 - \$4 = \$8$$

$$\text{Break-even point} = \frac{\$3\,600}{\$8}$$

$$= \underline{450 \text{ bottles}}$$

**(iii)** At a raised variable cost of \$6 per unit

$$\text{Contribution margin} = \$10 - \$6 = \$4$$

$$\begin{aligned} \text{Break-even point} &= \frac{\$3\,600}{\$4} \\ &= \underline{900 \text{ bottles}} \end{aligned}$$

At a lowered variable cost of \$2 per unit

$$\text{Contribution margin} = \$10 - \$2 = \$8$$

$$\begin{aligned} \text{Break-even point} &= \frac{\$3\,600}{\$8} \\ &= \underline{450 \text{ bottles}} \end{aligned}$$

**(iv)** At an increased total fixed cost of \$3 660

$$\begin{aligned} \text{Break-even point} &= \frac{\$3\,660}{\$6} \\ &= \underline{610 \text{ bottles}} \end{aligned}$$

At a decreased total fixed cost of \$3 540

$$\begin{aligned} \text{Break-even point} &= \frac{\$3\,540}{\$6} \\ &= \underline{590 \text{ bottles}} \end{aligned}$$

**b. (i)** Sales volume for \$4 800 profit

$$\begin{aligned} &= \frac{\text{Total fixed costs} + \text{Desired profit}}{\text{Contribution margin per unit}} \\ &= \frac{\$3\,600 + \$4\,800}{\$6} \\ &= \frac{\$8\,400}{\$6} \\ &= \underline{1\,400 \text{ bottles}} \end{aligned}$$

**(ii)** At a lowered selling price of \$8 per unit

$$\text{Contribution margin} = \$8 - \$4 = \$4$$

$$\underline{\$8\,400}$$

$$\text{Sales volume} = 4$$

$$= \underline{2\,100 \text{ bottles}}$$

**(iii)** At \$10/unit (contribution margin = \$10 - \$4 = \$6),

$$\text{Sales volume} = 1\,400 \text{ bottles of solvent}$$

$$\text{Profit} = (\text{Contribution margin} \times \text{Units sold}) - \text{Total fixed costs}$$

$$= (\$6 \times 1\,400) - \$3\,600$$

$$= \$8\,400 - \$3\,600$$

$$= \underline{\$4\,800}$$

At \$8/unit (contribution margin = \$8 - \$4 = \$4),

$$\text{Sales volume} = 1\,400 + (2 \times 325)$$

$$= 2\,050 \text{ bottles of solvent}$$

$$\text{Profit} = (\$4 \times 2\,050) - \$3\,600$$

$$= \$8\,200 - \$3\,600$$

$$= \underline{\$4\,600}$$

Lady MacBeth will not be able to earn \$4 800 profit by lowering the selling price by \$2. At the lower selling price, sales increase by 650 units and by \$2 400 [(1 400 bottles x \$10) – (2 050 bottles x \$8)] but variable costs increase by \$2 600 [(1 400 bottles x \$4) – (2 050 bottles x \$4)]. As a result, total profit will decrease by \$200 if Lady MacBeth lowers the price of solvent.

**(iv)** At \$12/unit (contribution margin = \$12 - \$4 = \$8),

$$\text{Sales volume} = 1\,400 - 400$$

$$= 1\,000$$

$$\text{Profit} = (\$8 \times 1\,000) - \$3\,600$$

$$= \$8\,000 - \$3\,600$$

$$= \underline{\$4\,400}$$

Lady MacBeth will not be able to earn \$4 800 profit by raising the selling price by \$2. Sales will decrease by 400 units, sales revenue will decrease by \$2 000 [(1 400 bottles x \$10) – (1 000 bottles x \$12)], and because fewer units are sold, variable costs will decrease by \$1 600 [(1 400 bottles x \$4) – (1 000 bottles x \$4)]. As a result, total profit will decrease by \$400 if Lady MacBeth raises the price of solvent.

