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SYRIAN VIRTUAL UNIVERSITY

Financial Analysis

Dr. Ali Kamel Ibrahim

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Ali Kamel Ibrahim .

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Contents

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Introduction

This book is designed to provide student with the knowledge and skills that enable them to analyze the financial statements of different businesses including banks. It starts with presenting the concept of financial reporting and explaining the main financial statements for general businesses and for banks. In chapter two students will learn about vertical and horizontal analyses of the main financial statements. Chapters three, four, five and six explain profitability, liquidity, solvency, and activity analyses. Chapter seven discusses integrated financial ratio analysis. Equity and credit analysis are described in chapter eight. Chapter nine talks about segment reporting. In chapter ten we explained the break even analysis. Chapter eleven elaborates the leverage analysis. The last chapter presents the prospective analysis and business failure.

All the chapters are supported with illustrative examples and exercises. It should be noted that some examples included real names of companies operating in Syria (Golden-Med Pharma, KINDA Pharma, and Karapeil). However, all the figures provided in examples and exercises related to these companies are hypothetical figures, and they are not representing real data by any means.

We hope that the book will achieve its intended purposes in providing simple and useful information in easy English language to our students.

The Author

Chapter One: An Introduction to Financial Analysis

1-1 Financial reporting and financial statements

Before starting our journey with financial analysis, it's beneficial to remember that accounting is seen as the language of business. It performs four main activities, which include, **identifying, measuring, recording, and communicating** the economic events of an organization to different parties, who have an interest in the organization. In this sense, **accounting** can be viewed as a **financial information system** that provides useful information to different parties interested in the business, to enable them making decisions. Figure (1-1) illustrates the different steps of accounting process.

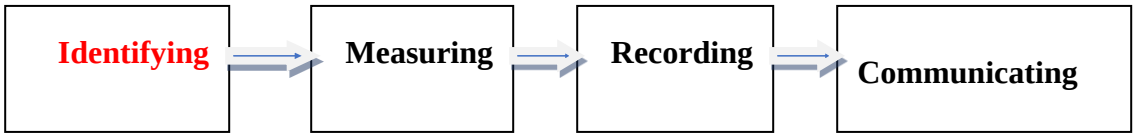

Figure (1-1) the steps of accounting process

In the first step of the accounting process, different economic events and transactions of the business are identified. Such transactions include the payment of the wages of employees in the company, the sale of its main goods or services etc.

After identifying economic events relevant to the business, these events and transactions are measured in monetary terms, and recorded in the accounting records. In the final step of the accounting process different transactions are processed and translated into accounting information that are communicated to different users, to allow them make informed decisions. This final step is a key part of financial reporting. Financial statements are the

main source by which companies communicate information to different users. Understanding financial analysis requires an understanding of financial reporting and how to prepare the main financial statements and the purpose of each statement.

1-1-1 Financial reporting.

Users of financial statements include different parties inside and outside the organization. Examples of internal users include a company's managers and employees. While external users of accounting information embrace: stockholders, bondholders, security analysts, suppliers, lending institutions, labor unions, regulatory authorities, and the general public.

These internal and external user groups need accounting information and reports to make different decisions concerning the business. For example, potential investors use the financial reports of a business to help them in deciding whether to buy its stocks. Suppliers use the financial reports to decide whether to sell their goods or services to a company on credit. Labor unions use the financial reports to help determine their demands when they negotiate for employees. Managers use financial information extracted from the financial reports to determine the company's profitability.

Accordingly, **financial reporting** can be defined as "providing financial information about the reporting entity that is useful to existing and potential equity investors, lenders and other creditors in making their decisions about providing resources to the entity." (CARLON, 2016, p:13).

It should be noted that the **International Accounting Standard Board (IASB)**, identified the **objective** of **financial reporting** as providing information about the financial position, performance and changes in financial position of an enterprise that is useful to a wide range

of users in making economic decisions.

In this sense financial reporting involves the disclosure of financial information to the various stakeholders about the financial performance and financial position of the organization over a specified period of time.

In case of listed companies the frequency of financial reporting is quarterly and annually.

For financial information to be useful it should has two main characteristics.

