



MANAGERIAL ACCOUNTING

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حقوق التأليف محفوظة

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Lecture Notes

Edited & compiled by:

DR. HISHAM ELMELIGY

PROFESSOR

DR. ASHRAF MANSOUR

PROFESSOR

Dr. Yasmine Abdelaal

Assistant Professor

Dr. Abdelrahman Mostafa Elfaramawy

Assistant Professor

Dr. Amr Hassan

Assistant Professor

DR. Gamal Ali Mohamed

PROFESSOR

Dr. MOHIY SAMY EL- SHABASY

ASSOCIATE PROFESSOR

Dr. Elham Mohammed Sahlool

Assistant Professor

Dr. MOHAMMED SAMY FARGHALY

Assistant Professor

Dr. Ahmed Ibrahim

Assistant Professor

Dr. Dalia Samir Abd El Aziz

Assistant Professor

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CHAPTER One

A Theoretical Framework for Managerial Accounting

Learning objectives for this chapter

This chapter aims to provide the student with a sufficient and appropriate amount of information on the following points:

- The Historical Development of Managerial Accounting.
- Definition and Nature of managerial Accounting.
- Objectives of Managerial Accounting.
- Importance and Limitations of managerial Accounting.
- Components of Managerial Accounting.
- Types of Managerial Accounting Methods.
- Managerial Accounting vs. Financial Accounting.
- Managerial Accounting vs. Cost Accounting.

Chapter (1)

A Theoretical framework for managerial accounting

1/1. Introduction:

Accounting is the system of recording and keeping tracking of financial transactions in a business and summarizing this information in reports. These reports provide information to people who are interested in knowing about the financial aspects of a business. The information guides business managers, investors, and creditors in planning and decision making. In fact, accounting is often referred to as “**the language of business**” because accounting is the backbone of any company and through it any business can communicate, evaluate performance, and determine value using dollars and amounts generated by the accounting process.

Financial accounting involves producing periodic reports called financial statements to inform external groups such as investors, creditors, and government/tax agencies about a company’s financial performance and status. The income statement, retained earnings statement, balance sheet, and statement of cash flows are published at fixed intervals to summarize the historical earnings performance and current financial position of a company. Financial statements are prepared according to Generally Accepted Accounting Principles (GAAP), which helps to ensure that the information is **relevant** (useful and timely for making decisions), **reliable** (accurate and unbiased), **consistent** (prepared the same way each time information is reported), and **comparable** (prepared the same way by different companies).¹

Managerial accounting is more targeting the company’s managers and employees. The information gathered and summarized for these internal groups is customized to provide feedback for planning, decision making, and evaluation purposes. Managerial reports do not necessarily follow any particular format, but instead are uniquely designed to meet the needs of

¹ <https://www.javatpoint.com/objectives-of-management-accounting>

specific users. Analyses are often focused on targeted segments of a business rather than on a company as a whole. Information may be published over periodic time intervals or on an as- need basis. Managerial accounting involves not only actual financial data from past periods, but also current estimates and future projections.²

A manager's responsibilities in a business include making decisions related to planning (identifying goals and strategies for accomplishing them), leading (directing daily operations and carrying out plans), and controlling (comparing expected and actual results and taking action for improvement). Since human, financial, and time resources are limited, managers must select among many alternatives, foregoing other options. They try to optimize the collective outcome of their choices. Managerial accounting provides timely and relevant financial information that contributes to effective decision making.

A business's operations are classified as one of three types - service, merchandising, or manufacturing - depending on what it has for sale. A service business sells expertise, advice, assistance, professional skills, or an experience rather than a physical product. A merchandising business purchases finished and packaged products from other companies, marks up the costs of these items, and sells them to customers. A manufacturing business assembles and packages products for selling them to merchandisers or end users.³

Managerial accounting is relevant to all of the three types of a business. In this document, we will focus on manufacturing since that type of a business involves the most in-depth facets and examples of managerial accounting. We will also discuss managerial accounting for service businesses where appropriate. Topics will fall into four broad categories: accumulating costs, analyzing costs, evaluating performance, and comparing alternatives.

The goal of a business is to generate profit, which is the difference between income and costs in a particular time period.

² <https://www.masterclass.com/articles/managerial-accounting>

³ <https://www.masterclass.com/articles/managerial-accounting>

Costs are monetary value spent or sacrificed in order to achieve certain objectives like earn revenues. Costs may be accumulated for a product, sales territory, department, or activity. It is critical to analyze costs because controlling them directly impacts profitability. Costs are also used to determine selling prices of products, and they are monitored over time to evaluate progress and discover irregularities and deviations.

Managerial accounting is the practice of identifying, measuring, analyzing, interpreting, and communicating financial information to managers in order to achieve the organization's goals.

Managerial accounting differs from financial accounting because the intended purpose of managerial accounting is to assist internal users to the company in making well-informed and sound decisions.

Managerial accounting encompasses many facets of accounting to improve the quality of information delivered to management about business operation metrics. Managerial accountants use information relating to the cost, sales revenue of goods and services generated by the company. Cost accounting is a large subset of managerial accounting that specifically focuses on capturing a company's total costs of production by assessing the variable costs of each step of production, as well as fixed costs. It allows businesses to identify and reduce unnecessary spending and maximize profits.⁴

Managerial accounting involves digging deep into a business's master budget and extracting ways to improve it. Discover some of the ways accounting information can help a company become more efficient and make better management decisions.

One of the definitions of Management accounting says that it is the application of professional skills and knowledge in the preparation of financial and accounting information in a manner in which it will assist the internal management in the formulation of policies, planning, and control of the operations of the firm.⁵

⁴ <https://www.investopedia.com/terms/m/managerialaccounting.asp>

⁵ <https://www.masterclass.com/articles/managerial-accounting>

The basic function of management accounting is to help the management make decisions. There is no fixed structure or format for it. Financial accounting, costing, business analysis, economics, etc. are some tools and techniques of management accounting. The importance of the management accounting comes from its ability to help the management in taking important business decisions.⁶ Managerial accounting focuses on internal users—executives, product managers, sales managers, and any other personnel within the organization who use accounting information to make important decisions. Managerial accounting information do not need to conform with GAAP. In fact, conformance with GAAP may be a deterrent to getting useful information for internal decision-making purposes. For example, when establishing an inventory cost for one or more units of product (each jersey or hat produced at Sportswear Company), GAAP requires that production overhead costs, such as factory rent and factory utility costs, be included. However, for internal decision-making purposes, it might make more sense to include nonproduction costs that are directly linked to the product, such as sales commissions or administrative costs.⁷

This chapter includes presentation, discussion and analysis of all of the following points:

- 1/2. The Historical Development of Managerial Accounting.**
- 1/3. Definition and Nature of managerial Accounting.**
- 1/4. Objectives of Managerial Accounting.**
- 1/5. Importance and Limitations of managerial Accounting.**
- 1/6. Components of Managerial Accounting.**
- 1/7. Types of Managerial Accounting Methods**
- 1/8. Managerial Accounting vs. Financial Accounting.**
- 1/9. Managerial Accounting vs. Cost Accounting.**
- 1/10. Questions & Exercises.**

1/2. The Historical Development of Managerial Accounting.

Chartered Institute of Management Accountants defines MA as information that comes from combination of accounting, finance and management that needed to ensure the success of the

⁶ <https://www.javatpoint.com/objectives-of-management-accounting>

⁷ https://saylordotorg.github.io/text_managerial-accounting/s05-01-characteristics-of-managerial-.html

organization. The changes in management accounting (MA) are a continuous matter that has been discussed over an age.⁸

The history of MA is continuously updated and always have innovation based on necessity and environment changes. MA has longer historical background than we expected.

traditionally, the managerial accountant role is limited to provide information and control financial part, however the changes and development in organizations also change this role to be a consultant in organization. The relationship between management and management accountant are closely tied because management accountant like a partner to the management of the organization. This change gives challenges to management accountant which are they need to learn more knowledge that cover accountancy, financial, economy, technology and social relationship.

Management accounting and management accountant become more important in the organization to ensure organization can implement their strategy successful in order to achieve its short-term and long-term objectives with gain competitive advantages worldwide and increase market.⁹

The purpose of this chapter is to explore the historical conditions that motivate organizations to develop management accounting. The management accounting systems did not develop as an extension of the market oriented double-entry booking keeping process, but instead management accounting systems emerged from efforts to overcome various market imperfections in order to serve organizations' internally.¹⁰

Origin of the Western Market Economy:

The market economy originated around 1000 A.D. and involved exchanges between institutions and individuals. This created the need for double-entry bookkeeping to keep "track of what was owing and owed". The information (or control concept) that supported economic activity was the market pricing mechanism.

⁸ <https://www.bartleby.com/essay/History-And-Development-Development-And-Evolution-Of-PJFUKD26>

⁹ <https://www.bartleby.com/essay/History-And-Development-Development-And-Evolution-Of-PJFUKD26>

¹⁰ <https://maaw.info/ArticleSummaries/ArtSumJohnson83.htm>

Later firms, or economic organizations, developed and began to perform economic activities within the firm, rather than in the market. This development probably started with the increased demand for textiles in Western Europe. Textiles had been provided by self-employed artisans. Increasing the price seemed to encourage the artisans to produce less rather than more. (An interesting example of the backward-bending labor supply curve). To overcome this market imperfection, the merchants became employers. Their purpose was to gain control over labor productivity by hiring workers to perform the activities internally for wages.

Early Cost Accounts in the Factory:

A new problem emerged. The wage contract did not provide the information needed to evaluate the labor conversion costs, or labor productivity. Cost accounting was developed to provide this information. Cost accounting helped motivate the merchant factory organizers to seek ways to reduce the slack in the production process. Members of the scientific management movement emphasized standard costing to monitor production efficiency.

Management Accounting in the Vertically Integrated Firm:

The vertically integrated firm emerged as a new form of non-market organization emphasizing marketing, purchasing and transportation as well as production. The industries involved were steel, petroleum refining, farm implements and food processing. Gains were captured by moving the purchasing and distribution activities from the market into the firm. This integration helped drive the slack out of the system. Budgeting systems and the return on investment (ROI) measurement to further serve the information needs of these integrated firms.

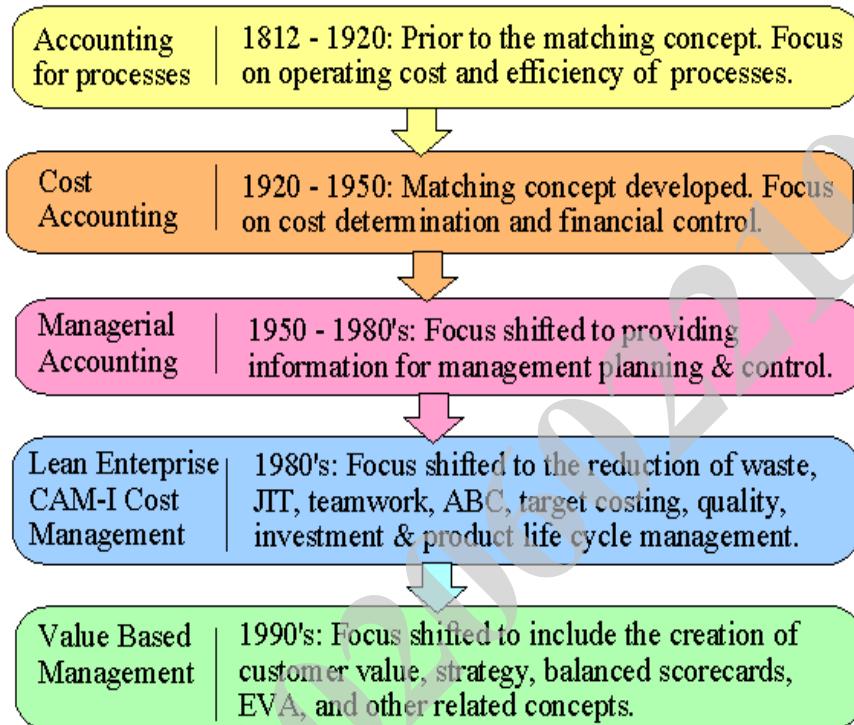
Management Accounting in the Multidivisional Firm:

The multidivisional firm was created by organizations in the 1920s to use capital more effectively. Their strategy was "to control a group of vertically-integrated enterprises through a non-market, internal structure". This structure allowed capital rationing among divisions based the ROI measurements, and the removal of managers that did not produce expected results. General Motors management accounting system, provides the

earliest and best-known system that linked all phases of the company's internal activities to ROI goals.

Evolution of Management Accounting Graphic:¹¹

The Evolution of Management Accounting Practice



1/3. Definition and Nature of managerial Accounting:

Managerial accounting is an accounting field that focuses on recognizing, analyzing, calculating and conveying financial information within an organization. This type of accounting also encompasses cost accounting, as professionals in this area focus heavily on the monitoring and analysis of essential accounting data. The goal of managerial accounting is to ensure accounting practices and financial activities support operational processes and continuous growth and development. Additionally, effective management accounting is crucial to ensure internal management

¹¹ <https://maaw.info/EvolutionOfMAGraphic.htm>

and executives make the most suitable business decisions for their organizations.¹²

The goal of management accounting is to use statistical data to make better and more accurate decisions about the **enterprise, business activities, and progress**. Management accounting is solely used by the organization's internal team, which is the only difference between it and financial accounting. During this procedure, the finance administration shares financial information and reports with the company's management team, such as **invoices and financial balance statements**.¹³

The function of management accounting is entrusted to a person referred to by many words such as a **financial controller, financial manager, controller, and so on**. Management accounting takes a broader perspective; assisting management becomes more accurate and exact. It is more concerned with the impact and effect of costs. It assists management in resolving the company's operating issues. It seeks to give accounting information to assist management in policy formulation and boost operational efficiency to maximize profits or decrease losses of the undertaking.¹⁴

Management accounting takes a forward-thinking approach. It is more predictive than cost accounting. It delivers a wealth of information to management to make informed judgments. It aids management in budgeting and budgetary control and production, planning, and control. Decision-making is a critical component of management, and it is heavily reliant on accounting data.¹⁵

Management accounting is also called managerial accounting. It is a type of accounting that generates statements, reports, and documentation to assist management in making better decisions about their firm's performance. Managerial accounting is largely utilised internally.

Management accounting is a subset of accounting. It is a modern and scientific accounting innovation. Accounting for

¹² <https://www.indeed.com/career-advice/career-development/what-is-managerial-accounting>

¹³ <https://www.javatpoint.com/objectives-of-management-accounting>

¹⁴ <https://www.masterclass.com/articles/managerial-accounting>

¹⁵ <https://www.javatpoint.com/objectives-of-management-accounting>

effective management is referred to as management accounting. It is the process of identifying, measuring, accumulating, analysing, preparing, interpreting, and communicating information to help executives achieve organisational goals.¹⁶

The following are some definitions of management accounting:¹⁷

- Management accounting is defined by the Institute of Chartered Accountants of England and Wales as "any form of accounting which enables a business to operate more efficiently."
- The American Accounting Association defines it as "the procedures and concepts required for effective planning, decision-making among alternative business activities, and control through the evaluation and interpretation of performance."
- It is defined by the Institute of Cost and Management Accountants London as "the application of professional knowledge and skill in the preparation of accounting information in such a way as to assist management in the formulation of policies and the planning control of the operation of the undertakings."

Managerial Accountant Job Description:

Managerial accountants can work for public or private companies, as well as for government organizations and not-for-profits. While the specific job description of a managerial accountant will vary from one organization to the next, their duties and responsibilities often encompass:¹⁸

- **Preparing financial and transactional data for use within an organization**
- **Evaluating and managing financial risks**
- **Analyzing the cost of products or services, and breaking down this information for different cost and/or revenue centers**
- **Modeling and forecasting cash flows**

¹⁶ <https://www.masterclass.com/articles/managerial-accounting>

¹⁷ <https://khatabook.com/blog/basics-of-managerial-accounting/>

¹⁸ <https://onlinedegrees.unr.edu/master-of-accountancy/careers/what-is-managerial-accounting/>

- Recording and analyzing cost and revenue data to help the company budget properly and perform optimally
- Collaborating with members of the management team to assess the company's investment opportunities
- Supervising lower-level accountants, including those who perform more basic accounting or tax preparation tasks

1/4. Objectives of Managerial Accounting:

Various objectives of management accounting are given below:^{19, 20}

(1) Assisting in the Planning and Formulation of Future Policies:

Policies: Proper planning, which is the core job of management, is critical to business success. It entails thoroughly examining available data and forecasting based on that data. When the date is placed in the right context, it aids management's ineffective planning. Management accounting provides costing and statistical data that can be used to set goals and create policies. The financial accountant offers relative numbers from the past and forecasts for the future. This aid management in deciding on courses of action and the company's program of activities. Management accounting aids in planning for a specific objective and overall organization planning.

(2) Assisting with the Understanding of Financial Data:

Management accounting focuses on **analysing and interpreting data**, which has opened up new avenues. It is concerned with keeping records of past accomplishments, maintaining values, establishing duties, and providing a foundation for helping future development. Management accounting delivers accounting information in an understandable style that allows **corporate executives, investors, and creditors** to analyze and evaluate financial statements. The financial accountant keeps a complete record of all transactions involving the organization's assets, creditors, claims, owners, and equity.

¹⁹ <https://www.javatpoint.com/objectives-of-management-accounting>

²⁰ <https://www.masterclass.com/articles/managerial-accounting>

- (3) **Assist in Performance Management:** Management accounting assists management in directing the organization's destiny by maintaining performance criteria and measuring and estimating deviations from them. Actual performance is measured against approved **operating plans, standards, and budgets**, which are interpreted and reported to me by department leaders at higher levels. All of this assist's management in maintaining total control of the organization's performance.
- (4) **Assisting with Organization:** Marketing management places a premium on **budgetary control and marginal costing**. Standard costing and a cash flow analysis Internal financial control, for example. All of this necessitates a thorough examination of the organizational structure. It aids in more efficiently streamlining the organizational structure of the commercial concern.
- (5) **Helpful in Resolving Strategic Problems:** Decision-making is largely a management activity. Accounting assists managers in making effective business decisions. These decisions may pertain to **business expansion, contraction, diversification, or establishing** a new line of business. All of these issues are addressed by management accounting. Management accounting uses accessible accounting statistics to solve a variety of management difficulties. Its purpose is to offer vital facts, not to make decisions. It simply informed management and delegated decision-making authority to them. It develops and exposes various plans comparably and provides insight into the implications for the organization's future. It is up to management to close the best course of the section using the available information provided by management accounting. It is an essential tool for **marginal costing, cost volume, profit analysis, standard costing, and capital budgeting** and helps managers to make sensible and sound judgments.
- (6) **Information Exchange:** Accounting is the language used to communicate financial information about an

organization and its activities to people who want to put them to good use by interpreting them. It boosts the company's efficiency and aids management in its goal of increasing profits or minimizing losses. Management accounting is a tool for communicating management plans within a company. It is an essential component of the company's management information system.

- (7) **Assisting in Employee Motivation:** Goal setting and good planning, employing a cost-effective strategy and assessing performance go a long way toward enhancing and increasing the organization's effectiveness. As a result, management accounting assists management in encouraging their staff.
- (8) **Coordination Assistance:** Management accounting is concerned with the efficiency of the many management phases; it aids in the overall and correct coordination of corporate operations, with budgets serving as the most effective form of coordination. The various plans are based on a budget, a financial statement of plans. Following the planning, the planned operations are directed, coordinating the actions of various departments and units and controlling the operations to meet the desired goals. Thus, management accounting is a tool whose goal is to extend **financial and statistical information** to cast light on all aspects of the organization's activities. For this goal, it employs methodologies like as marginal costing, cost volume profit analysis, standard costing, and capital budgeting, among others, to assist management in making good rational decisions.

1/5. Importance and Limitations of managerial Accounting:

1/5/1. Importance of managerial Accounting:

The main objective of managerial accounting is to assist the management of a company in efficiently performing its functions: planning, organizing, directing, and controlling. Management accounting helps with these functions in the following ways:²¹

²¹ <https://www.zoho.com/books/guides/management-accounting.html>

Managerial accounting helps managers make good decisions. Managerial accounting provides information about the cost of goods and services, whether a product is profitable, whether to invest in a new business venture, and how to budget. It compares actual performance to planned performance and facilitates many other important decisions critical to the success of organizations.²²

Consider several reasons why management accounting is integral to business operations:²³

- (1) **Provides data:** It serves as a vital source of data for planning. The historical data captured by managerial accounting shows the growth of the business, which is useful in forecasting.
- (2) **Analyzes data:** The accounting data is presented in a meaningful way by calculating ratios and projecting trends. This information is then analysed for planning and decision-making. For example, you can categorise purchase of different items period-wise, supplier-wise and territory wise.
- (3) **Aids meaningful discussions:** Management accounting can be used as a means of communicating a course of action throughout the organization. In the initial stages, it depicts the organisational feasibility and consistency of various segments of a plan. Later, it tells about the progress of the plans and the roles of different parties to implement it.
- (4) **Helps in achieving goals:** It helps convert organizational strategies and objectives into feasible business goals. These goals can be achieved by imposing budget control and standard costing, which are integral parts of management accounting.
- (5) **Uses qualitative information:** Management accounting does not restrict itself to quantitative information for decision-making. It takes into account qualitative information which cannot be measured in terms of money. Industry cycles, strength of research and development are some of the examples qualitative information that a business can collect using special surveys.

²² <https://khatabook.com/blog/basics-of-managerial-accounting/>

²³ <https://www.indeed.com/career-advice/career-development/what-is-managerial-accounting>

- (6) **Directs forecasting, budgeting and planning:** Management accounting is essential for businesses to create accurate financial forecasts and develop budgets. Planning and establishing objectives also rely on revenue projections that the processes of management accounting oversee. Additionally, capital budgets, cost-reduction integrations and investment plans all depend on effective managerial and cost accounting.
- (7) **Supports project management decisions:** Cost-benefit analysis, risk assessments and budget analysis depend on continuous reporting that cost accounting provides. Businesses that take on new projects often evaluate the worth and risk of initiating and completing corresponding tasks, and management accounting allow these professionals to better analyze how new initiatives can affect cash flow and other financial processes.
- (8) **Tracks and measures performance:** Effective management accounting is also important for measuring financial performance. Monitoring key areas like investment and revenue generation are essential for assessing a business' financial position. With continuous insight into financial performance and efficiency, companies can determine how well budgets perform, how efficiently departments allocate business funds and how successfully cost-reduction strategies work to improve financial health and profitability.

1/5/1. Limitations of managerial Accounting:

The preceding list of advantages does not imply that management accounting is without flaws. The following are some of the drawbacks that come with it.²⁴

- **Installation Is Expensive:** The expense of setting up a management accounting system is too expensive. As a result, a small business cannot afford to pay for such an installation. Furthermore, the system's utility is limited to large, complicated companies.
- **Resistance to Change:** The adoption and operation of a management accounting system in any organisation

²⁴ <https://khatabook.com/blog/basics-of-managerial-accounting/>

necessitate numerous modifications in the organisation's structure, norms, and regulations. These changes are fought by management because they pose a threat to the company's ability to operate successfully.

- **Lack of Objectivity:** There is always the risk of personal bias and manipulation from data collection to financial accounting interpretation. As a result, objectivity and validity are compromised.
- **Personal Bias:** While management accounting does provide some structure to the systems utilised, it also has the drawback of allowing personal bias to influence the systems chosen. Even if a management accountant or management prefers a particular strategy, it may not be the best appropriate method for every aspect. Aside from this constraint in management accounting, the systems are only as good as the management accountant or management itself.
- **Insufficient knowledge:** Managers who receive reports should have a solid understanding of the business and its environment, as well as the report's underlying principles. This is not always the case, which leads to diverse interpretations. As a result, poor decisions can be the result.

1/6. Components of Managerial Accounting:

Management accounting, in accordance with the Chartered Institute of Management Accountants (CIMA), is the procedure of recognizing, gauging, gathering, studying, researching, analyzing and communicating of information utilized by the management to plan, evaluate and control within body and to ensure proper use of and liability for its resources. It also includes the preparation of financial reports for non-management groups such as tax authorities and regulatory agencies.

On the other hand, The American Institute of Certified Public Accountants (AICPA) says that management accounting, as a practice extends to three areas such as (Key Components of Managerial Accounting):²⁵

²⁵ <https://marketinghrdpresentation.com/2012/12/22/key-components-of-management-accounting/>

- (1) **Risk Management** – contributes to practices and frameworks for determining, gauging, managing and reporting risks to the attainment of the objectives and goals of the organization.
- (2) **Performance Management** – develops the practice of decision-making and managing the organization's performance.
- (3) **Strategic Management** – advances the function of the management accountant as a tactical partner in the organization.

An excellent management accounting process also helps in tackling the four major aspects of a business such as:

- a) Proper planning
- b) Directing
- c) Decision-making
- d) Controlling

1/7. Types of Managerial Accounting Methods:

Management accounting encompasses several key areas and requires accounting principles to evaluate and improve organizational goals and performance. Consider each area within managerial accounting and its purpose within an organization. There are many potential ways to decrease a business's total costs and increase its overall revenue or valuation. Here are some approaches a managerial accountant can take in his task. A variety of different accounting methods and techniques are used in the managerial accounting process. Read on to learn about the most common methods:^{26, 27},

1) Cost Accounting: Cost accounting is used to measure and analyze all fixed and variable costs associated with the production of products or performance of services. There are several different types of cost accounting.

Common Types of Cost Accounting:²⁸

²⁶ <https://www.indeed.com/career-advice/career-development/what-is-managerial-accounting>

²⁷ <https://www.masterclass.com/articles/managerial-accounting>

²⁸ <https://www.masterclass.com/articles/managerial-accounting>

Standard costing	(30) Standard costing is used to determine a standard or budgeted cost for producing products or delivering a service, which is then compared to the actual costs of operations.
Job order costing	(31) Businesses that provide customized solutions that differ significantly from each other can use job order costing to compute the costs associated with each unit of output. A job costing sheet or cost record is created per custom job to record only job-specific costs.
Activity-based costing	(32) Activity-based costing (ABC) is a system for allocating indirect costs to specific activity pools. For each activity, such as product design, an activity measure, for example, the time spent working on a design, is identified and used as cost driver to assign specific overhead costs to a product or service.
Marginal costing	(33) Marginal costing is used to determine the cost of producing an additional unit in order to identify at which volume the production costs per additional unit are the lowest. Marginal costing essentially reveals the relationship between cost, volume, and profit which can be used to determine the break-even point, optimum production volume, and the optimal sales mix.
Variance analysis	(34) Variance analysis is used to assess a business's performance by comparing the planned or budgeted costs with the actual costs and identifying what is causing any deviations.

2) Product costing and valuation: Product costing determines total costs that relate to the production of products or services. The costs can account for various expenses, including direct, indirect, fixed and variable costs. Cost accounting is the tool professionals use to evaluate and determine these costs to analyze strategies for reducing overspending and maintaining budgets. Within the product costing area is the process of marginal costing, which helps companies determine break-even points and pricing frameworks.

- 3) **Inventory turnover analysis:** An inventory turnover analysis reviews how much inventory a company sells or replaces over a specific period. Calculating the inventory turnover rate results in a value you can use to determine the effectiveness of current pricing, marketing, manufacturing and purchasing strategies. Inventory turnover also shows areas of inventory management that need improvements. For instance, excessive inventory can indicate higher storage costs, inefficient pricing strategies or outdated components. Using the turnover rate, in this case, can help companies evaluate where improvements are necessary to reduce costs and increase sales.
- 4) **Cash flow analysis:** This method of managerial accounting evaluates how business decisions affect cash flow. Accrual-based accounting is often applicable to document cash flow activities that investors use to analyze risk and profitability. Internally, though, managerial accountants typically conduct the cash flow analysis to assess the financial impact of individual decisions. Additionally, the cash flow analysis can provide businesses with better insight into working capital and optimal strategies to maximize cash flow, increase the liquidity of assets and cover short-term liabilities more efficiently.

Cash flow analysis components

A cash flow analysis has the following three parts:²⁹

- a) **Cash flow from operations:** Cash flow from operations considers the normal business operations that create cash inflows and the corresponding outflows. You can calculate cash flow from operations either directly or indirectly. Cash flow from operations shows how much of the cash from the income statement is on an accrual basis, including accounts payable, accounts receivable and payable income taxes.
- b) **Cash flow from investments:** In addition to normal business operations, investments can create cash inflows and outflows. You can calculate cash flow from

²⁹ <https://www.indeed.com/career-advice/career-development/example-cash-flow-analysis>

investments by finding the number of cashless activities, losses or gains that have happened over a specific period of time. This includes activities such as purchasing or selling securities, long-term assets or loans. Cash flow from investments shows how much cash comes from sales and purchases, including fixed assets and investment transactions like property, vehicles, capital expenditures or investment securities.

- c) **Cash flow from financing:** In addition to normal business operations and investments, financing activities can create cash inflows and outflows. You can calculate cash flow from investments by finding the number of funds moved between the company, its owners, its investors and its creditors. This includes activities such as repaying or borrowing money for loans and buying or selling stocks. Cash flow from financing shows how much cash is from equity and debt transactions, including dividend payments and bonds.
- 5) **Constraint analysis:** Cost accounting also focuses on the review of various constraints that a production or sales process can present. Accountants reviewing cost constraints identify areas of manufacturing, conversion or acquisition that can accumulate and disrupt other areas of the process. Therefore, this area of management accounting serves to measure the effect production constraints have on cash flow, revenue generation and overall profits.
- 6) **Financial leverage monitoring:** Financial leverage is a business' ability to acquire assets through borrowed capital in order to increase investment returns. Management accountants often evaluate balance sheets to identify and evaluate how companies' equity and debt combine to create leverage. Data from financial leverage and balance sheet analysis can allow companies to better evaluate and communicate with outside sources regarding overall financial standing.
- 7) **Accounts receivable management:** Effective management of accounts receivable activities is also an area of cost accounting. Resolving outstanding accounts, collecting on

receivables and analyzing credit risk are essential for businesses to operate and generate revenue. Managerial accountants review receivables to analyze the efficiency of payment and collection methods and to protect accounts from becoming credit risks.

- 8) **Budgeting, trend analysis and forecasting:** Many companies employ budgets to regulate the operations and spending of a company, along with its fellow departments. You can easily find discrepancies between capital allocated to achieve results and how the results from employees. They can also forecast proposals, see what resources are necessary to execute a campaign and display solutions for financing. Information in budget trend analysis and forecasts are also beneficial to maintain in case of an audit or any budget deviations.
- 9) **Margin analysis:** Margin analysis involves process costing to identify ways to streamline production. One common method is to cut product costs (also known as the cost of goods sold—i.e., the costs associated with the production and sale of your goods). Practicing margin analysis requires considering the direct cost of a business's overall production, including fixed and variable costs that change based on scale.
- 10) **Financial leverage metrics:** Financial leverage metrics frame how a business can utilize its debt-to-equity ratio for sustainable growth. Learn how to calculate the debt-to-equity ratio for your business.
- 11) **Inventory and product valuation:** Maintaining and selling inventory require resources. Inventory and product valuation involves identifying the most efficient ways to do both tasks—for example, by pricing a product differently to increase the contribution margin or altering a business's storage method. A break-even analysis is a standard tool to determine how much a product must sell to cover its overall cost; learn how to calculate the break-even point.

1/8. Managerial Accounting vs Financial Accounting.

Financial accounting and managerial accounting (sometimes called management accounting) are quite different. While both of these types of accounting dealing with numbers, managerial

accounting is strictly for internal use. Financial accounting, on the other hand, focuses primarily on the collection of accounting information to create financial statements.³⁰

A financial accounting system is targeting external decision-makers such as investors, regulators, and creditors, while a managerial accounting system is targeting internal decision-makers such as managers.³¹

When it comes to roles that are essential to keep businesses up and running, accounting is always going to be a top contender. Why? Put simply, accounting—in all its forms—is the pulse of an organization. It informs all stakeholders of the financial state of the business so managers, investors and owners can make intelligent, informed decisions to succeed.

There are several different types of accounting—from cost auditing to public accounting—but two of the most common are managerial (sometimes referred to as management) accounting and financial accounting.

If you’re exploring accounting as a career option, understanding the difference between these two types of accounting is important. This chapter will help you differentiate between managerial and financial accounting so you can have a better idea of which direction you may want to take in your career.³²

Comparison chart:³³

³⁰ <https://www.masterclass.com/articles/managerial-accounting>

³¹ <https://www.masterclass.com/articles/managerial-accounting>

³² <https://www.franklin.edu/blog/accounting-mvp/managerial-accounting-vs-financial-accounting>

³³ https://www.diffen.com/difference/Financial_Accounting_vs_Management_Accounting

Financial Accounting versus Management Accounting comparison chart		
	Financial Accounting	Management Accounting
Objectives	The main objectives of financial accounting are to disclose the end results of the business, and the financial condition of the business on a particular date.	The main objective of managerial accounting is to help management by providing information that is used to plan, set goals and evaluate these goals.
Audience	Financial accounting produces information that is used by external parties, such as shareholders and lenders.	Managerial accounting produces information that is used within an organization, by managers and employees.
Optional?	It is legally required to prepare financial accounting reports and share them with investors.	Managerial accounting reports are not legally required.
Segment reporting	Pertains to the entire organization. Certain figures may be broken out for materially significant business units.	Pertains to individual departments in addition to the entire organization.
Focus	Financial accounting focuses on history; reports on the prior quarter or year.	Managerial accounting focuses on the present and forecasts for the future.

Financial Accounting versus Management Accounting comparison chart		
	Financial Accounting	Management Accounting
Format	Financial accounts are reported in a specific format, so that different organizations can be easily compared.	Format is informal and is on a per department/company basis as needed.
Rules	Rules in financial accounting are prescribed by standards such as GAAP or IFRS. There are legal requirements for companies to follow financial accounting standards.	Managerial accounting reports are only used internally within the organization; so they are not subject to the legal requirements that financial accounts are.
Reporting frequency and duration	Defined - annually, semi-annually, quarterly, yearly.	As needed - daily, weekly, monthly.
Information	Monetary, verifiable information.	Monetary and company goal driven information.

1/9. Managerial Accounting vs. Cost Accounting:³⁴

Cost accounting and financial accounting both address different segments. Financial accounting provides the financial position and other aspects of the company and is meant to be used for external users. Cost accounting is more related to the internal

³⁴ <https://shinewingtyleoh.com/difference-between-cost-accounting-management-accounting>

aspects of the company and is more related to manufacturing concerns.³⁵

While Managerial accounting is precisely the decision making calculations that use both costing as well as financial accounting for the purpose of deciding on different aspects of business. Such as, for instance, whether to BUY a particular product or to build it within the company. In this particular example, the managerial accounting will use costing of making as well as buying the product and then decide which option is more feasible.³⁶

Cost accounting is that section of accounting which strives at generating data to manage operations with a view to maximizing profits and performance of the company, it is also termed control accounting. On the contrary, management accounting is that type of accounting which support management in planning and decision-making and hence known as decision accounting.³⁷

Cost accounting and management accounting are two very crucial branches of accounting discipline. Both of them are used by most of the organizations for better functioning. The main user of both cost accounting and management accounting is an organization's internal management. This creates an impression that both cost accounting and management accounting are same.

The differences between cost accounting and management accounting are of a fine nature and have minor nuances. Cost accounting basically focuses on the quantitative aspects. While management accounting uses a combination of quantitative aspects as well as qualitative aspects.³⁸

1/9/1. Similarities between Cost Accounting and Management Accounting:³⁹

Many of the fundamental processes of cost accounting and management accounting are similar. Both of them require an essential knowledge of accounting basics and principles. Both

³⁵ https://content.kopykitab.com/ebooks/2018/06/19614/sample/sample_19614.pdf

³⁶ <https://keydifferences.com/difference-between-cost-accounting-and-financial-accounting.html>

³⁷ <https://byjus.com/commerce/difference-between-cost-accounting-and-management-accounting/>

³⁸ <http://www.differencebetween.net/business/accounting-business/difference-between-cost-accounting-and-management-accounting/>

³⁹ <http://www.differencebetween.net/business/accounting-business/difference-between-cost-accounting-and-management-accounting/>

cost accounting and management accounting use many similar procedures and techniques of accounting, computation and analysis.

Both strive to provide accurate and relevant data and information to help the management in decision making and improving operational performance of an organization.

The information and statements provided by both cost accounting and management accounting are prepared with reference to a particular period, but not necessarily reported or submitted at the financial year end. Both of them are mainly used by the internal management or the employees of an organization.⁴⁰

1/9/2. Difference between Cost Accounting and Management Accounting:^{41, 42}

- **Definition:** Cost accounting deals with the collection, recording, classification, ascertaining, and analysis of the information and data related to the costs of production and operations; while management accounting deals with the collection, recording, classification, analysis, and presentation of data and information related to the quantitative and the qualitative aspects pertaining to the activities of an organization.⁴³
- **Focus:** The primary focus of cost accounting is to accurately record the costs of the transactions or activities, and present cost statements; while the primary focus of management accounting is to help the management in decision making.
- **Objective:** Objective of cost accounting is reducing or controlling costs; while objective of management accounting is to help the management of the company in decision making, planning, and controlling. In other words, effective and efficient performance of an organization is the objective of management accounting.
- **Nature:** Cost accounting is both historical and futuristic as it records historical transactions which help in estimating future

⁴⁰ <http://www.mim.ac.mw/books/Cost%20Accounting.pdf>

⁴¹ <https://khatabook.com/blog/cost-accounting-vs-management-accounting/>

⁴² <https://khatabook.com/blog/cost-accounting-vs-management-accounting/>

⁴³ <http://www.mim.ac.mw/books/Cost%20Accounting.pdf>

costs; but management accounting is futuristic as it is mainly related with planning and forecasting.

- **Coverage:** Cost accounting covers typically the transactions, records and statements related with costing and quantitative aspects; while management accounting mainly covers qualitative and quantitative aspects.
- **Scope:** The scope of cost accounting is narrow as it is concerned with costing aspects; while the scope of management accounting is wider comparatively as it covers financial accounting, taxation, planning besides cost aspects in some respects.
- **Level of Depth and Detail:** Cost accounting takes an in-depth look at various details related to the cost of production and operations; while management accounting generally takes a top level view of the overall activities of an organization.
- **Type of Data and Information:** Cost accounting is concerned with the quantitative type of data and information; but management accounting is concerned with both the qualitative as well as quantitative type of data and information. It uses the information that may usually not be expressed in terms of money.
- **Sources of Data:** Cost accounting obtains the data of costs from financial accounting which help in costing work; but management accounting obtains the data from both Cost accounting and financial accounting.
- **Performed by:** cost accounting is performed by a qualified cost accountant with some statutory powers in certain cases; while management accounting is performed by management accountants or by others in some cases.
- **Status:** Cost accounting is constrained in status with limited area of influence; while management accounting has status of priority and a larger area of influence.
- **Timing:** Cost accounting is carried out on a somewhat regular basis; whereas management accounting is usually carried out more as a periodic process.
- **Necessity:** Cost accounting is necessary for some organizations in their day-to-day production related activities

or routine operations; while management accounting is optional in many cases and not necessary in the day-to-day operations of a firm.