**(v)** At a raised variable cost of \$6 per unit,

$$\text{Contribution margin} = \$10 - \$6 = \$4$$

$$\text{Sales volume} = \frac{\$3\,600 + \$4\,800}{\$4}$$

$$= \frac{\$8\,400}{\$4}$$

$$= \underline{2\,100 \text{ bottles}}$$

At a lowered variable cost of \$2 per unit,

$$\text{Contribution margin} = \$10 - \$2 = \$8$$

$$\text{Sales volume} = \frac{\$3\,600 + \$4\,800}{\$8}$$

$$= \frac{\$8\,400}{\$8}$$

$$= \underline{1\,050 \text{ bottles}}$$

**(vi)** At a raised total fixed cost of \$3 660

$$\text{Sales volume} = \frac{\$3\,660 + \$4\,800}{\$6}$$

$$= \frac{\$8\,460}{\$6}$$

$$= \underline{1\,410 \text{ bottles}}$$

At a lowered total fixed cost of \$3 540

$$\begin{aligned} \text{Sales volume} &= \frac{\$3\,540 + \$4\,800}{\$6} \\ &= \frac{\$8\,340}{\$6} \\ &= \underline{1\,390 \text{ bottles}} \end{aligned}$$

**2.26**

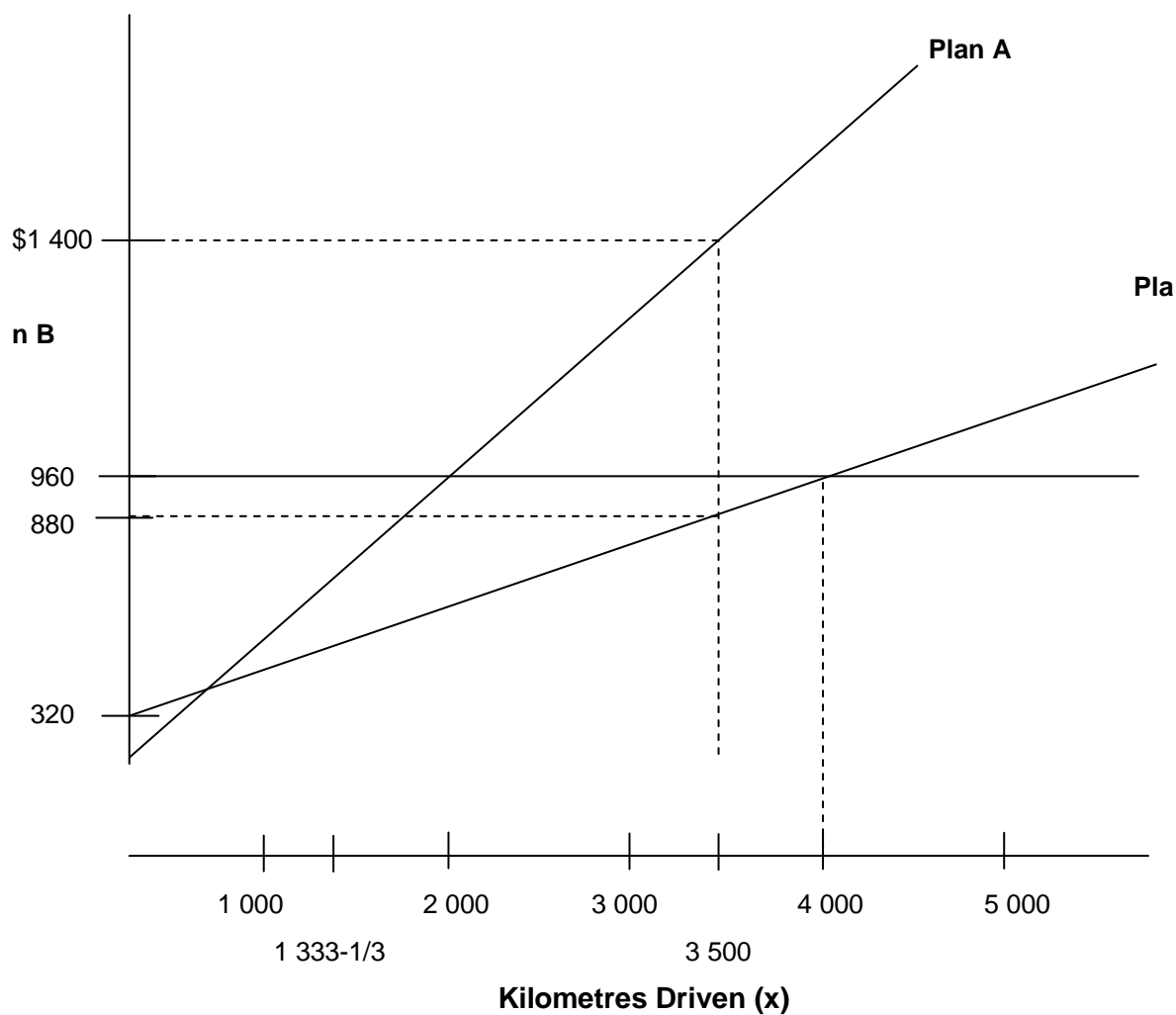
Let  $x$  = kilometres driven per month

$$\text{Cost of Plan A} = (\$0.34 + \$0.06)x = \$0.40x$$

$$\text{Cost of Plan B} = \$320 + (\$0.10 + \$0.06)x = \$320 + \$0.16x$$

$$\text{Cost of Plan C} = \$960$$

a.