The first qualitative characteristic of accounting information is **Relevance,** which is the capacity of information to affect users' decisions. This implies that *timeliness* is a desirable characteristic of accounting information. Interim (quarterly) financial reports are largely motivated by timeliness.

The second primary quality of accounting information is **Reliability.** For information to be reliable it must be verifiable, representationally faithful, and neutral. ***Verifiability*** means the information is confirmable. ***Representational faithfulness*** means the information reflects reality, and ***neutrality*** means it is truthful and unbiased. It should be noted that accounting information often demands a trade-off between relevance and reliability.

Another question concerning financial reporting is about its content or main elements. The key elements of financial reporting include:

The financial statements – balance sheet, profit & loss account (or income statement), cash flow statement & statement of changes in owners' equity.

The notes to financial statements

Quarterly & annual reports (interim reports) (in case of listed companies)

Management Discussion and Analysis (In case of public companies)

The importance of financial reporting cannot be over emphasized. It is required by each and

every stakeholder for multiple reasons and purposes. The following points highlights why financial reporting framework is important:

It helps an organization to comply with various statues and regulatory requirements.

It facilitates statutory audit. The Statutory auditors are required to audit the financial statements of an organization to express their opinion.

Financial Reports forms the backbone for financial planning, analysis, benchmarking and decision making.

Financial reporting helps organizations to raise capital both domestic as well as overseas.

On the basis of financial, the public in large can analyze the performance of the organization as well as of its management.

For the purpose of bidding, labor contract, government supplies etc., organizations are required to provide their financial reports and statements.

In sum the main objective of financial reporting is the dissemination of financial Statements that accurately measure the profitability and financial condition of a company.

Before going further in exploring financial analysis and its objectives and importance, it is necessary to recall the main financial statements and the purpose of each statement.

1-1-2 A review of financial statements:

As mentioned earlier financial statements are the outputs of accounting information system. They are means by which a business communicates information to its stakeholders. The key financial statements include : the income statement, the balance sheet (statement of financial position), the cash flow statement, and the statement of changes in owners' equity. In this section we will present each of these statements.

A. The Income Statement:

The income statement of a firm shows its revenues and expenses over a specific period of time (usually one year). The income statement equation in its simplest form is:

Revenues – Expenses = Net Income

Revenues are the amounts reported from the sale of goods and services in the normal course of business.

Expenses are the amounts incurred to generate revenue and include cost of goods sold, operating expenses, interest, and taxes. Expenses are grouped together by their nature or by function. According to the IASB, expenses are decreases in economic benefits during the accounting period in the form of outflows or depletions of assets or incurrence of liabilities that result in decreases in equity other than those relating to distributions to equity participants.

The income statements can be presented in different ways. In its simple form it compares the firm's revenues with its expenses to get net income. In this case it is called single-step income statement. Another form to present the income statement is called multi-step income statement. In this form the income statement is prepared to show different levels of income (gross profit, operating income, income before tax, net income after tax …)

Under IFRS, the income statement can be combined with "other comprehensive income" and presented as a single statement of comprehensive income. Alternatively, the income statement and the statement of comprehensive income can be presented separately. Presentation is similar under U.S. GAAP.

Investors examine a firm's income statement for valuation purposes while lenders examine the income statement for information about the firm's ability to make the promised interest and principal payments on its debt.

Figure (2-1) shows multi-step income statement format:

Figure (2-1) multi-step income statement:

Revenue	**XXX**
Cost of goods sold	(XXX)
Gross profit	**XXX**
Selling, general, and administrative expenses	(XXX)
Depreciation expense	(XXX)
Operating profit	**XXX**
Interest expense	(XXX)
Income before tax	**XXX**
Provision for income taxes	(XXX)
Income from continuing operations	**XXX**
Earnings (losses) from discontinued operations, net of tax	XXX
Net income	**XXX**

It should be noted that the overall structure of an income statement for a bank doesn't defer too much from a regular income statement. The top of the income statement is revenue and the bottom is net income.