- **Dependence:** Cost accounting does not depend on management accounting for its success and effectiveness; but management accounting depends on cost accounting for its success and effectiveness.
- **Regulations:** Cost accounting is governed by some cost accounting standards or regulations; but management accounting is usually not governed by a specific and stringent set of standards or regulations.
- **Audit Requirement:** In some cases, the statutory audit of the cost accounting reports is needed; but the statutory audit of the management accounting reports is typically not needed.
- **Report Submission:** Cost accounting reports are submitted to the management of the organization as well as some other external authorities or regulators; but management accounting reports are submitted to the internal management of the organization.⁴⁴

Comparison Chart for Cost Accounting vs. Management Accounting⁴⁵

Basis of Comparison	Management Accounting	Cost Accounting
Meaning	The accounting in which both financial and non-financial information is provided to managers is known as management accounting.	The recording, classifying and summarizing of cost data of an organization is known as cost accounting.
Information Type	Quantitative and qualitative.	Quantitative.

⁴⁴ <http://www.differencebetween.net/business/accounting-business/difference-between-cost-accounting-and-management-accounting/>

⁴⁵ <http://www.differencebetween.net/business/accounting-business/difference-between-cost-accounting-and-management-accounting/>

Basis of Comparison	Management Accounting	Cost Accounting
Objective	Providing information to help the management of the company in decision making, planning, and controlling	Determining the cost of production and reducing or controlling costs
Scope	Impact and effect aspect of costs.	Interested in determining, allocating, distributing and accounting for costs.
Specific Procedure	No	Yes
Recording	It focuses on the analysis of future projections.	Records past and present data
Planning	Short and long-range planning	Short range planning
Interdependency	Cannot be installed without cost accounting.	Can be installed without management accounting.

1/10. Questions & Exercises:

1/10/1. State which of the following statements is correct and which one is wrong: (a) for correct statements, (e) for wrong statements:^{46 47},

1)	Management Accounting is concerned with the adjustment in the value of assets, and of profit in the light of changes in the price level.	False
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⁴⁶ <http://www.dacc.edu.in/wp-content/uploads/2020/08/SY.BBA-Management-Accounting-MCQ.pdf>

⁴⁷ <https://www.proprofs.com/quiz-school/story.php?title=acct-302-exam-1-chapter-14>

2)	Inflation accounting helps the management in planning and controlling the cost relating to both, production and distribution activities.	False
3)	The changes in the economic condition of the country have direct impact of the business position of an organization.	True
4)	Management accounting furnishes useful accounting data and statistical information for the decision – making process.	True
5)	The principle of objectivity is followed in its real spirit in management accounting.	False
6)	Management Accounting is not based on double - entry system	True
7)	Although financial and managerial accounting differ in many ways, they are similar in that both rely on the same underlying financial data.	True
8)	Managerial accounting is a branch of financial accounting and serves essentially the same purposes as financial accounting.	False
9)	Managerial accounting places greater emphasis on the future than financial accounting, which is primarily concerned with the past.	True
10)	Managerial accounting is not needed in a non-profit or governmental organization.	False
11)	When carrying out their planning activities, managers select a course of action and specify how the action will be implemented.	True
12)	The controller occupies a line position in an organization.	False
13)	When carrying out their planning activities, managers obtain feedback to ensure that the plan is actually carried out and is appropriately modified as circumstances change.:	False
14)	The Chief Financial Officer of an organization is responsible for ensuring that line operations run smoothly.	False

15)	If ethical standards were not generally followed, one of the results would probably be fewer goods and services available in the marketplace.	True
16)	A budget is a qualitative expression of a plan.	False
17)	The process of preparing a budget forces coordination and communication throughout the company.	True
18)	Linking rewards to performance helps in good management performance.	True
19)	Traditionally, companies have maintained large amounts of raw materials, work in process, and finished goods inventories to act as buffers so that operations can proceed smoothly even if there are unanticipated disruptions.	True
20)	The last step in the decision-making process is to make decisions by choosing among alternatives.	False
21)	One of the steps in planning is evaluating the performance and taking corrective measures.	False
22)	A budget helps to control activities by adhering to the prescribed plan.	True
23)	To take advantage of changing market opportunities, the annual budget should be strictly enforced.	False
24)	Control comprises taking actions that implement the planning decisions, evaluating past performance, and providing feedback and learning to help future decision making.	True
25)	A budget can only be used as a planning tool.	False
26)	Gathering information before making a decision leads to a wastage of time and is not helpful.	False
27)	A budget is a benchmark against which actual performance can be compared.	True
28)	Evaluating performance helps in the future decision-making process.	False
29)	Management accounting is playing an increasingly important role by helping managers develop and implement strategy.	True

30)	A performance report compares actual performance to the amount budgeted.	True
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1/10/1. Choose the best answer for each of the following questions:⁴⁸

(1) What is considered the language of business used to communicate financial information?

A	Marketing	C	Pricing
B	Profit	D	Accounting

Answer: D) Accounting

Explanation- Accounting is considered the way of communication to attract customers through marketing.

(2) What is the main objective of management accounting?

A	To identify and analyse the result of business operations.	C	To check and maintain accounting records
B	A. To study business transactions	D	To remind the amount due to customers

Answer: A) To identify and analyse the result of business operations.

Explanation- Management accounting is focused on analysing the financial performance of a company and creating reports for future use.

(3) Which personnel of a financial firm play a key role in management accounting?

A	Investors	C	Suppliers
B	Managers	D	Customers

Answer: B) Managers

⁴⁸ Mainly relied on the following sources and references:

- <https://www.studocu.com/row/document/jamaa%20-%20zayd/business-communications/multiple-choice-with-solutions/27152582>
- <https://indiaclass.com/management-accounting-mcq/>
- <https://unacademy.com/content/ca-foundation/mcq/management-accounting/>
- <https://www.careerride.com/view/fundamentals-of-management-accounting-mcq-with-answers-23802.aspx>
- <https://mcqmate.com/topic/100/management-accounting-set-13>
- <http://www.dacc.edu.in/wp-content/uploads/2020/08/SY.BBA-Management-Accounting-MCQ.pdf>
- <https://www.csun.edu/sites/default/files/managerialquiz.pdf>

Explanation- Management accounting helps the managers in initiating policies and in decision making.

(4) Managerial accounting information is generally prepared for:

A	stockholders.	C	managers.
B	creditors.	D	regulatory agencies.

Answer: C) Managers

(5) Management accounting is mainly _____:

A	Future oriented	C	Customer oriented
B	Past oriented	D	Bank oriented

Answer: A. Future oriented

(6) The primary task of management accounting is, therefore, to redesign the entire accounting system so that it may serve the needs of the firm:

A	Marketing	C	Human resource
B	Operational	D	Production

Answer: B. Operational

(7) is the tool/s of management accounting:

A	Marginal Costing	C	Standard Costing
B	Budget and budgetary control	D	All A, B & C

Answer: D. All A, B & C

(8) Management accounting provides information to management so that planning organising directing and controlling of business operations can be done in an orderly manner:

A	Organising controlling planning and directing	C	Planning organising directing controlling
B	Planning controlling organising directing	D	Organising planning directing controlling

Answer: C. Planning organising directing controlling

(9) Which is the main characteristic of Management accounting?

A	Cause and effect analysis	C	Helping to achieve organisational goals
B	providing accounting information	D	All of the above

Answer: D. All of the above

(10) The term management accounting was first coined in:

A	1940	C	1960
B	1950	D	1970

Answer: B. 1950

(11) Which is NOT a limitation of Management accounting?

A	Management accounting is only a tool	C	Evaluation and control of performance
B	Personal prejudice and bias	D	Psychological resistance

Answer: C. Evaluation and control of performance

(12) Which is NOT an advantage of Management accounting?

A	Economic appraisal	C	Influenced by personal bias
B	Helps in decision making	D	Facilitates communication

Answer: C. Influenced by personal bias

(13) the sub-field of accounting:

A	Management accounting	C	Financial accounting
B	Cost accounting	D	All of the above

Answer: D. All of the above

(14) The main objective of management accounting is:

A	To maintain the accounting records	C	To ascertain analyse and interpret the results of business operations
B	To know the amount due from customers and suppliers	D	To record all the business transactions

Answer: C. To ascertain analyse and interpret the results of business operations

(15) The term Management Accounting was coined by

A	F.W. Taylor	C	R. N Carter
B	James H Bliss	D	Philip Kotler

Answer: B. James H Bliss

(16) The scope of Management accounting includes

A	Budgeting and forecasting	C	Financial and cost accounting
B	Internal audit and tax accounting	D	All of the above

Answer: D. All of the above

(17) The purpose of management accounting is to help make decisions:

A	managers	C	marketers
B	investors	D	banks

Answer: A. managers

(18) Managerial accounting information is generally prepared for:

A	managers	C	government agencies
B	stakeholders	D	competitors

Answer: A. managers

(19) is the study of managerial aspects of financial accounting:

A	Cost accounting	C	Management accounting
B	Financial accounting	D	Business accounting

Answer: C. Management accounting

(20) Management accounting is mainly applicable toentities:

A	non profit	C	manufacturing
B	service	D	All of the above

Answer: D. All of the above

(21) play a key role in management accounting:

A	Investors	C	Customers
B	Managers	D	Suppliers

Answer: B. Managers

(22)shows how the accounting function can be represented so as to fit it within the framework of Management activity:

A	Management accounting	C	Financial accounting
B	Cost accounting	D	Tax accounting cancer is Management accounting

Answer: A. Management accounting

(23) Management accounting is generally applied to:

A	Large industrial and trading organisations	C	Non Profit Organisations
B	Cooperative societies	D	Small trading organisations

Answer: A. Large industrial and trading organisations

(24) Management accounting assists the management in.....:

A	planning	C	Controloing
B	directing	D	All of the above

Answer: D. All of the above

(25) The concept of management accounting was introduced by

A	Arthur Andersen	C	William Beaver
B	James H. Bliss	D	Herman Bevis

Answer: B. James H. Bliss

(28) The term Management Accounting is mainly related to

A	presentation of account data	C	accurate recording of data
B	planning of account data	D	sharing the most reliable cost data with agencies

Answer: A. presentation of account data

(30) Management accounting is: A) Subjective, B) Objective

A	Only A	C	Both A and B
B	Only B	D	None of the above

ANSWER: a) Only A

(31) The management accounting can be stated an extension of

A) Cost Accounting

B) Financial Accounting

C) Responsibility Accounting

A	Both A and B	C	Both B and C
B	Both A and C	D	A, B, C

ANSWER: d) A, B, C

(32) Management accounting is related with

a) The problem of choice making

b) Recording of transactions

c) Cause and effect relationships

A	A and B	C	A and C
B	B and C	D	All are false

ANSWER: c) a and c**(33) Management accountancy is a structure for:**

A	Costing	C	Decision making
B	Accounting	D	Management

ANSWER: c) Decision making**(34) Which of the following is true about management accounting?**

A) Management accounting is associated with presentation of accounting data.

B) Management accounting is extremely sensitive to investor's needs:

A	Only A	C	Both A and B
B	Only B	D	None of the above

ANSWER: a) Only A**(35) Management accounting assists the management:**

A	Only in control	C	Only in planning
B	Only in direction	D	In planning, direction and control

ANSWER: d) In planning, direction and control**(36) The use of management accounting is:**

A	Optional	C	Legally obligatory
B	Compulsory	D	Compulsory to some and optional to others

ANSWER: a) Optional**(37) Improvement in time performance is most likely NOT enhanced by:**

A	redesign of products.	C	eliminating waste.
B	adding processes in production.	D	eliminating nonvalue-added activities.

Answer» B. adding processes in production. discuss**(38) Which of the following are tools of management accounting?**

A) Decision accounting

B) Standard costing

- C) Budgetary control
 D) Human Resources Accounting

A	A, B and D	C	A, B and C
B	A, C and D	D	A, B , C, D

ANSWER: c) A, B and C

(39) Which of the following statements are false about management accounting?

- A) Management accounting is concerned with historical events.
 B) Management accounting is related only with such instances which can be expressed in monetary terms.
 C) Management accounting is a part of Financial Management
 D) Management accounting information can be disclosed to outsiders.

A	A, B & D	C	A,B & C
B	A, C & D	D	A, B,C,D

ANSWER:

(40) Management accounting deals with:

A	Quantitative information	C	Both a and b
B	Qualitative information	D	None of the above

ANSWER: c) Both a and b

(41) Which of the following activities is NOT associated with the financial accounting information system?

A	reporting on the cost of quality	C	preparing reports for the tax authorities
B	reporting to the shareholders	D	preparing a statement of cash flows

Answer» A. reporting on the cost of quality

(42) Competitive advantage is established by:

A	providing more customer products than competitors.	C	providing greater customer value for less cost than competitors.
B	providing better quality than competitors.	D	providing greater efficiencies than competitors.

Answer» C. providing greater customer value for less cost than competitors.

(43) Which of the following statements is NOT true about world-class firms?

A	World-class firms are firms that are poor in customer support.	C	World-class firms strive continually to improve product design, manufacture, and delivery.
B	World-class firms know their market and their products.	D	World-class firms can compete with the best of the best in a global environment.

Answer» A. World-class firms are firms that are poor in customer support.

discuss

(44) is devoted to providing information for external users.

A	Management accounting	C	Internal accounting
B	Financial accounting	D	Cost accounting

Answer» B. Financial accounting

(45) Management accounting and financial accounting differ in that management accounting information is prepared:

A	following prescribed rules.	C	for shareholders.
B	using whatever methods the company finds beneficial.	D	to summarize the whole company with little detail.

Answer» B. using whatever methods the company finds beneficial.

(46) Monitoring the number of defects produced is an example of the management function of:

A	planning.	C	decision making.
B	control.	D	both a and c.

Answer: B. control.

(47) Management accounting can be viewed as

A	Marketing-oriented Accounting	C	Accounting-oriented Management
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B	Management-oriented Accounting	D	Manager-oriented Accounting
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Answer: B. Management-oriented Accounting

(48) is the language of Business which used to communicate financial information.

A	Accounting	C	Profit
B	Marketing	D	Pricing

Answer: A. Accounting

(49) Wealth maximization is a

A	short term concept	C	long term concept
B	temporary concept	D	outdated concept

Answer: C. long term concept

(50) Total quality management emphasizes:

A	zero defects.	C	elimination of waste.
B	continual improvement.	D	all of the above.

Answer: D. all of the above.

(51) Which of the following emerging themes in cost accounting deals with managers striving to create an environment that will enable workers to manufacture perfect (zero-defect) products?

A	advances in information technology	C	global competition
B	time as a competitive element	D	total quality management

Answer: D. total quality management

(52) Management Accounting provides invaluable services to management in performing

A	planning and controlling management principles	C	supply of regular funds
B	analysis and interpretation of financial data	D	all management functions

Answer: D. all management functions

(53) deals with the accounting & reporting of information to management regarding the detail information.

A	cost accounting	C	management accounting
B	financial accounting	D	traditional accounting

Answer: C. management accounting

(54) Management accounting concentrates on:

A	preparation of PL account	C	providing accounting details to macro environment
B	creation of balance sheet	D	control of business operations

Answer: D. control of business operations

(55) In management accounting, an emphasis and focus must be _____ oriented:

A	bank	C	future
B	communication	D	past

Answer: C. future

(56) Who discovered the term Management Accounting?

A	R. N Carter	C	Philip Cotler
B	James H Bliss	D	F.W. Taylor

Answer: B) James H Bliss

Explanation- James discovered the term Management through accounts, and he contributed to accounting through his book with the same title.

(57) What is the main function of management accounting?

A	Decision making	C	Direction
B	Planning	D	Provision of information to management

Answer: D) Provision of information to management

Explanation- Management accounting analyses and creates reports related to the financial performance management of a company with the help of available information.

**(58) Management accounting begins where.....
accounting ends:**

A	Cost Accounting	C	Financial Accounting
B	Management Accounting	D	Human resource Accounting

Answer: A)

(59) Sales Rs. 100000, variable cost Rs. 50000 and net profit ratio is 10% on sales, find out fixed cost.

A	50000	C	20000
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B	40000	D	The data inadequate
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Answer: B)

(60) What are the instruments/ tools related to management accounting?

A	Marginal costing	C	Budget control
B	Standard costing	D	All of the above

Answer: D) All of the above

Explanation- Marginal costing, standard costing, and budget control are tools based on cost-accounting information and for future information on management accounting.

(61) Where is management accounting applied?

A	Small trading organisations	C	Cooperative societies
B	NPOs	D	Large industrial and trading organisations

Answer: D) Large industrial and trading organisations

Explanation- Large-scale companies use management accounting to get an idea about the competition, business environment and production of technology.

(62) Which of the following options is not characteristic of management accounting?

A	Future-oriented	C	Compulsory accounting.
B	Accounting information	D	Management oriented

Answer: C) Compulsory accounting

Explanation- Management accounting is not mandatorily done in all financial institutions or companies.

(63) is responsible for financial operations of the organization:

A	CEO	C	CFO
B	CMO	D	CA

Answer: C. CFO (Chief Financial Officer)

(64) Financial accounting is primarily concerned with providing financial reports to all of the following EXCEPT:

A	creditors such as banks and other financial institutions.	C	shareholders of the company.
B	creditors such as suppliers.	D	management of the firm.

Answer: D. management of the firm.

(65) Management accounting helps to make decisions:

A	Customers	C	Managers
B	Investors	D	Banks

Answer: C. Managers

(66) Which of the following cost management tools supports the firm's concentration on the delivery of value to the customer?

A	service industry growth	C	preparing an earnings report for external reporting
B	global competition	D	value-chain analysis

Answer» D. value-chain analysis

(67) The primary objective of management accounting is to:

A	furnish management complete and true information	C	manage company account and improve sales
B	supply profit and loss details to stakeholders	D	cut the operation cost to provide more savings

Answer: A. furnish management complete and true information

(68) _____ is the type of accounting:

A	cost accounting	C	financial accounting
B	management accounting	D	all of the above

Answer: D. all of the above

(69) The term gross margin refers to

A	Profit before interest and tax	C	Profit before tax
B	Contribution	D	Total profit

Answer: B

(70) The use of management accounting is

A	mandatory	C	most essential
B	compulsory	D	optional

Answer: D.**(71) The other name of marginal costing is**:

A	Direct costing	C	Incremental costing
B	Variable costing	D	All of the above

Answer: D.**(72) External report use for**:

A	Top level management	C	Lower level management
B	Middle level management	D	Shareholders

Answer: D. Shareholders**(73) From following which is not a routine report?**

A	Production report	C	Investigation
B	Sales report	D	Administration report

Answer» C. Investigation**(74) Performance reports are accounting reports that compare:**

A	planned data with actual data.	C	managers' bonuses with performance ratings by supervisors.
B	audited data with actual data.	D	actual data with industry standards.

Answer: A. planned data with actual data.**(75) Which of the following statements correctly distinguishes between financial and management accounting?**

A	Management accounting reports on the whole organization.	C	Financial accounting is primarily concerned with providing information for internal users.
B	Financial accounting is oriented toward the future.	D	Management accounting is oriented more toward the planning and control

Answer: D. Management accounting is oriented more toward the planning and control

(76) Setting the company's profit targets for the upcoming year is an example of the management function of:

A	planning.	C	variance analysis.
B	control.	D	internal auditing.

Answer: A. planning.

(77) The primary objective of management accounting is

A	to provide shareholders and potential investors with useful information for decision making.	C	to provide management with information useful for planning and control of operations.
B	to provide banks and other creditors with information useful in making credit decisions.	D	to provide the relevant taxation authorities with information about taxable income.

Answer: C. to provide management with information useful for planning and control of operations.

(78) Management accounting is the branch of accounting concerned with reporting to:

A	internal managers.	C	the government.
B	shareholders.	D	bankers.

Answer» A. internal managers.

(79) Management accounting reports are prepared:

A	to meet the needs of decision makers within the firm.	C	according to guidelines prepared by the shares and Financial Services Authority.
B	whenever shareholders request them.	D	according to financial accounting standards.

Answer: A. to meet the needs of decision makers within the firm.

(80) What is the basic function of management accounting?

A	To serve public	C	To serve government
B	To manage the performance of the financial function	D	All of the above

Answer: B) To manage the performance the financial function

Explanation- The financial operations are managed and regulated by management accounting.

(81) Which of the following is not a management accounting tool?

A	Cash flow statement	C	Ratio analysis
B	Fund flow statement	D	Process costing

Answer: D) Process costing

Explanation- Process costing is a part of the management accounting which is used to ascertain the cost, process and operations of manufacture.

(82) What is the scope of management accounting?

A	Cost accounting	C	Forecasting
B	Budgeting	D	All of the above

Answer: D) All of the above

Explanation- Management accounting aims to perform correct budgeting, forecasting and cost accounting based on the information source.

(83) Which of the following statements are true according to management accounting?

A	Management accounting is compulsory.	C	It is mainly focused on future
B	Is objective in nature?	D	Management accounting and cost-accounting are similar.

Answer– A) It is only focused on the future.

Explanation- Management accounting helps in evaluating and keeping records of the activities and performance of the business which will be important for managers in the future.

(84) What are the decisions that are made for a long term period called?

A	Working capital decision	C	Capital budgeting decisions
B	Future decisions	D	Profit volume analysis.

Answer: C) Capital budgeting decisions

Explanation- These decisions are made for long term investment whether or not the project will be fruitful in terms of cash flow.

(85) Management accounting is used as:

A	Compulsory	C	Mandatory
B	Optional	D	Any of the above

Answer: B) Optional

Explanation- The reports and business performance results may not be compulsorily maintained in all the organisations so management accounting is optional.

(86) The management is provided with invaluable services by management accounting through?

A	Controlling functions	C	All managerial functions
B	Financial data evaluation	D	None of the above

Answer: C) All managerial functions

Explanation- The management accounting handles and regulates all the management functions of a company.

(87) Management accounting deals with managing:

A	Decision making	C	Tax returns
B	Raising finance	D	Final accounts preparation

Answer: A) Decision making

Explanation- Decision making is the most important function of a management account which helps the managers to resolve any financial problems.

(88) Who stated the definition of management accounting as “Management Accounting is concerned with accounting information which is useful to management”?

A	Robert Anthony	C	J. Batty
B	Michael Porter	D	James H Bliss

Answer: A) Robert Antony

Explanation- Robert Anthony has introduced the hierarchy of management in an organisation and created a framework related to managerial accounting.

(89) Which type of information can be recorded in management accounting?

A	Quantitative	C	Both (a) and (b)
B	Qualitative	D	All of the above

Answer: A) Quantitative information

Explanation- Management accounting identifies and stores the quantitative information of the operations performed in a company.

(90) Which phrase best describes the current role of the managerial accountant?

A	Managerial accountants prepare the financial statements for an organization.	C	Managerial accountants make the key decisions within an organization.
B	Managerial accountants facilitate the decision-making process within an organization.	D	Managerial accountants are primarily information collectors.

Answer: B)

(91) An example of qualitative data is:

A	product cost	C	net income
B	customer satisfaction	D	inventory cost

Answer: B)

(92) In comparison to the traditional manufacturing environment, overhead costs in a JIT environment all the following are true except:

A	are frequently direct in nature.	C	are more easily tracked to products.
B	include rent, insurance and utilities.	D	most of the costs are likely to be indirect in nature.

Answer: D)

(93) As production increases within the relevant range:

A	variable costs will vary on a per unit basis.	C	fixed costs will vary in total.
B	variable costs will vary in total.	D	fixed and variable cost stay the same in total.

Answer: B)

(94) Product and service costing information is prepared for:

A	service providers.	C	merchandising companies.
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B	manufacturing companies with inventory.	D	each of the other four answers.
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Answer: D)

(95) Manufacturing costs typically consist of

A	direct materials, direct labor, and manufacturing overhead.	C	direct materials, direct labor, and administrative costs.
B	production and shipping costs.	D	production and marketing costs.

Answer: A)

(96) Management accounting focuses primarily on providing data for:

A	internal uses by managers.	C	external uses by stockholders and creditors.
B	external uses by the Securities and Exchange Commission.	D	external uses by the Internal Revenue Service.

Answer: A

(97) Managerial accounting:

A	is more future oriented than financial accounting.	C	tends to summarize information more than financial accounting
B	is more concerned with precision than timeliness.	D	is primarily concerned with providing information to external users.

Answer: A

(98) Compared to financial accounting, managerial accounting places more emphasis on:

A	the timeliness of information.	C	the precision of information.
B	the flexibility of information.	D	both A and C above.

Answer: D

(99) The function of management that compares planned results to actual results is known as:

A	directing and motivating.	C	controlling.
B	planning.	D	decision making.

Answer: C

(100) Which of the functions of management involves overseeing day-to-day activities?

A	Controlling	C	Planning
B	Directing and motivating	D	Decision making

Answer: B

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مختصر السيرة الذاتية للأستاذ
الدكتور

أشرف محمد إبراهيم منصور

البريد الإلكتروني الشخصي

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- أشرف وشارك في لجان مناقشة والحكم على العديد من الرسائل الأكاديمية والمهنية لمرحلتي الماجستير والدكتوراه.
- البريد الإلكتروني الشخصي: amamansour@hotmail.com
- البريد الإلكتروني الرسمي: amansour@commerce.helwan.edu.eg

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CHAPTER TWO

COST-VOLUME-PRFOIT (CVP) ANALYSIS

Introduction

Planners and decision makers possess a preference for acquiring knowledge pertaining to the potential risks included in the activities they undertake. An often-employed metric by decision makers is the chance of achieving a breakeven point or attaining a predetermined profit objective as an indicator of a project's level of risk.

This chapter pertains to scenario analysis in which managers are endeavoring to assess the impacts resulting from alterations in the quantity of goods or services manufactured.

The impacts of fluctuations in volume encompass a multitude of consequences. Managers consistently exhibit a keen interest in comprehending the correlation between volume and key financial indicators, namely revenue, costs, and net income. This

analytical framework is commonly referred to as cost-volume-profit (CVP) analysis.

The results of cost-volume-profit (CVP) analysis frequently possess a satisfactory level of accuracy, rendering them highly valuable in practical applications. The potential peril mostly resides in the use of simplistic cost-volume-profit (CVP) analysis by managers when considering a substantial alteration in sales volume that surpasses the applicable range. Nevertheless, it is worth noting that the CVP model may be modified to incorporate projected alterations in selling prices, variable costs per unit, total fixed costs, and the sales mix that may occur when the forecasted sales volume exceeds the relevant range.

So, this chapter is divided into:

- (2-1): The nature of cost-volume-profit (CVP) analysis, objectives, and its main assumptions.
- (2-2): Cost-Volume-Profit (CVP) analysis methods.
- (2-3): Determination of the break-even point for a single product.
- (2-4): The role of break-even analysis in rationalizing administrative decisions.
- (2-5): Changes affecting break-even point and profitability.
- (2-6): Determination of the break-even point for multiple products (sales mix).

(2-1): The Nature of Cost-Volume-Profit (CVP) Analysis, Objectives, and its Main Assumptions:

Cost-volume-profit analysis offers a comprehensive financial perspective on the process of planning. The analysis of cost-volume-profit (CVP) explores the dynamics of overall revenues, costs, and operational profit in response to variations in production level, selling price, variable costs, or fixed costs. Cost-volume-profit (CVP) analysis is considered one of the fundamental techniques at the disposal of managers.

Managers who employ cost-volume-profit (CVP) analysis start the process by identifying the activities that contribute to cost variability. The management endeavors to identify a quantifiable basis for each action, enabling the correlation of changes in activity levels with corresponding changes in costs.

Cost behavior analysis examines how individual costs fluctuate with company activities. Furthermore, cost behavior analysis begins with essential business activities. Sales dollars, driven miles, hotel room occupancy, and dancing studio courses can be used to

measure activity levels. Many firms employ many measuring bases.

Cost behavior analysis requires a correlation between activity level and cost variations. The activity index, or driver, is the chosen activity level. Activities that influence cost behavior are identified by the activity index. With an appropriate activity index, organizations may classify cost responses to activity levels as variable, fixed, or mixed.

As previously indicated, the representation of an activity base might vary based on the specific characteristics of a company's operations. In the retail industry, an activity base can be delineated based on output metrics, such as the quantity of goods sold or the monetary value of sales revenue. In the context of manufacturing operations, it is occasionally more suitable to opt for certain components of production input as a basis for activity measurements, such as direct labor hours or machine hours.

In order to generate profits, companies must first attain the breakeven point. The break-even point (BEP) of a business refers to the level of activity, measured in

units or dollars, at which the total revenue generated is equal to the total cost incurred. Therefore, at the breakeven point (BEP), the business achieves a state where there is neither a profit nor a loss in terms of operational operations. However, companies are not just interested in achieving a breakeven point in their operations. The calculation of the BEP is conducted in order to establish a benchmark or reference point. Having knowledge of the Break-Even Point (BEP), managers are more proficient in establishing sales objectives that are expected to provide operational profits rather than losses.

Actually, it is common for many organizations to consider cost-volume-profit implications while making decisions at various stages. The concept of CVP (Cost-Volume-Profit) analysis is founded upon the utilization of simplified assumptions on the patterns of revenue and cost behavior. This chapter provides an overview of CVP (Cost-Volume-Profit) analysis and explores the impact of the reasonableness of its assumptions on the reliability of its outcomes.

The major objective of this analysis is to assess the impact of five specific factors on profitability:

1. Prices of goods or services being offered for sale.
2. Total quantity or amount of goods or services sold.
3. Variable costs per unit.
4. Total fixed costs.
5. Sales Mix of products sold.

In order to streamline cost-volume-profit (CVP) calculations, managers commonly employ the following assumptions pertaining to these factors:

1. The selling price remains fixed. The pricing of a product or service remains constant irrespective of fluctuations in volume.
2. The costs exhibit a linear relationship and may be effectively segregated into variable and fixed constituents. The variable costs exhibit a constant trend per unit value, while the fixed costs remain constant in total over the entire relevant range.
3. In the context of multiproduct enterprises, it is observed that the composition of products offered for sale stays constant.

(2-2): Cost-Volume-Profit (CVP) Analysis Methods:

(2-2-1): Cost-Volume-Profit (CVP) Analysis using Formula Method:

At breakeven point

$$\text{Net Profit} = \text{Zero} \quad \text{Total Revenue} - \text{Total Cost} = \text{Zero}$$

$$\therefore \text{Total Revenue} = \text{Total Cost}$$

- ✓ Total Revenue = Selling Price per Unit (P) \times Quantity Sold (Q)
- ✓ Total Cost = Total Fixed Cost (TFC) + Total Variable Cost (TVC)
- ✓ Total Cost = Total Fixed Cost (TFC) + {Variable per Unit (V) \times Quantity Produced (Q)}

**Assuming: Quantity Sold (Q) = Quantity Produced (Q)

The quantity at BEP using formula method, computed as follows:

$$\text{Total Revenue} = \text{Total Cost}$$

$$P \times Q = \text{Fixed Cost} - V \times Q$$

$$(P \times Q) - (V \times Q) = \text{Fixed Cost} \quad Q(P - V) = \text{Fixed Cost}$$

$$\text{Sales revenue} - \text{Variable Costs} - \text{Fixed Costs} = \text{Operating income}$$

$$\left(\frac{\text{Sales price}}{\text{per unit}} \times \text{Units Sold} \right) - \left(\frac{\text{Variable cost}}{\text{per unit}} \times \text{Units Sold} \right) - \text{Fixed Costs} = \text{Operating income}$$

$$\left(\frac{\text{Sales price}}{\text{per unit}} - \frac{\text{Variable cost}}{\text{per unit}} \right) \times \text{Units Sold} = \text{Fixed Costs} + \text{Operating income}$$

$$\text{Contribution margin per unit} \times \text{Units Sold} = \text{Fixed Costs} + \text{Operating income}$$

$$Q_{BEP}(\text{BEP in Units}) = \frac{\text{Fixed Cost (FC)}}{P - V}$$

(2-2-2): Cost-Volume-Profit (CVP) Analysis using Equation Method:

The quantity at BEP using equation method, computed as follows:

$$\text{Contribution margin/Unit (CM/U)} = P - V$$

$$Q_{BEP}(\text{BEP in Units}) = \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin/U (CM/U)}}$$

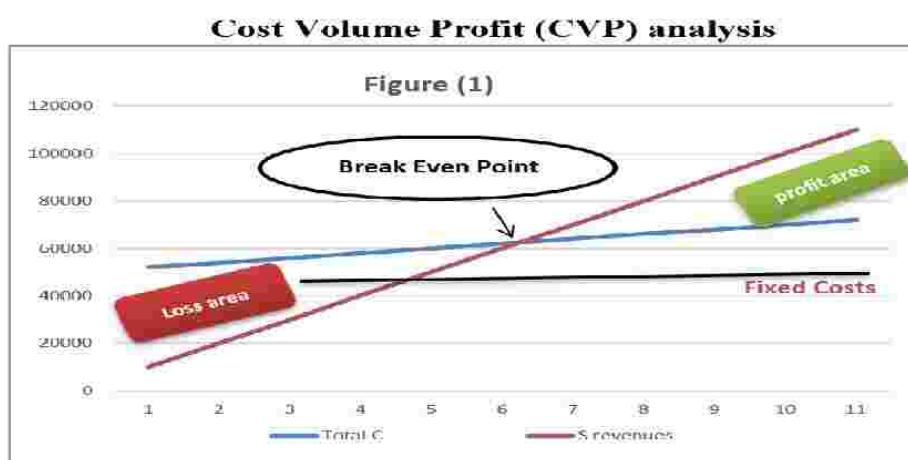
Q = Quantity at Breakeven point, FC = Fixed cost, P = Price / unit
 V = variable cost/unit, $P - V$ = contribution margin per unit

(2-2-3): Cost-Volume-Profit (CVP) Analysis using Graphical Method:

Although the break-even point provides valuable insights for management, it fails to demonstrate the relationship between profit and changes in activity. The use of a cost-volume-profit (CVP) graph is a prevalent method for depicting the correlation between profit and the level of activity.

The cost-volume-profit (CVP) analysis graph, which places unit volume on the horizontal axis and dollars on the vertical, shows a clear picture of how changes in sales levels will affect profits. At the point of intersection between the total costs and sales revenue lines, the break-even point is determined. This is where sales revenue exactly equals total costs.

Figure (2-1)



The subsequent steps are employed in the preparation of a cost-volume-profit (CVP) graph. The graph can be observed in Figure (2-1). It is evident from the graph that the relevant range shown represents the operational expectations of management.

Step 1: The initial step is delineating the axes of the graph. The vertical axis should be labeled as "Currency in USD" and the horizontal axis should be labeled as "Sales Units".

Step 2: involves the creation of the fixed-cost line. The reason for its parallelism to the horizontal axis is due to the fact that fixed costs remain constant regardless of the level of activity.

Step 3: involves calculating the total cost at a suitable volume and graphing the resulting total cost line.

Step 4: Calculate the total sales revenue at a suitable level of production and graph the total revenue line.

The region labeled as the (Red Zone), located to the left of the break-even point on the graph, signifies the (Operating Loss) area. This particular area represents a scenario in which the total costs incurred exceed the sales revenue generated.

The region shown as the (Green Zone) on the graph located to the right of the breakeven point signifies the area of (Operating Income), when the organization achieves profitability due to the surplus of sales revenue over total costs.

To determine the break-even point, which differs based on the number of products offered by the company, either a single product or multiple products (sales mix).

(2-3): Determination of the Break-even Point for a Single Product:

The break-even point is calculated for a single product using a break-even point equation analysis as follows:

(A) Break-even Point in units (quantities):

$$Q_{BEP} (BEP \text{ in Units}) = \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin/U (CM/U)}}$$

$$\text{Contribution margin/Unit (CM/U)} = P - V$$

(B) Break-even Point in revenue (Value):

$$BEP \text{ in \$ (Break even Sales in dollars)} = \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin \% (CM\%)}}$$

Or

$$BEP_{in} \$ (\text{Break even Sales in dollars}) = P \times Q_{BEP}$$

To Compute Contribution Margin Ratio, as follows:

1. **Contribution Margin Ratio** = Contribution Margin per Unit ÷ Selling price per Unit

Contribution Margin % (CM%)

$$= \frac{\text{Selling Price per Unit (P)} - \text{Variable Cost Per Unit (V)}}{\text{Selling Price per Unit (P)}}$$

Or

2. **Contribution Margin Ratio** = Contribution Margin ÷ Sales revenue.

Contribution Margin % (CM%)

$$= \frac{\text{Sales Revenue} - \text{Total Variable Cost}}{\text{Sales Revenue}}$$

Or

3. **Contribution Margin Ratio** = 1 - Variable Cost Ratio.

To Compute Variable Cost Ratio, as follows:

1. **Variable Cost Ratio** = Variable Cost per unit ÷ Selling price per Unit

Or

2. **Variable Cost Ratio** = Total Variable Cost ÷ Sales Revenue

Or

3. **Variable Cost Ratio** = 1 - Contribution Margin Ratio

Example (2-1):

XHUME, a manufacturing company, competes with Jack's World by providing a product (M). For the fiscal year 2023, XHUME will sell 30,000 units at a selling price of \$20 per unit. Variable costs are \$12 per unit, and the total fixed costs are \$60,000.

Required:

- 1) Calculate the break-even point in units and revenue.
- 2) Prepare the income statement using variable costing method at the break-even point.

Solution

1) Calculate the break-even point in units and revenue:

(A) Break-even point in units:

$$Q_{BEP}(\text{BEP in Units}) = \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin/Unit (CM/U)}}$$

$$\begin{aligned}\text{Contribution margin/Unit (CM/U)} &= P - V \\ &= \$60,000 \div (\$20 - \$12) \\ &= \$60,000 \div \$8 = \underline{\underline{7,500 \text{ Unit}}}\end{aligned}$$

(B) Break-even point in revenue:

$$\begin{aligned}BEP_{in\$}(\text{Break even Sales in dollars}) &= P \times Q_{BEP} \\ &= 7,500 \text{ unit} \times \$20 \\ &= \underline{\underline{\$150,000}}\end{aligned}$$

Or

$$\begin{aligned} BEP_{in\$} & (\text{Break even Sales in dollars}) \\ & \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin \% (CM\%)}} \\ & = \frac{\$60,000}{0.40} = \underline{\$150,000} \end{aligned}$$

Notes:

To Compute Contribution Margin Ratio, as follows:

1. **Contribution Margin Ratio** = Contribution Margin per Unit ÷ Selling price per Unit

Contribution Margin % (CM%)

$$\begin{aligned} & \frac{\text{Selling Price per Unit (P)} - \text{Variable Cost Per Unit (V)}}{\text{Selling Price per Unit (P)}} \\ & = (\$20 - \$12) / \$20 = \underline{0.40} \end{aligned}$$

Or

2. **Contribution Margin Ratio** = Contribution Margin ÷ Sales revenue.