b. Cost of Plan A = Cost of Plan B

$$\$0.40x = \$320 + \$0.16x$$

$$\$0.24x = \$320$$

$$x = \underline{1\,333\,1/3 \text{ kilometres}}$$

c. Cost of Plan B = Cost of Plan C

$$\$320 + \$0.16x = \$960$$

$$\$0.16x = \$640$$

$$x = \underline{4\,000 \text{ kilometres}}$$

d. Cost of driving 3 500 kilometres per month:

$$\text{Cost of Plan A} = \$0.40(3\,500) = \underline{\$1\,400}$$

$$\text{Cost of Plan B} = \$320 + \$0.16(3\,500) = \underline{\$880}$$

$$\text{Cost of Plan C} = \underline{\$960}$$

## 2.27

a. Let  $x$  = Unit sales volume (motors sold).

$$\text{Profit} = (\text{Sales price} \times \text{Units sold}) - (\text{Variable cost per unit} \times \text{Units sold}) - \text{Total fixed costs}$$

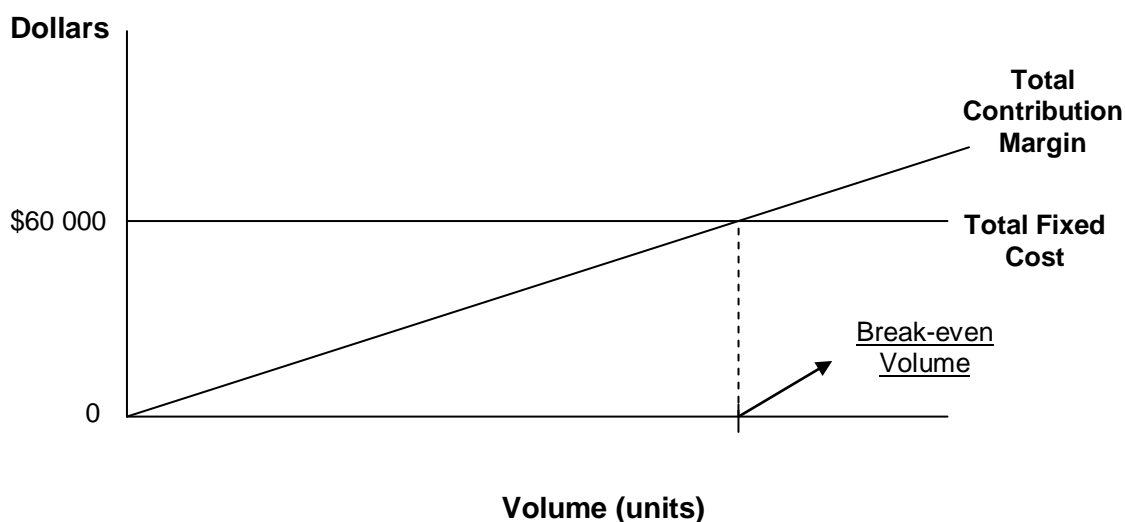
$$= \$2.00x - \$1.20x - \$60\,000$$

or

$$\text{Profit} = (\text{Contribution margin per unit} \times \text{Units sold}) - \text{Total fixed costs}$$

$$= \$0.80x - \$60\,000$$

b.



c. 
$$\text{Break-even point} = \frac{\text{Total fixed costs}}{\text{Contribution margin per unit}}$$

$$= \frac{\$60\,000}{\$0.80}$$

$$= \underline{75\,000 \text{ units}}$$

d. 
$$\begin{aligned} \text{Profit} &= (\text{Contribution margin per unit} \times \text{Units sold}) - \text{Total fixed costs} \\ &= \$0.80(500\,000) - \$60\,000 \\ &= \$400\,000 - \$60\,000 \\ &= \$340\,000 \end{aligned}$$

e. 
$$\text{Sales volume for } \$40\,000 \text{ profit} = \frac{\text{Total fixed costs} + \text{Desired profit}}{\text{Contribution margin per unit}}$$