However, revenue is derived differently from that of regular companies. The income

statement format for a bank will generally look as follows:

The income statement of (XY) bank for the year ended 31/12/2019

Revenue	
Interest income	
Interest expense	
Net interest income	
Non-interest income	
Total revenue	
provisions for loan losses	
Non-interest expenses	
Total Expenses	
Income before interest and tax (EBIT)	
Interest expense (on debts)	
Income before tax (EBT)	
Income tax expense	
Net income	

As can be seen from the bank income statement format, most of the bank's revenue and expenses are related to interest. The bank receives interest income on the loans it issues, while it pays interest expense to the deposits used to fund the loans. Interest expense does not include interest expense from general debt. Non-interest income encompasses all the other business activities that a bank engages in. These may include credit card fees, underwriting fees, fees from overdrawn accounts, transaction fees, and any other non-interest income that a bank earns. Non-interest expenses are generally operational expenses and are essential to the day-to-day operation of a bank. They include salaries and bonuses to staff, marketing, and other administrative expenses.

B. The Balance Sheet (statement of financial position):

While the income statement presents a picture of a firm's economic activities over a period of time, its balance sheet is a snapshot of its financial and physical assets and its liabilities at a point in time. Just as with the income statement, understanding balance sheet accounts, how they are valued, and what they represent, is also crucial to the financial analysis of a firm.

The **balance sheet** (also known as the statement of financial position or statement of financial condition) reports the firm's financial position at a point in time. The balance sheet consists of assets, liabilities, and equity.

Assets: Economic resources controlled by the business as a result of past transactions that are expected to generate future economic benefits.

Liabilities: Obligations resulted from past events that are expected to cause an outflow of economic resources.

Equity: The owners' residual interest in the assets after deducting the liabilities. Equity is also referred to as stockholders' equity, shareholders' equity, or owners' equity. Analysts sometimes refer to equity as "net assets.

The relationship among the main components of the balance sheet can be expressed using the accounting equation as flows:

Assets = Liabilities + Owner's equity

Figure (3-1) shows the format of the balance sheet:

Figure (3-1) the balance sheet format:

Current assets	XXX
Noncurrent assets	XXX
Total assets	**XXX**
Current liabilities	XXX
Noncurrent liabilities	XXX
Total liabilities	**XXX**
Equity	XXX
Total equity and liabilities	**XXX**

The balance sheet format presented in figure (3-1) confirm with both IFRSs and U.S. GAAP that entail firms to separately report their current assets and noncurrent assets and current and noncurrent liabilities. This format is known as a **classified balance sheet** and is useful in evaluating liquidity.

Liquidity-based presentations, which are often used in the banking industry, present assets and liabilities in the order of liquidity.

To understand financial analysis techniques students should be familiar with the elements of the balance sheet. As can be seen from the balance sheet format presented above, assets and liabilities are categorized into main groups.

Current assets include cash and other assets that will likely be converted into cash or used up within one year or one operating cycle, whichever is greater. The **operating cycle** is the

period of time it takes to produce or purchase inventory, sell the product, and collect the cash. Current assets are usually presented in the order of their liquidity, with cash being the most liquid. Current assets reveal information about the operating activities of the firm. They comprise elements such as cash and Cash equivalents, securities, trade receivables, inventories, and other current assets.

Current liabilities are obligations that will be satisfied within one year or one operating cycle, whichever is greater. More specifically, a liability that meets any of the following criteria is considered current:

- Settlement is expected during the normal operating cycle.
- Settlement is expected within one year.
- Held primarily for trading purposes.
- There is not an unconditional right to defer settlement for more than one year.

Current liabilities comprise elements such as accounts payable, notes payable and current portion of long-term debt, accrued liabilities (expense), and unearned revenue (deferred income).

Current assets minus current liabilities equals **working capital**. Insufficient working capital may indicate liquidity problems. Too much working capital may be an indication of inefficient use of assets.

Noncurrent assets are economic resources that provide long-term future benefits to the business. They comprise all other assets that do not meet the definition of current assets because they will not be converted into cash or used up within one year or operating cycle. Noncurrent assets provide information about the firm's investing activities, which form the foundation upon which the firm operates.