Contribution Margin % (CM%)

$$\begin{aligned} & \frac{\text{Sales Revenue} - \text{Total Variable Cost}}{\text{Sales Revenue}} \\ & = \{(30,000 \times \$20) - (30,000 \times \$12)\} / (30,000 \times \$20) \\ & = (\$600,000 - \$360,000) / \$600,000 \\ & = \$240,000 / \$600,000 = \underline{0.40} \end{aligned}$$

2) Prepare the income statement using variable costing method at the break-even point.

Sales revenue ($\$20 \times 7,500$ unit)	150,000	
(-) Variable Cost ($\$12 \times 7,500$ unit)	<u>(90,000)</u>	
= Contribution Margin		60,000
(-) Fixed costs		<u>(60,000)</u>
= Net Profit		0

Example (2-2):

CBC Manufacturing Company, for the fiscal year 2023, sells 20,000 units with a selling price per unit of \$20. Suppose that the total fixed cost amounted to \$80,000 and the variable cost per unit was \$12.

Required:

- 1) Calculate the break-even point in units and revenue.
- 2) Prepare the income statement using variable costing method at the break-even point.
- 3) Prepare the income statement using variable costing method at the actual situation.

Solution

1) Calculate the break-even point in units and revenue:

(A) Break-even point in units:

$$Q_{BEP}(\text{BEP}_{\text{in } \text{Units}}) = \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin}/U (\text{CM}/U)}$$

$$\begin{aligned}\text{Contribution margin/Unit (CM/U)} &= P - V \\ &= \$80,000 \div (\$20 - \$12) \\ &= \$80,000 \div \$8 = \underline{\underline{10,000 \text{ Unit}}}\end{aligned}$$

(B) Break-even point in revenue:

$$\begin{aligned}\text{BEP}_{\text{in } \$}(\text{Break even Sales in dollars}) &= P \times Q_{BEP} \\ &= 10,000 \text{ unit} \times \$20 \\ &= \underline{\underline{\$200,000}}\end{aligned}$$

Or

$$\begin{aligned}\text{BEP}_{\text{in } \$}(\text{Break even Sales in dollars}) &= \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin \% (CM\%)}} \\ &= \$80,000 \div 0.40 = \underline{\underline{\$200,000}}\end{aligned}$$

Notes:

To Compute Contribution Margin Ratio, as follows:

1. Contribution Margin Ratio = Contribution Margin per Unit ÷ Selling price per Unit

Contribution Margin % (CM%)

$$\begin{aligned}&= \frac{\text{Selling Price per Unit (P)} - \text{Variable Cost Per Unit (V)}}{\text{Selling Price per Unit (P)}} \\ &= (\$20 - \$12) \div \$20 = \underline{\underline{0.40}}\end{aligned}$$

Or

2. Contribution Margin Ratio = Contribution Margin ÷ Sales revenue.

Contribution Margin % (CM%)

$$= \frac{\text{Sales Revenue} - \text{Total Variable Cost}}{\text{Sales Revenue}}$$

$$\begin{aligned} &= \{(20,000 \times \$20) - (20,000 \times \$12)\} \div (20,000 \times \$20) \\ &= (\$400,000 - \$240,000) \div \$400,000 \\ &= \$160,000 \div \$400,000 = \underline{\underline{0.40}} \end{aligned}$$

- 2) Prepare the income statement using variable costing method at the break-even point.

Sales revenue ($\$20 \times 10,000$ unit)	200,000	
(-) Variable Cost ($\$12 \times 10,000$ unit)	<u>(120,000)</u>	
= Contribution Margin		80,000
(-) Fixed costs		<u>(80,000)</u>
= Net Profit		<u><u>0</u></u>

- 3) Prepare the income statement using variable costing method at the actual situation.

Sales revenue ($\$20 \times 20,000$ unit)	400,000	
(-) Variable Cost ($\$12 \times 20,000$ unit)	<u>(240,000)</u>	
= Contribution Margin		160,000
(-) Fixed costs		<u>(80,000)</u>
= Net Profit		<u><u>80,000</u></u>

Example (2-3):

The following data are presented below for an Egyptian manufacturer company for the fiscal year 2023:

- a. The sales quantity is 5,000 units with a selling price per unit of \$100.
- b. The variable costs per unit are composed of direct materials at \$25, direct labor at \$15, direct expenses at \$5, variable manufacturing overhead costs at \$10, and variable marketing costs at \$35.
- c. The fixed costs are composed of fixed manufacturing costs at \$9,000, fixed marketing costs at \$11,000, and fixed administrative costs at \$10,000.

Required:

- 1) Calculate the break-even point in units and revenue.
- 2) Prepare the income statement using variable costing method at the break-even point.

Solution

1) Calculate the break-even point in units and revenue:

(A) Break-even point in units:

$$Q_{BEP}(\text{BEP in Units}) = \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin/U (CM/U)}}$$

$$\begin{aligned}\text{Contribution margin/Unit (CM/U)} &= P - V \\ &= \$30,000 \div (\$100 - \$90) \\ &= \$30,000 \div \$10 = \underline{\underline{3,000 \text{ Unit}}}\end{aligned}$$

(B) Break-even point in revenue:

$$\begin{aligned}BEP_{in\$}(\text{Break even Sales in dollars}) &= P \times Q_{BEP} \\ &= 3,000 \text{ unit} \times \$100 \\ &= \underline{\underline{\$300,000}}\end{aligned}$$

Or

$$\begin{aligned}BEP_{in\$}(\text{Break even Sales in dollars}) &= \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin \% (CM\%)}} \\ &= \$80,000 \div 0.40 = \underline{\underline{\$200,000}}\end{aligned}$$

Notes:

To Compute Contribution Margin Ratio, as follows:

1. Contribution Margin Ratio = Contribution Margin per Unit ÷ Selling price per Unit

Contribution Margin % (CM%)

$$\begin{aligned}&= \frac{\text{Selling Price per Unit (P)} - \text{Variable Cost Per Unit (V)}}{\text{Selling Price per Unit (P)}} \\ &= (\$100 - \$90) \div \$100 = \underline{\underline{0.10}}\end{aligned}$$

Or

2. Contribution Margin Ratio = Contribution Margin ÷ Sales revenue.

Contribution Margin % (CM%)

$$= \frac{\text{Sales Revenue} - \text{Total Variable Cost}}{\text{Sales Revenue}}$$

$$\begin{aligned} &= \{(30,000 \times \$100) - (30,000 \times \$90)\} \div (30,000 \times \$100) \\ &= (\$3,000,000 - \$2,700,000) \div \$3,000,000 \\ &= \$300,000 \div \$3,000,000 = \underline{\underline{0.10}} \end{aligned}$$

2) Prepare the income statement using variable costing method at the break-even point.

Notes:

- a) The total fixed cost during the year = fixed manufacturing costs + fixed Marketing costs + fixed administrative costs = \$9,000 + \$11,000 + \$10,000 = \$30,000.
- b) The total variable cost per unit = direct materials + direct Labor + direct expenses + variable manufacturing overhead costs + variable marketing costs = \$25 + \$15 + \$5 + \$10 + \$35 = \$90.

Sales revenue (\$100 × 3,000 unit)	300,000	
(-) Variable Cost (\$90 × 3,000 unit)	(270,000)	
= Contribution Margin	30,000	
(-) Fixed costs		(30,000)
= Net Profit		<u>0</u>

A comprehensive income statement using variable costing method at the break-even point:

Sales revenue (3,000 units × \$100)		300,000
Direct materials used (3,000 units × \$25)	75,000	
Direct labor (3,000 units × \$15)	45,000	
Direct expenses (3,000 units × \$5)	<u>15,000</u>	
Prime costs	135,000	
+ Variable manufacturing overhead (3,000 units × \$10)	<u>30,000</u>	
= Variable Cost of units produced	165,000	
+ Variable Marketing Cost (3,000 units × \$35)	<u>105,000</u>	
= Total Variable Cost	(270,000)	
= Contribution Margin	30,000	
(-) Fixed Costs		
Fixed manufacturing overhead	9,000	
Fixed Marketing Costs	11,000	
Fixed Administrative costs	<u>10,000</u>	
Total Fixed Costs	(30,000)	
= Net Profit	0	

(2-4) The role of break-even analysis in rationalizing administrative decisions:

Break-even analysis helps management in making many administrative decisions in the field of sales and profit planning and comparing different alternatives, especially in cases where the decision affects fixed costs, whether alone or with other factors such as variable costs, selling price, and sales quantity. Among these decisions in which break-even analysis is useful in this area:

- Using breakeven point analysis in sales and profits planning.
- Determination of the safety margin.
- Determination of the cash break-even point.
- Determination of the break-even capacity.
- Determination of the Operating leverage.

(2-4-1) Using Break-even Point Analysis in Sales and Profits Planning:

The break-even point is the basis for studying the target sales number. The project determines a specific number of profits that it aims to achieve; this volume is extracted with the same equations as for extracting the break-even point, with the target profit added to the fixed costs within the elements of the equation as follows:

(2-4-1-1) Targeted Sales that achieve a target profit of a certain amount before taxes:

The units of sales needed to achieve the targeted profit before taxes can be determined as follows:

A) Targeted Sold Units:

$$\therefore Q_{BEP} (\text{BEP in Units}) = \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin/U (CM/U)}}$$

So, Targeted Sold Units (Q) → It's the units sold to achieve a targeted profit.

$$\text{Targeted Sold Units} = \frac{\text{Fixed Cost} + \text{Target Profit}}{\text{CM/U} (P - V)}$$

B) Targeted Sales Revenue (\$):

$$\because BEP_{in\$} (\text{Break even Sales in dollars}) = P \times Q_{BEP}$$

Or

$$\because BEP_{in\$} (\text{Break even Sales in dollars})$$

$$= \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin \% (CM\%)}}$$

So, Targeted Sales revenue (\$) → It's the value of units sold to achieve a targeted profit.

Targeted Sales Revenue

$$= \frac{\text{Fixed Cost} + \text{Target Profit}}{\text{CM \%} \left(\frac{P - V}{P} \right)}$$

(2-4-1-2) Targeted Sales that achieve a target profit of a certain amount after taxes:

The **Units of sales** needed to achieve the targeted profit after taxes can be determined as follows:

If the Targeted Profit is after tax

Target Profit after tax

$$= \frac{\text{Targeted Profit before tax}}{1 - \text{Tax Rate \%}}$$

A) Targeted Sold Units:

$$\because Q_{BEP} (\text{BEP in Units}) = \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin/U (CM/U)}}$$

So, Targeted Sold Units (Q) → It's the units sold to achieve a targeted profit after tax.

Targeted Sold Units

$$= \frac{\text{Fixed Cost} + \left(\frac{\text{Targeted Profit before tax}}{1 - \text{Tax Rate \%}} \right)}{\text{CM } (P - V)}$$

B) Targeted Sales Revenue (\$):

$$\because BEP_{in\$} (\text{Break even Sales in dollars}) = P \times Q_{BEP}$$

Or

$$\because BEP_{in\$} (\text{Break even Sales in dollars})$$

$$= \frac{\text{Fixed Cost } (FC)}{\text{Contribution Margin \% } (CM\%)}$$

So, Targeted Sales revenue (\$) → It's the value of units sold to achieve a targeted profit after tax.

Targeted Sales Revenue

$$= \frac{\text{Fixed Cost} + \left(\frac{\text{Targeted Profit before tax}}{1 - \text{Tax Rate \%}} \right)}{\text{CM \% } \left(\frac{P - V}{P} \right)}$$

(2-4-1-3) Targeted Sales that achieve a target profit of a certain percentage:

To achieve a target profit %:

$$\text{Targeted Profit \%} = \% \text{ Total Sales Revenue}$$

1) Sales Revenue to achieve a Targeted Profit %:

$$= \frac{FC}{CM\% - \text{Targeted Profit \%}}$$

2) Sales units to achieve a target profit %:

$$\text{Profit} = \text{Total Sales Revenue} - \text{Total Cost}$$

$$\% \text{ Total Sales Revenue} = \text{Total Sales Revenue} - \text{Total Cost}$$

$$\% \times (P \times Q) = P \times Q - V \times Q - \text{Fixed Cost}$$

Example (2-4):

WERP Manufacturing Company, for the fiscal year 2023, sells 20,000 units with a selling price per unit of \$10. Suppose that the total fixed cost amounted to \$40,000 and the variable cost per unit was \$8.

Required:

- 1) Calculate the break-even point in units and revenue.
- 2) Prepare the income statement using variable costing method at the break-even point.
- 3) Prepare the income statement using variable costing method at the actual situation.
- 4) Compute the units and value of sales that achieve a target profit before taxes of \$30,000 with verification of your answer.

Solution

1) Calculate the break-even point in units and revenue:

(A) Break-even point in units:

$$Q_{BEP}(BEP \text{ in units}) = \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin/U (CM/U)}}$$

$$\begin{aligned}\text{Contribution margin/Unit (CM/U)} &= P - V \\ &= \$40,000 \div (\$10 - \$8) \\ &= \$40,000 \div \$2 = \underline{\underline{20,000 \text{ Unit}}}\end{aligned}$$

(B) Break-even point in revenue:

$$\begin{aligned} BEP_{in\$} (\text{Break even Sales in dollars}) &= P \times Q_{BEP} \\ &= 20,000 \text{ unit} \times \$10 \\ &= \underline{\$200,000} \end{aligned}$$

Or

$$\begin{aligned} BEP_{in\$} (\text{Break even Sales in dollars}) &= \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin \% (CM\%)}} \\ &= \frac{\$40,000}{0.40} = \underline{\$200,000} \end{aligned}$$

Notes:

To Compute Contribution Margin Ratio, as follows:

1. **Contribution Margin Ratio** = Contribution Margin per Unit ÷ Selling price per Unit

Contribution Margin % (CM%)

$$\begin{aligned} &= \frac{\text{Selling Price per Unit (P)} - \text{Variable Cost Per Unit (V)}}{\text{Selling Price per Unit (P)}} \\ &= (\$10 - \$8) \div \$2 = \underline{0.20} \end{aligned}$$

Or

2. **Contribution Margin Ratio** = Contribution Margin ÷ Sales revenue.

Contribution Margin % (CM%)

$$\begin{aligned} &= \frac{\text{Sales Revenue} - \text{Total Variable Cost}}{\text{Sales Revenue}} \\ &= \{(20,000 \times \$10) - (20,000 \times \$8)\} \div (20,000 \times \$10) \\ &= (\$200,000 - \$160,000) \div \$200,000 \\ &= \$40,000 \div \$200,000 = \underline{0.20} \end{aligned}$$

- 2) Prepare the income statement using variable costing method at the break-even point.**

Sales revenue ($\$10 \times 20,000$ unit)	200,000	
(-) Variable Cost ($\$8 \times 20,000$ unit)	(160,000)	
= Contribution Margin		40,000
(-) Fixed costs		(40,000)
= Net Profit		0

- 3) Prepare the income statement using variable costing method at the actual situation.**

Sales revenue ($\$10 \times 24,000$ unit)	240,000	
(-) Variable Cost ($\$8 \times 24,000$ unit)	(192,000)	
= Contribution Margin		48,000
(-) Fixed costs		(40,000)
= Net Profit		8,000

- 4) Compute the units and value of sales that achieve a target profit before taxes of \$30,000 with verification of your answer.**

A) Targeted Sold Units:

Targeted Sold Units (Q) → It's the units sold to achieve a targeted profit.

$$\begin{aligned} \text{Targeted Sold Units} &= \frac{\text{Fixed Cost} + \text{Target Profit}}{\text{CM}/U (P - V)} \\ &= \frac{\$40,000 + \$30,000}{\$10 - \$8} = 35,000 \text{ units} \end{aligned}$$

B) Targeted Sales Revenue (\$):

Targeted Sales revenue (\$) → It's the value of units sold to achieve a targeted profit.

$$\begin{aligned} \text{Targeted Sales Revenue} &= \frac{\text{Fixed Cost} + \text{Target Profit}}{\text{CM \% } (\frac{P - V}{P})} \\ &= \frac{\$40,000 + \$30,000}{0.2} = \$350,000 \end{aligned}$$

Verification of the answer by preparing an income statement:

Sales revenue ($\$10 \times 35,000$ unit)	350,000	
(-) Variable Cost ($\$8 \times 35,000$ unit)	(280,000)	
= Contribution Margin		70,000
(-) Fixed costs		(40,000)
= Net Profit		<u>30,000</u>

Example (2-5):

ANS Manufacturing Company, for the fiscal year 2023, sells 3,000 units with a selling price per unit of \$60. Suppose that the total fixed cost amounted to \$50,000, the variable cost per unit was \$40, and the tax rate is 20%.

Required:

- 1) Calculate the break-even point in units and revenue.
- 2) Prepare the income statement using variable costing method at the break-even point.
- 3) Prepare the income statement using variable costing method at the actual situation.
- 4) Compute the units and value of sales that achieve a target profit before taxes of \$20,000 with verification of your answer.
- 5) Compute the units and value of sales that achieve a target profit after taxes of \$30,000 with verification of your answer.

Solution

1) Calculate the break-even point in units and revenue:

(A) Break-even point in units:

$$Q_{BEP} (BEP \text{ in units}) = \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin/U (CM/U)}}$$

$$\begin{aligned}\text{Contribution margin/Unit (CM/U)} &= P - V \\ &= \$50,000 \div (\$60 - \$40) \\ &= \$50,000 \div \$20 = \underline{\underline{2,500 \text{ Unit}}}\end{aligned}$$

(B) Break-even point in revenue:

$$\begin{aligned}BEP_{in\$} (\text{Break even Sales in dollars}) &= P \times Q_{BEP} \\ &= 2,500 \text{ unit} \times \$60 \\ &= \underline{\underline{\$150,000}}\end{aligned}$$

Or

$$\begin{aligned}BEP_{in\$} (\text{Break even Sales in dollars}) &= \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin \% (CM\%)}} \\ &= \$50,000 \div 0.3333333333 = \underline{\underline{\$150,000}}\end{aligned}$$

Notes:

To Compute Contribution Margin Ratio, as follows:

1. Contribution Margin Ratio = Contribution Margin per Unit ÷ Selling price per Unit

Contribution Margin % (CM%)

$$\begin{aligned}&= \frac{\text{Selling Price per Unit (P)} - \text{Variable Cost Per Unit (V)}}{\text{Selling Price per Unit (P)}} \\ &= (\$60 - \$40) \div \$60 = \underline{\underline{0.3333333333}}\end{aligned}$$

Or

2. Contribution Margin Ratio = Contribution Margin ÷ Sales revenue.

Contribution Margin % (CM%)

$$= \frac{\text{Sales Revenue} - \text{Total Variable Cost}}{\text{Sales Revenue}}$$

$$\begin{aligned} &= \{(2,500 \times \$60) - (2,500 \times \$40)\} \div (2,500 \times \$60) \\ &= (\$150,000 - \$100,000) \div \$150,000 \\ &= \$50,000 \div \$100,000 = \underline{\underline{0.3333333333}} \end{aligned}$$

- 2) Prepare the income statement using variable costing method at the break-even point.

Sales revenue ($\$60 \times 2,500$ unit)	150,000	
(-) Variable Cost ($\$40 \times 2,500$ unit)	<u>(120,000)</u>	
= Contribution Margin		50,000
(-) Fixed costs		<u>(50,000)</u>
= Net Profit		<u>0</u>

- 3) Prepare the income statement using variable costing method at the actual situation.

Sales revenue ($\$60 \times 3,000$ unit)	180,000	
(-) Variable Cost ($\$40 \times 3,000$ unit)	<u>(120,000)</u>	
= Contribution Margin		60,000
(-) Fixed costs		<u>(50,000)</u>
= Net Profit		<u>10,000</u>

- 4) Compute the units and value of sales that achieve a target profit before taxes of \$20,000 with verification of your answer.**

A) Targeted Sold Units:

Targeted Sold Units (Q) → It's the units sold to achieve a targeted profit.

$$\begin{aligned} \text{Targeted Sold Units} &= \frac{\text{Fixed Cost} + \text{Target Profit}}{\text{CM}/U (P - V)} \\ &= \frac{\$50,000 + \$20,000}{\$60 - \$40} = 3,500 \text{ units} \end{aligned}$$

B) Targeted Sales Revenue (\$):

Targeted Sales revenue (\$) → It's the value of units sold to achieve a targeted profit.

$$\begin{aligned} \text{Targeted Sales Revenue} &= \frac{\text{Fixed Cost} + \text{Target Profit}}{\text{CM \% } (\frac{P - V}{P})} \\ &= \frac{\$50,000 + \$20,000}{0.3333333333333333} = \$210,000 \end{aligned}$$

Verification of the answer by preparing an income statement:

Sales revenue ($\$60 \times 3,500$ unit)	210,000	
(-) Variable Cost ($\$40 \times 3,500$ unit)	(140,000)	
= Contribution Margin		70,000
(-) Fixed costs		(50,000)
= Net Profit		20,000

- 5) Compute the units and value of sales that achieve a target profit after taxes of \$30,000 with verification of your answer.

If the Targeted Profit is after tax

Target Profit after tax

$$= \frac{\text{Targeted Profit before tax}}{1 - \text{Tax Rate \%}}$$

A) Targeted Sold Units:

Targeted Sold Units (Q) → It's the units sold to achieve a targeted profit after tax.

Targeted Sold Units

$$\begin{aligned} &= \frac{\text{Fixed Cost} + \left(\frac{\text{Targeted Profit before tax}}{1 - \text{Tax Rate \%}} \right)}{\text{CM } (P - V)} \\ &= \frac{\$50,000 + (\$30,000 \div (1 - 0.20))}{\$60 - \$40} \\ &= 4,375 \text{ units} \end{aligned}$$

B) Targeted Sales Revenue (\$):

Targeted Sales revenue (\$) → It's the value of units sold to achieve a targeted profit after tax.

Targeted Sales Revenue

$$\begin{aligned}
 & \text{Fixed Cost} + \left(\frac{\text{Targeted Profit before tax}}{1 - \text{Tax Rate \%}} \right) \\
 & = \frac{\text{CM \% } \left(\frac{P - V}{P} \right)}{\$50,000 + (\$30,000 \div (1 - 0.20))} = \$262,500 \\
 & = \frac{0.333333333333}{\$50,000 + (\$30,000 \div (1 - 0.20))} = \$262,500
 \end{aligned}$$

Verification of the answer by preparing an income statement:

Sales revenue ($\$60 \times 4,375$ unit)	262,500	
(-) Variable Cost ($\$40 \times 4,375$ unit)	(175,000)	
= Contribution Margin		87,500
(-) Fixed costs		(50,000)
= Net Profit before tax		37,500
(-) Income tax ($\$37,500 \times 20\%$)		(7,500)
= Net Profit after tax		30,000

Example (2-6):

SHAMS Manufacturing Company, for the fiscal year 2023, sells 4,000 units with a selling price per unit of \$100. Suppose that the total fixed cost amounted to \$100,000, the variable cost per unit was \$50, and the company tried to achieve a target profit of 10%.

- The value of sales that achieve the target profit
$$10\% = 100000 / (50\% - 10\%) = 100000 / 40\% = \$250,000$$
- The quantity of sales that achieve the target profit
$$10\% = \$250,000 / 100 = 2,500 \text{ units}$$

In the case that the target profit number is not available, as if the management aims to achieve a certain profitability percentage, this percentage can be treated as the percentage of variable costs (variable cost rate).

(2-4-2) Determination of the safety margin:

The break-even point is considered the main point in determining the margin or safety margin, and it represents the difference between sales and the break-even, as any sales after the break-even point do not bear any fixed costs because they have been covered. Thus, a net profit is achieved, which is the difference between sales revenue and its variable cost.

Therefore, the margin of safety is a metric that quantifies the number of units sold beyond the break-even point, indicating the level of security for a company. It serves as a measure to assess the correlation between estimated or actual sales and the break-even sales. A higher margin of safety signifies a greater level of security for the company. The safety margin and its percentage of sales can be determined when planning project sales and profitability by one of the following equations:

1. Margin of safety in Units:

$$\begin{aligned} \textit{Safety Margin in units} \\ = & \textit{Expected or Actual Sales}_{\textit{in units}} \\ - & \textit{BEP}_{\textit{in units}} \end{aligned}$$

2. Margin of safety in revenue (value):

$$\begin{aligned} \text{Safety Margin in } (\$) \\ = & \text{Safety Margin in units} \\ & \times \text{Selling Price per unit } (P) \end{aligned}$$

or

$$\begin{aligned} \text{Safety Margin in } (\$) \\ = & \text{Expected or Actual Sales value in } (\$) \\ - & \text{BEP value in } (\$) \end{aligned}$$

If the sign is –ve it's Riskif it's +ve = safe.

*By the time the passing the firm must check the current sales and
know if its safe \Rightarrow profit or in risk \Rightarrow loss*

3. Safety Margin Ratio (%):

$$\begin{aligned} \text{Safety Margin Ratio } (\%) \\ = \frac{\text{Safety Margin in units}}{\text{Expected or Actual Sales units}} \times 100 \end{aligned}$$

Or

$$\begin{aligned} \text{Safety Margin Ratio } (\%) \\ = \frac{\text{Safety Margin value in } (\$)}{\text{Expected or Actual Sales value in } (\$)} \times 100 \end{aligned}$$

4. Net profit by using Safety Margin:

$$\begin{aligned} \text{Net Profit by using Safety Margin} \\ = \text{Safety Margin in units} \times CM/U (P - V) \end{aligned}$$

Example (2-7):

MDF Manufacturing Company, for the fiscal year 2023, sells 3,000 units with a selling price per unit of \$60. Suppose that the total fixed cost amounted to \$50,000, and the variable cost per unit was \$40.

Required:

- 1) Calculate the break-even point in units and revenue.
- 2) Prepare the income statement using variable costing method at the break-even point.
- 3) Compute the safety margin in units, revenue, and percentage.
- 4) Compute the net profit using the safety margin in the actual situation, with verification of your answer.

Solution

1) Calculate the break-even point in units and revenue:

(A) Break-even point in units:

$$Q_{BEP}(\text{BEP in Units}) = \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin/Unit (CM/U)}}$$

$$\begin{aligned}\text{Contribution margin/Unit (CM/U)} &= P - V \\ &= \$60,000 \div (\$60 - \$40) \\ &= \$60,000 \div \$20 = \underline{\underline{2,500 \text{ Unit}}}\end{aligned}$$

(B) Break-even point in revenue:

$$\begin{aligned} BEP_{in\$} (\text{Break even Sales in dollars}) &= P \times Q_{BEP} \\ &= 2,500 \text{ unit} \times \$60 \\ &= \$\underline{\underline{150,000}} \end{aligned}$$

Or

$$\begin{aligned} BEP_{in\$} (\text{Break even Sales in dollars}) &= \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin \% (CM\%)}} \\ &= \$50,000 \div 0.3333333333 = \$\underline{\underline{150,000}} \end{aligned}$$

Notes:

To Compute Contribution Margin Ratio, as follows:

1. **Contribution Margin Ratio** = Contribution Margin per Unit ÷ Selling price per Unit

Contribution Margin % (CM%)

$$\begin{aligned} &= \frac{\text{Selling Price per Unit (P)} - \text{Variable Cost Per Unit (V)}}{\text{Selling Price per Unit (P)}} \\ &= (\$60 - \$40) \div \$60 = \underline{\underline{0.3333333333}} \end{aligned}$$

Or

2. **Contribution Margin Ratio** = Contribution Margin ÷ Sales revenue.

Contribution Margin % (CM%)

$$\begin{aligned} &= \frac{\text{Sales Revenue} - \text{Total Variable Cost}}{\text{Sales Revenue}} \\ &= \{(2,500 \times \$60) - (2,500 \times \$40)\} \div (2,500 \times \$60) \\ &= (\$150,000 - \$100,000) \div \$150,000 \\ &= \$50,000 \div \$100,000 = \underline{\underline{0.3333333333}} \end{aligned}$$

- 2) Prepare the income statement using variable costing method at the break-even point.

Sales revenue ($\$60 \times 2,500$ unit)	150,000	
(-) Variable Cost ($\$40 \times 2,500$ unit)	<u>(120,000)</u>	
= Contribution Margin		50,000
(-) Fixed costs		<u>(50,000)</u>
= Net Profit		<u>0</u>

- 3) Compute the safety margin in units, revenue, and percentage.

- a) Margin of safety in Units:

Safety Margin in units

$$\begin{aligned}
 &= \text{Expected or Actual Sales}_{\text{in units}} \\
 &- \text{BEP}_{\text{in units}} = 3,000 - 2,500 \\
 &= 500 \text{ units}
 \end{aligned}$$

- b) Margin of safety in revenue (value):

Safety Margin in (\$)

$$\begin{aligned}
 &= \text{Safety Margin in units} \\
 &\times \text{Selling Price per unit (P)} = \\
 &= 500 \times \$60 = \$30,000
 \end{aligned}$$

or

Safety Margin in (\$)

$$\begin{aligned}
 &= \text{Expected or Actual Sales value}_{\text{in ($)}} \\
 &- \text{BEP value}_{\text{in ($)}} = \$180,000 - \$150,000 \\
 &= \$30,000
 \end{aligned}$$

If the sign is –ve it's Riskif it's +ve = safe.

By the time the passing the firm must check the current sales and know if its safe \Rightarrow profit or in risk \Rightarrow loss

c) Safety Margin Ratio (%):

Safety Margin Ratio (%)

$$= \frac{\text{Safety Margin in units}}{\text{Expected or Actual Sales units}} \times 100 \\ = \frac{500}{3000} \times 100 = 16.666666\%$$

Or

Safety Margin Ratio (%)

$$= \frac{\text{Safety Margin value in ($)}}{\text{Expected or Actual Sales value in ($)}} \times 100 = \\ = \frac{\$30,000}{\$180,000} \times 100 = 16.66666666\%$$

4) Compute the net profit using the safety margin in the actual situation, with verification of your answer.

Net profit by using Safety Margin:

Net Profit by using Safety Margin

$$= \text{Safety Margin in units} \times \frac{CM}{U} (P - V) \\ = 500 \times 20 = \$10,000$$

Verification of the answer by preparing the income statement:

Sales revenue ($\$60 \times 3,000$ unit)	180,000	
(-) Variable Cost ($\$40 \times 3,000$ unit)	(120,000)	
= Contribution Margin		60,000
(-) Fixed costs		(50,000)
= Net Profit		<u>10,000</u>

(4-2-3) Determination of the cash break-even point:

The objective of the cash-break-even analysis is to ascertain the quantity of sales required by a business in order to sufficiently offset its cash costs. The calculation of the cash break-even quantity may be determined by employing the following equation in cases where fixed costs comprise non-cash fixed costs such as depreciation:

(A) Cash Break-even point in units:

$$Q_{BEP} (CBEP \text{ in units}) = \frac{\text{Fixed Cost (FC)} - \text{Non Cash Fixed Cost (NCFC)}}{\text{Contribution Margin/U (CM/U)}} \\ \text{Contribution margin/Unit (CM/U)} = P - V$$

(B) Cash Break-even point in revenue:

$$CBEP_{in\$} (\text{Cash Break even Sales in dollars}) = P \times Q_{BEP}$$

Or

$$CBEP_{in\$} (\text{Cash Break even Sales in dollars}) = \frac{\text{Fixed Cost (FC)} - \text{Non Cash Fixed Cost (NCFC)}}{\text{Contribution Margin \% (CM\%)}}$$

Example (2-8):

World Manufacturing Company, for the fiscal year 2023, sells 4,000 units with a selling price per unit of \$80. Suppose that the total fixed cost amounted to \$90,000 of which \$30,000 are depreciation expense, and the variable cost per unit was \$50.

Required:

- 1) Calculate the break-even point in units and revenue.
- 2) Prepare the income statement using variable costing method at the break-even point.
- 3) Compute the cash break-even in units and revenue.
- 4) Prepare the income statement using variable costing method at the cash break-even point.
- 5) Compute the net profit using the safety margin in the actual situation, with verification of your answer.

Solution

1) Calculate the break-even point in units and revenue:

(A) Break-even point in units:

$$Q_{BEP}(BEP \text{ in Units}) = \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin/U (CM/U)}}$$
$$\begin{aligned}\text{Contribution margin/Unit (CM/U)} &= P - V \\ &= \$80,000 \div (\$80 - \$50) \\ &= \$80,000 \div \$30 = \underline{\underline{3,000 \text{ Unit}}}\end{aligned}$$

(B) Break-even point in revenue:

$$\begin{aligned} BEP_{in\$} (\text{Break even Sales in dollars}) &= P \times Q_{BEP} \\ &= 3,000 \text{ unit} \times \$80 \\ &= \underline{\underline{\$240,000}} \end{aligned}$$

Or

$$\begin{aligned} BEP_{in\$} (\text{Break even Sales in dollars}) &= \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin \% (CM\%)}} \\ &= \frac{\$90,000}{0.375} = \underline{\underline{\$240,000}} \end{aligned}$$

Notes:

To Compute Contribution Margin Ratio, as follows:

1. **Contribution Margin Ratio** = Contribution Margin per Unit ÷ Selling price per Unit

Contribution Margin % (CM%)

$$\begin{aligned} &= \frac{\text{Selling Price per Unit (P)} - \text{Variable Cost Per Unit (V)}}{\text{Selling Price per Unit (P)}} \\ &= (\$80 - \$50) \div \$80 = \underline{\underline{0.375}} \end{aligned}$$

Or

2. **Contribution Margin Ratio** = Contribution Margin ÷ Sales revenue.

Contribution Margin % (CM%)

$$\begin{aligned} &= \frac{\text{Sales Revenue} - \text{Total Variable Cost}}{\text{Sales Revenue}} \\ &= \{(3,000 \times \$80) - (3,000 \times \$50)\} \div (3,000 \times \$80) \\ &= (\$240,000 - \$150,000) \div \$240,000 \\ &= \$90,000 \div \$240,000 = \underline{\underline{0.375}} \end{aligned}$$

2) Prepare the income statement using variable costing method at the break-even point.

Sales revenue ($\$80 \times 3,000$ unit)	240,000	
(-) Variable Cost ($\$50 \times 3,000$ unit)	<u>(150,000)</u>	
= Contribution Margin		90,000
(-) Fixed costs		<u>(90,000)</u>
= Net Profit		<u>0</u>

3) Compute the cash break-even in units and revenue:

(A) Cash Break-even point in units:

$$Q_{BEP} (CBEP \text{ in Units}) = \frac{\text{Fixed Cost (FC)} - \text{Non Cash Fixed Cost (NCFC)}}{\text{Contribution Margin per unit (CM/U)}} = \frac{\$90,000 - \$30,000}{\$30} = 2,000 \text{ units}$$

(B) Cash Break-even point in revenue:

$$CBEP_{in\$} (\text{Cash Break even Sales in dollars}) =$$

$$P \times Q_{BEP} = \$80 \times 2,000 = \$160,000$$

Or

$$CBEP_{in\$} (\text{Cash Break even Sales in dollars}) = \frac{\text{Fixed Cost (FC)} - \text{Non Cash Fixed Cost (NCFC)}}{\text{Contribution Margin \% (CM\%)}} = \frac{\$90,000 - \$30,000}{0.375} = \$160,000$$

- 4) Prepare the income statement using variable costing method at the cash break-even point:**

Sales revenue ($\$80 \times 2,000$ unit)	160,000	
(-) Variable Cost ($\$50 \times 2,000$ unit)	(100,000)	
= Contribution Margin		60,000
(-) Fixed costs (Cash)		(60,000)
= Net Profit		<u>0</u>

- 5) Compute the net profit using the safety margin in the actual situation, with verification of your answer.**

Margin of safety in Units:

Safety Margin in units

$$\begin{aligned}
 &= \text{Expected or Actual Sales}_{\text{in units}} \\
 &- \text{BEP}_{\text{in units}} = 4,000 - 3,000 \\
 &= 1,000 \text{ units}
 \end{aligned}$$

Net profit by using Safety Margin:

Net Profit by using Safety Margin

$$\begin{aligned}
 &= \text{Safety Margin in units} \times \frac{CM}{U} (P - V) \\
 &= 1,000 \times \$30 = \$30,000
 \end{aligned}$$

Verification of the answer by preparing the income statement:

Sales revenue ($\$80 \times 4,000$ unit)	320,000	
(-) Variable Cost ($\$50 \times 4,000$ unit)	(200,000)	
= Contribution Margin		120,000
(-) Fixed costs		(90,000)
= Net Profit		<u>30,000</u>

(2-4-4) Determination of the break-even capacity:

The calculation of the break-even point may be expressed as a proportion of the business's production capacity. This involves establishing the correlation between the break-even point and the available production capacity of the firm, enabling the determination of the percentage of capacity required to reach the break-even point.

A) Break-even capacity ratio (%):

Break – even capacity ratio (%)

$$= \frac{BEP \text{ in Units}}{\text{Number of capacity units available}} \times 100$$

(B) Utilization ratio of Capacity (%):

Utilization ratio of Capacity

$$= \frac{\text{Actual sales quantity}}{\text{Number of capacity units available}} \times 100$$

Example (2-9):

GHER Manufacturing Company, for the fiscal year 2023, the available capacity for production and sales is 4000 units, while sells 3,000 units with a selling price per unit of \$120. Suppose that the total fixed cost amounted to \$100,000, and the variable cost per unit was \$20.

Required:

- 1) Calculate the break-even point in units and revenue.
- 2) Prepare the income statement using variable costing method at the break-even point.
- 3) Compute the break-even capacity and utilization ratio of capacity.
- 4) Compute the net profit using the safety margin in the actual situation, with verification of your answer.