$$= \frac{\$60\,000 + \$40\,000}{\$0.80}$$

$$= \frac{\$100\,000}{\$0.80}$$

$$= \underline{125\,000 \text{ motors}}$$

## 2.28

a. 
$$\begin{aligned} \text{Contribution margin per unit} &= \text{Sales price per unit} - \text{Variable cost per unit} \\ &= \$2\,500 - \$1\,900 \\ &= \underline{\$600} \end{aligned}$$

b. 
$$\begin{aligned} \text{Profit (at 160 units)} &= (\text{Contribution margin per unit} \times \text{Units sold}) - \text{Total fixed costs} \\ &= \$600(160) - \$180\,000 \\ &= \$96\,000 - \$180\,000 \\ &= \underline{\$84\,000 \text{ loss}} \end{aligned}$$

**c.** Total fixed costs

Break-even point = Contribution margin

$$\begin{aligned} & \frac{\$180\,000}{\$600} \\ & = \underline{300\text{ units}} \end{aligned}$$

**d.** Total fixed costs + Desired profit

Sales volume for \$30 000 profit = Contribution margin per unit

$$\begin{aligned} & \frac{\$180\,000 + \$30\,000}{\$600} \\ & = \underline{350\text{ units}} \end{aligned}$$

**2.29**

**a.** Contribution margin per unit = Sales price per unit - Variable cost per unit

$$\begin{aligned} & = \$13 - \$8 \\ & = \$5 \end{aligned}$$

Total fixed costs

Break-even point = Contribution margin per unit

$$\begin{aligned} & \frac{\$110\,000}{\$5} \\ & = \underline{22\,000\text{ containers}} \end{aligned}$$

**b.** Sales volume for \$70 000 profit = Total fixed costs + Desired profit  
Contribution margin per unit

$$\begin{aligned} & \frac{\$110\,000 + \$70\,000}{\$5} \\ & = \underline{36\,000\text{ containers}} \end{aligned}$$

**c. (i)** \$150 000

Break-even point = \$5

$$= \underline{30\,000\text{ containers}}$$



(ii) Profit = (Contribution margin p/unit x units sold) - Total fixed costs  
 = \$5(28 000) - \$150 000  
 = \$140 000 - \$150 000  
 = (\$10 000) loss

(iii) Sales volume for \$70 000 profit =  $\frac{\$150\,000 + \$70\,000}{\$5}$   
 =  $\frac{\$220\,000}{\$5}$   
 = 44 000 containers

**2.30**

a. (i) Contribution margin per unit = Sales price per unit - Variable cost per unit  
 = \$40 - \$34  
 = \$6 per unit

(ii) Break-even point =  $\frac{\text{Total fixed costs}}{\text{Contribution margin per unit}}$   
 =  $\frac{\$360\,000}{\$6}$   
 = 60 000 units

(iii) Sales volume for \$30 000 profit =  $\frac{\text{Total fixed costs} + \text{Desired profit}}{\text{Contribution margin per unit}}$   
 =  $\frac{\$360\,000 + \$30\,000}{\$6}$   
 =  $\frac{\$390\,000}{\$6}$   
 = 65 000 units

b. (i) Contribution margin = \$44 - \$34  
 = \$10 per unit

(ii) Break-even point =  $\frac{\$360\,000}{\$10}$

$$= \underline{36\,000 \text{ units}}$$

(iii)

$$\begin{aligned} \text{Sales volume for } \$30\,000 \text{ profit} &= \frac{\$360\,000 + \$30\,000}{\$10} \\ &= \frac{\$390\,000}{\$10} \\ &= \underline{39\,000 \text{ units}} \end{aligned}$$

### 2.31

a. Fixed costs/CMU

$$\begin{aligned} &= (\text{Fixed costs} + \text{Comp. Pkg})/\text{CMU} \\ &= (10\,000 + 5\,000)/(260-60) \\ &= 15\,000/(200) \\ &= 75 \text{ people} \times \$260 \\ &= \$19\,500 \end{aligned}$$

OR using CM ratio

$$\begin{aligned} &= 15\,000 / (200/260) \\ &= 15\,000 / 0.769 \\ &= \$19\,500 \text{ rounded} \end{aligned}$$