This group of assets contains several items such as property, plant, and equipment (tangible non-current assets including lands, buildings, machinery and equipment, furniture, and natural resources), investment property, and intangible assets.

Noncurrent liabilities obligations that do not meet the criteria of current liabilities. Noncurrent liabilities provide information about the firm's long-term financing activities.

It should be noted that a bank has unique classes of balance sheet line items that other companies won't. The typical structure of a balance sheet for a bank is shown below:

A bank balance sheet format

Assets	
Property	
Trading assets	
Loans to customers	
Deposits to the central bank	
Total Assets	
Equity and Liabilities	
Liabilities	
Loans from the central bank	
Deposits from customers	
Trading liabilities	
Misc. debt	
Equity	
Common and preferred shares	
Total Equity and Liabilities	

As can be seen from the bank balance sheet format, **loans to customers** are classified as **assets**. This is because the bank expects to receive interest and principal repayments for loans in the future, and thus generate economic benefit from the loans.

Deposits from customers, on the other hand, are expected to be withdrawn by customers or also pay out interest payments, generating an economic outflow in the future. They are, therefore, classified as **liabilities**.

Deposits from a bank in a central bank are considered assets, similar to cash and equivalents for a regular company. This is because the bank can withdraw these deposits rather easily. It also expects to receive a small interest payment, using the central bank's prime rate.

Loans from the central bank are considered liabilities, much like normal debt.

Banks may hold **marketable securities** or certain currencies for the purposes of trading. These will naturally be considered **trading assets**. They may have **trading liabilities** if the securities they purchase decline in value.

C. The Cash flow statement:

The third important financial statement is the cash flow statement. The income statement is based on the accrual basis, which in turn means that net income may not represent cash generated from operations. A company may generate positive and growing net income but may face insolvency because insufficient cash is being generated from operating activities. As a result preparing cash flow statement, using either the direct or indirect method, is very important in analyzing a firm's activities and prospects.

The cash flow statement provides information about the following:

- A company's cash receipts and cash payments during an accounting period.
- A company's operating, investing, and financing activities.

- The impact of accrual accounting transactions on cash flows.
- The firm's liquidity, solvency, and financial flexibility.

An analyst can use the cash flow statement of a business to determine whether:

- Regular operations of the business generate enough cash to sustain the business.
- Sufficient cash is generated to settle current obligations when they become due.
- The business is likely to need more funding.
- Unforeseen debts can be met.
- A company can benefit of new business opportunities as they arise.

Preparing the cash flow statement requires information about the income statement items and changes in balance sheet accounts.

Cash receipts and payments in the cash flow statement are classified into three main groups:

- **Cash flow from operating activities,** sometimes referred to as "cash flow from operations" or "operating cash flow," consists of the inflows and outflows of cash resulting from transactions that affect a company's net income.
- **Cash flow from investing activities** consists of the inflows and outflows of cash resulting from the acquisition or disposal of long-term assets and certain investments.
- **Cash flow from financing activities** (CFF) consists of the inflows and outflows of cash resulting from transactions affecting a firm's capital structure.

Figure (4-1) gives examples of cash flow items under each category:

Cash flows from operating activities	
In cash flows	**Out cash flows**
Cash receipts from customers	Cash payments to employees and suppliers

Interest and dividends received	Cash payments for other expenses
Sale proceeds from trading securities.	Cash payments for the purchase of trading securities.
	Interest payments
	Tax payments
Cash flows from investing activities	
In cash flows	**Out cash flows**
Sale of non-current assets	Acquisition of non-current assets
Sale of debt and equity investments	Acquisition of debt and equity investments
Principal received form loans made to others	loans made to others
Cash flows from financing activities	
In cash flows	**Out cash flows**
Issuing shares	Reacquire shares
Issuing debts	Dividends payments
	Loan (debts) payments

There are two methods of presenting the cash flow statement: the direct method and the indirect method. Both methods allowed under U.S. GAAP and IFRS. The use of the direct method, however, is encouraged by both standard setters. Unfortunately, most firms use the indirect method. The difference between the two methods relates to the presentation of cash

flows from operating activities. The presentation of cash flows from investing activities and financing activities is exactly the same under both methods.