Solution

1) Calculate the break-even point in units and revenue:

(A) Break-even point in units:

$$Q_{BEP}(BEP \text{ in Units}) = \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin/U (CM/U)}}$$
$$\begin{aligned}\text{Contribution margin/Unit (CM/U)} &= P - V \\ &= \$100,000 \div (\$120 - \$20) \\ &= \$100,000 \div \$100 = \underline{\underline{1,000 \text{ Unit}}}\end{aligned}$$

(B) Break-even point in revenue:

$$\begin{aligned} BEP_{in\$} (\text{Break even Sales in dollars}) &= P \times Q_{BEP} \\ &= 1,000 \text{ unit} \times \$120 \\ &= \underline{\$120,000} \end{aligned}$$

Or

$$\begin{aligned} BEP_{in\$} (\text{Break even Sales in dollars}) &= \frac{\text{Fixed Cost (FC)}}{\text{Contribution Margin \% (CM\%)}} \\ &= \frac{\$100,000}{\$120,000 / \$120} = \underline{\$120,000} \end{aligned}$$

Notes:

To Compute Contribution Margin Ratio, as follows:

1. **Contribution Margin Ratio** = Contribution Margin per Unit ÷ Selling price per Unit

Contribution Margin % (CM%)

$$\begin{aligned} &= \frac{\text{Selling Price per Unit (P)} - \text{Variable Cost Per Unit (V)}}{\text{Selling Price per Unit (P)}} \\ &= (\$120 - \$20) / \$120 = \underline{0.83333333} \end{aligned}$$

Or

2. **Contribution Margin Ratio** = Contribution Margin ÷ Sales revenue.

Contribution Margin % (CM%)

$$\begin{aligned} &= \frac{\text{Sales Revenue} - \text{Total Variable Cost}}{\text{Sales Revenue}} \\ &= \{(3,000 \times \$120) - (3,000 \times \$20)\} / (3,000 \times \$120) \\ &= (\$360,000 - \$60,000) / \$360,000 \\ &= \$300,000 / \$360,000 = \underline{0.83333333} \end{aligned}$$

2) Prepare the income statement using variable costing method at the break-even point.

Sales revenue ($\$120 \times 1,000$ unit)	120,000	
(-) Variable Cost ($\$20 \times 1,000$ unit)	<u>(20,000)</u>	
= Contribution Margin		100,000
(-) Fixed costs		<u>(100,000)</u>
= Net Profit		<u>0</u>

3) Compute the break-even capacity and utilization ratio of capacity.

A) Break-even capacity ratio (%):

$$\begin{aligned} & \text{Break - even capacity ratio (\%)} \\ & = \frac{\text{BEP in Units}}{\text{Number of capacity units available}} \times 100 \\ & = \frac{1,000}{4,000} \times 100 = 25\% \end{aligned}$$

(B) Utilization ratio of Capacity (%):

$$\begin{aligned} & \text{Utilization ratio of Capacity} \\ & = \frac{\text{Actual sales quantity}}{\text{Number of capacity units available}} \times 100 \\ & = \frac{3,000}{4,000} \times 100 = 75\% \end{aligned}$$

- 4) Compute the net profit using the safety margin in the actual situation, with verification of your answer.

Margin of safety in Units:

Safety Margin in units

$$\begin{aligned}
 &= \text{Expected or Actual Sales}_{\text{in units}} \\
 &- \text{BEP}_{\text{in units}} = 3,000 - 1,000 \\
 &= 2,000 \text{ units}
 \end{aligned}$$

Net profit by using Safety Margin:

Net Profit by using Safety Margin

$$\begin{aligned}
 &= \text{Safety Margin in units} \times \frac{CM}{U} (P - V) \\
 &= 2,000 \times \$100 = \$200,000
 \end{aligned}$$

Verification of the answer by preparing the income statement:

Sales revenue ($\$120 \times 3,000$ unit)	360,000	
(-) Variable Cost ($\$20 \times 3,000$ unit)	<u>(60,000)</u>	
= Contribution Margin		300,000
(-) Fixed costs		<u>(100,000)</u>
= Net Profit		<u>200,000</u>

(2-4-5) Determination of the Operating Leverage:

Operating leverage refers to the extent to which a corporation may enhance its operational income via an expansion of sales. It examines the correlation between the contribution margin and operational income. The disparity between the aforementioned quantities is attributed to fixed costs.

The determination of a company's operating leverage is as follows:

$$\text{Operating leverage} = \frac{\text{Contribution Margin}}{\text{Operating income}}$$

The use of operating leverage outcomes is employed to ascertain the impact of a modification in sales on operating income. In order to calculate the percentage change in operating income, multiply the percentage change in sales by the operational leverage factor. A positive correlation exists between operational leverage and the magnitude of operating income fluctuations resulting from changes in sales.

(2-5): Changes affecting break-even point and profitability:

The use of the break-even point is based on certain assumptions, the most important of which is that the factors that affect the relationship between costs, volume of activity, and profits remain constant, as any change in these factors will have an impact on the location of the break-even point and thus on the profitability of the project. By studying the impact of the change in these factors on the break-even point, management can take appropriate decisions in different situations.

First: Change in selling price:

A change in selling price affects the contribution margin (assuming variable costs remain the same), which in turn affects the break-even point. It also affects the total revenue and, ultimately, the net profit. Any increase in the selling price will result in an increase in the contribution margin (marginal profit), a decrease in the break-even volume, and thus the possibility of an increase in the net profit.

Example (2-10):

A company sells 4,000 units with a selling price per unit of \$100, a variable cost per unit of \$50, and a total fixed cost of \$100,000.

Assuming an increase in the selling price of 10% with the rest of the other factors remaining the same.

The actual activity volume is 4000 units, and the impact of this change can be seen in the following table:

	<u>Original situation</u>	<u>Situation after increasing price by 10%</u>
Sales revenues	$4,000 \times \$100 = \$400,000$	$4,000 \times \$110 = \$440,000$
- Total variable cost	$(\$200,000)$	$(\$200,000)$
Contribution margin	\$200,000	\$240,000
- Total Fixed cost	$(\$100,000)$	$(\$100,000)$
Net profit	\$100,000	\$140,000
1. Contribution margin ratio	$(\$200,000 / \$400,000) \times \$100 = 50\%$	$(\$240,000 / \$440,000) \times \$100 = 54.5\%$
2. Net profit percentage	$(\$100,000 / \$400,000) \times \$100 = 25\%$	$(\$140,000 / \$440,000) \times \$100 = 31.8\%$
3. break-even point (units)	$\$100,000 / (\$100 - \$50) = 2,000 \text{ units}$	$\$100,000 / (\$110 - \$50) = 1,667 \text{ units}$
4. break-even point (value)	$\$100,000 / 50\% = \$200,000$	$\$100,000 / 54.5\% = \$183,639$

It is clear from the previous table the extent to which the change in the selling price affects each of the contribution margin, net profit, and the break-even point, and that there is an inverse relationship between the change in the selling price and break-even point, as the higher the selling price, the lower the quantity and the break-even value, and vice versa. As the increase in the selling price by 10% resulted in an increase in the contribution margin by \$40,000, and an increase in the net profit from \$100,000 to \$140,000, while the quantity of break-even sales decreased by 333 units, and the value of break-even sales also decreased by \$16,361.

Example (2-11):

A company sells 4,000 units with a selling price per unit of \$100, a variable cost per unit of \$50, and a total fixed cost of \$100,000.

Assuming a 10% decrease in the selling price with the rest of the other factors remaining the same. The actual activity volume is 4,000 units, and the impact of this change can be seen in the following table:

	<u>Original situation</u>	<u>Situation after decrease price by 10%</u>
Sales revenues	$4,000 \times \$100 = \$400,000$	$4,000 \times \$70 = \$360,000$
- Total variable cost	<u>$(\\$200,000)$</u>	<u>$(\\$200,000)$</u>
Contribution margin	$\\$200,000$	$\\$160,000$
- Total Fixed cost	<u>$(\\$100,000)$</u>	<u>$(\\$100,000)$</u>
Net profit	$\\$100,000$	$\\$60,000$
1. Contribution margin ratio	$(\$200,000 / \$400,000) \times \$100 = 50\%$	$(\$160,000 / \$360,000) \times \$100 = 44.4\%$
2. Net profit percentage	$(\$100,000 / \$400,000) \times \$100 = 25\%$	$(\$60,000 / \$360,000) \times \$100 = 16.66\%$
3. break-even point (units)	$\$100,000 / (\$100 - \$50) = 2,000 \text{ units}$	$\$100,000 / (\$90 - \$50) = 2,500 \text{ units}$
4. break-even point (value)	$\$100,000 / 50\% = \$200,000$	$\$100,000 / 44.4\% = \$225,000$

It is clear from the previous table the extent to which the change in the selling price affects each of the marginal contribution margin, net profit, and break-even point, and that there is an inverse relationship between the change in the selling price and break-even point, as the lower the selling price, the higher the quantity and the break-even value, and vice versa. As the decrease in the selling price by 10% resulted in a decrease in the contribution margin by \$40,000 and a

decrease in the net profit from \$100,000 to \$60,000, the quantity of break-even sales increased by 500 units, and the value of break-even sales also increased by \$25,000.

Second: Change in Variable Costs:

The change in variable costs will have an effect on the total cost of the project, which is one of the main factors affecting the location of the break-even point and net profit. There is a direct relationship between the variable unit cost and the quantity and break-even value, meaning that the greater the variable unit cost, the greater the quantity and break-even value, and vice versa.

Example (2-12):

A company sells 4,000 units with a selling price per unit of \$100, a variable cost per unit of \$50, and a total fixed cost of \$100,000.

Assuming a 20% increase in the variable cost with the rest of the other factors remaining the same. The impact of this change can be seen in the following table:

	<u>Original situation</u>	<u>Situation after increasing variable cost by 20%</u>
Sales revenues	$4,000 \times \$100 = \$400,000$	$4,000 \times \$100 = \$400,000$
- Total variable cost	<u>$(\\$200,000)$</u>	<u>$(\\$240,000)$</u>
Contribution margin	$\\$200,000$	$\\$160,000$
- Total Fixed cost	<u>$(\\$100,000)$</u>	<u>$(\\$100,000)$</u>
Net profit	$\\$100,000$	$\\$60,000$
1. Contribution margin ratio	$(\$200,000 / \$400,000) \times \$100 = 50\%$	$(\$160,000 / \$400,000) \times \$100 = 40\%$
2. Net profit percentage	$(\$100,000 / \$400,000) \times \$100 = 25\%$	$(\$60,000 / \$400,000) \times \$100 = 15\%$
3. break-even point (units)	$\$100,000 / (\$100 - \$50) = 2,000 \text{ units}$	$\$100,000 / (\$100 - \$60) = 2,500 \text{ units}$
4. break-even point (value)	$\$100,000 / 50\% = \$200,000$	$\$100,000 / 40\% = \$250,000$

It is clear from the previous table that the increase in the variable unit cost by 20% led to a decrease in the contribution margin from 50% to 40%, as well as a decrease in the net profit and its percentage from \$100,000, 25%, to \$60,000, 15%, respectively, and an increase in the quantity and break-even value from 2,000 units, \$200,000, to 2,500 units, \$250,000, respectively.

Example (2-13):

A company sells 4,000 units with a selling price per unit of \$100, a variable cost per unit of \$50, and a total fixed cost of \$100,000.

Assuming a 20% decrease in the variable cost with the rest of the other factors remaining the same. The impact of this change can be seen in the following table:

	<u>Original situation</u>	<u>Situation after decreasing variable cost by 20%</u>
Sales revenues	$4,000 \times \$100 = \$400,000$	$4,000 \times \$100 = \$400,000$
- Total variable cost	<u>$(\\$200,000)$</u>	<u>$(\\$160,000)$</u>
Contribution margin	$\\$200,000$	$\\$240,000$
- Total Fixed cost	<u>$(\\$100,000)$</u>	<u>$(\\$100,000)$</u>
Net profit	$\\$100,000$	$\\$140,000$
1. Contribution margin ratio	$(\$200,000 / \$400,000) \times \$100 = 50\%$	$(\$240,000 / \$400,000) \times \$100 = 60\%$
2. Net profit percentage	$(\$100,000 / \$400,000) \times \$100 = 25\%$	$(\$140,000 / \$400,000) \times \$100 = 35\%$
3. break-even point (units)	$\$100,000 / (\$100 - \$50) = 2,000 \text{ units}$	$\$100,000 / (\$100 - \$40) = 1,667 \text{ units}$
4. break-even point (value)	$\$100,000 / 50\% = \$200,000$	$\$100,000 / 60\% = \$166,666$

It is clear from the previous table that reducing the variable unit cost by 20% has led to an increase in the contribution margin percentage from 50% to 60%, as well as an increase in net profit from \$100,000, 25%, to \$140,000, 35%, respectively. The quantity and break-even value decreased from 2,000 units and \$200,000 to 1,667 units and \$166,667, respectively.

Third: Change in Fixed Costs:

The change in fixed costs affects the total cost of the project, which is one of the main factors affecting the location of the break-even point and net profit. There is a direct relationship between the fixed cost and the quantity and value of the break-even, meaning that the greater the fixed cost, the greater the quantity and value of the break-even, and vice versa.

Example (2-14):

A company sells 4,000 units with a selling price per unit of \$100, a variable cost per unit of \$50, and a total fixed cost of \$100,000.

Assuming a 20% increase in the fixed cost with the rest of the other factors remaining the same. The impact of this change can be seen in the following table:

	<u>Original situation</u>	<u>Situation after increasing fixed cost by 20%</u>
Sales revenues	$4,000 \times \$100 = \$400,000$	$4,000 \times \$100 = \$400,000$
- Total variable cost	<u>$(\\$200,000)$</u>	<u>$(\\$200,000)$</u>
Contribution margin	$\\$200,000$	$\\$200,000$
- Total Fixed cost	<u>$(\\$100,000)$</u>	<u>$(\\$120,000)$</u>
Net profit	$\\$100,000$	$\\$80,000$
1. Contribution margin ratio	$(\$200,000 / \$400,000) \times \$100 = 50\%$	$(\$200,000 / \$400,000) \times \$100 = 50\%$
2. Net profit percentage	$(\$100,000 / \$400,000) \times \$100 = 25\%$	$(\$80,000 / \$400,000) \times \$100 = 20\%$
3. break-even point (units)	$\$100,000 / (\$100 - \$50) = 2,000 \text{ units}$	$\$120,000 / (\$100 - \$50) = 2,400 \text{ units}$
4. break-even point (value)	$\$100,000 / 50\% = \$200,000$	$\$120,000 / 50\% = \$240,000$

It is clear from the previous analysis that the increase in the fixed cost by 20% has led to the stability of the contribution margin at 50%, as well as a decrease in net profit and its percentage from \$100,000, 25%, to \$80,000, 20%, respectively. It is also noted that the amount and the break-even value have increased from

2,000 units, or \$200,000, to 2,400 units, or \$240,000, respectively.

Example (2-15):

A company sells 4,000 units with a selling price per unit of \$100, a variable cost per unit of \$50, and a total fixed cost of \$100,000.

Assuming a 20% decrease in the fixed cost with the rest of the other factors remaining the same. The impact of this change can be seen in the following table:

	<u>Original situation</u>	<u>Situation after decreasing fixed cost by 20%</u>
Sales revenues	$4,000 \times \$100 = \$400,000$	$4,000 \times \$100 = \$400,000$
- Total variable cost	<u>$(\\$200,000)$</u>	<u>$(\\$200,000)$</u>
Contribution margin	$\\$200,000$	$\\$200,000$
- Total Fixed cost	<u>$(\\$100,000)$</u>	<u>$(\\$80,000)$</u>
Net profit	$\\$100,000$	$\\$120,000$
1. Contribution margin ratio	$(\$200,000 / \$400,000) \times \$100 = 50\%$	$(\$200,000 / \$400,000) \times \$100 = 50\%$
2. Net profit percentage	$(\$100,000 / \$400,000) \times \$100 = 25\%$	$(\$120,000 / \$400,000) \times \$100 = 30\%$
3. break-even point (units)	$\$100,000 / (\$100 - \$50) = 2,000 \text{ units}$	$\$80,000 / (\$100 - \$50) = 1,600 \text{ units}$
4. break-even point (value)	$\$100,000 / 50\% = \$200,000$	$\$80,000 / 50\% = \$160,000$

It is clear from the previous table that the decrease in the fixed cost by 20% led to the contribution margin remaining stable at 50%, as well as an increase in the net profit and its percentage from \$100,000, 25%, to \$120,000, 30%, respectively. It is also noted that the break-even quantity and value decreased from 2,000 units at \$200,000 to 1,600 units at \$160,000, respectively.

(2-6) Determination of the Break-even Point for Multiple Products (Sales Mix):

The approach employed to calculate the break-even point for a single product is essentially the same as the methodology used for break-even analysis involving multiple products. Therefore, in this context, we will solely provide examples that illustrate the application of break-even analysis for multiple products.

The break-even point is calculated for multiple products using a break-even point equation analysis as follows:

(A) Company's Break-even Point in revenue (Value):

$BEP_{in\$}$ (*Break even Sales in dollars*) of the Company

$$= \frac{\text{Total Fixed Cost (TFC)}}{\text{Weighted Contribution Margin \% (CM\%) by sales mix}}$$

Note:

Weighted Contribution Margin \% (CM\%) by sales mix

$$= \text{SUM of Contribution Margin \% (CM\%) for each product} \\ \times \text{Sales Mix (\%)} \text{ for each product}$$

(B) Break-even Point in revenue for each Product (Value):

$BEP_{in\$}$ (*Break even Sales in dollars*) for each Product
= $BEP_{in\$}$ (*Break even Sales in dollars*) of the Company
 \times *Sales Mix (%) for the product*

(C) Break-even Point in units for each Product:

$BEP_{in\text{ units}}$ for each Product
=
$$\frac{BEP_{in\$} (\text{Break even Sales in dollars}) \text{ for each Product}}{\text{Selling Price per unit (P)}}$$

(D) Targeted Sales Revenue (\$):

Targeted Sales revenue (\$) → It's the value of units sold to achieve a targeted profit.

Targeted Sales Revenue
=
$$\frac{\text{Total Fixed Cost (TFC)} + \text{Target Profit}}{\text{Weighted Contribution Margin \% (CM\%) by sales mix}}$$

(E) The safety margin for the whole company can be calculated using the following equations:

1. Margin of safety in revenue (value):

Safety Margin in (\$)

= Expected or Actual Sales value in (\$)

– BEP value in (\$)

If the sign is –ve it's Riskif it's +ve = safe.

By the time the passing the firm must check the current sales and know if its safe \Rightarrow profit or in risk \Rightarrow loss

2. Safety Margin Ratio (%):

Safety Margin Ratio (%)

$$= \frac{\text{Safety Margin value in } (\$)}{\text{Expected or Actual Sales value in } (\$)} \times 100$$

Example (2-16):

EGP Company produces two products (A) and (B). This data is available from the records of the company during December 2023:

<u>Item</u>	<u>A</u>	<u>B</u>
Sold units	2000	4000
Unit selling price (\$)	50	100
Unit variable costs (\$)	20	60

The Fixed costs for the company are \$61,600.

Required:

- 1) Calculate the break-even point in revenue for the whole company, and for each product in units and revenue.
- 2) Prepare the income statement using variable costing method at the break-even point.

Solution

a) Contribution margin ratio for each product

Product	Selling price per unit	Variable cost per unit	*CM/Unit	**CM %
A	50	20	30	0.6
B	100	60	40	0.4

b) sales mix ratio for each product:

Product	Sold units	Selling price for unit	Sales value	sales mix ratio
A	2000	50	\$100,000	0.20
B	4000	100	\$400,000	0.80
Total			\$500,000	1

c) Contribution margin ratio for company:

Product	Contribution margin ratio	sales mix ratio	Contribution margin ratio for the company
A	0.6	0.20	0.12
B	0.4	0.80	0.32
Weighted contribution margin ratio by sales mix			0.44

* Contribution margin per unit = (Selling price per unit - Variable cost per unit)

** Contribution margin ratio = (Contribution margin per unit ÷ Selling price per unit)

1) Company's Break-even Point in revenue (Value):

$$\text{BEP}_{in\$} (\text{Break even Sales in dollars}) \text{ of the Company} = \frac{\text{Total Fixed Cost (TFC)}}{\text{Weighted Contribution Margin \% (CM\%) by sales mix}} = \frac{\$61,600}{0.44} = \$140,000$$

Note:

Weighted Contribution Margin % (CM%) by sales mix
= **SUM of Contribution Margin % (CM%) for each product**
× **Sales Mix (%) for each product**

Break-even Point in revenue for each Product

(Value):

BEP_{in\$} (Break even Sales in dollars) for each Product
= **BEP_{in\$} (Break even Sales in dollars) of the Company**
× **Sales Mix (%) for the product**

$$\text{Product (A)} = \$140,000 \times 0.20 = \$28,000$$

$$\text{Product (B)} = \$140,000 \times 0.80 = \$112,000$$

Break-even Point in units for each Product:

BEP_{in units} for each Product
= $\frac{\text{BEP}_{in\$} (\text{Break even Sales in dollars}) \text{ for each Product}}{\text{Selling Price per unit (P)}}$

$$\text{Product (A)} = \$28,000 \div 50 = 560 \text{ units}$$

$$\text{Product (B)} = \$112,000 \div 100 = 1,120 \text{ units}$$

2) Prepare the income statement using variable costing method at the break-even point.

Items	A	B	Company
Sales revenues	28,000	112,000	140,000
- Variable costs	(11,200)	(67,200)	(78,400)
Contribution margin	16,800	44,800	61,600
- Fixed costs			(61,600)
Net profit			Zero

Example (2-17):

MX Company produces two products (C) and (D). This data is available from the records of the company during December 2023:

<u>Item</u>	<u>C</u>	<u>D</u>
Sold units	4,000	8,000
Unit selling price (\$)	100	200
Unit variable costs (\$)	40	120

The Fixed costs for the company are \$88,000.

Required:

- 1) Calculate the break-even point in revenue for the whole company, and for each product in units and revenue.

- 2) Prepare the income statement using variable costing method at the break-even point.
- 3) Preparing the income statement to show the company's net profit at a sales value of \$600,000.
- 4) Compute the value of sales that achieve a target profit before taxes of \$ 264,000 for the company and for each product with verification of your answer.
- 5) Compute the safety margin and safety margin ratio for the company only.

Solution

a) Contribution margin ratio for each product

Product	Selling price per unit	Variable cost per unit	*CM/Unit	**CM %
A	100	40	60	0.6
B	200	120	80	0.4

b) Sales mix ratio for each product:

Product	Sold units	Selling price for unit	Sales value	sales mix ratio
A	4000	100	\$400,000	0.20
B	8000	200	\$1,600,000	0.80
Total			\$2,000,000	1

* Contribution margin per unit = (Selling price per unit - Variable cost per unit)

** Contribution margin ratio = (Contribution margin per unit ÷ Selling price per unit)

c) Contribution margin ratio for company:

Product	Contribution margin ratio	sales mix ratio	Contribution margin ratio for the company
A	0.6	0.20	0.12
B	0.4	0.80	0.32
Weighted contribution margin ratio by sales mix			0.44

1) Company's Break-even Point in revenue (Value):

$$BEP_{in\$} \text{ (Break even Sales in dollars) of the Company} = \frac{\text{Total Fixed Cost (TFC)}}{\text{Weighted Contribution Margin \% (CM\%) by sales mix}} = \frac{\$88,000}{0.44} = \$200,000$$

Note:

Weighted Contribution Margin \% (CM\%) by sales mix
 $= SUM \text{ of Contribution Margin \% (CM\%) for each product} \times Sales \text{ Mix (\%)} \text{ for each product}$

Break-even Point in revenue for each Product

(Value):

BEP_{in\\$} \text{ (Break even Sales in dollars) for each Product}
 $= BEP_{in\$} \text{ (Break even Sales in dollars) of the Company} \times Sales \text{ Mix (\%)} \text{ for the product}$

$$\text{Product (C)} = \$200,000 \times 0.20 = \$40,000$$

$$\text{Product (D)} = \$200,000 \times 0.80 = \$160,000$$

Break-even Point in units for each Product:

BEP_{in units} for each Product

$$= \frac{BEP_{in\$} \text{ (Break even Sales in dollars) for each Product}}{\text{Selling Price per unit (P)}}$$

$$\text{Product (C)} = \$40,000 \div 100 = 400 \text{ units}$$

$$\text{Product (D)} = \$160,000 \div 200 = 800 \text{ units}$$

2) Prepare the income statement using variable costing method at the break-even point.

Items	A	B	Company
Sales revenues	40,000	160,000	200,000
- Variable costs	(16,000)	(96,000)	(112,000)
Contribution margin	24,000	64,000	88,000
- Fixed costs			(88,000)
Net profit			Zero

3) Preparing the income statement to show the company's net profit at a sales value of \$600,000.

- a) Determining the sales of each product separately by multiplying the total sales value \times the sales mix ratio.
- **Product (C)** = $\$600,000 \times 0.20 = \$120,000$
 - **Product (D)** = $\$600,000 \times 0.80 = \$480,000$

- b) Determine the number of units sold for each product separately, by dividing the sales of each product ÷ unit selling price.
- **Product (C)** = $\$120,000 \div 100 = 1,200$ units
 - **Product (D)** = $\$480,000 \div 200 = 2,400$ units

The income statement under level sales \$ 600,000 is as follows:

Items	C	D	Company
Sales revenues	120,000	480,000	600,000
- variable costs	(48,000)	(288,000)	(336,000)
Contribution margin	72,000	192,000	264,000
- fixed costs			(88,000)
Net profit			176,000

- 4) **Compute the value of sales that achieve a target profit before taxes of \$ 264,000 for the company and for each product with verification of your answer.**

Targeted Sales Revenue (\$):

Targeted Sales revenue (\$) → It's the value of units sold to achieve a targeted profit.

Targeted Sales Revenue

$$\begin{aligned}
 &= \frac{\text{Total Fixed Cost (TFC)} + \text{Target Profit}}{\text{Weighted Contribution Margin \% (CM\%) by sales mix}} \\
 &= \frac{\$88,000 + \$264,000}{0.44} = \$800,000
 \end{aligned}$$

Sales value that generates a target profit for each product:

$$\text{Product (C)} = \$800,000 \times 0.20 = \$160,000$$

$$\text{Product (D)} = \$800,000 \times 0.80 = \$640,000$$

Sales Quantity that generates a target profit for each product:

$$\text{Product (C)} = \$160,000 \div 100 = 1,600 \text{ units}$$

$$\text{Product (D)} = \$640,000 \div 200 = 3,200 \text{ units}$$

Income statement

Items	C	D	Company
Sales revenues	160,000	640,000	800,000
- variable costs	(64,000)	(384,000)	(448,000)
Contribution margin	96,000	256,000	352,000
- fixed costs			(88,000)
Net profit			264,000

5) Compute the safety margin and safety margin ratio for the company only.

- Margin of safety in revenue (value):

Safety Margin in (\$)

= Expected or Actual Sales value in (\$) - BEP value in (\$)

= \$2,000,000 - \$200,000 = \$1,800,000

If the sign is –ve it's Riskif it's +ve = safe.

By the time the passing the firm must check the current sales and know if its safe \Rightarrow profit or in risk \Rightarrow loss

- Safety Margin Ratio (%):

$$\text{Safety Margin Ratio (\%)} = \frac{\text{Safety Margin value in (\$)}}{\text{Expected or Actual Sales value in (\$)}} \times 100$$
$$= \frac{\$1,800,000}{\$2,000,000} = 90\%$$

Essays, True or False, Multiple-Choice Questions, and Problems

A- Essays

- 1) What precisely is the breakeven point? Why should management be worried about the breakeven point, and what tools might assist them in researching it?
- 2) Describe the cost-volume-profit analysis.
- 3) Explain the assumptions that underlie CVP analysis.
- 4) Differentiate operational income from net income.
- 5) Specify the contribution margin, the contribution margin per unit, and the contribution margin percentage.
- 6) Describe three ways managers might represent CVP relationships.
- 7) Why is it more accurate to refer to this chapter's subject matter as CVP analysis rather than breakeven analysis?
- 8) What exactly is operational leverage? How can managers benefit from understanding the degree of operating leverage?
- 9) How does a business with multiple products calculate its breakeven point?

B- True or False Questions

- 1) The unit's selling price is \$25, with a variable cost of \$15 per unit and a fixed cost of \$4 per unit. When the company's operations exceed the breakeven point, the sale of an additional unit will result in a net income increase of \$6.
- 2) A corporation generating \$50,000 in sales, incurring \$35,000 in variable costs, and \$25,000 in fixed costs, will provide a net income of \$15,000.
- 3) Salama Enterprises engages in the sale of a singular product, which is priced at \$25. At the present level of sales, the variable expenditure per unit is \$15, whereas the fixed expense per unit amounts to \$5. If an additional unit is sold, the company's net operating income gets a \$5 increase.
- 4) In order to enhance the process of decision-making, it is advisable to provide fixed expenditures in a per-unit format.
- 5) In the context of a cost-volume-profit (CVP) analysis, it may be observed that the total revenue line on a graph representing a profitable firm would have a greater slope compared to the total expenditure line.

- 6) On a cost-volume-profit (CVP) graph depicting the financial performance of a profitable company, the slope of the total expense line will be greater than that of the line representing fixed expenses.
- 7) At the break-even point, the equation that represents the relationship between sales, variable expenditures, and fixed expenses is: Sales minus variable expenses equals fixed expenses.
- 8) The variable expenditure per unit is \$12, but the selling price per unit is \$40. The contribution margin ratio is 70%.
- 9) It can be observed that, at a constant level of sales, a lower contribution margin ratio would result in a comparatively lower net operating income when compared to a higher contribution margin ratio.
- 10) The calculation of the effect on net operating income resulting from a certain dollar change in sales may be determined by multiplying the contribution margin ratio by the dollar change in sales.
- 11) The current selling price of the video recorder offered by Sharks Company is \$300 per device. The variable cost per unit is \$175, whereas the fixed

costs amount to \$100,000. In the event that the corporation implements a reduction of \$20 per unit in variable expenditures while simultaneously increasing fixed expenses by \$10,000, it may be anticipated that the break-even point will see an upward adjustment.

- 12) The calculation of the entire sales volume in dollars necessary to achieve a specific targeted profit is obtained by dividing the sum of the fixed expenditures and the target profit by the contribution margin ratio.
- 13) The break-even point in units may be found by dividing total fixed expenditures by the contribution margin ratio.
- 14) If there is an annual rise of \$10,000 in fixed expenditures, the break-even point will also increase by \$10,000.
- 15) If there is a rise in fixed expenditures inside a corporation, but all other elements stay constant, it may be anticipated that the margin of safety will decline.

- 16) The margin of safety percentage may be calculated by dividing the margin of safety in dollars by the total sales in dollars.
- 17) If two firms have identical total sales and total costs while producing the same product, the one with a larger share of fixed expenses in its cost structure will exhibit lower operational leverage.
- 18) A corporation exhibiting an operational leverage ratio of 4 would anticipate a 200% growth in net operating income as sales escalate from \$100,000 to \$150,000.
- 19) If two organizations possess identical total sales and total costs and produce the same product, the company with a higher share of fixed expenses in its cost structure will exhibit greater volatility in net operating income when faced with swings in sales.
- 20) A reallocation of the sales mix from goods exhibiting a low contribution margin ratio to those displaying a high contribution margin ratio would result in a reduction of the overall break-even point for the firm.

C-Multiple Choice Questions

- 1) The Hady Company incurs fixed expenses amounting to \$60,000, while its variable costs are equivalent to 75% of the selling price. In order to achieve a profit of \$10,000 from the sale of 50,000 units, the selling price per unit needs to be determined must be
 - A. \$5.60.
 - B. \$4.23.
 - C. \$6.00.
 - D. \$1.20.
- 2) Which of the below factors will result in the rise of a company's breakeven point?
 - A. expanding the contribution margin per unit.
 - B. raising the unit selling price.
 - C. lowering overall fixed costs.
 - D. rise in variable cost per unit.
- 3) Monaco Lights exclusively offers a selection of monaco necklaces. A total of 8,000 units were successfully sold, generating a sales income of \$240,000. The variable costs associated with these sales amounted to \$60,000, while the fixed costs incurred were \$40,000. The breakeven point in

terms of total sales dollars is

- A. \$53,334.
- B. \$58,334.
- C. \$40,000.
- D. \$100,000.

Answer the following questions from 4 to 5 using the information below:

The accompanying data pertains to Katty Corp. The selling price of each unit is \$60. The variable costs amount to \$40 per unit. The total fixed costs amount to \$125,000.

- 4) In order to achieve a targeted operational income of \$25,000, Katty Corp has to sell units.
 - A. 3,334
 - B. 7,500
 - C. 4,334
 - D. 6,000
- 5) In the scenario where the targeted operating income is \$50,000, the corresponding value for targeted sales revenue may be
 - A. \$525,052
 - B. \$517,072
 - C. \$533,333
 - D. \$498,133

- 6) In the case that unit outputs exceeded the breakeven point,
A. there will be a profit.
B. the overall sales revenue is projected to exceed the fixed costs.
C. there is expected to be a rise in fixed expenses.
D. the entire revenue from sales is expected to be higher than the variable expenses.
- 7) To determine the number of units that need to be sold in order to achieve a goal operating income of \$23,000, given that the variable expenses per unit are \$25, total fixed costs amount to \$2,000, and the unit selling price is \$30, will be units.
A. 5,200
B. 4,400
C. 4,800
D. 5,000
- 8) Considering that the breakeven point is 1,000 units, the selling price per unit is \$30, and the fixed costs amount to \$10,000, the graphical representation of this scenario would depict
A. the point of intersection between the total revenue line and the total cost line occurs at a

revenue level of \$40,000.

- B. The revenue line is projected to begin at a value of \$10,000.
- C. at sold units with zero value, the total cost line will be zero.
- D. The point of intersection between the total revenue line and the total cost line occurs at a revenue level of \$30,000.

9) Given that the breakeven point is 1,000 units and the selling price per unit is \$50, then

- A. there will be a profit from selling \$45,000.
- B. \$50,000 sales will generate no profit.
- C. there will be a loss in sales of \$60,000.
- D. there will be a loss on the sale of 1,040 units.

10) The term used to describe the divergence between the total sales in dollars and the total variable costs is referred to as

- A. the contribution margin.
- B. the gross margin.
- C. net operating income.
- D. net profit.

- 11) In relation to the Cost-Volume-Profit (CVP) graph, which of the following claims is inaccurate?
- A. The CVP graph is predicated on the assumption that selling prices remain constant.
 - B. The CVP graph is based on the assumption that variable costs exhibit a downward trend as the volume of production or sales increases.
 - C. The CVP graph is predicated on the assumption that fixed expenses remain constant in total within the relevant range.
 - D. The CVP graph is based on the assumption that total cost is only influenced by changes in volume.
- 12) The assumption made in break-even analysis is that
- A. variable expenditures exhibit nonlinearity.
 - B. the average fixed expenditure per unit remains unchanged.
 - C. total expenses remain constant.
 - D. the average variable expenditure per unit remains consistent.

13) The safety margin percentage is calculated as

- A. subtracting the break-even sales from the total sales and then dividing the result by the Break-even sales.
- B. The break-even sales are divided by the total sales.
- C. The difference between total sales and break-even sales.
- D. subtracting the break-even sales from the total sales and then dividing the result by the total sales.

14) The calculation for the degree of operating leverage involves

- A. dividing net operating income by sales.
- B. dividing the contribution margin by the sales.
- C. dividing contribution margin by net operating income.
- D. dividing the gross margin by the net operating income.

- 15) YANI Company has a total of \$150,000 in fixed expenditures. The variable expense ratio for the company is 60%, and the variable expenses amount to \$4.50 per unit. Based on the above information, the break-even point in terms of units is units.
- A. 100,000
 - B. 33,333
 - C. 50,000
 - D. 37,500
- 16) In the previous fiscal year, McCarthy Company disclosed a net income of \$70,000, achieved from sales amounting to \$520,000 and a contribution margin ratio of 40%. In the event of a \$10,000 rise in fixed expenditures in the upcoming year, the firm must generate sales of what magnitude to achieve a profit of \$80,000.
- A. \$625,000
 - B. \$562,500
 - C. \$600,000
 - D. \$570,000

- 17) Farko Corporation engages in the production and sale of a solitary product, with a contribution margin ratio of 63%. The corporation incurs a monthly fixed expenditure of \$460,530 while aiming to achieve a monthly goal profit of \$19,000. The dollar sales required to achieve the specified target profit is approximately:
- A. \$731,000
 - B. \$761,159
 - C. \$290,134
 - D. \$302,104
- 18) In the previous fiscal year, Jako Corporation reported total revenues amounting to \$1,500,000. The company's variable expenditures were recorded at \$900,000, while its fixed expenses amounted to \$400,000. What would be the value in dollars of sales at the break-even point?
- A. \$1,200,000
 - B. \$1,380,000
 - C. \$1,300,000
 - D. \$1,000,000

D-Problems

Problem (2-1):

Marco Filler, Inc. is a company that engages in the sale of automotive batteries to service stations at an average price of \$30 per unit. The variable cost associated with each battery is \$20, whereas the cumulative monthly fixed manufacturing costs amount to \$10,000. The cumulative amount of the company's monthly fixed costs is \$8,000.

Required:

- a. What is the breakeven point in batteries?
- b. What is the safety margin, given that the entire sales amount to \$60,000?
- c. What is the breakeven point in battery production, given a 20% rise in variable costs?
- d. What is the breakeven point for batteries, given a 10% increase in the selling price, a 10% decrease in fixed manufacturing costs, and a \$100 decrease in other fixed costs?

Problem (2-2):

Sharm Corp reported the following:

Revenues	\$5,000
Fixed manufacturing costs	\$ 700
Fixed non-manufacturing costs	\$ 540
Variable manufacturing costs	\$ 600
Variable non-manufacturing costs	\$ 960

Required:

- Calculate the contribution margin.
- Calculate the gross margin.
- Calculate the operational income.

Problem (2-3):

The Vacation Card Company, a manufacturer of specialized greeting cards, has requested your assistance in doing various computations using the following information:

Total fixed costs	\$92,400
Selling price per unit	\$13.20
Income tax rate	30%
Variable cost per unit	\$10.56

Required:

- a. What is the breakeven point at which the revenue generated from selling cards equals the total costs incurred, resulting in neither profit nor loss?
- b. What is the minimum number of cards that need to be sold in order to generate an after-tax net income of \$36,960?
- c. What is the required sales volume in order to achieve an after-tax net income of \$26,056.80?

Problem (2-4):

XTY Company sells only two products, Product R and Product M, this data is available from the records of the company during December 2023:

	R	M	Total
Selling price	\$20	\$25	
Variable cost per unit	\$12	\$20	
Total fixed costs			\$420,000

XTY has a sales ratio of two units of Product R for every unit of Product M. The tax rate imposed on XTY is 30%.