- b. (i)** For professor to receive a payment of 6 000:

$$\text{Net profit} \times 50\% = 6\,000$$

$$\text{NP} = 6\,000 / 50\%$$

$$\text{NP} = 12\,000$$

Therefore  $(\text{FC} + \text{NP}) / \text{CMU}$

$$(10\,000 + 12\,000) / \text{CMU}$$

$$22\,000 / 200 = 110 \text{ people}$$

Proof:

Contribution: 200 x 110	22 000
-------------------------	--------

Fixed costs	<u>10 000</u>
-------------	---------------

Net profit	12 000
------------	--------

Professors portion (50%)	6 000
--------------------------	-------

- (ii)** ie the breakeven point

$$= \text{FC} / \text{CMU}$$

$$= 10\,000 / 200$$

$$= 50 \text{ people}$$

## Making evaluations

**2.32** From the information available so far, Sweet Temptations appears to be a safe investment prospect. It will be operating in a location with a growing customer base and with no competitors. It is selling Unlimited Decadence chocolate which is a quality, accepted product and has a ready supply of chocolate. And although the owner is right out of school, she has had some experience in the chocolate business. Based on that information alone, it appears that Sweet Temptations has a good chance of being successful.

As noted in the chapter, cost-volume-profit analysis is a good tool to use to evaluate the potential profitability of the business. It costs Sweet Temptations \$4.95 for every box of chocolate purchased and it is charging a selling price per box of \$11. With fixed costs of \$4 235, Sweet Temptations needs to sell 700 boxes of chocolate per month to break even. Using this information, before you invest, you might want to know how many boxes of chocolate Sweet Temptations can reasonable expect to sell monthly.

Other information you would want to consider before you invest your \$10,000 might include the following:

- What is the owner's credit history? (indicates Anna's level of responsibility which is important if she is going to be the primary manager of the business)
- How is the economic health of the shopping centre and of Hornsby in particular?
- What is the success rate of the financial advisor (i.e. of his clients, how many have been successful and how many have gone bankrupt?)
- Are there any local tax laws or regulations which would affect the way in which Sweet Temptations is run?
- What are the tax implications of your investment?
- Would the investment give you the status of creditor or of part owner?
- Will your repayment be in the form of cash or chocolate?
- What other investments are available?

**2.33** Because Sweet Temptations can open a store with a small investment (Anna's initial investment was only \$15 000) you would assume that most of the \$100 000 would be used to expand. In this instance, as well as the information from 2.30 (\$100 000 buys a lot of chocolate), you might also want to know the following:

- How would Anna choose new locations? (What kind of criteria would she use?)
- Who would be hired to run any additional stores?
- Is the market large enough for an expansion?

- How will an expansion affect fixed and variable costs? What will happen to the break-even point, and will Sweet Temptations still be able to sell enough chocolate bars to break even?
- Will Sweet Temptations earn enough to give you a satisfactory return on your investment?
- How quickly will you be able to get your investment back?

**2.34**

**a. (i)** Contribution margin = Sales price per unit - Variable cost per unit  
 = \$24 - \$15  
 = \$9 per hat

**(ii)** Break-even point =  $\frac{\text{Total fixed costs}}{\text{Contribution margin per unit}}$   
 =  $\frac{\$180\,000}{\$9}$   
 = 20,000 hats

**(iii)** Sales volume for \$27 000 profit =  $\frac{\text{Total fixed costs} + \text{Desired profit}}{\text{Contribution margin per unit}}$   
 =  $\frac{\$180\,000 + \$27\,000}{\$9}$   
 =  $\frac{\$207\,000}{\$9}$   
 = 23,000 hats

**b. (i)** Contribution margin = \$25 - \$15  
 = \$10 per hat

$$\begin{aligned}
 \text{(ii) Break-even point} &= \frac{\$180\,000}{\$10} \\
 &= \underline{18\,000 \text{ hats}}
 \end{aligned}$$

$$\begin{aligned}
 \text{(iii)} & & & \frac{\$180\,000 + \$27\,000}{\$10} \\
 \text{Sales volume for } \$27\,000 \text{ profit} &= & & \\
 & & & \frac{\$207\,000}{\$10} \\
 & & & = \\
 & & & = \underline{20\,700 \text{ hats}}
 \end{aligned}$$

- c. Using the preceding information, it appears that John Williams decision to raise the price of hats is a good one. It now has to sell fewer hats to break even and to earn \$27 000 profit. However, before the managers decide whether or not to implement the price change, they need to consider the effect the change in price will have on the number of hats that they can sell. If, at the higher price, 18 000 hats cannot be sold, they should rethink the decision.