Under the **direct method** cash flows from operating activities are calculated as shown in the following:

Operating Cash Flow – Direct Method For the year ended December 31

Cash collections from customers	Xxx
Cash paid to suppliers	(xxx)
Cash paid for operating expenses	(xxx)
Cash paid for interest	(xxx)
Cash paid for taxes	(xxx)
Net cash flows from Operating activities	**Xxx**

Under the **indirect method**, net income is converted to operating cash flow by making adjustments for transactions that affect net income but are not cash transactions. These adjustments include eliminating noncash expenses (e.g., depreciation and amortization), non-operating items (e.g., gains and losses), and changes in balance sheet accounts resulting from accrual accounting events.

Operating Cash Flow – indirect Method For the year ended December 31

Net income	**Xxx**
Adjustments to reconcile net income to cash flow provided by operating activities:	
Depreciation and amortization	Xxx
Deferred income taxes	Xxx
Increase (deduct) or decrease (add) in accounts	(xxx)

receivable	
Increase (deduct) or decrease (add) in inventory	(xxx)
Decrease (add) or Increase (deduct) in prepaid expenses	Xxx
Increase (add) or decrease (deduct) in accounts payable	Xxx
Increase (add) or decrease (deduct) in accrued liabilities	Xxx
Net cash flows from Operating activities	**Xxx**

It can be seen that under the indirect method, we start with the net income, the "bottom line" of the income statement. Under the direct method, the starting point is the top of the income statement, revenues, adjusted to show cash received from customers. Total cash flow from operating activities is exactly the same under both methods, only the presentation methods differ.

The main **advantage** of **the direct method** is that it shows the firm's operating cash receipts and payments, while the indirect method only presents the net result of these receipts and payments. This information of past in cash flows and out cash flows is beneficial in predicting future operating cash flows.

After calculating net cash flows from operating activities, using either direct or indirect methods, it becomes possible to prepare the cash flow statement. Figure (5-1) shows the format of cash flow statement:

Figure (5-1) cash flow statement format

Net cash flows from Operating activities	XXX
+ Net cash flows from investing activities	XXX
+ Net cash flows from financing activities	XXX
Net Change in cash balance during the period	XXXX
+ Beginning cash balance	XXX
= Closing balance of cash	**XXXX**

D. Statement of Changes in owner's Equity (or owner's equity statement)

The last financial statement required by IFRSs is statement of changes in owner's equity. This statement summarizes the changes in owner's equity for a specific period of time. It starts with the beginning balance of owner's equity, it then adds to this amount the net income for the period and new investments by the owner. After that owner's drawings are deducted to get the closing balance of owner's equity. This statement explains why the owner's equity increased or decreased during the period.

The statement of owner's equity is usually prepared by referring to the balance sheet and income statement during a specific period of time. The income statement provides information about the net income or losses of the business, while the balance sheet will provide the information regarding the new contributions (investments) and drawings by the owner.

Figure (6-1) presents the format of statement owner's equity.

Figure (6-1) format of statement of owner's equity.

Owner's capital at the beginning of the period	XXX
Add:	
Net income	XXX
Owner's new investments	XXX
Less:	
Owner's drawings	XXX
Net loss	XXX
= Closing balance of owner's equity	**XXXX**

1-2 The concept of financial analysis

Financial statement analysis is seen as an essential and important part of the broader field of business analysis. **Business analysis** is the process of evaluating a company's economic prospects and risks. This includes analyzing a company's business environment, its strategies, and its financial position and performance. **Financial statement analysis** is the application of analytical tools and techniques to general-purpose financial statements and related data to derive estimates and inferences useful in business analysis.

Financial analysis uses the information in a company's financial statements, together with other relevant information, to make economic decisions. It can be useful in assessing a company's performance and trends in that performance. Essentially, an analyst translates data into financial metrics that assist in decision making. He seeks to answer such questions as: How successfully has the firm performed, relative to its own past performance and relative to its competitors? How is the firm likely to perform in the future? Based on

expectations about future performance, what is the value of this company or the securities it issues?

A primary source of data is a company's annual report, including the financial statements and notes, and management commentary (operating and financial review or management's discussion and analysis).