Required:

- a. Compute each product's breakeven point, If the sales mix is two units of Product R for every one of Product M.
- b. Compute each product's breakeven point, as XTY's tax rate is decreased to 25%, if the sales mix is 2 units of Product R for every unit of Product M.
- c. Compute the targeted sold units of each product in order for XTY to achieve an after-tax net income of \$36,750 while paying a 30% tax rate.

Problem (2-5):

MX Company produces two products (C) and (D). This data is available from the records of the company during December 2023:

<u>Item</u>	<u>C</u>	<u>D</u>
Sold units	2,000	4,000
Unit selling price (\$)	50	100
Unit variable costs (\$)	20	60

The Fixed costs for the company are \$44,000.

Required:

- 1) Calculate the break-even point in revenue for the whole company, and for each product in units and revenue.
- 2) Prepare the income statement using variable costing method at the break-even point.
- 3) Preparing the income statement to show the company's net profit at a sales value of \$300,000.
- 4) Compute the value of sales that achieve a target profit before taxes of \$132,000 for the company and for each product with verification of your answer.
- 5) Compute the safety margin and safety margin ratio for the company only.

Problem (2-6):

Markos Manufacturing Company is engaged in the production of two distinct goods, namely T and W. The accompanying data is provided for both products:

	T	W
Unit Selling Price	\$80	\$50
Unit Variable cost	50	30

Total fixed costs are \$550,000.

Required:

- a. Compute each product's contribution margin.
- b. Compute the breakeven point for both T and W in units assuming the sales mix is 3 units of T for every unit of W.
- c. If the sales mix is 2 units of T for every 3 units of W, Compute the breakeven quantity in total dollars.

Problem (2-7):

GHER Manufacturing Company, for the fiscal year 2023, the available capacity for production and sales is 8,000 units, while sells 6,000 units with a selling price per unit of \$60. Suppose that the total fixed cost amounted to \$200,000, and the variable cost per unit was \$10.

Required:

- 1) Calculate the break-even point in units and revenue.
- 2) Prepare the income statement using variable costing method at the break-even point.
- 3) Compute the break-even capacity and utilization ratio of capacity.
- 4) Compute the net profit using the safety margin in the actual situation, with verification of your answer.

Problem (2-8):

The predicted profit for the upcoming year of HOKAS Company is outlined as follows:

	<u>Total</u>	<u>Per unit</u>
Sales	\$400,000	\$40
Less: Variable costs	240,000	24
Contribution margin	<u>\$160,000</u>	<u>\$16</u>
Less: Fixed costs	128,000	
Operating income	<u>\$32,000</u>	

Required:

- 1) Calculate the break-even point in quantity.
- 2) What is the minimum number of units that need to be sold in order to achieve a profit of \$60,000?
- 3) Calculate the incremental profit that MAKOS would accrue in the event that sales exceed expectations by \$50,000.
- 4) Assume MAKOS aims to achieve an operating income equivalent to 20 percent of its sales revenue. What is the minimum number of units that need to be sold in order to achieve this objective? Please include an income statement as evidence to support your response.

- 5) Calculate the margin of safety based on the projected amount of sales.

Problem (2-9):

The predicted income before taxes for the upcoming year has been provided by Murphy Company, as shown in the following manner. The Murphy company is subject to a tax rate of 40 percent.

Sales (80,000 units)	\$4,000,000
Cost of sales	
Variable costs	\$1,000,000
Fixed costs	1,500,000
Total costs	<hr/> 2,500,000
Income before taxes	<hr/> <u>\$1,500,000</u>

Required

- 1) What is the breakeven point for Murphy in terms of units sold for the upcoming fiscal year?
- 2) In order for Murphy to achieve an income before taxes amounting to \$2.25 million, what is the necessary level of sales in dollar terms?
- 3) In order for Murphy to obtain a 10% after-tax return on assets, what is necessary the dollar sales that must be attained, given that Murphy's net assets amount to \$18 million?

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CHAPTER 3

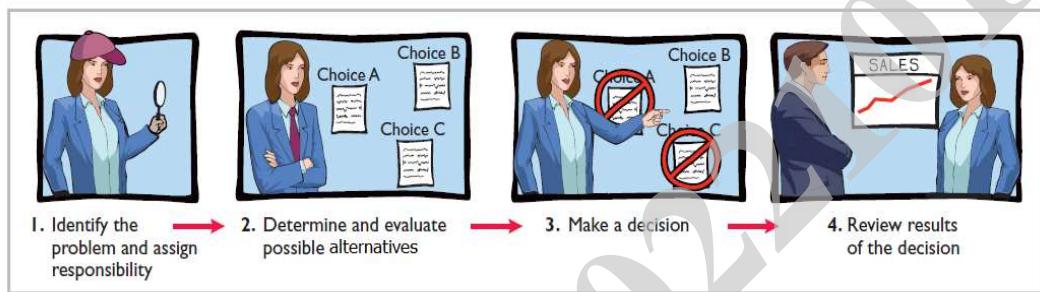
Relevant costs for decision-making

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Introduction:

Making decisions is an important management function.

It is possible to identify some steps that are frequently involved in the decision-making process. These steps are shown in Illustration below.



Source: Weygandt, Kimmel, Kieso, "Managerial Accounting", John Wiley & Sons, Inc.

Accounting's contribution to the decision-making process occurs primarily in Steps 2 and 4—evaluating possible alternatives, and reviewing results.

1- The key cost concepts in decision-making:

a) Incremental Analysis (Differential Analysis):

The process used to identify the financial data that change under two or more alternatives, incremental analysis uses the **relevant cost** and disregards any **sunk cost**.

- **Differential Cost:** is the difference in costs between two alternatives.
- **Differential revenue:** is the difference in revenues between two alternatives.
- **Differential profit:** is the difference in profits between two alternatives.

b) Relevant costs: The costs that expected in the future and differ across alternatives. These costs cannot be ignored when trying to choose between alternatives.

Examples:

- If the management comparing two types of machines (–two alternatives), both of which require an annual maintenance cost of \$ 20,000, then the maintenance cost is considered **irrelevant cost** for decision-making process, because it is similar to the two decision-making alternatives, but if the maintenance cost differs in the two machines, it is considered **relevant cost** to decision-making process.

- If the management chooses between selling a semi-finished product or finished product, the **relevant cost** to decision-making is the cost necessary to complete the production process.

c) **Sunk cost:** is a cost that has already been paid for and cannot be recovered in any way, and it's a cost that cannot be changed or avoided by any present or future decision.

Examples:

- The amount you spent in the past to purchase or repair a machine should have no effect on your decisions.
- The amount that the company has spent in the past in training employees how to use new software that you have installed on your company's computers. After a while, the software is no longer used and the company needs to use a different software. This will require training the employees again. The amount that company spent on training employees in the first software is a sunk cost because it will never be recovered.

d) Opportunity cost: the potential benefit that's lost when an alternative is chosen over another.

Examples:

- If a machine is used to produce one type of product, the revenue of producing another type of product with the same machine is lost.
- A business has \$100,000 to invest in a machine. The business must choose between machine A which has a return of \$50,000, and machine B which has a return of \$60,000. So, if management chooses the machine B, the returns of machine A are called Opportunity cost.

Example (1):

The company's management is considering utilizing of the idle capacity in production lines by adding a new product (X) or (Y) to the sales mix.

The following is the estimated data on the new product for a period of 6 months:

- 1- Adding a new product does not affect the fixed costs.
- 2- Adding product (X) will result in the following:

Sales revenues	500,000
- costs of goods sold (25% fixed)	(400,000)
Gross profit	100,000
- Marketing and administrative expenses (100% fixed)	(50,000)
Net profit	50,000

- 3- Adding product (Y) will result in contribution margin of \$ 150,000.

Required:

- A- Determine the sunk costs of adding the product (X).
- B- Provide your opinion on choosing product (X) or product (Y).
- C- Determine what is the opportunity cost of choosing product (X) or product (Y).

Solution

- A- Determining the sunk costs of adding the product (X).

$$\text{Sunk costs} = 400,000 \times 25\% + 50,000 = \$ 150,000.$$

B- Comparing the product (X), (Y), The basis for comparison is the contribution margin for each product as follows:

- Contribution margin of the product (X) = 500,000
 $-(400,000 \times 0.75) = \$ 200,000$
- Contribution margin of the product (Y) = \$ **150,000**
- So that, the decision to choose the product (X).

C- Opportunity cost of choosing product (X) is the returns of the rejected alternative (Y) = \$ **150,000**

2- Cost Indifference Point (Cost-Equal-Point)

The indifference point: is the level of volume at which total costs (Fixed Cost and Variable Cost), and profits, associated with the two alternatives are equal.

Cost Indifference Point (Cost-Equal-Point) =

$$\frac{\text{Differential Fixed Cost}}{\text{Differential Variable Cost per unit}}$$

The **Cost Indifference Point (Cost-Equal-Point) analysis** helps in choosing between two cost structure alternatives (production methods):

- if the expected production units are greater than the cost Indifference point, then the method with higher fixed costs is preferred.
- if the expected production units are less than the cost Indifference point, then the method with lower fixed costs is preferred.

Example (2):

A manufacturing firm plans to produce a specific product that is sold at \$ 100 per unit, and that that product can be produced in two methods, the costs for each alternative are given below:

- **The first method:** Fixed costs \$ 200,000 - unit variable costs \$ 60
- **The second method:** Fixed costs \$ 300,000 - unit variable costs \$ 40

Required:

- 1- Determine the Cost Indifference Point (Cost-Equal Point).
- 2- Provide your opinion to management to choose the best production methods if you know that the expected sales quantity is 7,500 units

Solution:

1- Determining the Cost Indifference Point (Cost-Equal Point):

Cost Indifference Point (Cost-Equal-Point) =

$$\frac{300,000 - 200,000}{60 - 40} = 5,000 \text{ Units.}$$

To make sure of the result we got, let's calculate the total costs of the two alternatives at production quantity of 5,000 Units:

- Total costs of the first alternative = $200,000 + 5000 \times 60 = \$ 500,000$
- Total costs of the second alternative = $300,000 + 5000 \times 40 = \$ 500,000$

2- Providing the opinion to management to choose the best production methods if the expected sales quantity is 7,500 units

and since the expected production quantity is 7,500 units greater than the cost Indifference point quantity (5,000 units), so the second method is preferred.

To make sure of the result we got, let's calculate the total costs of the two alternatives at production quantity of 7,500 Units:

- Total costs of the first alternative = $200,000 + 7500 \times 60 = \$ 650,000$
- Total costs of the second alternative = $300,000 + 7500 \times 40 = \$ 600,000$

3- Using the Incremental Analysis (Differential Analysis) in decision-making:

A number of different types of decisions involve incremental analysis. The more common types of decisions are whether to:

1. Accept or Reject a Special Order at a special price.
2. Eliminate an unprofitable business segment or product.
3. Make or buy component parts or finished products.
4. Sell products or process them further.

Decision (1): Accept or Reject a Special Order at a special price.

Sometimes a company may have an opportunity to obtain additional business sales by accepting or rejecting a special order to specific customer at a special price, usually it is lower than the major price.

We assume that:

- **The sales of the product in other markets would not be affected by this special order.** If other sales were affected, then we would have to consider the lost sales.
- **The special order would have to use the unused capacity.** If the plant is operating at full capacity, then we would have to consider the additional costs related to expanding the plant capacity.

Example (3):

El Nasr plant with a production capacity of 10,000 units and a production quantity of 7000 units, variable cost per unit \$ 60, fixed costs \$ 200,000, selling price per \$ 100, and management received special order to sell 3000 units at \$ 70 per unit.

Required: using the Differential analysis, assist the management is to accept the special order in the following independent situations:

- A-** Producing and selling the special order does not require new equipment and will not affect the current selling prices, the opportunity cost of unused capacity is zero.
- B-** Producing and selling the special order does not require new equipment, but it's leads to reducing the current selling price to \$ 90, the opportunity cost of unused capacity is zero.
- C-** Producing and selling the special order does not require new equipment and will not affect the current selling prices, and there is also the possibility of leasing the unused capacity with an annual revenue of \$ 20,000
- D-** Producing and selling the special order requires new equipment with cost of \$ 200,000, and its annual depreciation rate is 10%, and will not affect the current selling prices, and the opportunity cost of unused capacity is zero.

Solution

The contribution margin per unit resulting from accepting the special order is $70 - 60 = \$10$, which means that the special order will achieve a contribution margin of $3000 \times 10 = \$30,000$.

A- Producing and selling the special order does not require new equipment and will not affect the current selling prices.

	Rejecting Order	Accepting Order	Differential analysis
Sales revenues	700,000	910,000	210,000
- Variable costs	(420,000)	(600,000)	(180,000)
Contribution Margin	280,000	310,000	30,000
- Fixed costs	(200,000)	(200,000)	0
Net Profit	80,000	110,000	30,000

The Decision in this situation: Accept the special order

B- Producing and selling the special order does not require new equipment, but it's leads to reducing the current selling price to \$ 90.

	Rejecting Order	Accepting Order	Differential analysis
Sales revenues	700,000	840,000	140000
- Variable costs	(420,000)	(600,000)	(180000)
Contribution Margin	280,000	240,000	(40,000)
- Fixed costs	(200,000)	(200,000)	0
Net profit	80,000	40,000	(40,000)

The Decision in this situation: Reject the special order

C- Producing and selling the special order does not require new equipment and will not affect the current selling prices, and there is also the possibility of leasing the unused capacity with an annual revenue of \$ 20,000

	Rejecting Order	Accepting Order	Differential analysis
Sales revenues	700,000	910,000	210,000
- Variable costs	(420,000)	(600,000)	(180,000)
Contribution Margin	280,000	310,000	30,000
- Fixed costs	(200,000)	(200,000)	0
- Opportunity cost	0	(20,000)	(20,000)
Net profit	80,000	90,000	10,000

The Decision in this situation: Accept the special order

D- Producing and selling the special order requires new equipment with cost of \$ 200,000, and its annual depreciation rate is 10%, and will not affect the current selling prices, and the opportunity cost of unused capacity is zero.

	Rejecting Order	Accepting Order	Differential analysis
Sales revenues	700,000	910,000	210,000
- Variable costs	(420,000)	(600,000)	(180,000)
Contribution Margin	280,000	310,000	30,000
- Fixed costs	(200,000)	(220,000)	(20,000)
Net profit	80,000	90,000	10,000

The Decision in this situation: Accept the special order

Decision (2): Eliminate an unprofitable business product:

Management sometimes must decide whether to eliminate an unprofitable business product. Making this decision requires distinguishing between two types of costs:

- **Avoidable costs:**

The costs which are incurred only when a product or activity is continued and a decision to

discontinue a product or activity will eliminate or reduce these costs.

- **Unavoidable costs:**

The costs which are incurred regardless a product or activity is continued or dropped.

Example (4):

El Nasr plant producing three products (X), (Y) and (Z), and the income statement was as follows:

	(X)	(Y)	(Z)	Total
Sales revenues	60,000	120,000	75,000	255,000
- Variable costs	(40,000)	(80,000)	(65,000)	(185,000)
Contribution Margin	20,000	40,000	10,000	70,000
- Fixed costs	(15,000)	(30,000)	(14,000)	(59,000)
Net profit	5000	10,000	(4000)	11,000

Because the product (Z) achieves a loss of 4,000, the management is considering stopping this product.

Required: using the Differential analysis, assist the management is decide whether to eliminate (stop) producing the product (Z), in the following independent situations:

A- Eliminating the product (Z) will not affect the fixed costs of the plant.

B- Eliminating the product (Z) will result in avoiding \$ 11,000 of the plant fixed costs.

Solution

A- Eliminating the product (Z) will not affect the fixed costs of the plant.

	Continue producing product (Z)	Eliminate producing product (Z)	Differential analysis
Sales revenues	255,000	180,000	75,000
- Variable costs	(185,000)	(120,000)	(65,000)
Contribution Margin	70,000	60,000	10,000
- Fixed costs	(59,000)	(59,000)	0
Net profit	11,000	1,000	(10,000)

Since the fixed costs of the product (Z) are completely unavoidable costs, and the revenue of the product (Z) cover its variable costs and part of the fixed costs of the

plant, and eliminating the product (Z), will lead to a decrease in the plant's profits.

Therefore, The Decision in this situation: Continue producing product (Z).

B- Eliminating the product (Z) will result in avoiding \$ 11,000 of the plant fixed costs.

	Continue producing product (Z)	Eliminate producing product (Z)	Differential analysis
Sales revenues	255,000	180,000	75,000
- Variable costs	(185,000)	(120,000)	(65,000)
Contribution Margin	70,000	60,000	10,000
- Fixed costs	(59,000)	(48,000)	(11,000)
Net profit	11,000	12,000	(1,000)

Therefore, The Decision in this situation: Eliminate producing product (Z).

Decision (3): Make or buy component parts in producing a finished product.

When a manufacturer assembles component parts in producing a finished product, management must decide whether to make or buy the components. The decision to buy parts or services is often referred to as outsourcing.

Considering the opportunity cost:

As indicated earlier, opportunity cost is the potential benefit that's lost when an alternative is chosen over another.

In the make-or-buy decision, it is important for management to take into account the **opportunity cost** of its choice. If there is an opportunity to use this productive capacity in some other manner, then this opportunity cost must be considered by the rational decision maker.

Example (5):

ABC company needs 10,000 units per year of a component part, and the cost of producing these units was \$ 19 as follows:

- Raw materials \$ 7
- Direct wages \$ 3
- Manufacturing overhead \$ 5 (60% fixed)
- Fixed general expenses \$ 4

The prices will rise in the coming year by 20% for raw materials and by 10% for direct wages, while other costs will remain the same.

An external supplier offered to sell this quantity to the company at a price of \$ 18 per unit. The company has found that if this offer is accepted, it can save \$ 10,000 fixed Manufacturing overhead and \$ 10,000 of fixed general expenses, and the production capacity of these units can be leased to others at \$ 25,000.

Required:

Using the method of differential analysis of costs to assist management in making or buying decision.

Solution:

- Buy:

Cost of purchases from supplier = $10,000 \times 18 = \$ 180,000$

- Make:

Raw material costs and direct wages will be adjusted because their prices are expected to rise.

Raw materials = $10,000 \times 7 \times 120\% = \$ 84,000$

Direct wages = $10,000 \times 3 \times 110\% = \$ 33,000$

Variable Manufacturing overhead = $10,000 \times 5 \times 40\% = \$ 20,000$

Fixed Manufacturing overhead = $10,000 \times 5 \times 60\% = \$ 30,000$

Fixed General expenses = $10,000 \times 4 = \$ 40,000$

Opportunity cost (for leasing the production capacity) = $\$ 25,000$

The differential analysis:

	Make	Buy	Differential analysis
Purchase price	0	180,00 0	(180,000)
Raw materials	84,000	0	84,000
Direct wages	33,000	0	33,000
Variable Manufacturing overhead	20,000	0	20,000
Fixed Manufacturing overhead	30,000	20,000	10,000
Fixed General expenses	40,000	30,000	10,000
Opportunity cost	25,000	0	25,000
Total	232,00 0	230,00 0	2,000

The differential analysis shows that the decision in this situation: is buying the component part.

Example (6)

A company needs 25,000 component parts to be included in the manufacture of its main product, and the estimated cost data for manufacturing this part was as follows:

- Unit cost (\$ 40): direct materials \$ 4 - direct wages \$ 18 - variable indirect industrial costs \$ 8 - fixed industrial indirect costs \$ 10

One of the suppliers of such a part offered the company to sell it the necessary quantity for it at the price of unit \$ 35 to be delivered to its warehouse.

Required:

Using the differential analysis of costs to assist management in make-or-buy decision in the following independent situations:

- A- The production capacity cannot be used for any other purpose.
- B- The production capacity can be utilized in other activities by 80%.
- C- The company saving 50% of the fixed costs by stopping the manufacturing the component parts and buying it from suppliers.
- D- Leasing the unused production capacity of producing the component parts to another company for \$ 250,000

Solution:

A- The production capacity cannot be used for any other purpose.

In this case the company will pay all fixed industrial costs whether it make or buy the from suppliers.

$$\text{Fixed costs} = 25,000 \times 10 = \$ 250,000$$

- Make:

$$\text{Variable costs} = 25,000 \times (4+18+8) = \$ 750,000$$

- Buy:

$$\begin{aligned}\text{Cost of purchases from supplier} &= 25,000 \times 35 = \\ \$ 875,000\end{aligned}$$

The differential analysis:

	Make	Buy	Differential analysis
Purchase price	0	875,000	(875,000)
Variable costs	750,000	0	750,000
Fixed costs	250,000	250,000	0
Total costs	1,000,000	1,125,000	(125,000)

It should be noted that the fixed costs could be omitted from the differential analysis as being equal in both cases, and thus irrelevant cost for decision making, but we have included them in the differential analysis table to show the total cost of each alternative.

The differential analysis shows that the decision in this situation: is making the component part.

B- The production capacity can be utilized in other activities by 80%.

The differential analysis:

	Make	Buy	Differential analysis
Purchase price	0	875,000	(875,000)
Variable costs	750,000	0	750,000
Fixed costs	250,000	50,000	200,000
Total costs	1,000,000	925,000	75,000

The differential analysis shows that the decision in this situation: is buying the component part.

C- The company saving 50% of the fixed costs by stopping the manufacturing the component parts and buying it from suppliers.

The differential analysis:

	Make	Buy	Differential analysis
Purchase price	0	875,000	(875,000)
Variable costs	750,000	0	750,000
Fixed costs	250,000	125,000	125,000
Total costs	1,000,000	1,000,000	0

The differential analysis shows that the costs of each of the two alternatives are equal and the management decision to make-or-buy should be taken in light of other considerations.

D-Leasing the unused production capacity of producing the component parts to another company for \$ 250,000

The differential analysis:

	Make	Buy	Differential analysis
Purchase price	0	875,000	(875,000)
Variable costs	750,000	0	750,000
Fixed costs	250,000	250,000	0
Opportunity cost (Leasing revenue)	250,000	0	250,000
Total costs	1,250,000	1,125,000	125,000

The differential analysis shows that the decision in this situation: is buying the component part.

Decision (4): Sell products or process them further.

Many manufacturers have the option of selling products at a given point in the production cycle or process them further with the expectation of selling them at a later point at in the production cycle at a higher price.

Example (7):

Assume that a milling firm produces wheat which can be used to produce two products (X) and (Y).

The company expects to produce 30 tons of product (X), and 40 tons of product (Y). And the joint cost of producing these products is \$ 200,000, and the selling price per KG of these products at the point of separation is \$ 2 and \$ 1.5.

The production manager suggested an additional process to the product (X) to be final product at a cost of \$ 40,000, and product (Y) at a cost \$ 25,000, thereafter, product (X) and product (Y) are sold at a price of \$ 3 per KG.

Required:

Using the differential analysis to assist the management to rationalize the decision to perform the additional process for products (X, Y)?

Solution:

The revenue after further process (as finished good):

Final product revenue (X) = $30000 \times 3 = \$ 90,000$

Final product revenue (Y) = $40000 \times 3 = \$ 120,000$

The revenue at the point of separation (as unfinished good):

Product (X) = $30,000 \times 2 = \$ 60,000$

Product (Y) = $40,000 \times 1.5 = \$ 60,000$

The differential analysis table for the decision of additional process for products (X, Y)

	Product (X)	Product (Y)
Revenue of (X) and (Y) – as finished	90,000	120,000
Revenue of (X) and (Y) – as unfinished product (At point of separation)	(60,000)	(60,000)
The differential revenue	30,000	60,000
The differential costs	40,000	25,000
The Differential profit or (loss)	(10,000)	35,000

From the above, it is clear that the differential costs of the product (X) are greater than its differential revenues by an amount of \$ 10,000. Therefore, **we do not recommend process this product after the point of separation.**

But the differential revenue of the product (Y), it is greater than its differential costs by \$ 35,000. Therefore, **we recommend process this product after the point of separation.**

Questions & Exercises

True / False Questions

1. The book value of old equipment is not a relevant cost in a decision. (F)
2. Irrelevant costs are already incurred, and regardless of any alternative chosen by the management, they will remain to be incurred. A sunk cost is an example of an irrelevant cost. (T)
3. Fixed costs are irrelevant in decisions about whether a product line should be dropped. (F)
4. In a special-order situation, any fixed cost associated with the order would be irrelevant. (F)
5. When a company has a production constraint, total contribution margin will be maximized by emphasizing the products with the highest contribution margin per unit of the constrained resource. (T)
6. Eliminating nonproductive time is particularly important in a bottleneck operation. (T)
7. One way to increase the effective utilization of a bottleneck is to reduce the number of defective units. (T)
8. As a general guide, it is profitable to continue processing joint products after the split-off point if their total revenues exceed the joint costs. (F)
9. Joint costs are irrelevant in the decision of whether to sell a joint product at the split-off point or process it further and then sell it. (T)

10. A key advantage of using activity-based costing is that any cost that is assigned to a product is also a relevant cost in any decision involving that product. (F)

Multiple Choice Questions

1- Relevant costs are

- A) All fixed and variable costs.
- B) All costs that would be incurred within the relevant range of production.
- C) Past costs that are expected to be different in the future.
- D) Anticipated future costs that will differ among various alternatives.

Answer (D)

2- The term incremental cost refers to

- A) The profit foregone by selecting one choice instead of another.
- B) The additional cost of producing or selling another product or service.
- C) A cost that continues to be incurred in the absence of activity
- D) A cost common to all choices in question and not clearly or feasibly allocable to any of them.

Answer (B)

3- Costs forgone when an individual or organization chooses one option over another

- A) Budgeted costs.
- B) Sunk costs.
- C) Historical costs.
- D) Opportunity costs.

Answer (D)

4- Which of the following costs would not be accounted for in a company's recordkeeping system?

- A) An unexpired cost
- B) An expired cost
- C) A product cost
- D) An opportunity cost

Answer (D)

5- A fixed cost is relevant if it is

- A) Uncontrollable.
- B) Avoidable
- C) Sunk.
- D) A product cost.

Answer (B)

6- Which of the following is the least likely to be a relevant item in deciding whether to replace an old machine?

- A) Acquisition cost of the old machine
- B) Outlay to be made for the new machine
- C) Annual savings to be enjoyed on the new machine
- D) Life of the new machine

Answer (A)

7- If a cost is irrelevant to a decision, the cost could not be

- A) A sunk cost
- B) A future cost.
- C) A variable cost.
- D) An incremental cost.

Answer (A)

8- Which of the following costs would be relevant in short-term decision making?

- A) Incremental fixed costs
- B) All costs of inventory
- C) Total variable costs that are the same in the considered alternatives
- D) The cost of a fixed asset that could be used in all the considered alternatives

Answer (A)

9- The term incremental cost refers to

- A) The profit foregone by selecting one choice instead of another.
- B) The additional cost of producing or selling another product or service.
- C) A cost that continues to be incurred in the absence of activity.
- D) A cost common to all choices in question and not clearly or feasibly allocable to any of them.

Answer (B)

10- The point of similarity of costs is determined by the following equation:

- A) Fixed costs / unit variable costs.
- B) Fixed costs / contribution margin per unit.
- C) Differential fixed costs / differential variable cost per unit.
- D) Differential variable costs per unit / contribution margin per unit.

Answer (B)

11- Costs which can be eliminated in whole or in part if a particular business segment is discontinued are called:

- A) Sunk costs.
- B) Opportunity costs.
- C) Avoidable costs.
- D) Irrelevant costs.

Answer (C)

12- The acceptance of a special order will improve overall net operating income so long as the revenue from the special order exceeds:

- A) The contribution margin on the order.
- B) The incremental costs associated with the order.
- C) The variable costs associated with the order.
- D) The sunk costs associated with the order.

Answer (B)

13- In a sell or process further decision, consider the following costs:

- I. A variable production cost incurred prior to split-off.
- II. A variable production cost incurred after split-off.
- III. An avoidable fixed production cost incurred after split-off.

Which of the above costs is (are) not relevant in a decision regarding whether the product should be processed further?

- A) Only I
- B) Only III
- C) Only I and II
- D) Only I and III

Answer (A)

14- AL Gaml Company has 5,000 obsolete units that are carried in inventory at a manufacturing cost of LE 100,000. If the units are reworked for LE 30,000, they could be sold for LE 40,000. Alternatively, the lamps could be sold for LE 15,000 for scrap. In a decision model analyzing these alternatives, the sunk cost would be:

- A) LE 10,000
- B) LE 15,000
- C) LE 40,000
- D) LE 100,000

Answer (D)

15- Ali Inc. has some material that originally cost LE80,000. The material has a scrap value of LE50,000 as is, but if reworked at a cost of LE 5,000, it could be sold for LE 56,000. What would be the incremental effect on the company's overall profit of reworking and selling the material rather than selling it as is as scrap?

- A) LE 1,000
- B) LE 5,000
- C) LE 2,000
- D) LE 50,000

Answer (A)

Unsolved exercises

No. (1)

The following information is for the cost of producing one of the products in Gold Star Company

Direct materials 60 - direct wages LE10 – Overhead LE 25, and the Overhead are borne by 250% of direct wages, and that 60% of these costs are fixed, and idle capacity is available to the company, and that the product can be purchased from outside the Company at a price of LE 85, and in this case, 40% of the additional fixed overhead can be saved.

Required: Do you agree to buy the product from outside the company instead of producing it internally and why?

No. (2)

Al-Nasr Company produces automatic washing machines and produces 1,000 washing machines to sell in the local market at a price of LE 1200 per washing machine, and the production costs were as follows: Direct materials LE 300,000 - Direct wages LE 250,000- Variable overhead LE 150,000- Fixed overhead for factory as a whole LE 20,000 . Fixed Administrative expenses LE 40,000

The management is considering manufacturing a part of this washing machine instead of buying it from abroad because this saves 25% of material costs but increases direct wages and industrial variable indirect costs by 10%.

What is required: To advise the management to purchase this part from suppliers or to manufacture internally

No. (3)

The production capacity of the Union Factory is 40,000 units annually, but the factory produces half of this capacity, and sells the unit at a price of 2. It was found from the records that the cost elements of these units are: Direct raw materials LE 26,000 direct wages LE7, 000 industrial expenses LE 2,000 of which 60% are fixed, Sale and distribution expenses LE 1,000, of which 80% are fixed, administrative expenses LE500, and the factory management is studying one of the two alternatives:

The first alternative: to accept a new offer from a customer to produce 10,000 new units, which he buys at a price of LE 1.75/unit?

The second alternative: allocated LE 5000 to advertising sales, in excess of what is currently being spent, and if this is done, it is expected that the number of units sold will increase until it absorbs the full production capacity, and it is expected that the selling price of the unit LE 2 will continue.

Required: Compare the two alternatives using differential analysis.

No. (4)

Al-Shorouk Company has a production capacity of 7500 units of product, and the following are the costs of production and sales for the company: Production cost: variable LE 6 per unit, annual fixed costs LE 45,000

Selling and administrative cost: unit variable LE 3 and annual fixed cost LE 3000

The company currently sells 6000 units annually at a price of LE 14 per unit.

The Future Company has submitted to Al-Shorouk Company its desire to purchase 1500 units at a price of LE 10 per unit, bearing in mind that the company's regular sales will not be affected by this demand, and the sales commission on the company's request is reduced by 33%

Required:

- 1- If the offer submitted by the future company is accepted, calculate each of the following:
 - A- Sales by units if the offer is accepted
 - B- Total variable costs in case the offer is accepted
 - C- Total contribution margin in case the offer is accepted
- 2- Is it in the interest of the company to accept the offer or not?

No. (5)

ABC Corporation has in stock 20,000 kilograms of material (R) that it bought five years ago for LE 11.5 per kilogram. This raw material was purchased to use in a product line that has been discontinued. This Material R can be sold as is for scrap for LE 7.8 per kilogram. An alternative would be to use this material in one of the company's current products, which currently requires 2 kilograms of another raw material that is available for LE 15.2 per kilogram. But Material R can be modified at a cost of LE 1.5 per kilogram so that it can be used as a substitute for this material in the production of product. However, after modification, 4 kilograms of material R is required for every unit of product that is produced. ABC Corporation has now received a request from a company that could use material R in its production process. Assuming that ABC Corporation could use all of its stock of material R to make product, or the

company could sell all of its stock of the material at the current scrap price of LE 7.8 per kilogram,

Required: what is the minimum acceptable selling price of material R to the company that could use material R in its own production process?

No. (6)

ABC Inc. is considering using stocks of an old raw material in a special project. The special project would require all 200 kilograms of the raw material that are in stock and that originally cost the company LE 20000 in total. If the company were to buy new supplies of this raw material on the open market, it would cost LE10 per kilogram. However, the company has no other use for this raw material and would sell it at the discounted price of LE 8 per kilogram if it were not used in the special project.

Required:

1- What is the irrelevant cost of the 200 kilograms of the raw material when deciding whether to proceed with the special project?

2- What is the relevant cost of the 200 kilograms of the raw material when deciding whether to proceed with the special project?

No. (7)

One of the companies manufactures cars, and every year it produces and sells 1,000 cars at an amount of LE

260,000 per car, and this company buys the car's motor from another company at LE 25,000 per motor.

1- There is idle capacity for the company that can be used in the production of the motor, and the cost of producing the motor is as follows: Raw materials E 15500 - wages 5500 - other costs 5000

2 - There is no idle capacity for the company, and the production of the motor requires the purchase of a new machine whose cost is LE10000,000 and its annual depreciation rate is 20%. The purchase decision will be financed by borrowing from the bank at an interest rate of 10%

Required: help management in making a purchase or manufacture decision

No. (8)

Ezz Al-Arab Company for the Automotive Industry produces the lighting lanterns that it uses in its main product (cars), and the costs department has prepared the following report on the costs of producing that part, as follows: Unit cost: direct materials LE25 - direct wages LE5 - variable indirect industrial costs LE3 - depreciation of machinery LE 2 - other fixed indirect industrial costs LE 5 The company has received an offer from one of the suppliers specialized in the manufacture of this part to supply 10,000 units of lighting lanterns every year at a price of LE35 per unit.

Required: - As the management accountant, prepare a study that provides the appropriate information to make a decision to continue production or purchase from the supplier, if you know that in the event of a decision to purchase externally, there are several alternatives to exploiting the energy allocated to the production of the part under study, which are:

1. Lease it to others for an annual rent of LE36000.
2. Exploiting it to produce another product that will generate an additional income of LE40,000 for the company.

No. (9)

One of the industrial companies is exposed to repeated losses as it operates only at 50% of the production capacity. The income statement appeared on December 30, 2021, as follows: Sales revenue 400,000 - variable cost of sales 240,000 - fixed costs 250,000 and the company wants to stop production

Required: help management to choose between continuing production or temporarily stopping, in two cases: fixed costs that cannot be avoided in the event of a temporary halt amount to: A- LE100,000. B - LE60,000.

No. (10)

An industrial company received order from a customer to buy 10,000 new units at a price of LE 15 per unit while the current unit selling price is LE 25 and the

production capacity of the company is 30,000 units, but the capacity used at the moment is only 70% and fixed costs are LE 70,000, and variable costs LE 252000

Required: Expressing an opinion regarding the acceptance or rejection of the order in these cases

- A- Acceptance of the order will not affect the selling price of the unit in the market.
- B- Acceptance of the order will reduce the unit price in the market from LE 24 to LE 15 per unit.

No. (11)

If you know that the normal production capacity of an industrial company is 20,000 units per year, but the annual utilization capacity is 15,000 units that are sold in the local market at the unit price LE 6 and the variable cost of the unit is LE 4 and one of the importers has submitted to the company requesting the production of 3000 units at a price of LE 4.5 per unit and the annual fixed of the company is LE 200,000.

The commercial manager of the company has considered that this order will not generate additional profits on the basis that the price will not cover the total cost of the unit. Required: assist the management in identifying the most appropriate alternative

CHAPTER 4

Introduction to Financial Statement

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Introduction:

All financial statements are historical documents. They summarize what *has happened* during a particular period. However, most users of financial statements are concerned with what *will happen* in the future. For example, stockholders are concerned with future earnings and dividends and creditors are concerned with the company's future ability to repay its debts.

While financial statements are historical in nature, they can still provide users with valuable insights. These users rely on

In this chapter, we focus our attention on the most important ratios and other analytical tools that financial analysts use.

In addition to stockholders and creditors, managers are also vitally concerned with the financial ratios discussed in this chapter.

First, the ratios provide indicators of how well the company and its business units are performing.

The specific ratios selected depend on the company's strategy.

For example, a company that wants to emphasize responsiveness to customers may closely monitor the inventory turnover ratio discussed later in this chapter.

Second, because managers must report to stockholders and may want to raise funds from external sources, managers must pay attention to the financial ratios used by external investors.

Chapter (4) - Introduction to Financial Statement Analysis

1-Limitations of Financial Statement Analysis:

This section discusses two limitations of financial statement analysis related to comparing financial data across companies and looking beyond ratios when formulating conclusions.

1/1Comparing Financial Data across Companies:

Comparisons of one company with another can provide valuable clues about the financial health of an organization. Unfortunately, differences in accounting methods between companies sometimes make it difficult to compare their financial data.

For example, if one company values its inventories by the LIFO method and another company by the average cost method, then direct comparisons of their financial data such as inventory valuations and cost of goods sold may be misleading. Sometimes enough data are presented in footnotes to the financial statements to restate data to a comparable basis.

Otherwise, the analyst should keep in mind any lack of comparability. Even with this limitation in mind, comparisons of key ratios with other companies and with industry averages often suggest avenues for further investigation.

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1/2Looking beyond Ratios:

Ratios should not be viewed as an end, but rather as a *starting point*. They raise many questions and point to opportunities for further analysis, but they rarely answer any questions by themselves. In addition to ratios, analysts should evaluate industry trends, technological changes, changes in consumer tastes, changes in broad economic factors, and changes within the company itself.

2-Statements in Comparative and Common-Size Form :

An item on a balance sheet or income statement has little meaning by itself. Suppose a company's sales for a year were 250 million. In isolation, that is not particularly useful information.

How does that stack up against last year's sales? How do the sales relate to the cost of goods sold? In making these kinds of comparisons, three analytical techniques are widely used:

1. Pound and percentage changes on statements (*horizontal analysis*).
2. Common-size statements (*vertical analysis*).
3. Ratios.

Throughout the chapter, we will illustrate these analytical techniques using the financial statements of Nervana Electronics, a producer of specialized electronic components.

2/1Pound and Percentage Changes on Statements :

Horizontal analysis (also known as **trend analysis**) involves analyzing financial data over time, such as computing year-to-year pound and percentage changes within a set of financial statements. Exhibits 1 and 2 show Nervana Electronics' financial statements in this comparative form. The Pound changes highlight the changes that are the most important economically; the percentage changes highlight the changes that are the most unusual.