### 2.35

$$\begin{aligned}
 \text{a. (i) Contribution margin} &= \text{Sales price per unit} - \text{Variable cost per unit} \\
 &= \$1.80 - \$1.20 \\
 &= \underline{\$0.60 \text{ per pack of bait}}
 \end{aligned}$$

$$\begin{aligned}
 & & & \frac{\text{Total fixed costs}}{\text{Contribution margin per unit}} \\
 \text{Break-even point} &= & & \\
 & & & \frac{\$36\,000}{\$0.60} \\
 & & & = \\
 & & & = \underline{60\,000 \text{ packs of bait}}
 \end{aligned}$$

**(ii)** Profit = (Contribution margin x Units sold) - Fixed costs

$$\begin{aligned}\text{At 52 000 units} &= \$0.60(52\ 000) - \$36\ 000 \\ &= \$31\ 200 - \$36\ 000 \\ &= \underline{\underline{\$4\ 800\ \text{loss}}}\end{aligned}$$

$$\begin{aligned}\text{At 56 000 units} &= \$0.60(56\ 000) - \$36\ 000 \\ &= \$33\ 600 - \$36\ 000 \\ &= \underline{\underline{\$2\ 400\ \text{loss}}}\end{aligned}$$

$$\begin{aligned}\text{At 64 000 units} &= \$0.60(64\ 000) - \$36\ 000 \\ &= \$38\ 400 - \$36\ 000 \\ &= \underline{\underline{\$2\ 400\ \text{profit}}}\end{aligned}$$

$$\begin{aligned}\text{At 68 000 units} &= \$0.60(68\ 000) - \$36\ 000 \\ &= \$40\ 800 - \$36\ 000 \\ &= \underline{\underline{\$4\ 800\ \text{profit}}}\end{aligned}$$

**b. (i)** Contribution margin = \$1.80 - \$1.40  
= \$0.40 per pack of bait

$$\begin{aligned}\text{Break-even point} &= \frac{\$24\ 000}{\$0.40} \\ &= \underline{\underline{60\ 000\ \text{packs of bait}}}\end{aligned}$$

**(ii)** At 52 000 units = \$0.40(52 000) - \$24 000  
= \$20 800 - \$24 000  
= \$3 200 loss

At 56 000 units = \$0.40(56 000) - \$24 000  
= \$22 400 - \$24 000  
= \$1 600 loss

At 64 000 units = \$0.40(64 000) - \$24 000  
= \$25 600 - \$24 000  
= \$1 600 profit

$$\begin{aligned}
 \text{At 68 000 units} &= \$0.40(68\ 000) - \$24\ 000 \\
 &= \$27\ 200 - \$24\ 000 \\
 &= \underline{\$3\ 200\ \text{profit}}
 \end{aligned}$$

- c. It would not be profitable for Arnie Bass to try to change his space rental from a fixed cost to a variable cost. Even though Arnie's break-even number of units remains unchanged, because the contribution margin per unit is lower, Arnie does not make as much profit at each level of unit sales.

## 2.36

### a. Total fixed costs

$$\text{Break-even point} = \text{Contribution margin per unit}$$

*Alternative 1 (increase selling price by \$3 per bottle):*

$$\begin{aligned}
 \text{Contribution margin} &= \text{Selling price per unit} - \text{Variable cost per unit} \\
 &= \$13 - \$4 = \$9
 \end{aligned}$$

$$\begin{aligned}
 & \quad \quad \quad \underline{\$3\ 600} \\
 \text{Break-even point} &= \quad \quad \quad \$9 \\
 &= \underline{400\ \text{bottles}}
 \end{aligned}$$

*Alternative 2 (decrease variable cost by \$2 per bottle):*

$$\text{Contribution margin} = \$10 - \$2 = \$8$$

$$\begin{aligned}
 & \quad \quad \quad \underline{\$3\ 600} \\
 \text{Break-even point} &= \quad \quad \quad \$8 \\
 &= \underline{450\ \text{bottles}}
 \end{aligned}$$

*Alternative 3 (decrease total fixed cost by \$1 260):*

$$\begin{aligned}
 & \quad \quad \quad \underline{\$2\ 340} \\
 \text{Break-even point} &= \quad \quad \quad \$6 \\
 &= \underline{390\ \text{bottles}}
 \end{aligned}$$

Based on the break-even points, the best alternative appears to be the third one, but based on each bottle's contribution margin, alternative 1 might be the best choice. An example of a memo you might write to your boss is as follows:



Dear Boss,

This memo is in response to your request for input on alternative cost-volume-profit plans. I have looked at all three alternatives in terms of break-even unit sales and I think that the third alternative (of lowering fixed costs) seems to be the best plan because the break-even unit sales are the lowest under this alternative. However, alternative 1 may be better, depending on how many bottles of solvent we can sell. Under this alternative, the break-even unit sales are only 10 bottles greater than those of alternative 3, but after that point each bottle we sell adds \$3 more to profit than the bottles we sell under alternative 3. It might be a good idea to do further analysis before coming to a decision. If you have any questions or comments, please let me know.