It should be noted that financial statements are the primary source of information for financial analysis. This means that the quality of financial analysis depends on the reliability of financial statements.

1-3 The objectives of financial analysis

The major objective of financial statement analysis is to provide decision makers information about a business for use in decision-making. Users of financial statement information are the decision makers concerned with evaluating the economic situation of the firm and predicting its future course.

Financial statement analysis can be used by the different users and decision makers to achieve the following objectives:

Assessment of past performance and current position:

A business previous performance is often a good indicator of its future performance. Consequently, an investor or creditor is interested in the trend of past sales, expenses, net income, cash flows and return on investment. These trends provide a means for judging management's past performance and are probable indicators of future performance.

Similarly, analyzing current position indicates where the business stands today. For example, the current position analysis will show the types of assets owned by a business and the different liabilities it owes. It, additionally, indicates what the cash position is, how much

debt the company has in relation to equity and how reasonable the inventories and receivables are.

Prediction of net income and growth prospects:

The financial statement analysis helps in predicting the earning prospects and growth rates in the earnings which are used by investors while comparing investment alternatives and other users interested in judging the earning potential of the business. Investors also consider the risk or uncertainty associated with the expected return. With the help of financial analysis, assessment and prediction of the bankruptcy and probability of business failure can be done.

Loan decision by financial institutions and banks: Financial analysis helps the financial institutions and banks to decide whether a loan can be given to the company or not. It assists them in identifying the credit risk, deciding the terms and conditions of a loan if sanctioned, interest rate, maturity date etc.

1-4 The importance of financial analysis

As we have seen earlier financial analysis is the process of reviewing and analyzing a company's financial statements to make better economic decisions by different parties who have an interest in the business. Financial analysis is deemed important for the different parties interested in the business. We will explore why financial analysis is important for each of those parties:

For Financial Manager: Analysis of financial statements helps the financial manager in:

- Assessing the operational efficiency and managerial effectiveness of the company.
- Analyzing the financial strengths and weaknesses and creditworthiness of the company.
- Analyzing the current financial position of the company.

- Assessing the types of assets owned by a business and the liabilities which are due to the business.
- Providing information about the cash position of the company and how much debt it has in relation to its equity.
- Studying the reasonability of stock and debtors held by the company.

For Top Management: Financial analysis helps the top management in:

- Assessing whether the resources of the firm are used in the most efficient manner
- Evaluating whether the financial condition of the firm is sound
- Determining the success of the company's operations
- Appraising the individual's performance
- Evaluating the system of internal control
- Investigating the future prospects of the enterprise.

For Trade Payables: Trade payables analyze financial statements for:

- Appraising the ability of the company to meet its short-term obligations

Judging the probability of firm's continued ability to meet all its financial obligations in the future.

- Firm's ability to meet claims of creditors over a very short period of time.
- Evaluating the financial position and ability to pay off the concerns.

For Lenders: Business lenders are concerned with its long-term solvency and survival. They consider financial analysis important:

- To ascertain the profitability of the company over a period of time,
- For determining a company's ability to generate cash, to pay interest and repay the principal amount
- To assess the relationship between various sources of funds (i.e. capital structure relationships)
- To assess financial statements which contain information on past performances and interpret it as a basis for forecasting future rates of return and for assessing risk.
- For determining credit risk, deciding the terms and conditions of a loan if sanctioned, interest rate, and maturity date etc.

For Investors: Investors, who have invested their money in the firm's shares, are interested in the firm's earnings and future profitability. Financial analysis helps them in predicting the bankruptcy and failure probability of business enterprises. After being aware of the probable failure, investors can take preventive measures to avoid/minimize losses.

For Labor Unions: Labor unions analyze the financial statements in order to:

- Assess whether an enterprise can increase their pay.
- Check whether an enterprise can increase productivity or raise the prices of products/ services to absorb a wage increase.