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EXHIBIT 1

Nervana Electronics
Comparative Balance Sheet
(Pounds in thousands)

	This Year	Last Year	Amount	Increase (Decrease) Percent
Assets				
Current assets:				
Cash	1,200	2,350	(1,150)	(48.9)%*
Accounts receivable, net	6,000	4,000	2,000	50.0%
Inventory	8,000	10,000	(2,000)	(20.0)%
Prepaid expenses	300	120	180	150.0%
Total current assets	<u>15,500</u>	<u>16,470</u>	<u>(970)</u>	(5.9)%
Property and equipment:				
Land	4,000	4,000	0	0.0%
Buildings and equipment, net ...	<u>12,000</u>	<u>8,500</u>	<u>3,500</u>	41.2%
Total property and equipment ...	<u>16,000</u>	<u>12,500</u>	<u>3,500</u>	28.0%
Total assets	31,500	28,970	2,530	8.7%
Liabilities and Stockholders' Equity				
Current liabilities:				
Accounts payable	5,800	4,000	1,800	45.0%
Accrued payables	900	400	500	125.0%
Notes payable, short term	300	600	(300)	(50.0)%
Total current liabilities	7,000	5,000	2,000	40.0%
Long-term liabilities:				
Bonds payable, 8%	<u>7,500</u>	<u>8,000</u>	<u>(500)</u>	(6.3)%
Total liabilities	<u>14,500</u>	<u>13,000</u>	<u>1,500</u>	11.5%
Stockholders' equity:				
Preferred stock, 100L.E. par, 6%	2,000	2,000	0	0.0%
Common stock, 12L.E. par	6,000	6,000	0	0.0%
Additional paid-in capital	<u>1,000</u>	<u>1,000</u>	<u>0</u>	0.0%
Total paid-in capital	9,000	9,000	0	0.0%
Retained earnings	<u>8,000</u>	<u>6,970</u>	<u>1,030</u>	14.8%
Total stockholders' equity	<u>17,000</u>	<u>15,970</u>	<u>1,030</u>	6.4%
Total liabilities and stockholders' equity ..	31,500	28,970	2,530	8.7%

* The changes between this year and last year are expressed as a percentage of the pound amount for last year. For example, Cash decreased by 1,150 L.E. between this year and last year. This decrease expressed in percentage form is computed as follows: $1,150 \div 2,350 = 48.9\%$. Other percentage figures in this exhibit and Exhibit 2 are computed in the same way.

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EXHIBIT 2

Nervana Electronics
Comparative Income Statement and Reconciliation of
Retained Earnings (Pounds in thousands)

	This Year	Last Year	Increase (Decrease)	
			Amount	Percent
Sales	\$52,000	\$48,000	\$4,000	8.3%
Cost of goods sold	36,000	31,500	4,500	14.3%
Gross margin	16,000	16,500	(500)	(3.0)%
Selling and administrative expenses:				
Selling expenses	7,000	6,500	500	7.7%
Administrative expenses	5,860	6,100	(240)	(3.9)%
Total selling and administrative expenses	12,860	12,600	260	2.1%
Net operating income	3,140	3,900	(760)	(19.5)%
Interest expense	640	700	(60)	(8.6)%
Net income before taxes	2,500	3,200	(700)	(21.9)%
Income taxes (30%)	750	960	(210)	(21.9)%
Net income	1,750	2,240	\$ (490)	(21.9)%
Dividends to preferred stockholders, \$6 per share (see Exhibit 1)	120	120		
Net income remaining for common stockholders	1,630	2,120		
Dividends to common stockholders, \$1.20 per share	600	600		
Net income added to retained earnings	1,030	1,520		
Retained earnings, beginning of year ...	6,970	5,450		
Retained earnings, end of year	\$ 8,000	\$ 6,970		

Horizontal analysis can be even more useful when data from a number of years are used to compute trend percentages. To compute trend percentages, a base year is selected and the data for all years are stated as a percentage of that base year.

To illustrate, consider the sales and net income of McDonald's Corporation, the world's largest food service retailer, with more than 31,000 restaurants worldwide:

	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
Sales (millions)	\$23,522	\$22,787	\$20,895	\$19,117	\$17,889	\$16,154	\$14,527	\$14,074	\$13,794	\$13,251
Net income (millions) ...	\$4,313	\$2,395	\$3,544	\$2,602	\$2,279	\$1,471	\$893	\$1,637	\$1,977	\$1,948

Be careful to note that the above data have been arranged with the most recent year on the left. This may be the opposite of what you are used to, but it is the way financial data are commonly displayed in annual reports.

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and other sources. By simply looking at these data, you can see that sales increased every year, but the net income has not. However, recasting these data into trend percentages aids interpretation:

	2008	2007	2006	2005	2004	2003	2002	2001	2000	1999
Sales	176%	172%	158%	144%	135%	122%	110%	106%	104%	100%
Net income ...	221%	123%	182%	134%	117%	76%	46%	84%	101%	100%

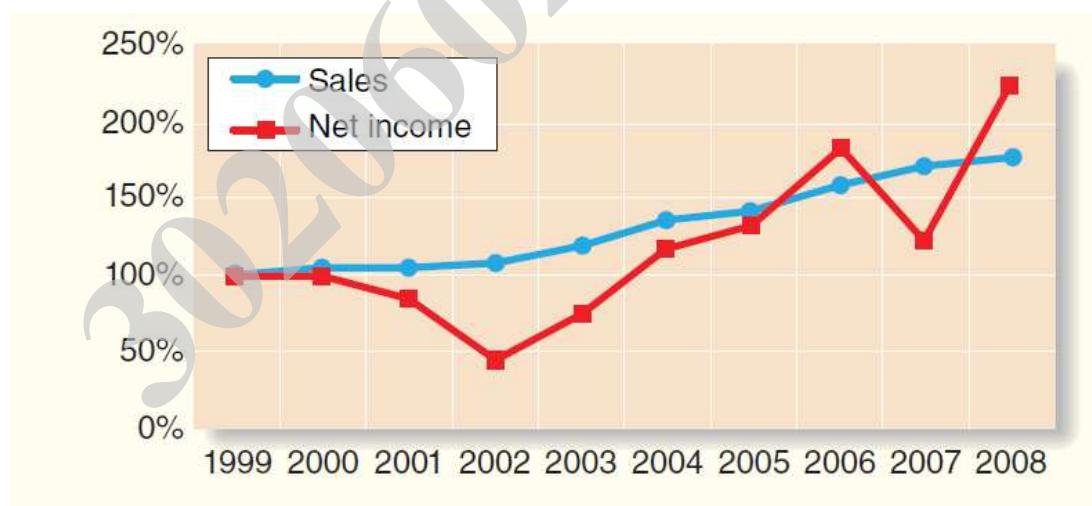
In the above table, both sales and net income have been restated as a percentage of the 1999 sales and net income. For example, the 2008 sales of \$23,522 are 221% of the 1999 sales of \$13,251.

This trend analysis is particularly striking when the data are plotted as in Exhibit 3.

McDonald's sales growth was impressive throughout the 10-year period, but net income was far more erratic. Notice that net income plummeted in 2001 and 2002, fully recovered by 2004, and then plummeted again in 2007. In 2008, McDonald's earned record sales and profits.

EXHIBIT 3

**McDonald's Corporation:
Trend Analysis of Sales
and Net Income**



2/2 Common-Size Statements :

Horizontal analysis, which was discussed in the previous section, examines changes in financial statement accounts over time.

Vertical analysis focuses on the relations among financial statement accounts at a given point in time.

A **common-size financial statement** is a vertical analysis in which each financial statement account is expressed as a percentage.

In income statements, all items are usually expressed as a percentage of sales. In balance sheets, all items are usually expressed as a percentage of total assets.

Exhibit 4 contains Nervana Electronics' common-size balance sheet and Exhibit 5 contains its common-size income statement.

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Notice from Exhibit 4 that placing all assets in common-size form clearly shows the relative importance of the current assets as compared to the noncurrent assets.

It also shows that significant changes have taken place in the composition of the current assets over the last year. For example, accounts receivable have increased in relative importance and both cash and inventory have declined in relative importance. Judging from the sharp increase in accounts receivable, the deterioration in the cash balance may be a result of an inability to collect from customers.

Shifting now to the income statement, in Exhibit 5 the cost of goods sold as a percentage of sales increased from 65.6% last year to 69.2% this year. Or looking at this from a different viewpoint, the *gross margin percentage* declined from 34.4% last year to 30.8% this year.

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EXHIBIT 4

Nervana Electronics Common-Size Comparative Balance Sheet (in thousands)

	This Year	Last Year	Common-Size Percentages			
			This Year	Last Year		
Assets						
Current assets:						
Cash	\$ 1,200	\$ 2,350	3.8%*	8.1%		
Accounts receivable, net	6,000	4,000	19.0%	13.8%		
Inventory	8,000	10,000	25.4%	34.5%		
Prepaid expenses	300	120	1.0%	0.4%		
Total current assets	<u>15,500</u>	<u>16,470</u>	<u>49.2%</u>	<u>56.9%</u>		
Property and equipment:						
Land	4,000	4,000	12.7%	13.8%		
Buildings and equipment, net	12,000	8,500	38.1%	29.3%		
Total property and equipment	<u>16,000</u>	<u>12,500</u>	<u>50.8%</u>	<u>43.1%</u>		
Total assets	<u>\$31,500</u>	<u>\$28,970</u>	<u>100.0%</u>	<u>100.0%</u>		
Liabilities and Stockholders' Equity						
Current liabilities:						
Accounts payable	\$ 5,800	\$ 4,000	18.4%	13.8%		
Accrued payables	900	400	2.9%	1.4%		
Notes payable, short term	300	600	1.0%	2.1%		
Total current liabilities	<u>7,000</u>	<u>5,000</u>	<u>22.2%</u>	<u>17.3%</u>		
Long-term liabilities:						
Bonds payable, 8%	7,500	8,000	23.8%	27.6%		
Total liabilities	<u>14,500</u>	<u>13,000</u>	<u>46.0%</u>	<u>44.9%</u>		
Stockholders' equity:						
Preferred stock, \$100, 6%	2,000	2,000	6.3%	6.9%		
Common stock, \$12 par	6,000	6,000	19.0%	20.7%		
Additional paid-in capital	1,000	1,000	3.2%	3.5%		
Total paid-in capital	<u>9,000</u>	<u>9,000</u>	<u>28.6%</u>	<u>31.1%</u>		
Retained earnings	8,000	6,970	25.4%	24.0%		
Total stockholders' equity	<u>17,000</u>	<u>15,970</u>	<u>54.0%</u>	<u>55.1%</u>		
Total liabilities and stockholders' equity	<u>\$31,500</u>	<u>\$28,970</u>	<u>100.0%</u>	<u>100.0%</u>		

*Each asset account on a common-size statement is expressed as a percentage of total assets, and each liability and equity account is expressed as a percentage of total liabilities and stockholders' equity. For example, the percentage figure above for this year's Cash balance is computed as follows: $\$1,200 \div \$31,500 = 3.8\%$.

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EXHIBIT 5:

Nervana Electronics
Common-Size Comparative
Income Statement (in thousands)

	This Year	Last Year	Common-Size Percentages*	
			This Year	Last Year
Sales	\$52,000	\$48,000	100.0%	100.0%
Cost of goods sold	36,000	31,500	69.2%	65.6%
Gross margin	16,000	16,500	30.8%	34.4%
Selling and administrative expenses:				
Selling expenses	7,000	6,500	13.5%	13.5%
Administrative expenses	5,860	6,100	11.3%	12.7%
Total selling and administrative expenses	12,860	12,600	24.7%	26.3%
Net operating income	3,140	3,900	6.0%	8.1%
Interest expense	640	700	1.2%	1.5%
Net income before taxes	2,500	3,200	4.8%	6.7%
Income taxes (30%)	750	960	1.4%	2.0%
Net income	\$ 1,750	\$ 2,240	3.4%	4.7%

*Note that the percentage figures for each year are expressed as a percentage of total sales for the year. For example, the percentage figure for this year's cost of goods sold is computed as follows: $\$36,000 \div \$52,000 = 69.2\%$

Managers and investment analysts often pay close attention to this measure of profitability. The **gross margin percentage** is computed as follows:

Gross margin percentage =

$$\frac{\text{Gross margin}}{\text{Sales}}$$

The gross margin percentage should be more stable for retailing companies than for other companies because the cost of goods sold in retailing excludes fixed costs. When fixed costs are included in the cost of goods sold, the gross margin percentage should increase and decrease with sales volume. With increases in sales volume, fixed costs are spread across more units and the gross margin percentage should improve.

Common-size statements are particularly useful when comparing the performance of different companies.

For example, in 2008 Burger King's net income was \$190 million and McDonald's was \$4,313 million. It would be naïve to look at these two numbers and conclude that McDonald's outperformed Burger King. McDonald's is much larger than Burger King, so its higher net income may be due solely to its larger size rather than its managerial performance. To control for their different sizes, each company's net

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income can be expressed as a percentage of its sales revenues. Given that Burger King's sales revenues were \$2,455 million and McDonald's were \$23,522 million, Burger King's net income as a percentage of sales was 7.7% and McDonald's was 18.3%. These common size percentages support the more informed conclusion that McDonald's performance compares favorably with Burger King's performance.

2/3Ratio Analysis :

2/3/1Ratio Analysis—The Common Stockholder:

Common stockholders use financial ratios related to net income, dividends, and stockholders' equity to assess a company's financial performance. This section describes seven of those ratios. *All calculations will be performed for this year.*

2/3/1/1Earnings per Share:

An investor buys a stock in the hope of realizing a return in the form of either dividends or future increases in the value of the stock. Because earnings form the basis for dividend payments and future increases in the value of shares, investors are interested in a company's *earnings per share*.

Earnings per share: is computed by dividing net income available for common stockholders by the average number of common shares outstanding during the year. -Net income available for common stockholders is net income minus dividends paid to preferred stockholders.

$$\text{Earnings per share} = \frac{\text{Net income} - \text{Preferred dividends}}{\text{Average number of common shares outstanding}}$$

Using the data in Exhibits 1 and 2 , Nervana Electronics' earnings per share would be computed as follows:

$$\text{Earnings per share} =$$

$$\frac{1,750,000 - 120,000}{(500,000 \text{ shares}^* + 500,000 \text{ shares})/2}$$

$$= 3.26\text{L.E. per share}$$

$$^* 6,000,000 \text{ total par value} \div 12 \text{ par value per share} = 500,000 \text{ shares.}$$

2/3/1/2 Price-Earnings Ratio :

The **price-earnings ratio** expresses the relationship between a stock's market price per share and its earnings per share.

If we assume that Nervana Electronics' stock has a market price of 40L.E. per share at the end of this year, then its price-earnings ratio would be computed as follows:

$$\text{Price-earnings ratio} =$$

$$\frac{\text{Market price per share}}{\text{Earnings per share}}$$

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$$= \frac{40 \text{ L.E. per share}}{3.26 \text{ L.E. per share}} \\ = 12.3$$

The price-earnings ratio is 12.3; that is, the stock is selling for about 12.3 times its current earnings per share.

A high price-earnings ratio means that investors are willing to pay a premium for the company's stock—presumably because the company is expected to have higher than average future earnings growth. Conversely, if investors believe a company's future earnings growth prospects are limited, the company's price-earnings ratio would be relatively low.

2/3/1/3 Dividend Payout and Yield Ratios:

Investors in a company's stock make money in two ways—increases in the market value of the stock and dividends. In general, earnings should be retained in a company and not paid out in dividends as long as the rate of return on funds invested inside the company exceeds the rate of return that stockholders could earn on alternative investments outside the company.

Therefore, companies with excellent prospects of profitable growth often pay little or no dividend. Companies with little opportunity for profitable growth, but with steady, dependable earnings, tend to pay out a higher percentage of their cash flow from operations as dividends.

The Dividend Payout Ratio:

The **dividend payout ratio** quantifies the percentage of current earnings being paid out in dividends.

This ratio is computed by dividing the dividends per share by the earnings per share for common stock:

Dividend payout ratio =

$$\frac{\text{Dividends per share}}{\text{Earnings per share}}$$

For Nervana Electronics, the dividend payout ratio is computed as follows:

Dividend payout ratio =

$$= \frac{1.20 \text{ L.E. per share (see Exhibit 2)}}{3.26 \text{ L.E. per share}} \\ = 36.8\%$$

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There is no such thing as a "right" dividend payout ratio, although the ratio tends to be similar for companies within the same industry. As noted above, companies with ample growth opportunities at high rates of return tend to have low payout ratios, whereas companies with limited reinvestment opportunities tend to have higher payout ratios.

The Dividend Yield Ratio:

The **dividend yield ratio** is computed by dividing the current dividends per share by the current market price per share:

Dividend yield ratio =

$$\frac{\text{Dividends per share}}{\text{Market price per share}}$$

Because the market price for Nervana Electronics' stock is \$40 per share, the dividend yield is computed as follows:

Dividend yield ratio =

$$\frac{1.20 \text{ L.E. per share}}{40 \text{ L.E. per share}}$$

= 3.0%

The dividend yield ratio measures the rate of return (in the form of cash dividends only) that would be earned by an investor who buys common stock at the current market price. A low dividend yield ratio is neither bad nor good by itself.

2/3/1/4 Return on Total Assets:

The **return on total assets** is a measure of operating performance that is defined as follows:

Return on total assets =

$$\frac{\text{Net income} + [\text{Interest expense} \times (1 - \text{Tax rate})]}{\text{Average total assets}}$$

Interest expense is added back to net income to show what earnings would have been if the company had no debt. With this adjustment, the return on total assets can be compared for companies with differing amounts of debt, or for a single company that has changed its mix of debt and equity over time. Notice that the interest expense is placed on an after-tax basis by multiplying it by the factor $(1 - \text{Tax rate})$.

The return on total assets for Nervana Electronics is computed as follows (from Exhibits 1 and 2):

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Return on total assets =

$$\frac{1,750,000 + [640,000 \times (1 - 0.30)]}{(31,500,000 + 28,970,000)/2}$$

= 7.3%

Nervana Electronics has earned a return of 7.3% on average total assets employed over the last year.

2/3/1/5 Return on Common Stockholders' Equity:

The **return on common stockholders' equity** is based on the book value of common stockholders' equity. It is computed as follows:

Return on common stockholders' equity=

$$\frac{\text{Net income} - \text{Preferred dividends}}{\text{Average common stockholders' equity}}$$

Where:

Average common stock holder s' equity =

Average total stockholders' equity – Average preferred stock

For Nervana Electronics, the return on common stockholders' equity is computed as follows:

Average total stockholders' equity =

$$\frac{(17,000,000 + 15,970,000)}{2}$$

$$= 16,485,000$$

Average preferred stock =

$$\frac{(2,000,000 + 2,000,000)}{2}$$

$$= 2,000,000$$

Average common stockholders' equity =

$$16,485,000 - 2,000,000 = 14,485,000$$

Return on common stockholders' equity =

$$\frac{1,750,000 - 120,000}{14,485,000}$$

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= 11.3%

Compare the return on common stockholders' equity above (11.3%) with the return on total assets computed in the preceding section (7.3%).

Why is the return on common stockholders' equity so much higher? The answer lies in financial leverage.

2/3/1/6 Financial Leverage :

Financial leverage results from the difference between the rate of return the company earns on investments in its own assets and the rate of return that the company must pay its creditors.

If the company's rate of return on total assets exceeds the rate of return the company pays its creditors, financial leverage is positive. If the rate of return on total assets is less than the rate of return the company pays its creditors, financial leverage is negative.

We can see financial leverage in operation in the case of Nervana Electronics. Notice from Exhibit 1 that the company pays 8% interest on its bonds payable.

The after tax interest cost of these bonds is only 5.6% [8% interest rate \times (1 – 0.30) = 5.6%].

As shown earlier, the company's after-tax return on total assets is 7.3%. Because the return on total assets of 7.3% is greater than the 5.6% after-tax interest cost of the bonds, leverage is positive, and the difference goes to the common stockholders.

This explains in part why the return on common stockholders' equity of 11.3% is greater than the return on total assets of 7.3%.

If financial leverage is positive, having some debt in the capital structure can substantially benefit common stockholders. For this reason, companies often try to maintain a level of debt that is considered to be normal within their industry.

Unfortunately, leverage is a two-edged sword. If assets do not earn a high enough return to cover the interest costs of debt and preferred stock dividends, then the common stockholder suffers. In that case, financial leverage is negative.

2/3/1/7 Book Value per Share:

Book value per share measures the amount that would be distributed to holders of each share of common stock if all assets were sold at their balance sheet carrying amounts (i.e., book values) and if all creditors were paid off.

Book value per share is based entirely on historical costs. The formula for computing it is:

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Book value per share =

$$\frac{\text{Total stockholders' equity} - \text{Preferred stock}}{\text{Number of common shares outstanding}}$$

The book value per share of Nervana Electronics' common stock is computed as follows:

Book value per share =

$$\frac{17,000,000 - 2,000,000}{500,000 \text{ shares}}$$

= 30L.E. per share

If this book value is compared with the 40L.E. market value of Nervana Electronics' stock, then the stock may appear to be overpriced. However, as we discussed earlier, market prices reflect expectations about future earnings and dividends, whereas book value largely reflects the results of events that have occurred in the past. Ordinarily, the market value of a stock exceeds its book value.

2/3/2 Ratio Analysis—The Short-Term Creditor :

Short-term creditors, such as suppliers, want to be repaid on time. Therefore, they focus on the company's cash flows and on its *working capital* because these are the company's short-term primary sources of cash.

All calculations in this section will be performed for this year.

2/3/2/1 Working Capital :

The excess of current assets over current liabilities is known as **working capital**.

Working capital = Current assets – Current liabilities

The working capital for Nervana Electronics is computed as follows: Working capital = 15,500,000 – 7,000,000 = 8,500,000

Ample working capital provides some assurance to short-term creditors that they will be paid by the company. However, maintaining large amounts of working capital isn't free.

Working capital must be financed with long-term debt and equity—both of which are expensive. Therefore, managers often want to minimize working capital.

A large and growing working capital balance may not be a good sign. For example, it could be the result of unwarranted growth in inventories. To put working capital into proper perspective, it should be supplemented with the following four ratios—the current ratio, the acid-test ratio, the accounts receivable turnover, and the inventory turnover—each of which will be discussed in turn.

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2/3/2/2 Current Ratio:

A company's working capital is frequently expressed in ratio form.

A company's current assets divided by its current liabilities is known as the **current ratio**:

Current ratio =

$$\frac{\text{Current assets}}{\text{Current liabilities}}$$

For Nervana Electronics, the current ratio is computed as follows:

Current ratio =

$$\frac{15,500,000}{\underline{7,000,000}} = 2.21$$

Although widely regarded as a measure of short-term debt-paying ability, the current ratio must be interpreted with great care. A *declining* ratio might be a sign of a deteriorating financial condition, or it might be the result of eliminating obsolete inventories or other stagnant current assets. An improving ratio might be the result of stockpiling inventory, or it might indicate an improving financial situation. In short, the current ratio is useful, but tricky to interpret.

The general rule of thumb calls for a current ratio of at least 2. However, many companies successfully operate with a current ratio below 2.

The adequacy of a current ratio depends heavily on the composition of the assets.

For example, as we see in the table on the next page, both El Maadi Corporation and Zahraa El Maadi, Inc., have current ratios of 2. However, they are not in comparable financial condition. Zahraa El Maadi is more likely to have difficulty meeting its current financial obligations because almost all of its current assets consist of inventory rather than more liquid assets such as cash and accounts receivable.

M. Z.

Current assets:		
Cash	\$ 25,000	\$ 2,000
Accounts receivable, net	60,000	8,000
Inventory	85,000	160,000
Prepaid expenses	5,000	5,000
Total current assets (a)	<u><u>\$175,000</u></u>	<u><u>\$175,000</u></u>
Current liabilities (b)	<u><u>\$ 87,500</u></u>	<u><u>\$ 87,500</u></u>
Current ratio, (a) ÷ (b)	2	2

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2/3/2/3 Acid-Test (Quick) Ratio:

The **acid-test (quick) ratio** is a more rigorous test of a company's ability to meet its short-term debts than the current ratio. Inventories and prepaid expenses are excluded from total current assets, leaving only the more liquid (or -quick) assets to be divided by current liabilities.

Acid-test ratio =

$$\frac{\text{Cash} + \text{Marketable securities} + \text{Accounts receivable} + \text{Short-term notes receivable}}{\text{Current liabilities}}$$

The acid-test ratio measures how well a company can meet its obligations without having to liquidate or depend too heavily on its inventory. Ideally, each Pound of liabilities should be backed by at least 1L.E. of quick assets. However, acid-test ratios as low as 0.3 are common.

The acid-test ratio for Nervana Electronics is computed below:

Acid-test ratio =

$$\frac{1,200,000 + 0 + 6,000,000 + 0}{7,000,000}$$

= 1.03

Although Nervana Electronics' acid-test ratio is within the acceptable range, an analyst might be concerned about several trends revealed in the company's balance sheet.

Notice in Exhibit 1 that short-term debts are rising, while the cash balance is declining.

Perhaps the lower cash balance is a result of the substantial increase in accounts receivable. In short, as with the current ratio, the acid-test ratio should be interpreted with one eye on its basic components.

2/3/2/4 Accounts Receivable Turnover :

The accounts receivable turnover and average collection period ratios measure how quickly credit sales are converted into cash. The **accounts receivable turnover** is computed by dividing sales on account (i.e., credit sales) by the average accounts receivable balance for the year:

Accounts receivable turnover =

$$\frac{\text{Sales on account}}{\text{Average accounts receivable balance}}$$

Assuming that all of Nervana Electronics' sales were on account, its accounts receivable turnover is computed as follows:

Accounts receivable turnover =

$$\frac{52,000,000}{(6,000,000 + 4,000,000)/2}$$

= 10.4

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The accounts receivable turnover can then be divided into 365 days to determine the average number of days required to collect an account (known as the **average collection period**).

Average collection period =

$$\frac{365 \text{ days}}{\text{Accounts receivable turnover}}$$

The average collection period for Brickey Electronics is computed as follows:

Average collection period =

$$\begin{aligned} & \frac{365 \text{ days}}{10.4} \\ & = 35 \text{ days} \end{aligned}$$

This means that on average it takes 35 days to collect a credit sale. Whether this is good or bad depends on the credit terms Nervana Electronics is offering its customers.

Many customers will tend to withhold payment for as long as the credit terms allow.

If the credit terms are 30 days, then a 35-day average collection period would usually be viewed as very good. On the other hand, if the company's credit terms are 10 days,

then a 35-day average collection period is worrisome. A long collection period may result from having too many old uncollectible accounts, failing to bill promptly or follow up on late accounts, lax credit checks, and so on. In practice, average collection periods ranging all the way from 10 days to 180 days are common, depending on the industry.

2/3/2/5 Inventory Turnover:

The **inventory turnover ratio** measures how many times a company's inventory has been sold and replaced during the year. It is computed by dividing the cost of goods sold by the average level of inventory [(Beginning inventory balance + Ending inventory balance) ÷ 2]:

Inventory turnover =

$$\frac{\text{Cost of goods sold}}{\text{Average inventory balance}}$$

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Nervana's inventory turnover is computed as follows:

Inventory turnover =

$$\frac{36,000,000}{(8,000,000 + 10,000,000)/2}$$

$$= 4.0$$

The number of days needed on average to sell the entire inventory (called the **average sale period**) can be computed by dividing 365 by the inventory turnover:

Average sale period =

$$\frac{365 \text{ days}}{\text{Inventory turnover}}$$

$$=$$

$$\frac{365 \text{ days}}{4 \text{ times}}$$

$$= 91\frac{1}{4} \text{ days}$$

The average sale period varies from industry to industry. Grocery stores, with significant perishable stocks, tend to turn over their inventory quickly. On the other hand, jewelry stores tend to turn over their inventory slowly.

In practice, average sales periods of 10 days to 90 days are common, depending on the industry.

A company whose inventory turnover ratio is much slower than the average for its industry may have too much inventory or the wrong sorts of inventory. Some managers argue that they must buy in large quantities to take advantage of quantity discounts.

But these discounts must be compared to the added costs of insurance, taxes, financing, and risks of obsolescence and deterioration that result from carrying added inventories.

Inventory turnover should increase in companies that adopt Lean Production. If properly implemented, Lean Production should result in both a decrease in inventories and an increase in sales due to better customer service.

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2/3/3 Ratio Analysis—The Long-Term Creditor:

Long-term creditors are concerned with a company's ability to repay its loans over the long run. For example, if a company paid out all of its available cash in the form of dividends, then nothing would be left to pay back creditors. Consequently, creditors often seek protection by requiring that borrowers agree to various restrictive covenants, or rules.

These restrictive covenants typically include restrictions on dividend payments as well as rules stating that the company must maintain certain financial ratios at specified levels. Although restrictive covenants are widely used, they do not ensure that creditors will be paid when loans come due. The company still must generate sufficient earnings to cover payments.

2/3/3/1 Times Interest Earned Ratio:

The most common measure of a company's ability to provide protection to its long-term creditors is the **times interest earned ratio**. It is computed by dividing earnings before interest expense and income taxes (i.e., net operating income) by interest expense:

Times interest earned =

$$\frac{\text{Earnings before interest expense and income taxes}}{\text{Interest expense}}$$

For Nervana Electronics, the times interest earned ratio for this year is computed as follows:

Times interest earned =

$$\frac{3,140,000}{640,000} \\ = 4.9$$

The times interest earned ratio is based on earnings before interest expense and income taxes because that is the amount of earnings that is available for making interest payments. Interest expenses are deducted before income taxes are determined; creditors have first claim on the earnings before taxes are paid.

A times interest earned ratio of less than 1 is inadequate because interest expense exceeds the earnings that are available for paying that interest. In contrast, a times interest earned ratio of 2 or more may be considered sufficient to protect long-term creditors.

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2/3/3/2 Debt-to-Equity Ratio:

Long-term creditors are also concerned with a company's ability to keep a reasonable balance between its debt and equity. This balance is measured by the **debt-to-equity ratio** :

Debt-to-equity ratio =

$$\frac{\text{Total liabilities}}{\text{Stockholders' equity}}$$

Nervana's debt-to-equity ratio for this year is computed as follows:

Debt-to-equity ratio =

$$\frac{14,500,000}{17,000,000}$$

= 0.85

The debt-to-equity ratio indicates the relative proportions of debt and equity on the company's balance sheet. At the end of this year, Nervana Electronics' creditors were providing 85 Piaster for each 1L.E. being provided by stockholders.

Creditors and stockholders have different views about the optimal debt-to-equity ratio. Ordinarily, stockholders would like a lot of debt to take advantage of positive financial leverage. On the other hand, because equity represents the excess of total assets over total liabilities, and hence a buffer of protection for the creditors, creditors would like to see less debt and more equity.

In practice, debt-to-equity ratios from 0.0 (no debt) to 3.0 are common. Generally speaking, in industries with little financial risk, creditors tolerate high debt-to-equity ratios. In industries with more financial risk, creditors demand lower debt-to-equity ratios.

Example:

Starbucks Corporation is the leading retailer and roaster of specialty coffee in North America, selling freshly brewed coffee, pastries, and coffee beans. Data (slightly modified) from the company's financial statements are as follows:

Starbucks Corporation Comparative Balance Sheet (dollars in millions)		
	This Year	Last Year
Assets		
Current assets:		
Cash	\$ 281	\$ 313
Marketable securities	157	141
Accounts receivable	288	224
Inventories	692	636
Other current assets	278	216
Total current assets	1,696	1,530
Property and equipment, net	2,890	2,288
Other assets	758	611
Total assets	\$5,344	\$4,429
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	\$391	\$341
Short-term bank loans	710	700
Accrued payables	757	662
Other current liabilities	298	233
Total current liabilities	2,156	1,936
Long-term liabilities	904	265
Total liabilities	3,060	2,201
Stockholders' equity:		
Preferred stock	0	0
Common stock and additional paid-in capital	40	40
Retained earnings	2,244	2,188
Total stockholders' equity	2,284	2,228
Total liabilities and stockholders' equity	\$5,344	\$4,429

Starbucks Corporation Income Statement (dollars in millions)		This Year
Sales	\$9,411	
Cost of goods sold	3,999	
Gross margin	<u>5,412</u>	
Selling and administrative expenses:		
Store operating expenses	3,216	
Other operating expenses	294	
Depreciation and amortization	467	
General and administrative expenses	<u>489</u>	
Total selling and administrative expenses	<u>4,466</u>	
Net operating income	946	
Plus interest and other income	110	
Interest expense	<u>0</u>	
Net income before taxes	1,056	
Income taxes (about 36%)	<u>384</u>	
Net income	<u><u>\$ 672</u></u>	

Required:

1. Compute the return on total assets.
2. Compute the return on common stockholders' equity.
3. Is Starbucks' financial leverage positive or negative? Explain.
4. Compute the current ratio.
5. Compute the acid-test ratio.
6. Compute the inventory turnover.
7. Compute the average sale period.
8. Compute the debt-to-equity ratio.

Solution

1. Return on total assets:

Return on total assets =

$$\frac{\text{Net income} + [\text{Interest expense} \times (1 - \text{Tax rate})]}{\text{Average total assets}}$$

$$\frac{672 + [0 \times (1 - 0.36)]}{(5,344 + 4,429)/2}$$

$$= 13.8\%$$

2. Return on common stockholders' equity:

Return on common stockholders' equity =

$$\frac{\text{Net income} - \text{Preferred dividends}}{\text{Average common stockholders' equity}}$$

$$\frac{672 - 0}{(2,284 + 2,228)/2}$$

$$= 29.8\%$$

3. The company has positive financial leverage because the return on common stockholders' equity of 29.8% is greater than the return on total assets of 13.8%.

The positive financial leverage was obtained from current and long-term liabilities.

4. Current ratio:

Current ratio =

$$\frac{\text{Current assets}}{\text{Current liabilities}}$$

$$= 0.79 \quad \frac{1,696}{2,156}$$

5. Acid-test ratio:

Acid-test ratio =

$$\frac{\text{Cash} + \text{Marketable securities} + \text{Accounts receivable} + \text{Short-termnotes receivable}}{\text{Current liabilities}}$$

$$= \frac{281 + 157 + 288 + 0}{2,156}$$

$$= 0.34$$

6. Inventory turnover:

Inventory turnover =

$$\frac{\text{Cost of goods sold}}{\text{Average inventory balance}}$$

$$= \frac{3,999}{(692 + 636)/2}$$

$$= 6.02$$

7. Average sale period:

Average sale period =

$$\frac{365 \text{ days}}{\text{Inventory turnover}}$$

$$= \frac{365 \text{ days}}{6.02}$$

$$= 61 \text{ days}$$

8. Debt-to-equity ratio:

Debt-to-equity ratio =

$$\frac{\text{Total liabilities}}{\text{Stockholders' equity}}$$

$$= \frac{2,156 + 904}{2,284}$$

$$= 1.34$$

Exercises :**Exercise Number (1) :**

A comparative income statement is given below for Sahlool Company:

Sahlool Company
Comparative Income Statement

	This Year	Last Year
Sales	5,000,000	4,000,000
Cost of goods sold	<u>3,160,000</u>	<u>2,400,000</u>
Gross margin	<u>1,840,000</u>	<u>1,600,000</u>
Selling and administrative expenses:		
Selling expenses	900,000	700,000
Administrative expenses	<u>680,000</u>	<u>584,000</u>
Total selling and administrative expenses	<u>1,580,000</u>	<u>1,284,000</u>
Net operating income	260,000	316,000
Interest expense	<u>70,000</u>	<u>40,000</u>
Net income before taxes	190,000	276,000

The president is concerned that net income is down even though sales have increased during the year. The president is also concerned that administrative expenses have increased because the company made a concerted effort to cut waste out of the organization.

Required:

1. Express each year's income statement in common-size percentages. Carry computations to one decimal place.
2. Comment briefly on the changes between the two years.

Exercise Number (2):

Comparative financial statements for El Faramawy Company for the fiscal year ending December 31 appear on the following page. The company did not issue any new common or preferred stock during the year. A total of 600 thousand shares of common stock were outstanding.

The interest rate on the bond payable was 14%, the income tax rate was 22.5%, and the dividend per share of common stock was 0.75L.E. . The market value of the company's common stock at the end of the year was \$26. All of the company's sales are on account.

El Faramawy Company
Comparative Balance Sheet
(in thousands)

	This Year	Last Year
Assets		
<u>Current assets:</u>		
Cash	1,080	1,210
Accounts receivable, net	9,000	6,500
Inventory	12,000	10,600
Prepaid expenses	<u>600</u>	<u>500</u>
Total current assets	<u>22,680</u>	<u>18,810</u>
<u>Property and equipment:</u>		
Land	9,000	9,000
Buildings and equipment, net	<u>36,800</u>	<u>38,000</u>
Total property and equipment	<u>45,800</u>	<u>47,000</u>
Total assets	68,480	65,810
Liabilities and Stockholders' Equity		
<u>Current liabilities:</u>		
Accounts payable	18,500	17,400
Accrued payables	900	700
Notes payable, short term	<u>—</u>	<u>100</u>
Total current liabilities	<u>19,400</u>	<u>18,200</u>
<u>Long-term liabilities:</u>		
Bonds payable	<u>8,000</u>	<u>8,000</u>
Total liabilities	<u>27,400</u>	<u>26,200</u>
<u>Stockholders' equity:</u>		
Preferred stock	1,000	1,000
Common stock	2,000	2,000
Additional paid-in capital	<u>4,000</u>	<u>4,000</u>
Total paid-in capital	<u>7,000</u>	<u>7,000</u>
Retained earnings	<u>34,080</u>	<u>32,610</u>
Total stockholders' equity	<u>41,080</u>	<u>39,610</u>
Total liabilities and stockholders' equity	68,480	65,810

El Faramawy Company
Comparative Income Statement and Reconciliation
(in thousands)

	This Year	Last Year
Sales	66,000	64,000
Cost of goods sold	<u>43,000</u>	<u>42,000</u>
Gross margin	<u>23,000</u>	<u>22,000</u>
Selling and administrative expenses:		
Selling expenses	11,500	11,000
Administrative expenses	<u>7,400</u>	<u>7,000</u>
Total selling and administrative expenses	<u>18,900</u>	<u>18,000</u>
Net operating income	4,100	4,000
Interest expense	<u>800</u>	<u>800</u>
Net income before taxes	3,300	3,200
Income taxes	<u>1,320</u>	<u>1,280</u>
Net income	1,980	1,920
Dividends to preferred stockholders	60	<u>400</u>
Net income remaining for common stockholders	1,920	1,520
Dividends to common stockholders	<u>450</u>	<u>450</u>
Net income added to retained earnings	1,470	1,070
Retained earnings, beginning of year	<u>32,610</u>	<u>31,540</u>
Retained earnings, end of year	34,080	32,610

Required:

First :Compute the following financial ratios for common stockholders for this year:

1. Gross margin percentage.
2. Earnings per share of common stock.
3. Price-earnings ratio.
4. Dividend payout ratio.
5. Dividend yield ratio.
6. Return on total assets.
7. Return on common stockholders' equity.
8. Book value per share.