**b.** 
$$\text{Sales volume for } \$4\,320 \text{ profit} = \frac{\text{Total fixed costs} + \text{Desired profit}}{\text{Contribution margin per unit}}$$

*Alternative 1 (increase selling price by \$3 per bottle):*

$$\begin{aligned} \text{Sales volume for } \$4\,320 \text{ profit} &= \frac{\$3\,600 + \$4\,320}{\$9} \\ &= \frac{\$7\,920}{\$9} \\ &= \underline{880 \text{ bottles}} \end{aligned}$$

*Alternative 2 (decrease variable cost by \$2 bottle):*

$$\begin{aligned} \text{Sales volume for } \$4\,320 \text{ profit} &= \frac{\$3\,600 + \$4\,320}{\$8} \\ &= \frac{\$7\,920}{\$8} \\ &= \underline{990 \text{ bottles}} \end{aligned}$$

*Alternative 3 (decrease total fixed cost by \$1 260):*

$$\begin{aligned} \text{Sales volume for } \$4\,320 \text{ profit} &= \frac{\$2\,340 + \$4\,320}{\$6} \\ &= \frac{\$6\,660}{\$6} \end{aligned}$$

$$= \underline{1\,110 \text{ bottles}}$$

Based on this new information, the first alternative seems to be better than alternative three (3) (recommended in requirement 1) and alternative two (2). Under this alternative, the business needs to sell only 880 units to make a profit of \$4 320 whereas under alternative two 990 units must be sold and under alternative three 1 110 units must be sold. The first plan has better results under this scenario because the contribution margin of \$9 is higher than it is for the other two plans.

Information (issues) which you might also want to consider before offering your opinion to your boss could include the following:

- How does the profit goal of the business fit with other goals of the business (different plans might be better suited to different goals)? For example, does Lady MacBeth want to offer the lowest possible prices?
- How will the price changes affect the number of bottles of solvent which Lady MacBeth is able to sell?
- Will the decrease in variable costs affect the quality of the product? (For example, if Lady MacBeth were purchasing lower quality ingredients for its spot remover, it may have to worry about losing customers.)
- Will the decrease in fixed costs affect the quality of the product? (For example, if conditions in the plant affect the end quality of the product, Lady MacBeth will again have to worry about losing customers.)
- Who is Lady MacBeth's target consumer and how will each plan appeal to that consumer?

**2.37**

- a. The break-even point is determined as follows:

$$\frac{\text{Total fixed costs}}{\text{Selling price per unit} - \text{Variable cost per unit}}$$

The reduction of employees has several potential effects on the break-even point. If the employees were in supervisory positions, their leaving could reduce fixed costs, in which case the break even number of units would decrease. If the employees worked on the production line, their salaries would be part of the variable costs assigned to the trucks and 4WDs produced, and the elimination of jobs would reduce those costs. This would cause Fred Sports' contribution margin per unit to increase and the break-even number of units to (again) decrease. Finally, if the employees worked on the production line but also received benefits, which are considered fixed costs, then the reduction of employees would reduce both fixed and variable costs, and the break-even number of units would decrease. In all these cases, the number of units that would need to be sold to reach a particular level of income would decrease.

- b. Before making this decision, Fred Sports' owners probably considered, non-financial issues such as the following:
- morale of employees
  - effect on the community in which Fred Sports operates
  - the mix of talents and expertise of its remaining employees.
- c. In addressing these issues, the owners had to answer questions such as the following:
- Does the production area need to be rearranged to accommodate fewer workers?
  - Can the remaining workers produce the same quality of trucks and 4WDs?
  - Will the elimination of jobs result in bad 'PR' for Fred Sports?
  - Can the elimination of jobs be structured such that employee morale will not be adversely affected?