1-5 The Applications of financial analysis

Performing financial analysis goes through the following main steps:

a) ***Stating the objective and context of the analysis***. *In this step analyst* decide what questions the analysis seeks to answer, the form in which this information needs to be presented, and what resources and how much time are available to perform the analysis.

b) ***Gathering data***. In this step analyst collects the data required for analysis from different sources including company's financial statements and other relevant data on its industry and the economy, ask questions of the company's management, suppliers, and customers, and visit company sites.

c) ***Processing and analyzing the data***. In this step analyst uses different financial analysis techniques to make any appropriate adjustments to the financial statements, makes the required analysis to answer the questions stated in the first step, and decides what conclusions or recommendations the information supports.

d) ***Report the conclusions or recommendations****:* In this step analyst prepares a report and communicates it to its intended audience. Be sure the report and its dissemination comply with the code and standards that relate to investment analysis and recommendations.

e) ***Updating the analysis***. *In this final step analyst* repeats the previous steps periodically and change the conclusions or recommendations when necessary.

Financial analysis is not a mere collection of information, computations, tables, and graphs, rather an effective analysis contains both computations and interpretations. A well-reasoned analysis integrates the data collected into a solid whole.

A key question concerns financial analysis is why it is used? Or what are its main applications?

In fact, financial analysis of a company may be applied or performed for a variety of reasons these include:

a) Analyzing the existing profitability and risk of the company. Most financial analysts evaluate the profitability of a company relative to the risks involved. They try to answer the following questions: What rate of return is the firm generating from the use of its assets? How much return is it generating for the equity capital invested? Is its profit margin growing or declining over time? Are returns and profit margins greater or lower than those of its key competitors? How much leverage does the firm have in its capital structure? How much of the leverage consists of debt financing that will come due in the short-term versus the long-term? Ratios that reflect relations among particular items in the financial statements are the tools used to analyze profitability and risk.

b) Preparing forecasted financial statements. Financial analysis is used to forecast the firm's future resources, obligations, investments, cash flows, revenues, and expenses. Financial analysts provide information about the likely future profitability and risk and, in turn, the likely future returns from investing in the company? Forecasts of a firm's ability to manage risks, particularly those elements of risk with measurable financial consequences, permit the analyst to estimate the likelihood that the firm will experience financial difficulties in the future. Forecasted financial statements that rely on the analyst's projections of the firm's future operating, investing, and financing activities provide the basis for projecting future profitability and risk.

c) Value the firm. What is the firm worth? What is the value of the firm's common shares? Financial analysts use their estimates of share value to make recommendations to

buy, sell, or hold the equity securities of various firms whose market price they think is too low, too high, or about right. Investment banking firms that underwrite the initial public offering of a firm's common stock must set the initial offering price.

We will discuss these issues in more details in the subsequent chapters in this book.

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Questions

1-1 Define the concept of financial reporting and describe its main objective*? (para.. 1-1-1, 4Min.)*

1-2 *What are the main steps in the accounting process? (para.. 1-1, 3min.)*

1-3 *Define the concept of financial analysis ? (para.. 1-2, 2 min.)*

1-4 *What are the main objectives of Financial analysis? (para.. 1-3, 4min)*

True/False

1- The main **disadvantage** of **the direct method** is that it shows the firm's operating cash receipts and payments. (***True/False)***

2- The **operating cycle** is the period of time it takes to produce or purchase inventory, sell the product, and collect the cash. (***True/False)***

3- **Relevance,** which is the capacity of information to affect users' decisions. (***True/False)***

4- For information to be reliable it must be verifiable and relevant. (***True/False)***

5- ***neutrality*** means the information is confirmable. (***True/False)***

Multiple Choices

1- A firm's financial position at a specific point in time is reported in the:

A. balance sheet.

B. income statement.

C. cash flow statement.

D. None of the previous answers

2- According to the IASB Conceptual Framework, the fundamental qualitative characteristics that make financial statements useful are:

A. verifiability and timeliness.

B. relevance and reliability .

C. understandability and relevance.

D. None of the previous answers

3- Sales of inventory would be classified as:

A. operating cash flow.

B. investing cash flow.

C. financing cash flow.

D. None of the previous answers

4- Issuing bonds would be classified as:

A. investing cash flow.

B. financing cash flow.

C. no cash flow impact.

D. None of the previous answers

Chapter Two: Vertical, horizontal, and trend analysis of financial statements

2-1 Vertical, analysis of financial statements

The vertical analysis of financial statements expresses each amount on a financial statement for a particular period, as a percentage of another amount in that statement for the same period.