Second :Compute the following financial data for short-term creditors for this year:

1. Working capital.
2. Current ratio.
3. Acid-test ratio.
4. Accounts receivable turnover.
5. Average collection period.
6. Inventory turnover.
7. Average sale period.

Third :Compute the following financial ratios for long-term creditors for this year:

1. Times interest earned ratio.
2. Debt-to-equity ratio.

True/False:

1. Vertical analysis compares the results of financial information with a business in the same industry for a number of consecutive periods of time.
2. The quick ratio is especially useful in evaluating the liquidity of a company with fast moving inventories.
3. Deducting the cost of goods sold from net income gives us operating income.
4. The gross profit rate is gross profit expressed as a percentage of net sales.
5. The gross profit rate usually is lowest on fast moving merchandise and highest on specialty and novelty products.
6. When an income statement does not show gross profit or operating income it is called a consolidated statement.
7. ROE - return on equity - is measured by dividing net income by average number of shares outstanding.
8. The yield rate on stock is measured by dividing dividends per share by market price per share.
9. The trend in ratios is usually more useful than looking at a single year's ratio.
10. The acid test ratio includes marketable securities but does not include accounts receivable.
11. Comparative financial statements show side-by-side financial data for two or more companies.
12. The quality of earnings tends to be higher for a company that uses straight-line depreciation and defers costs whenever possible than for a company which uses accelerated depreciation and defers costs only when necessary.
13. If total current assets are \$130,000 at the end of Year 1, increase by \$40,000 by the end of Year 2, and increase by \$40,000 in Year 3, the percentage increase over the preceding year is less in Year 3 than in Year 2.
14. Working capital is the excess of current assets over current liabilities.
15. A company's liquidity refers to its ability to remain profitable.
16. Inventory is an example of a quick asset.
17. Current assets are those assets that can be converted into cash within a year and never longer.
18. The debt ratio is computed by dividing total liabilities by current assets.
19. The lower the current ratio, the more liquid the company appears.
20. The owners of a corporation are not personally responsible for the debts of the business.
21. A single-step and multiple-step income statement differs in form and in the amount of net income reported.
22. A company whose sales are growing at less than the rate of inflation may actually be selling less merchandise every year.
23. A company cannot be increasing its market share if its net sales are

declining.

24. Net income stated as a percentage of sales is one means of evaluating a company's ability to control its expenses.
25. A company whose future earnings are expected to rise substantially is likely to have a higher p/e ratio than a company whose future earnings are expected to decline.
26. From a creditor's point of view, the lower the debt ratio, the safer the creditors' position.
27. The price/earnings ratio is calculated by dividing EPS by the current market price of a share of the company's stock.
28. If the return on total assets is substantially below the cost of borrowing, common stockholders will benefit from a high debt ratio.
29. The return on equity may be either higher or lower than the return on assets.
30. The current ratio may be less than, equal to, or greater than the quick ratio.
31. The inventory turnover rate indicates how quickly inventory sells.
32. In a single-step income statement, all revenue items are listed then all expense items are combined and deducted from total revenue
33. In a classified balance sheet assets are subdivided into current assets, plant and equipment and other assets while liabilities are all classified as current.
34. The more pessimistic investors' expectations regarding a company's future performance the lower the p/e ratio is likely to be.
35. A company should carry the amount of working capital necessary to conduct operations not necessarily maximize it's working capital.

Answers

1 False	19 False
2 False	20 True
3 False	21 False
4 True	22 True
5 True	23 False
6 False	24 True
7 False	25 True
8 True	26 True
9 True	27 False
10 False	28 False
11 False	29 True
12 False	30 False
13 True	31 True
14 True	32 True
15 False	33 False
16 False	34 True
17 False	35 True
18 False	

Multiple Choice

1. In order for investors and creditors to decide whether to invest in a company or loan a company funds they may
 - A) Analyze financial statements
 - B) Focus on corporate governance

- C) Both of the above
 - D) Neither of the above.
2. A comparative financial statement
- A) Places the balance sheet, the income statement and the statement of cash flows side by side in order to compare the results.
 - B) Places two or more years of a financial statement side by side in order to compare results
 - C) Places the financial statements of two or more companies side by side in order to compare results.
 - D) Places the dollar amounts next to the percentage amounts of a given year for the income statement
3. The changes in financial statement items from a base year to following years are called:
- A) Money changes
 - B) Trend percentages
 - C) Component percentages
 - D) Ratios
4. The measurement of the relative size of each item included in a total is called:
- A) Money changes
 - B) Trend percentages
 - C) Component percentages
 - D) Ratios
5. One number expressed as a percentage of another is called:
- A) Money changes
 - B) Trend percentages
 - C) Component percentages
 - D) Ratios
6. The excess of current assets over current liabilities is called:
- A) Current ratio
 - B) Working capital
 - C) Debt ratio
 - D) Quick ratio
7. Quick assets include
- A) Cash, marketable securities and receivables
 - B) Cash, marketable securities and inventories
 - C) Cash, inventories and receivables
 - D) Market securities, receivables and inventories.
8. The ratio which measures total liabilities as a percentage of total assets is called:
- A) Current ratio
 - B) Working capital
 - C) Debt ratio
 - D) Quick ratio
9. The price/earnings ratio is measured by dividing

- A) Book value by earnings per share
B) Par value by earnings per share
C) Market value by earnings per share
D) Market value by total net income
10. The principle factors affecting the quality of working capital are:
A) The nature of the current assets
B) The length of time to convert current assets into cash
C) Both A and B
D) Neither A nor B
11. All of the following ratios are considered measures of profitability except:
A) Earnings per share
B) Gross profit rate
C) Price earnings ratio
D) Return on assets
12. All of the following ratios are considered measures of liquidity except:
A) Quick ratio
B) Debt ratio
C) Current ratio
D) Receivables turnover rate
13. The term classified financial statements refers:
A) To the financial statements of all companies working on government projects.
B) Only to the financial statements of defense contractors working on secret projects.
C) To financial statements prepared for use by management, but not for distribution outside of the organization.
D) To financial statements in which items with certain characteristics are placed together in a group in an effort to develop useful subtotals.
14. Comparative financial statements compare the company's current statements with:
A) Those of prior periods.
B) Those of other companies in the same industry.
C) Those of the company's principal competitor.
D) The budgeted level of performance for the period.
15. Which of the following is not a measure of short-term liquidity?
A) Quick ratio.
B) Working capital.
C) Current ratio.
D) Debt ratio.
16. The current ratio will be _____ the quick ratio.
A) Less than.
B) Greater than or equal to.
C) The same as.
D) Always different than.

17. Which of the following is not a measure of long-term credit risk?
- A) Quick ratio.
 - B) Debt ratio.
 - C) Interest coverage ratio.
 - D) Trend in net cash provided by operating activities.
18. A high quality of earnings is indicated by:
- A) Earnings derived largely from newly introduced products.
 - B) Declaration of both cash and stock dividends.
 - C) Use of the FIFO method of inventory during sustained inflation.
 - D) A history of increasing earnings and conservative accounting methods.
19. In evaluating the quality of a company's earnings, which of the following factors is least important?
- A) The accounting methods used by management.
 - B) The trend of the company's earnings over a period of years.
 - C) The dollar amount of earnings per share.
 - D) The stability and sources of the company's earnings.
20. The measures most often used in evaluating solvency--the current ratio, quick ratio, and amount of working capital are developed from amounts appearing in the:
- A) Balance sheet.
 - B) Income statement.
 - C) Statement of retained earnings.
 - D) Statement of cash flows.
21. Which of the following is not a measure of profitability?
- A) EPS.
 - B) ROI.
 - C) ROE.
 - D) NLR.
22. Which American industry would tend to have the greatest debt ratio?
- A) Auto.
 - B) Retail clothing.
 - C) Manufacturing.
 - D) Banking.
23. The current ratio:
- A) Is computed by dividing current assets by current liabilities.
 - B) Is computed by subtracting current liabilities from current assets.
 - C) Remains unchanged throughout the operating cycle.
 - D) Is a measure of short-term profitability.
24. Component percentages indicate the relative size of each item included in a total. Which of the following statements is true?
- A) Income statement items are expressed as a percentage of net income and balance sheet items as a percentage of total assets.
 - B) Income statement items are expressed as a percentage of sales and balance sheet items as a percentage of total assets.

- C) Income statement items are expressed as a percentage of net income and balance sheet items as a percentage of net worth.
- D) Both income statement and balance sheet items are expressed as a percentage of net worth.
25. How would a company's working capital be affected if a substantial amount of accounts payable were paid in cash?
- A) It would be unaffected.
 - B) It would fall.
 - C) It would increase.
 - D) The change would depend on the relationship between the payables liquidated and current liabilities.
26. Current assets are those assets that can be converted into cash within:
- A) One year and never longer.
 - B) One year or the operating cycle, whichever is longer.
 - C) One year or the operating cycle, whichever is shorter.
 - D) Management's discretion.
27. The current ratio is calculated by:
- A) Dividing current assets by total assets.
 - B) Dividing current assets by total liabilities.
 - C) Dividing current assets by stockholders' equity.
 - D) Dividing current assets by current liabilities.
28. The quick ratio:
- A) Is computed by dividing current assets by current liabilities.
 - B) Is always higher than the current ratio.
 - C) Cannot be higher than the current ratio.
 - D) May be higher or lower than the current ratio.
29. Short-term creditors are most likely to use the quick ratio instead of the current ratio in evaluating the solvency of a company with large, slow-moving:
- A) Plant and equipment.
 - B) Receivables.
 - C) Inventories.
 - D) Employees.
30. Which of the following is considered a quick asset?
- A) Accounts receivable.
 - B) Inventory.
 - C) Automobiles.
 - D) Prepaid expenses.
31. Which of the following transactions would cause a change in the amount of a company's working capital?
- A) Collection of an account receivable.
 - B) Payment of an account payable.
 - C) Borrowing cash over a 60-day period.
 - D) Selling merchandise at a price above its cost.
32. The debt ratio indicates the percentage of:

- A) Total assets financed by long-term mortgages.
B) Revenue consumed by interest expense.
C) Total assets financed by creditors.
D) Total liabilities classified as current.
33. The debt ratio is used primarily as a measure of:
A) Short-term liquidity.
B) Creditors' long-term risk.
C) Profitability.
D) ROI.
34. Generally speaking, which appears to be a desirable current ratio?
A) 20 to 1.
B) 1 to 20.
C) 2 to 1.
D) 1 to 2.
35. All of the following captions or subtotals are typical of a multiple-step income statement except for:
A) Net sales.
B) Gross profit.
C) Total costs and expenses.
D) Operating income.
36. When comparing the current ratio to the quick ratio:
A) The current ratio will always be greater
B) The quick ratio will always be greater
C) The quick ratio is sometimes greater and sometimes less than the current ratio
D) They always will be the same
37. The gross profit rate represents:
A) Total sales revenue.
B) The percentage change in net sales from the prior period.
C) The percentage of sales revenue remaining after providing for the cost of the merchandise sold.
D) Net income stated as a percentage of total sales revenue.
38. A rising gross profit rate most strongly suggests:
A) An increase in physical sales volume.
B) Strong consumer demand for the company's products.
C) Intense competition.
D) Increased short-term solvency.
39. Operating income excludes each of the following, except:
A) Interest expense.
B) Income taxes.
C) Depreciation.
D) Prepaid expenses.
40. Assume that net sales are increasing faster than the rate of inflation, and that the company's gross profit rate is rising. Of the following, the most logical

conclusion is that:

- A) The company's cost of purchasing merchandise is rising rapidly.
- B) Operating expenses are falling.
- C) Demand for the company's products is very strong.
- D) The company has achieved an increase in sales volume by reducing its sales prices.

41. In calculating EPS, the denominator of the equation includes:

- A) Only common stock outstanding.
- B) Common stock plus preferred stock.
- C) Common stock less preferred stock.
- D) The total shares of authorized common stock.

42. On common size income statements, each component in the income statement is represented as a percentage of:

- A) Net income.
- B) Sales.
- C) Total assets.
- D) Profit.

43. In a multiple-step income statement, interest expense usually is not classified as an operating expense because interest charges:

- A) Do not contribute to the production of revenue.
- B) Stem from the manner in which assets are financed, not the manner in which they are used in business operations.
- C) Relate directly to the cost of goods sold.
- D) The statement is incorrect. Interest usually is classified as an operating expense.

44. In a multiple-step income statement, income taxes are not classified as operating expenses because:

- A) Income taxes do not contribute to the production of revenue.
- B) Income taxes stem from the manner in which assets are financed, not the manner in which they are used in business operations.
- C) Not all forms of business organization are subject to income taxes.
- D) The statement is incorrect; income taxes are classified as operating expenses.

45. Traditionally, stock of financially sound companies with stable earnings usually have a price/earnings ratio of:

- A) 90.
- B) 12.
- C) 1/4.
- D) 3.

46. Return on equity computations are used in evaluating:

- A) Liquidity.
- B) Profitability.
- C) Gross profit.
- D) Whether a ratio is improving or deteriorating over time.

47. The financial ratio intended to measure the effectiveness with which

management has utilized the resources of the business, regardless of how these resources are financed, is:

- A) Gross profit rate.
- B) Current ratio.
- C) Return on assets.
- D) Return on equity.

48. The return on assets usually is computed as:

- A) Net sales divided by average total assets.
- B) Gross profit divided by average total assets.
- C) Operating income divided by average total assets.
- D) Net income divided by average total assets.

49. If a company has a current ratio of 2 to 1, and purchases inventory on credit, what will this do to its current ratio?

- A) Increases the current ratio.
- B) Decreases the current ratio.
- C) Does not change the current ratio.
- D) Cannot be determined.

50. The return on equity usually is computed as:

- A) Net income divided by average total assets.
- B) Operating income divided by average total stockholders' equity.
- C) Gross profit divided by average total stockholders' equity.
- D) None of the above answers is correct.

51. The measurement that best reflects investors' expectations about future earnings is:

- A) Earnings per share.
- B) Return on assets.
- C) The price/earnings ratio.
- D) Return on equity.

52. The interest coverage ratio is computed by dividing:

- A) Operating income by annual interest expense.
- B) Net income by annual interest expense.
- C) Carrying value of bonds by cash interest payments.
- D) Earnings per share by the prime interest rate.

53. Unified Corporation's net income was \$1,800,000 in 2021 and \$600,000 in 2022. What percentage increase in net income must Unified achieve in 2023 to offset the decline in profits in 2022?

- A) 75%.
- B) 300%.
- C) 33.33%.
- D) 800%.

54. If a retail store has a current ratio of 2 1/2 to 1 and current assets of \$175,000, the amount of working capital is:

- A) \$ 70,000.
- B) \$262,500.

- C) \$225,000.
D) \$105,000.

55. The ABC company has working capital of \$180,000 and a current ratio of 3 to 1. The amount of current assets is:

- A) \$135,000.
B) \$180,000.
C) \$270,000.
D) \$ 90,000.

56. During the years 2021 through 2023, X, Inc., reported the following amounts of net income (dollars in thousands):

2021	2022	2023
110	130	150

Relative to the prior year, the percentage change in net income:

- A) Was the same in 2022 and 2023.
B) Was larger in 2023 than in 2022.
C) Was smaller in 2023 than in 2022.
D) Cannot be determined without knowing how many shares of stock were outstanding.

Answers

1C	29C
2B	30A
3B	31D
4C	32C
5D	33B
6B	34C
7A	35C
8C	36A
9C	37C
10C	38B
11C	39C
12B	40C
13D	41A
14A	42B
15D	43B
16B	44A
17A	45B
18D	46B
19C	47C
20A	48C
21D	49B
22D	50D
23A	51C
24B	52A

25A	53B because $1,800,000/600,000 = 3$ or 300%
26B	54 D because $175,000 - (175,000/2.5) = 105,000$
27D	55C because $3CL - CL = 180,000$: CL = 90,000; CA=270,000
28C	56 C because $20/130$ less than $20/110$

The following refers to questions 57-60

Shown below are selected data from the balance sheet of XYZ, a small electronics store (dollar amounts are in thousands):

Cash	\$50
Accounts receivable	90
Inventory	160
Total assets	600
Current liabilities	200
Non current liabilities	250

57. Refer to the above data. The quick ratio is:

- A) 1.5 to 1.
- B) 0.7 to 1.
- C) 0.45 to 1.
- D) Some other amount.

Answer: B

Because:

$$(50 + 90)/200 = 0.7$$

58. Refer to the above data. The current ratio is:

- A) 5.0 to 1.
- B) 1.5 to 1.
- C) 0.7 to 1.
- D) Some other amount.

Answer: B

Because:

$$(50 + 90 + 160)/200 = 1.5$$

59. Refer to the above data. Working capital amounts to:

- A) \$150,000.
- B) \$250,000.
- C) \$100,000.
- D) Some other amount.

Answer: C

Because:

$$300 - 200 = 100$$

60. Refer to the above data. Megabyte's debt ratio is:

- A) 75%.

- B) 25%.
- C) 60%.
- D) Some other amount.

Answer: A

Because:

$$450/600 = 75\%$$

The following refers to questions 61-64

Shown below are selected data from the balance sheet of Select Auto Parts, a retail store (dollar amounts are in thousands):

Cash	\$110
Accounts receivable	310
Inventory	335
Total assets	1,055
Current liabilities	285
Non current liabilities	235

61. Refer to the above data. The quick ratio is:

- A) 5%.
- B) 1.5 to 1.
- C) 20%.
- D) Some other amount.

Answer: B

Because:

$$(110 + 310)/285 = 1.47$$

62. Refer to the above data. The current ratio is:

- A) 1.2 to 1.
- B) Less than 2 to 1, but not 1.2 to 1.
- C) 2.6 to 1.
- D) More than 2 to 1, but not 2.6 to 1.

Answer: C

Because:

$$(110 + 310 + 335)/285 = 2.65$$

63. Refer to the above data. Working capital amounts to:

- A) \$470,000
- B) \$530,000
- C) \$270,000
- D) Some other amount.

Answer: A

Because:

$$(110 + 310 + 335) - 285 = 470$$

64. Refer to the above data. Select's debt ratio is:

- A) 22%.

- B) 27%.
 C) 57%.
 D) Some other amount.

Answer: D

Because:

$$(285 + 235)/1055 = 49\%$$

The following refers to questions 65-69

Shown below are selected data from the financial statements of Ideal Co. (dollar amounts are in millions, except for the per share data).

Income statement data:	
Net sales	\$1,540
Cost of goods sold	660
Operating expenses	550
Net income	440
Balance sheet data:	
Average total equity	3,000
Average total assets	5,000

Per share data (these amounts stated in actual dollars, not millions):

Ideal reported earnings per share for the year of \$5 and paid cash dividends of \$1 per share. At year end, the Wall Street Journal listed Ideal's capital stock as trading at \$110 per share.

65. Refer to the above data. Ideal's gross profit rate was:

- A) 42.9%.
 B) 57.1%.
 C) 20.0%.
 D) Some other amount.

Answer: B

Because:

$$1,540 - 660 = 880; 880/1,540 = 57.1\%$$

66. Refer to the above data. Ideal's operating income was (in millions):

- A) \$880.
 B) \$440.
 C) \$330.
 D) Some other amount.

Answer: C

Because:

$$1,540 - 660 - 550 = 330$$

67. Refer to the above data. Ideal's return on assets was:

- A) 10%.
 B) 6%.
 C) 15%.

D) Some other percentage.

Answer: B

Because:

$$330/5,000 = .6\%$$

68. Refer to the above data. Ideal's return on equity was:

- A) 11%.
- B) 25%.
- C) 7.5%.
- D) 14.7%.

Answer: D

Because:

$$440/3,000 = 14.7\%$$

69. Refer to the above data. Ideal's price/earnings ratio at year end was:

- A) 25.
- B) 22.
- C) 100.
- D) Some other amount.

Answer: B

Because:

$$110/5 = 22$$

Use the following to answer 70-74

Shown below are selected data from the financial statements of Marquis Computers. (Dollar amounts are in millions, except for the per share data.)

Income statement data:	
Net sales	\$3,900
Cost of goods sold	2,100
Operating expenses	750
Net income	128
Balance sheet data:	
Average total equity	600
Average total assets	4,900

Per share data (these amounts stated in actual dollars, not millions):

Marquis reported earnings per share for the year of \$7 and paid cash dividends of \$2.00 per share. At year end, the Wall Street Journal listed Marquis's capital stock as trading at \$90 per share.

70. Refer to the above data. Marquis's price/earnings ratio at year end was:

- A) .7.
- B) 13.
- C) 17.
- D) Some other amount.

Answer: B

Because:

$$90/7 = 13$$

71. Refer to the above data. Marquis's gross profit rate was:

- A) 18%.
- B) 46%.
- C) 50%.
- D) Some other amount.

Answer: B

Because:

$$(3,900 - 2,100)/3,900 = 46\%$$

72. Refer to the above data. Marquis's operating income was:

- A) \$1,800.
- B) \$750
- C) \$1,050.
- D) Some other amount.

Answer: C

Because:

$$3,900 - 2,100 - 750 = 1,050$$

73. Refer to the above data. Marquis's return on assets was:

- A) 2.6%
- B) 21%.
- C) 26%.
- D) Some other amount.

Answer: B

Because:

$$1,050/4,900 = 21\%$$

74. Refer to the above data. Marquis's return on equity was:

- A) 10%.
- B) 13%.
- C) 21%.
- D) Some other amount.

Answer: C

Because:

$$128/600 = 21\%$$

The following refers to questions 75-79

Given below are comparative balance sheets and an income statement for Garnet Corporation

Garnet Corporation Balance Sheets – 2007			Garnet Corporation Income Statement for the year ended 2007	
	Dec. 31	Jan. 1		
Cash	\$ 12,000	\$ 12,000	Sales	\$176,000
Accounts receivable	36,000	29,000	Cost of goods sold	(105,800)
Inventory	25,000	28,000	Gross profit on sales	\$ 70,200
Equipment (net)	44,000	51,000	Operating expenses	(58,360)
	<u>\$117,000</u>	<u>\$120,000</u>	Operating income	\$ 11,840
Accounts payable	20,000	22,000	Interest expense and income taxes	(7,000)
Dividends payable	6,000	3,000	Net income	<u>\$ 4,840</u>
Long-term note payable	11,000	11,000		
Capital stock, \$5 par	56,000	56,000		
Retained earnings	24,000	28,000		
	<u>\$117,000</u>	<u>\$120,000</u>		

All sales were made on account. Cash dividends declared during the year totaled \$8,840

75. Refer to the above data. Garnet Corporation's accounts receivable turnover for 2007 is:

- A) 4.6 times.
- B) 2.9 times.
- C) 5.4 times.
- D) 68 days.

Answer: C

Because:

$$176,000 / [(36,000 + 29,000)/2] = 5.4$$

76. Refer to the above data. Garnet Corporation's inventory turnover for 2007 is:

- A) 6.6 times.
- B) 3.9 times.
- C) 4.1 times.
- D) 94 days.

Answer: B

Because:

$$105,800 / [(25,000 + 28,000)/2] = 3.9$$

77. Refer to the above data. Garnet Corporation's gross profit rate for 2007 is:

- A) 60.1%.
- B) 39.9%.
- C) 33%.
- D) 68%.

Answer: B

Because:

$$70,200/176,000 = 39.9\%$$

78. Refer to the above data. Garnet Corporation's return on assets for 2007, rounded to the nearest tenth of a percent, is:

- A) 9.9%.
- B) 4.1%.
- C) 5.9%.
- D) 16.9%.

Answer: A

Because:

$$11,840/[117,000 + 120,000]/2] = 9.9\%$$

79. Refer to the above data. Garnet Corporation's return on common stockholders' equity for 2007, rounded to the nearest tenth of a percent, is:

- A) 5.9%.
- B) 6.05%.
- C) 14.4%.
- D) 9.4%.

Answer: A

Because:

$$4,840/[(80,000 + 84,000)/2] = 5.9\%$$

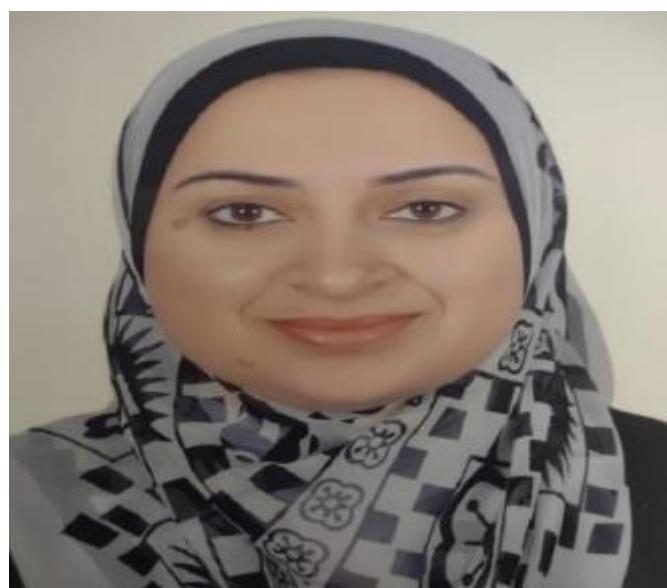
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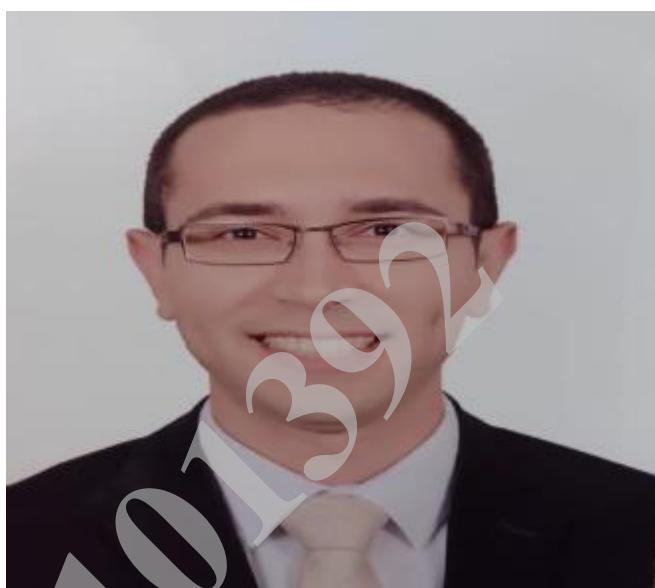
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Dr. Elham Mohammed Sahlool
Assistant Professor of Accounting
Helwan University
Faculty of Commerce and Business Administration
Accounting Department
From February 2018 Till now



Dr. Abdelrahman Mostafa Faramawy
Assistant Professor of Accounting
Helwan University
Faculty of Commerce and Business Administration
Accounting Department
From February 2018 Till now

CHAPTER FIVE

Introduction to Budgeting

Introduction:

Management seeks to turn its strategies into action plans. These action plans include financial details that are compiled in a master budget. **The budgeting process** serves several purposes, including motivating employees and communicating with them. **The budget process** also helps coordinate a company's activities toward common goals and is useful in evaluating results and management performance.

A **budget** is a formal written statement of management's plans for a specified future time period, expressed in financial terms. It represents the primary method of communicating agreed-upon objectives throughout the organization. Once adopted, a budget becomes an important basis for evaluating performance. It promotes efficiency and serves as a deterrent to waste and inefficiency. We consider the role of budgeting as a **control device**.

Budgeting and Accounting:

Accounting information makes major contributions to the budgeting process. From the accounting records, companies can obtain historical data on revenues, costs, and expenses. These data are helpful in formulating future budget goals.

Normally, accountants have the responsibility for presenting management's budgeting goals in financial terms. In this role, they translate management's plans and communicate the budget to employees throughout the company.

They prepare periodic budget reports that provide the basis for measuring performance and comparing actual results with planned objectives. The budget itself and the administration of the budget, however, are entirely management responsibilities.

The Benefits of Budgeting:

The primary benefits of budgeting are as follows.

1. It requires all levels of management to *plan* and formalize goals on a recurring basis.

2. It provides **definite objectives** for evaluating performance at each level of responsibility.
3. It creates an **early warning system** for potential problems so that management can make changes before things get out of hand.
4. It facilitates the **coordination of activities** within the business. It does this by correlating the goals of each segment with overall company objectives. Thus, the company can integrate production and sales promotion with expected sales.
5. It results in greater **management awareness** of the entity's overall operations and the impact on operations of external factors, such as economic trends.
6. It motivates personnel throughout the organization to meet planned objectives.

A **budget** is an aid to management; it is not a substitute for management. A budget cannot operate or enforce itself. Companies can realize the benefits of budgeting only when managers carefully administer budgets.

Essentials of Effective Budgeting:

Effective budgeting depends on a sound organizational structure. In such a structure, authority and responsibility for all phases of operations are clearly defined. Budgets based on research and analysis are more likely to result in realistic goals that will contribute to the growth and profitability of a company.

And the effectiveness of a budget program is directly related to its acceptance by all levels of management.

Once adopted, the budget is an important tool for evaluating performance. Managers should systematically and periodically review variations between actual and expected results to determine their cause(s). However, individuals should not be held responsible for variations that are beyond their control.

LENGTH OF THE BUDGET PERIOD:

The budget period is not necessarily one year in length.

A budget may be prepared for any period of time.

Various factors influence the length of the budget period. These factors include the type of budget, the

nature of the organization, the need for periodic appraisal, and prevailing business conditions.

The budget period should be long enough to provide an attainable goal under normal business conditions.

Ideally, the time period should minimize the impact of seasonal or cyclical fluctuations. On the other hand, the budget period should not be so long that reliable estimates are impossible.

The most common budget period is one year. The annual budget, in turn, is often supplemented by monthly and quarterly budgets. Many companies use continuous 12-month budgets. These budgets drop the month just ended and add a future month. One benefit of continuous budgeting is that it keeps management planning a full year ahead.

The Different Types of Budgets:

There are many different ways that companies create budgets. Some companies will use the previous year's results and modify for expected changes. In this traditional format, managers

must only justify changes to the budget from the previous year's actual results. As an alternative, budgets can also be developed using a zero-based budget (ZBB). In zero based budgeting, all revenues and expenses must be justified for each new period. This approach assumes that operations are being started for the first time and the previous year's actual results are ignored. Zero-based budgeting is an effective way to limit the inflation of budgets and control unnecessary expenses. Because there are many different ways budgets are created and many different purposes, there are many different types of budgets. Let's look at some different types.

Strategic and Operational Budgets:

The term strategic generally indicates a long-term goal. A company will develop strategies such as becoming the cost leader in a particular

market or expanding into international markets.

It may take several years to achieve these goals.

A strategic budget is a long-term financial plan used to coordinate the activities needed to achieve the long-term goals of the company.

Strategic budgets often span three to 10 years.

Because of their longevity, they often are not as detailed as budgets for shorter periods.

The term operational generally indicates a short-term goal. After the company develops strategies and creates a strategic budget, the next step is to plan for shorter periods. An operational budget is a short-term financial plan used to coordinate the activities needed to achieve the short-term goals of the company. Operational budgets are generally much more detailed than strategic budgets. Operational budgets are most often one year in length (generally encompassing the fiscal year) but may also span only a week, a month, or

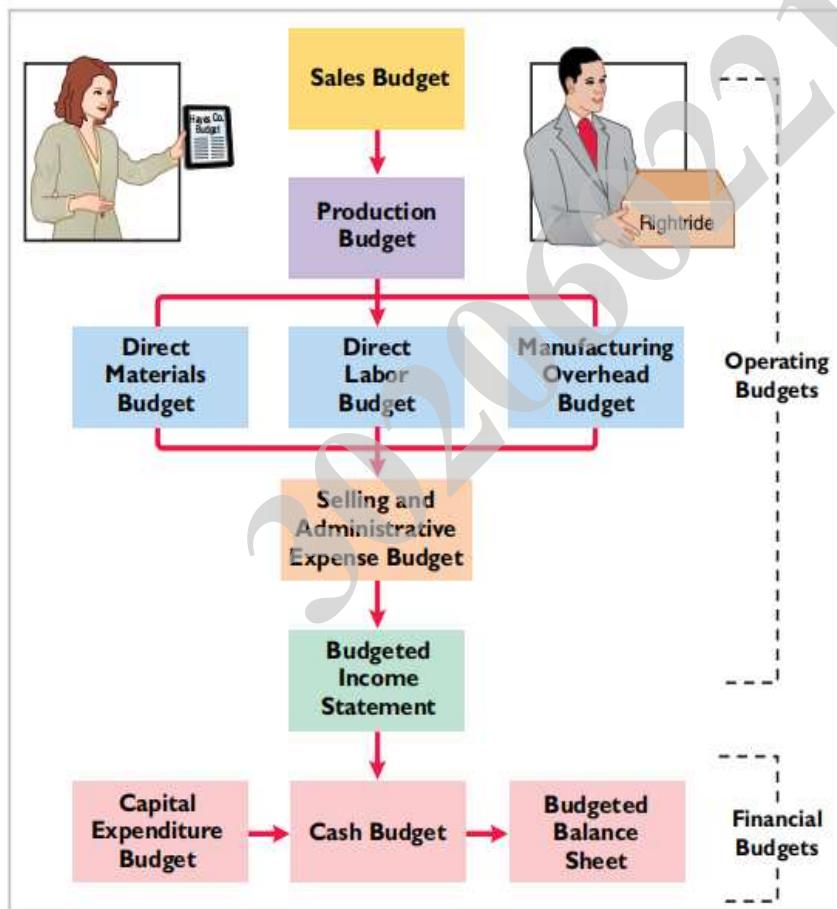
*a quarter depending on the company's needs. Some companies develop a variation of an operational budget that maintains a continuous projection into the future. A **continuous budget** is a type of operational budget that involves continuously adding one additional month as each month goes by. When a company uses continuous budgeting, the company revises the budget by replacing the month that just ended with a month at the end so there is always a continuous 12-month period. Continuous budgeting allows a company to constantly monitor the budget and keep track of current and future amounts.*

The Master Budget:

The term “budget” is actually a shorthand term to describe a variety of budget documents. All of

these documents are combined into a master budget.

The master budget is a set of interrelated budgets that constitutes a plan of action for a specified time period.



The master budget contains two classes of budgets. Operating budgets are the individual budgets that result in the preparation of the budgeted income statement. These budgets establish goals for the company's sales and production personnel. In contrast, financial budgets focus primarily on the cash resources needed to fund expected operations and planned capital expenditures. Financial budgets include the capital expenditure budget, the cash budget, and the budgeted balance sheet.

The master budget includes three types of budgets:

- 1. The operating budget**
- 2. The capital expenditures budget**
- 3. The financial budget**

The operating budget is the set of budgets that projects sales revenue, cost of goods sold, and selling and administrative expenses, all of which feed into the cash budget and then the budgeted financial statements. The first component of the operating budget is the sales budget, the cornerstone of the master budget. Why?

Because sales affect most other components of the master budget. The company should not produce products it does not expect to sell. Additionally, variable product and period costs are projected based on sales and production levels. Therefore, the sales budget is the first step in developing the master budget.

*The second type of budget is **the capital expenditures budget**. This budget presents the company's plan for purchasing property, plant, equipment, and other long-term assets.*

*The third type of budget is the financial budget. The **financial budget** includes the cash budget and the budgeted financial statements. Prior components of the master budget provide information for the first element of the financial budget: the cash budget. The **cash budget** details how the business expects to go from the beginning cash balance to the desired ending cash balance and feeds into the budgeted financial statements.*

These budgeted financial statements include the budgeted income statement and budgeted balance sheet and look exactly like ordinary financial statements. The

only difference is that they list budgeted (projected) amounts rather than actual amounts.

In creating the master budget, managers must think carefully about pricing, product lines, job assignments, needs for additional equipment, and negotiations with banks. **Successful managers** use this opportunity to make decisions that affect the future course of business.

The sales budget:

The sales budget is prepared first. Each of the other budgets depends on the sales budget. The **sales budget** is derived from the sales forecast. It represents management's best estimate of sales revenue for the budget period. An inaccurate sales budget may adversely affect net income. For example, an overly optimistic sales budget may result in excessive inventories that may have to be sold at reduced prices. In contrast, an unduly pessimistic sales budget may result in loss of sales revenue due to inventory shortages.

$$\text{Sale revenue} = \text{sales quantity} \times \text{selling price per unit}$$

Example (1):

A firm makes two products (A), (B) and is preparing its sales budget for the next period, the following information is available.

Expected Sales: (A) 40,000 units, (B) 30,000 units.

Selling price per unit: (A) \$ 10 and (B) \$ 15.

A firm distributes sales in Cairo and Alexandria at ratio 40% Cairo, 60% Alex.

Required: Prepare sales budget.

Solution

Sales budget

Product	Cairo			Alex			Total Q	Total V
	Q	P	V	Q	P	V		
A	16,000	10	160,000	24,000	10	240,000	40,000	400,000
B	12,000	15	180,000	18,000	15	270,000	30,000	450,000
							<u>70,000</u>	<u>850,000</u>

Production Budget:

The production budget shows the number of units of a product to produce to meet anticipated sales demand. Production requirements are determined from the following formula.

Budgeted Sales Units	+	Desired Ending Finished Goods Units	-	Beginning Finished Goods Units	=	Required Production Units
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The production budget, in turn, provides the basis for the budgeted costs for each manufacturing cost element.

Example (2):

ABC firm produce and sale product (X), the following information about budgeted sales units for the next four quarters.

Quarter 1	6000 units
Quarter 2	8000 units
Quarter 3	7000 units
Quarter 4	5000 units

If you know the target ending finished goods inventory is 10% from sales for the same period and the beginning finished goods inventory is 500 units.

Required: Prepare production budget.

Solution:

Production budget

Period	Sales units	Ending inventory	Beginning inventory	Production units
Quarter 1	6000	600	<u>500 (given)</u>	6,100
Quarter 2	8000	800	600	8,200
Quarter 3	7000	700	800	6,900
Quarter 4	5000	<u>500</u>	700	4,800
Total (Year)	26,000	<u>500</u>	<u>500</u>	26,000

Direct Materials Budget:

The **direct materials budget** shows both the quantity and cost of direct materials to be purchased. The quantities of direct materials are derived from the following formula.

$$\text{Required Direct Materials Units to Be Purchased} = \text{Direct Materials Units Required for Production} + \text{Desired Ending Direct Materials Units} - \text{Beginning Direct Materials Units}$$

After the company determines the number of units to purchase, it can compute the budgeted cost of direct materials to be purchased. It does so by multiplying the

required units of direct materials by the anticipated cost per unit.