## 2.38

- a. The memo which you write to your boss may be similar to the following:

Dear Boss,

This memo is in regard to the proposed plans to increase profit for Miniola Hills Bus Business. Regarding plan A, changing the bus routes and reducing the number of trips from 80 per day to 60 per day should reduce the number of kilometres driven by the buses. The result should be a decrease for any costs which vary with the number of kilometres driven. These variable costs should include gasoline and oil expenses (\$90 000); and although it is less certain, other variable costs might include drivers' salaries (\$65 000), the tires expense (\$20 000), and maintenance costs (\$15 000). If we assume that all of these costs are variable, then the variable cost per kilometre is \$0.543 (\$190 000/350 000). If we also assume that plan A will not affect revenue, Miniola Hills will have to limit the number of kilometres driven to 162 063 [(total revenue of \$248 000 - total fixed costs of \$160 000)/variable cost per kilometre of \$0.543] in order to break even.

Unfortunately, under this plan it is highly likely that the reduction in the number of trips will also reduce the number of passengers so the assumption that revenue will not be affected is likely invalid.

Under plan B, the revenue per passenger should decrease. Currently, passengers pay \$0.50 each time they ride the bus. With plan B, passengers can pay as little as \$0.20 per ride by purchasing 5 tickets for \$1.00. It is logical that most passengers will not pay more than \$0.20 per ride. Passengers will purchase passes only if they ride more than 12.5 times per week ( $\$2.50/\$0.20 = 12.5$ ), otherwise they would be better off purchasing tickets. Because we do not know how many passes will be sold or how many trips each pass-holder will take in a week, let us assume that Miniola will receive \$0.20 sales revenue

for each trip. To maintain the current level of revenue (\$248 000) under plan B, Miniola will have to sell 1 240 000 trips (as compared with 496 000 currently). At the current level of revenue, however, Miniola is losing money. Assuming costs (\$350 000) remain the same (if the cost of obtaining tickets and printing passes is minimal), at \$0.20 per ride Miniola will have to sell 1 750 000 rides to break even (1 254 000 more than they currently sell).

Because \$0.20 per ride may be low, if we assume that many people will still purchase rides at \$0.50, that many tickets will not be used, or that one week passes will be used as a matter of convenience rather than savings, it is likely that the average revenue is higher than \$0.20 per ride. For example, let us assume that the average price paid per ride is closer to \$0.40 per ride. In this case, Miniola will have to sell 620

000 rides to maintain the same level of revenue, and 875 000 rides to break even. This is an additional 379 000 rides just to break even.

While it is probable that plan B will increase the amount of sales, it is questionable whether they will increase by this amount.

The above analysis assumes that there will be virtually no change in cost. However, it is quite possible that plan B will increase Miniola's costs. If so, the business will have to sell even more rides to break even.

- b.** Each of the plans requires more information before it would be possible to decide which plan seems best for Miniola Hills Bus Business. Some examples of question which you would want answered might include the following:
- What additional costs, and cost savings, will be incurred by each plan?
  - Under plan A, how many kilometres will be eliminated?
  - How many passengers or how much revenue will be lost under plan A?
  - Under plan B, what are the predicted sales of single tickets (\$0.50), tickets (5 for \$1), and passes (1 week for \$2.50).
  - Under plan B, how many trips will the average pass holder take in one week?
  - What is the average number of kilometres travelled per passenger each time they ride the bus?
  - What is the potential market for new customers?

Some of this information is necessary for a complete analysis of each plan. It is possible that neither plan will help Miniola Hills Bus Business increase net profit.

- 2.39** No, because if your sales volume doubles then variable costs will double but the fixed costs would not increase but will be spread across more units therefore profit should more than double.

**2.40** The following is an example of a response students might write:

Dear Starving,

Even though Dr. Decisive never recommends biting (or criticising) the hand that feeds you, in this situation you were correct.

There is more than one possible explanation for the Hawaiian Pizzas price increase. Of course, it is possible that your boyfriend was correct and the price was increased solely for the purpose of increasing profit. But another explanation would be that the price increase is a way for Pizza Place to offset increases in their cost of doing business. The following are examples of costs that might cause Pizza Place to raise prices:

- an increase in rent,
- higher utility bills,
- increase in the minimum wage,
- higher cost of foods used in their pizzas, and
- higher demand causing them to reorder ingredients more often resulting in higher reorder costs.

So you see, there are many things that should be considered before assuming that price increases are purely for profit. I hope this helps open your boyfriend's mind.

Sincerely,

Dr. Decisive