The desired ending inventory is again a key component in the budgeting process.

So, the direct materials budget shows both the quantity and cost of direct materials to be purchased, as following:

1. Direct Material required for production =

production units x Direct material per unit

2. Direct materials units to be purchased =

Material required for production + Ending Material inventory – Beginning Material inventory.

3. Cost of direct materials purchases =

Direct materials purchases x Cost per unit of Material

Example (3):

Bronco Company produces and sales product (Z), to produce this product need two direct materials (A) and (B), and the following information is available:

Production units of product (Z) 10,000

	(A)	(B)
<i>Direct material per unit</i>	3 KG	5 KG
<i>Direct material cost per KG</i>	\$ 5	\$ 4
<i>Beginning Material inventory (KG)</i>	4000	2000
<i>Ending Material inventory (KG)</i>	3000	5000

Required: Prepare Direct Material Budget

Solution
Direct Material Budget

	Direct Materials	
	(A)	B
<i>Production units</i>	10,000	10,000
<i>x Direct material per unit</i>	3	5
<i>Direct Material required for production</i>	30,000	50,000
+ ending inventory	3,000	5,000
- Beginning inventory	(4,000)	(2,000)
<i>Direct materials units to be purchased</i>	29,000	53,000
<i>x Cost per unit</i>	5	4
<i>Cost of direct materials purchases</i>	145,000	212,000

Direct Labor Budget:

Like the direct materials budget, the direct labor budget contains the quantity (hours) and cost of direct labor

necessary to meet production requirements. The total direct labor cost is derived from the following formula.

Units to Be Produced	x	Direct Labor Hours per Unit	x	Direct Labor Cost per Hour	=	Total Direct Labor Cost
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The direct labor budget is critical in maintaining a labor force that can meet the expected levels of production.

Example (4):

Silver Bowl Company manufactures a single product, and the company is preparing its budgets for the next year. The following information is available:

Sales estimations:

Product (A)	
Expected Sales units	100,000 UNITS
Selling price per unit	300 \$

The product has the following material and labor requirements:

<i>Product (A)</i>		<i>Costs information</i>
<i>Direct Material per unit</i>	2 KG	<i>Direct material \$ 8 per KG.</i>
<i>Labor hours per unit</i>	4 hours	<i>Direct labor \$ 6 per hour.</i>

Inventory information:

	<i>Beginning inventory</i>	<i>Ending inventory</i>
<i>Product (A)</i>	20,000 UNITS	30,000 UNITS
<i>Material</i>	6,000 KG	12,000 KG

Required: Prepare the following Budgets: Sales Budget, production Budget, Direct material Budget, Direct labor budget.

Solution

Sales Budget :

<i>Expected Sales</i>	<i>100,000 UNIT</i>
<i>Selling Price</i>	<i>300</i>
<i>Expected Sales Revenue</i>	<i>30,000,000 \$</i>

Production Budget:

<i>Expected Sales units</i>	<i>100,000</i>
<i>+ Ending Inventory</i>	<i>30,000</i>
<i>- Beg. Inventory</i>	<i>(20,000)</i>
<i>Production Units</i>	<i>110,000 UNITS</i>

Direct material Budget:

<i>production units</i>	<i>110,000</i>
<i>× Needs From Material Per Unit</i>	<i>2</i>
<i>Requirements</i>	<i>220,000 K.G</i>
<i>+ Ending Inventory</i>	<i>12,000</i>
<i>- Beg. Inventory</i>	<i>(6,000)</i>
<i>Purchases</i>	<i>226,000 K.G</i>
<i>Cost Of Material Per Unit</i>	<i>8</i>
<i>Total Cost Of Purchased Material</i>	<i>1,808,000 \$</i>

Direct labor budget:

<i>production units</i>	<i>110,000 unit</i>
<i>× Needs From Labor Per Unit</i>	<i>4 hours</i>
<i>Requirements</i>	<i>440,000 hours</i>
<i>Cost of labor per unit</i>	<i>6</i>
<i>Total cost of labor</i>	<i>2,640,000 \$</i>

Manufacturing Overhead Budget:

The manufacturing overhead budget shows the expected manufacturing overhead costs for the budget period. This budget distinguishes between variable and fixed overhead costs.

The general and administrative expense budget plans:

The predicted operating expenses not included in the selling expenses budget. General and administrative expenses can be either variable or fixed with respect to sales volume. The office manager responsible for general administration often is responsible for preparing the initial general and administrative expense budget. Interest expense and income tax expense are often classified as general and administrative expenses in published income statements, but normally cannot be planned at this stage of the budgeting process. The prediction of interest expense follows the preparation of the cash budget and the decisions regarding debt. The predicted income tax expense depends on the budgeted amount of pretax income. Both interest and income taxes are usually beyond the control of the office manager. As a result, they are not used in comparison to the budget to evaluate that person's performance.

Example (5)

XYZ company produces 2 products, (A) and (B) and the company preparing its budgets for the next year. The following information is available:

Sales estimations:

	Product (A)	Product (B)
<i>Expected Sales units</i>	50,000	30,000
<i>Selling price per unit</i>	\$ 150	\$ 400

Each product has the following material and labor requirements:

	Product (A)	Product (B)
<u>Direct Material per unit</u>		
<i>Direct Material (K)</i>	1 KG	8 KG
<i>Direct Material (L)</i>	1.5 KG	10 KG
<u>Labor hours per unit</u>		
<i>Department (1)</i>	2 hours	6 hours
<i>Department (2)</i>	3 hours	4 hours

Costs information:

- Direct material \$ 4 per KG for material (K) and \$ 2 Per KG for material (L).
- Direct labor \$ 3 per hour in Department (1) and \$ 5 in Department (2).

- *Production overhead is \$ 119,700 in Department (1) and \$ 147,950 in Department (2) and are absorbed on **budgeted hours**.*
- *Selling overhead are \$ 140,000 and are absorbed on **sales units**.*
- *Administrative overhead is \$ 64,290 and is absorbed on **labor cost**.*

Inventory information:

	<i>Beginning inventory</i>	<i>Ending inventory</i>
<i>Product (A)</i>	<i>10,000 Units</i>	<i>15,000 Units</i>
<i>Product (B)</i>	<i>12,000 Units</i>	<i>8,000 Units</i>
<i>Material (K)</i>	<i>3,000 KG</i>	<i>6,000 KG</i>
<i>Material (L)</i>	<i>5,000 KG</i>	<i>3,500 KG</i>

Required: Prepare the following Budgets:

1. *Sales Budget.*
2. *Production Budget.*
3. *Direct material Requirements Budget.*
4. *Direct material cost budget.*
5. *Direct labor cost budget.*
6. *Production Overhead Budget.*
7. *Selling Overhead Budget.*
8. *Administration Overhead Budget.*

Solution

1- Sales Budget:

	<i>Sales units</i>	<i>Selling price per unit</i>	<i>Sales revenue</i>
Product (A)	50,000	150	7,500,000
Product (B)	30,000	400	12,000,000
TOTAL	<u>80,000</u>		<u>19,500,000</u>

2- Production Budget:

	<i>Sales units</i>	<i>Ending Inventory</i>	<i>Beginning Inventory</i>	<i>Production units</i>
Product (A)	50,000	15,000	10,000	<u>55,000</u>
Product (B)	30,000	8,000	12,000	<u>26,000</u>
TOTAL	<u>80,000</u>			<u>81,000</u>

3- Direct Material Requirements Budget:

Product	Production units	Material (K) Requirements		Material (L) Requirements	
		Per unit	Total	Per unit	Total
Product (A)	55,000	1	55,000	1.5	82,500
Product (B)	26,000	8	208,000	10	260,000
TOTAL			<u>263,000</u>		<u>342,500</u>

4-Direct Material Cost Budget:

	Materials Requirement	Ending Inventory	Beginning Inventory	Purchases	Cost per unit	Total Costs
Material (K)	263,000	6,000	3,000	266,000	4	1,064,000
Material (L)	342,500	3,500	5,000	341,000	2	682,000
TOTAL						<u>1,746,000</u>

5- Direct Labor Requirements Budget:

Product	Production units	Department (1) Requirements		Department (2) Requirements	
		hours per unit	Total	hours per unit	Total
Product (A)	55,000	2	110,000	3	165,000
Product (B)	26,000	6	156,000	4	104,000
Total hours			<u>266,000</u> <u>hours</u>		<u>269,000</u> <u>hours</u>

6- Direct Labor Cost Budget:

	Product (A)			Product (B)			Total Labor Costs
	Req.	Rate	Cost	Req.	Rate	Cost	
Department (1)	110,000	3	330,000	156,000	3	468,000	<u>798,000</u>
Department (2)	165,000	5	825,000	104,000	5	520,000	<u>1,345,000</u>
Total Labor Cost			<u>1,155,000</u>			<u>988,000</u>	<u>2,143,000</u>

7-Production overhead Budget:

Production overhead is \$ 119,700 in Department (1) and \$ 147,950 in Department (2) and are absorbed on budgeted hours.

Production overhead absorption rate =

$$\frac{\text{Production overhead}}{\text{Budgeted Hours}}$$

$$\text{Department (1)} = \frac{119,700}{266,000} = \$ 0.45 \text{ per hour}$$

$$\text{Department (2)} = \frac{147,950}{269,000} = \$ 0.55 \text{ per hour}$$

Production overhead Budget

	Product (A)			Product (B)			Total Costs
	Hours	Rate	Total Cost	Hours	Rate	Total Cost	
<i>Department (1)</i>	110,000	0.45	49,500	156,000	0.45	70,200	<u>119,700</u>
<i>Department (2)</i>	165,000	0.55	90,750	104,000	0.55	57,200	<u>147,950</u>
<u>Total Costs</u>			<u>140,250</u>			<u>127,400</u>	<u>267,650</u>

8- Selling Overhead Budget:

Selling overhead are \$ 140,000 and are absorbed on sales units.

Selling overhead absorption rates =

$$\frac{\text{selling overhead}}{\text{sales units}} \\ = \frac{140,000}{80,000} = \$ 1.75 \text{ per unit}$$

Selling overhead Budget

	Product (A)			Product (B)			Total Costs
	Sales	Rate	Total Cost	Sales	Rate	Total Cost	
Total Costs	50,000	1.75	87,500	30,000	1.75	52,500	140,000

9- Administrative Overhead Budget:

Administrative overhead is \$ 64,290 and is absorbed on labor cost.

Administrative overheads absorption rate =

$$\frac{\text{Administrative overhead}}{\text{Labor costs}} \\ = \frac{64,290}{2,143,000} = \$ 0.03$$

Administrative Overhead Budget

	Product (A)			Product (B)			Total Costs
	Labor Cost	Rate	Admin. Cost	Labor Cost	Rate	Admin. Cost	
<u>Total Costs</u>	<u>1,155,000</u>	<u>0.03</u>	<u>34,650</u>	<u>988,000</u>	<u>0.03</u>	<u>29,640</u>	<u>64,290</u>

Capital Expenditures Budget:

The capital expenditures budget lists dollar amounts to be both received from plant asset disposals and spent to purchase additional plant assets to carry out the budgeted business activities. It is usually prepared after the operating budgets. Since a company's plant assets determine its productive capacity, this budget is usually affected by long-range plans for the business. Yet the process of preparing a sales or purchases budget can reveal that the company requires more (or less) capacity, which implies more (or less) plant assets.

Capital budgeting is the process of evaluating and planning for capital (plant asset) expenditures. This is an important management task because these expenditures often involve long-run commitments of large amounts, affect predicted cash flows, and impact future debt and equity financing. This means that the capital expenditures budget is often linked with management's evaluation of the company's ability to take on more debt.

Financial Budgets After preparing its operating and capital expenditures budgets, a company uses information from these budgets to prepare at least three financial budgets: the cash budget, budgeted income statement, and budgeted balance sheet.

Cash Budget After developing budgets for sales, merchandise purchases, expenses, and capital expenditures, the next step is to prepare the cash budget, which shows expected cash inflows and outflows during the budget period. It is especially important to maintain a cash balance necessary to meet ongoing obligations. By preparing a cash budget, management can

prearrange loans to cover anticipated cash shortages before they are needed. A cash budget also helps management avoid a cash balance that is too large. Too much cash is undesirable because it earns a relatively low (if any) return. When preparing a cash budget, we add expected cash receipts to the beginning cash balance and deduct expected cash disbursements. If the expected ending cash balance is inadequate, additional cash requirements appear in the budget as planned increases from short-term loans. If the expected ending cash balance exceeds the desired balance, the excess is used to repay loans or to acquire short-term investments. Information for preparing the cash budget is mainly taken from the operating and capital expenditures budgets.

Budgeted Income Statement One of the final steps in preparing the master budget is to summarize the income effects. **The budgeted income statement** is a managerial accounting report showing predicted amounts of sales and expenses for the budget period. Information needed for preparing a budgeted income

statement is primarily taken from already prepared budgets. The volume of information summarized in the budgeted income statement is so large for some companies that they often use spreadsheets to accumulate the budgeted transactions and classify them by their effects on income.

Budgeted Balance Sheet *The final step in preparing the master budget is summarizing the company's financial position. The budgeted balance sheet shows predicted amounts for the company's assets, liabilities, and equity as of the end of the budget period.*

Essay questions

1. ABC Company plans to sell 33,000 units of a product during the month of May. The company plans to have 2,500 units on hand at the end of the month. If 1,200 units are on hand on May 1, **how many units must be produced during May?**
2. Jiggy Company plans to sell 33,000 units during the month of May. Beginning inventory was 1,200 units. The company plans to have 2,500 units on hand at the end of the month. Each unit requires 3 pounds of raw materials. If raw material inventory on May 1 is 4,400 pounds and desired ending inventory is 2,200 pounds, **how many pounds of raw materials must be purchased during May?**
3. Fedele Company has budgeted sales and production (in units) over the next three months as follows:

	January	February	March
Sales	50,000	?	80,000
Production	52,000	64,000	78,000

There are 10,000 units on hand on January 1. A minimum of 20 percent of the next month's sales in units must be on hand at the end of each month. April sales are expected to be 70,000. What is the budgeted sales for February?

4. Projected sales for Sommers, Inc., for next year and beginning and ending inventory data are as follows:

Sales 50,000 units

Beginning inventory 4,000 units

ending inventory 8,000 units

The selling price is \$40 per unit. Each unit requires four pounds of material which costs \$6 per pound. The beginning inventory of raw materials is 12,000 pounds. The company wants to have 3,000 pounds of material in inventory at the end of the year.

Required:

- A. Prepare Sommers' budgeted sales.
- B. Prepare Sommers' production budget.
- C. Prepare Sommers' material budget.

D. Prepare Sommers' budgeted total purchase cost of direct materials?

5. Budgeted sales for the first quarter for Cullison Company, a retailer, are as follows:

Budgeted Sales (Units)

January 75,000

February 100,000

March 110,000

Cullison started the year with an inventory of 7,500 units. The company likes to maintain an inventory equal to 10 percent of next month's budgeted sales.

What is budgeted purchases in units for February?

6. Arlo Company uses an annual cost formula for overhead of \$72,000 + \$1.60 for each direct labor hour worked. For the upcoming month, Arlo plans to manufacture 96,000 units. Each unit requires five minutes of direct labor.

What is Arlo's budgeted overhead for the month?

7. *Cal Company uses the following formula for annual overhead: \$360,000 + \$1.20 for each machine hour used. For the upcoming month, Cal plans to manufacture 6,000 units. Each unit requires 2 machine hours.*

What is Cal's budgeted overhead for the month?

8. *Mattingly Corporation sells a single product for \$150 per unit. Total sales were 6,000 units. The company is considering a 10 percent price reduction in order to stay competitive. It is estimated that such a reduction will increase sales volume by 10 percent. Assume a 40 percent tax rate. Costs are budgeted as follows:*

Direct material \$30 per unit.

Direct labor \$20 per unit.

Variable manufacturing overhead \$15 per unit.

Variable selling and administrative \$10 per unit.

Fixed manufacturing overhead \$100,000

Fixed selling and administrative \$80,000

Required: Prepare a budgeted income statement for next year assuming that the company reduces prices as planned.

9. Stephanie only sells one product, the water wiz. The water wiz sells for \$20 per unit. For the upcoming year, she expects to sell 20,000 units in the first quarter, 24,000 units in the second quarter, 33,000 units in the third quarter, and 40,000 units in the fourth quarter. In the first quarter of year 3, she expects to sell 21,000 units.

Required: Prepare The sales budget.

10. Stephanie wants to maintain a desired ending finished goods inventory in the current quarter equal to 10% of the next quarter's production. Stephanie began the first quarter of year with 2,000 units in the beginning finished goods inventory account. In the first quarter of year, the desired ending finished goods inventory is projected IN first quarter of year to be 2,700 units. and Estimated Sales each quarter of year (Q.(1)20000/ Q.(2)24000/ Q.(3)33000 / Q.(4) 40000)

Required: Prepare the production budget.

11. Delta Manufacturing has budgeted the following unit sales:

2016	Units
April	25,000
May	40,000
June	60,000
July	45,000

Of the units budgeted, 40% are sold by the Coastal Division at an average price of \$15 per unit and the remainder are sold by the Central Division at an average price of \$12 per unit.

Required: Prepare separate sales budgets for each division and for the company in total for the second quarter of 2017.

12. Perine Company has completed all of its operating budgets. The sales budget for the year shows 50,000 units and total sales of \$2,000,000. The total unit cost of making one unit of sales is \$22. Selling and administrative expenses are expected to be \$300,000. Income taxes are estimated to be \$150,000.

Required: Prepare a budgeted income statement for the year ending December 31, 2008.

13. Key Co. manufactures beanies. The budgeted units to be produced and sold are below:

	August	September
Expected Production	6,500	7,000
Expected Sales	6,200	7,100

It takes 5 metres of yarn to produce a beanie. The company's policy to maintain yarn at the end of each month equal to 25% of the next month's production needs and to maintain a finished goods inventory at the end of each month equal to 30% of next month's anticipated production needs. The cost of yarn is \$0.75 a metre. At August 1, 4,250 metres of yarn were on hand.

Required: Prepare a materials purchases budget for August.

14. Pulham Company is preparing its direct labor budget for 2016 from the following production budget based on a calendar year:

<u>Quarter</u>	<u>Units</u>
1	60,000
2	30,000
3	45,000
4	75,000

Each unit requires 2 hours of direct labor. The union contract provides for a 10% increase in wage rate to \$11 per hour on October 1.

Required: prepare labor budget.

15. Hayes Company expects sales volume to be 3,000 units in the first quarter, with 500-unit increases in each succeeding quarter. The variable expense rates per unit of sales are sales commissions \$3 and freight-out \$1. Variable expenses per quarter are based on the unit sales from the sales budget.

Fixed expenses per quarter:

Supervisory salaries	20000
Depreciation	3800
Property taxes and insurance	9000
Maintenance	5700

Required: prepare overhead budget.

16. In September 2012, the budget committee of Fidelity Company assembled the following data:

A. Expected Sales

October \$400,000

November 420,000

December 450,000

B. Cost of goods sold is expected to be 45% of sales.

C. Purchases for October are \$180,900.

D. Desired ending merchandise inventory is 10% of the next month's cost of goods sold.

Required: Prepare the budgeted income statement for October through gross profit on sales, including a cost of goods sold schedule.

17. Clark and Associates provides accounting services. It is preparing its quarterly budgeted income statement for 2013. Ms.Clark anticipates that billable hours (units)in the first quarter of 2013 will increase by 5% over the same quarter of the preceding year, and by 6% in the second quarter. There were 700 billable hours in the first quarter of 2012, and 600 in the second quarter.

Ms. Clark billed clients \$200 per hour (price per unit) in 2012, and due to strong competition is unable to raise that rate for the foreseeable future.

Salary expenses for both accountants and support staff are \$20,000 plus 70% of revenue per quarter. Income tax is 30%. Other quarterly expenses are estimated to be as follows:

Rent expense \$4,500

Depreciation 700

Utilities expense 2,100

Miscellaneous expenses 5% of revenue

Required: Prepare a budgeted quarterly income statement for the first quarter of 2013.

18. The budgeted unit sales of Weller Company for the upcoming fiscal year are provided below:

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Budgeted unit sales.	15,000	16,000	14,000	13,000

The company's variable selling and administrative expense per unit is \$2.50. Fixed selling and administrative expenses include advertising expenses of \$8,000 per quarter, executive salaries of \$35,000 per

quarter, and depreciation of \$20,000 per quarter. In addition, the company will make insurance payments of \$5,000 in the first quarter and \$5,000 in the third quarter. Finally, property taxes of \$8,000 will be paid in the second quarter.

Required: Prepare the company's selling and administrative expense budget for the upcoming fiscal year.

19. Coliseum Company has budgeted the following unit sales:

Quarter 1, 2006	60,000 Units
Quarter 2, 2006	50,000 Units
Quarter 3, 2006	40,000 Units
Quarter 4, 2006	80,000 Units

The finished goods inventory on hand on December 31, 2005, was 6,000 units. It is the company's policy to maintain a finished goods inventory at the end of each quarter equal to 10% of the next quarter's anticipated sales.

Required: Prepare a production budget for the second quarter of 2006.

True And False Question

1. *Budgets represent management's plans in financial terms.*
2. *Budgets promote efficiency and serve as a deterrent to waste.*
3. *A budget can be a means of communicating a company's objectives to external parties.*
4. *A budget facilitates coordination of activities within the business but is a poor tool for evaluating performance.*
5. *A budget is more beneficial if accepted by lower-level management.*
6. *The budget itself and the administration of the budget are the responsibility of management.*
7. *the most common budget period is one year.*
8. *The flow of input data for budgeting should be from the lowest levels of responsibility to the highest level.*
9. *Budgets, by their very nature, create a negative effect on human behavior within companies because they imply that management is trying to control.*

10. A budget committee coordinates the budget activities of a company.
11. The shorter the budget period, the more reliable the estimates of future outcomes.
12. Upper-level managers are responsible for preparing the entire budget.
13. The last step in the budgeting process is developing a sales forecast.
14. Budgeting and long-range planning differ in the emphasis and the time period involved.
15. Long-range plans are used primarily as an evaluation of specific results to be achieved.
16. Long-range plans reflect management's long-term plans encompassing five years or more.
17. The master budget consists of a plan of action for a specified time period.
18. Operating budgets must be completed before the financial budgets can be prepared.

19. *The production budget must be completed before the materials purchases budget because the number of units to be produced must be known to determine how much material to buy.*
20. *The number of direct labor hours needed for production is obtained from the direct labor budget.*
21. *Companies can use either a predetermined overhead rate or a manufacturing overhead budget.*
22. *The manufacturing overhead budget generally has separate sections for variable and fixed costs.*
23. *A sales budget should be prepared before the production budget.*
24. *The direct materials budget contains only quantity data so the purchasing department knows how much materials should be purchased.*
25. *The budgeted income statement indicates the expected amount of cash expected to be acquired from operations.*
26. *Companies that do not prepare cash budgets have significant cash deficiencies.*

27. In preparing the budgeted balance sheet, management should not be concerned if it does not balance since it does not reflect actual results.
28. The first budget prepared should be the sales budget.
29. A merchandiser has a merchandise purchases budget, and a manufacturer has a materials purchases budget.
30. A service company has no purchases budget.

Multiple Choice Questions

- 1. Which of the following is not a benefit of budgeting?**
 - a. Management can plan ahead.
 - b. An early warning system is provided for potential problems.
 - c. It enables disciplinary action to be taken at every level of responsibility.
 - d. The coordination of activities is facilitated.
- 2. The essentials of effective budgeting do not include:**
 - a. Top-down budgeting.
 - b. Management acceptance.
 - c. Research and analysis.
 - d. Sound organizational structure.

3. A sales budget is:

- a. Derived from the production budget.
- b. Management's best estimate of sales revenue for the year.
- c. Not the starting point for the master budget.
- d. Prepared only for credit sales.

4. Each of the following budgets is used in preparing the budgeted income statement except the:

- a. Sales budget.
- b. Selling and administrative budget.
- c. Capital expenditure budget.
- d. Direct labor budget.

5. Expected direct materials purchases in Read Company are \$70,000 in the first quarter and \$90,000 in the second quarter. Forty percent of the purchases are paid in cash as incurred, and the balance is paid in the following quarter. The budgeted cash payments for purchases in the second quarter are:

- a. \$96,000
- b. \$90,000
- c. \$78,000
- d. \$72,000

6. Budgeting is used to help companies

- a. plan to better satisfy customers.
- b. anticipate potential problems.
- c. focus on opportunities.
- d. do all of the above.

7. Which of the following statements is true?

- a. All organizations have the same set of budgets.
- b. All organizations are required to budget.
- c. Budgets are a quantitative expression of an organization's goals and objectives.
- d. Budgets should never be used to evaluate performance.

8. Which of the following is not an "operating" budget?

- a. sales budget
- b. production budget
- c. purchases budget
- d. capital budget.

- 9. The master budget is a static budget because it**
- a. is geared to only one level of production and sales.
 - b. never changes from one year to the next.
 - c. covers a preset period of time.
 - d. always contains the same operating and financial budgets.

- 10. The master budget is a**

- a. static budget.
- b. flexible budget.
- c. qualitative expression of a prior goal.
- d. qualitative expression of a future goal.

- 11. The master budget usually includes**

- a. an operating budget.
- b. a capital budget.
- c. pro forma financial statements.
- d. all of the above.

12. Which of the following is usually perceived as being the master budget's greatest advantage to management?

- a. performance analysis.
- b. increased communication.
- c. increased coordination.
- d. required planning.

13. the first part of the master budget to be prepared would be the

- a. sales budget.
- b. production budget.
- c. cash budget.
- d. pro forma financial statements

14. An example of a recurring short-term plan is

- a. a probable product line change.
- b. expansion of plant and facilities.
- c. a unit sales forecast.
- d. a change in marketing strategies.

15. It is least likely that a production budget revision would cause a revision in the

- a. capital budget.
- b. cash budget.
- c. purchases budget.
- d. pro forma balance sheet.

16. Budgeted production for a period is equal to

- a. the beginning inventory + sales - the ending inventory.
- b. the ending inventory + sales - the beginning inventory.
- c. the ending inventory + the beginning inventory - sales.
- d. sales - the beginning inventory + purchases.

17. Chronologically, in what order are the sales, purchases, and production budgets prepared?

- a. sales, purchases, production
- b. sales, production, purchases
- c. production, sales, purchases
- d. purchases, sales, production

18. The material purchases budget tells a manager all of the following except the

- a. quantity of material to be purchased each period.
- b. quantity of material to be consumed each period.
- c. cost of material to be purchased each period.
- d. cash payment for material each period.

19. The amount of raw material purchased in a period may be different than the amount of material used that period because

- a. the number of units sold may be different from the number of units produced.
- b. finished goods inventory may fluctuate during the period.
- c. the raw material inventory may increase/decrease during the period.
- d. companies often pay for material in the period after it is purchased.

20. A purchases budget is

- a. not affected by the firm's policy of granting credit to customers.
- b. the same thing as a production budget.
- c. needed only if a firm does not pay for its merchandise in the same period as it is purchased.
- d. affected by a firm's inventory policy only if the firm purchases on credit.

21. Which of the following equations can be used to budget purchases?

(BI = beginning inventory, EI = ending inventory desired, CGS = budgeted cost of goods sold, P = budgeted purchases)

- a. $P = CGS + BI - EI$
- b. $P = CGS + BI$
- c. $P = CGS + EI + BI$
- d. $P = CGS + EI - BI$

22. Both the budgeted quantity of material to be purchased and the budgeted quantity of material to be consumed can be found in the

- a. material purchases budget.
- b. production budget.
- c. pro forma income statement.
- d. cash budget.

23. A company that maintains a raw material inventory, which is based on the following month's production needs, will purchase less material than it uses in a month where

- a. sales exceed production.
- b. production exceeds sales.
- c. planned production exceeds the next month's planned production.
- d. planned production is less than the next month's planned production.

24. If a company has a policy of maintaining an inventory of finished goods at a specified percentage of the next month's budgeted sales, budgeted production for January will exceed budgeted sales for January when budgeted

- a. February sales exceed budgeted January sales.
- b. January sales exceed budgeted December sales.
- c. January sales exceed budgeted February sales.
- d. December sales exceed budgeted January sales.

25. Depreciation on the production equipment would appear in which of the following budgets?

- a. cash budget
- b. production budget
- c. selling and administrative expense budget
- d. manufacturing overhead budget

26. The selling, general, and administrative expense budget is based on the..... budget.

- a. production
- b. sales
- c. cash
- d. purchases

27. The budgeted amount of selling and administrative expense for a period can be found in the.....

- a. sales budget.
- b. cash budget.
- c. pro forma income statement.
- d. pro forma balance sheet.

28. Which of the following represents a proper sequencing in which the budgets below are prepared?

- a. Direct Material Purchases, Cash, Sales.
- b. Production, Sales, Income Statement.
- c. Sales, Balance Sheet, Direct Labor.
- d. Sales, Production, Manufacturing Overhead.

29. The detailed plan for the acquisition and replacement of major portions of property, plant, and equipment is known as the

- a. capital budget.
- b. purchases budget.
- c. commitments budget.
- d. treasury budget.

29. The budgeted payment for labor cost each period would be found in the

- a. labor budget.
- b. pro forma income statement.
- c. selling, general, and administrative expense budget.
- d. cash budget.

30. The cash budget ignores all.....

- a. dividend payments.
- b. sales of capital assets.
- c. noncash accounting accruals.
- d. sales of common stock.

31. Which of the following items would not be found in the financing section of the cash budget?

- a. cash payments for debt retirement
- b. cash payments for interest
- c. dividend payments
- d. payment of accounts payable

32. The primary reason that managers impose a minimum cash balance in the cash budget is

- a. because management needs discretionary cash for unforeseen business opportunities.*
- b. managers lack discipline to control their spending.*
- c. that it protects the organization from the uncertainty of the budgeting process.*
- d. that it makes the financial statements look more appealing to creditors.*

33. Chronologically, the last part of the master budget to be prepared would be the

- a. pro forma financial statements.*
- b. cash budget.*
- c. capital budget*
- d. production budget*

34. The pro forma income statement is not a component of the

- a. master budget.*
- b. financial budgets.*
- c. operating budgets.*
- d. capital budget.*

35. A *pro forma* financial statement is

- a. a financial statement for past periods.
- b. a projected or budgeted financial statement.
- c. presented for the form but contains no dollar amounts.
- d. a statement of planned production.

36. The budgeted cost of products to be sold in a future period would be found in the.....

- a. production budget.
- b. sales budget.
- c. purchases budget.
- d. *pro forma* income statement

37. A budget that includes a 12-month planning period at all times is called a budget.

- a. *pro forma*
- b. flexible
- c. master
- d. continuous

38. The method of budgeting that adds one month's budget to the end of the plan when the current month's budget is dropped from the plan is called budgeting.

- a. long-term*
- b. operations*
- c. incremental*
- d. continuous*

39. Ebony Company has the following expected pattern of collections on credit sales: 70 percent collected in the month of sale, 15 percent in the month after the month of sale, and 14 percent in the second month after the month of sale. The remaining 1 percent is never collected. At the end of May, Ebony Company has the following accounts receivable balances:

From April sales \$21,000

From May sales 48,000

Ebony's expected sales for June are \$150,000. What were total sales for April?

- a. \$150,000
- b. \$72,414
- c. \$70,000
- d. \$140,000

40. *Ball Company has a policy of maintaining an inventory of finished goods equal to 30 percent of the following month's sales. For the forthcoming month of March, Ball has budgeted the beginning inventory at 30,000 units and the ending inventory at 33,000 units. This suggests that*

- a. February sales are budgeted at 10,000 units less than March sales.*
- b. March sales are budgeted at 10,000 units less than April sales.*
- c. February sales are budgeted at 3,000 units less than March sales.*
- d. March sales are budgeted at 3,000 units less than April sales.*

41. Budgeted sales for the first six months for Porter Corp. are listed below:

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Units	6,000	7,000	8,000	7,000	5,000	4,000

Porter Corp. has a policy of maintaining an inventory of finished goods equal to 40 percent of the next month's budgeted sales. If Porter Corp. plans to produce 6,000 units in June, what are budgeted sales for July?

- a. 3,600 units
- b. 1,000 units
- c. 9,000 units
- d. 8,000 units

42. Weaver Co. manufactures card tables. The company has a policy of maintaining a finished goods inventory equal to 40 percent of the next month's planned sales. Each card table requires 3 hours of labor. The budgeted labor rate for the coming year is \$13 per hour. Planned sales for the months of April, May, and June are respectively 4,000; 5,000; and

3,000 units. The budgeted direct labor cost for June for Weaver Co. is \$136,500. What are budgeted sales for July for Weaver Co.?

- a. 3,500 units
- b. 4,250 units
- c. 4,000 units
- d. 3,750 units

43. Budgeted sales for Knox Inc. for the first quarter the year are shown below:

	JANUARY	FEBRUARY	MARCH
Units	35,000	25,000	32,000

The company has a policy that requires the ending inventory in each period to be 10 percent of the following period's sales. Assuming that the company follows this policy, what quantity of production should be scheduled for February?

- a. 24,300 units
- b. 24,700 units
- c. 25,000 units
- d. 25,700 units

44. Budgeted sales for the first six months the year for Gibson Corporation are listed below:

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
Units	6,000	7,000	8,000	7,000	5,000	4,000

Gibson Corporation has a policy of maintaining an inventory of finished goods equal to 40 percent of the next month's budgeted sales. How many units has Gibson Corporation budgeted to produce in the first quarter of the year?

- a. 21,400 units.
- b. 20,600 units.
- c. 19,000 units.
- d. 23,000 units.

45. Production of Product X has been budgeted at 200,000 units for May. One unit of X requires 2 lbs. of raw material. The projected beginning and ending materials inventory for May are:

Beginning inventory: 2,000 lbs.

Ending inventory: 10,000 lbs.

How many lbs. of material should be purchased during May?

- a. 192,000
- b. 208,000
- c. 408,000
- d. 416,000

46. Xanadu Company manufactures toy airplanes

Information on Xanadu Company's labor costs follow:

Sales commissions \$5 per plane

Administration \$10,000 per month

Indirect factory labor \$3 per plane

Direct factory labor \$5 per plane

The following information applies to the upcoming month of July for Xanadu Company:

Budgeted production 1,200 units

Budget sales 1,000 units

What amount of budgeted labor cost would appear in the July selling, general, and administrative expense budget?

- a. \$10,000
- b. \$16,000
- c. \$15,000
- d. \$23,000

47. Harrison Company manufactures card tables. The company has a policy of maintaining a finished goods inventory equal to 40 percent of the next month's planned sales. Each card table requires 3 hours of labor. The budgeted labor rate for the coming year is \$13 per hour. Planned sales for the months of April, May, and June are respectively 4,000; 5,000; and 3,000 units. What is Harrison Company's budgeted direct labor cost for May?

- a. \$54,600
- b. \$163,800
- c. \$226,200
- d. \$179,400

48. For the month of October, P Corp. predicts total cash collections to be \$1 million. Also, for October, P Corp. estimates that its beginning cash balance will be \$50,000 and that it will borrow cash in the amount of \$70,000. If P Corp. estimates an ending cash balance of \$30,000 for October, what must its projected cash disbursements be?

- a. \$1,090,000
- b. \$1,120,000
- c. \$1,070,000
- d. \$1,020,000

49. Managers may be more willing to accept a budget if

- a. it is continuous.
- b. it is imposed.
- c. it is very hard to attain.
- d. they can participate in its development.

50. A budget manual should include which of the following?

- a. a list of specific budgetary activities to be performed.
- b. original, revised, and approved budgets.
- c. a calendar of scheduled budgetary activities
- d. all of the above

51. Which of the following is not true about an imposed budget?

- a. It reduces the budgeting process time frame.
- b. It uses the knowledge of top management as it relates to resource availability.
- c. It enhances coordination.
- d. It increases the feeling of teamwork.

52. A disadvantage of participatory budgets is that ...

- a. there is a high degree of acceptance of the goals and objectives by operating management.
- b. they are usually more realistic.
- c. they lead to better morale and higher motivation.
- d. they usually require more time to prepare.

53. The master budget

- a. reflects the determination of an organization's cost of capital.
- b. serves as a managerial tool for the organization.
- c. includes only an organization's pro forma financial statements.
- d. utilizes only information from the financial accounting system.

54. Krebs Company is preparing its Manufacturing Overhead budget for the second quarter of the year.

Budgeted variable factory overhead is \$3.00 per unit produced; budgeted fixed factory overhead is \$75,000 per month, with \$16,000 of this amount being factory depreciation.

If the budgeted production for April is 6,000 units, then the total budgeted factory overhead for April is:

- a. \$77,000
- b. \$82,000
- c. \$85,000
- d. \$93,000

55. Tactical planning usually involves which level of management?

- a. middle
- b. top
- c. middle and top
- d. operational.

56. Farley Company reported the following information for 2006:

	September	October	November	December	January
Budgeted sales	\$240,000	\$310,000	\$290,000	\$360,000	\$200,000
Budgeted purchases	\$90,000	\$120,000	\$128,000	\$144,000	\$88,000

- All sales are on credit.
- Customer amounts on account are collected 50% in the month of sale and 50% in the following month.
- Cost of goods sold is 35% of sales.
- Farley purchases and pays for merchandise 60% in the month of acquisition and 40% in the following month.
- Accounts payable is used only for inventory acquisitions.

How much cash will Farley receive during November?

- a. \$145,000
- b. \$325,000
- c. \$300,000
- d. \$290,000

57. Which one of the following is a budget that would never be prepared by a merchandising company?

- a. Production budget.*
- b. Cost of goods sold budget.*
- c. Purchases budget.*
- d. Budgeted income statement.*

58. A budget that presents the plan for a range of activity so that the plan can be adjusted for changes in activity levels is referred to as....

- a. Flexible budget.*
- b. Master budget.*
- c. Static budget.*
- d. Participative budget.*

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مختصر السيرة الذاتية للأستاذ الدكتور



أشرف محمد إبراهيم منصور

البريد الإلكتروني الشخصي

(amamansour@hotmail.com)

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البيانات الأساسية:

- الاسم: عمرو حسن إبراهيم محمد علي
- الوظيفة: مدرس بقسم المحاسبة – كلية التجارة وإدارة الأعمال جامعة حلوان.
- البريد الإلكتروني: amr.hassan.me@commerce.helwan.edu.eg

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