The vertical analysis of a balance sheet results in by simply dividing the amount of every item on the balance sheet by the same period's total assets, and multiplying the resulted figure by 100. That is:

$$\frac{\textbf{The amount of the balance sheet item in one period}}{\textbf{Total Assets in the same period}} \quad \textbf{X} \quad \textbf{100}$$

This analysis, also known as vertical common-size analysis of the balance sheet, highlights the composition of the balance sheet,. It helps answering such questions: What is the mix of assets being used? How is the company financing itself?

Similarly, the vertical analysis of an income statement results in by restating the amount of every income statement item in one period as a percentage of sales revenue in the same period (or sometimes income statement items are divided by total assets especially in the case of financial institutions). That is:

$$\frac{\text{The amount of the income statement item in one period}}{\text{Sales revenues in the same period}} \times 100$$

To illustrate how to perform the vertical analysis of the balance sheet and the income statement consider the following example.

The following are the income statement and the balance sheet of KARAPIEL Ltd. For the year ended 31 Dec. 2019 (figures are in thousands of $):

The income statement of KARAPIEL Ltd. for the year ended 31/ 12/ 2019

income statement of KARAPIEL Ltd. year 31/ 12/ 2019	**$(000)**
Sales Revenue	**100000**
Cost of goods sold	**-45600**
Gross profit	**54400**
Selling, general, and administrative expenses	**-7500**
Depreciation expense	**-6000**
Operating profit	**40900**
Interest expense	**-4500**
Income before tax	**36400**
Provision for income taxes	**-4000**
Income from continuing operations	**32400**
Earnings from discontinued operations, net of tax	**3500**
Net income	**35900**

The balance sheet of *KARAPIEL Ltd*. as on 31/12/2019

	$(000)
Current assets	180000
Non-current assets	320000
Total assets	**500000**
Current liabilities	50000

Noncurrent liabilities	100000
Total liabilities	**150000**
Equity	350000
Total equity liabilities and	**500000**

Required:

Prepare the vertical analysis of both the income statement and the balance sheet of KARAPIEL Ltd. for the year ended 31 December 2019?

Briefly comment on your analysis?

Solution:

Vertical common-size income statement of KARAPIEL Ltd. 2019

	$(000)	**%**
Sales Revenue	**100000**	**100**
Cost of goods sold	(45600)	**45.6**
Gross profit	**54400**	**54.4**
Selling, general, and administrative expenses	(7500)	**7.5**
Depreciation expense	(6000)	**6**
Operating profit	**40900**	**40.9**
Interest expense	(4500)	**4.5**
Income before tax	**36400**	**36.4**
Provision for income taxes	(4000)	**4**
Income from continuing operations	**32400**	**32.4**
Earnings (losses) from discontinued	3500	**3.5**

operations, net of tax		
Net income	**35900**	**35.9**

Vertical common-size balance sheet of KARAPIEL Ltd. 2019

	$(000)	%
Current assets	180000	**36**
Non-current assets	320000	**64**
Total assets	**500000**	**100**
Current liabilities	50000	**10**
Noncurrent liabilities	100000	**20**
Total liabilities	**150000**	**30**
Equity	350000	**70**
Total liabilities and equity	**500000**	**100**

As can be seen form the vertical common-size income statement of KARAPIEL Ltd. for the year 2019 total sales revenue is set at 100 percent. The vertical analysis of the income statement essentially shows how many cents of each sales dollar are absorbed by the various expenses. For example cost of goods sold as a percentage of sales revenue was (45.6%), while the percentage of operating expenses was (11.5%) . In other words, for every $1 in sales earned, 45.6 cents go to cost of goods sold and 11.5 cents go to operating expenses. It can be seen also from the vertical analysis of the income statement that the gross profit, operating profit and net income as percentages of sales revenue totaled (54.4%), (40.9%) and (35.9%) respectively .

An investigation of the vertical common-size balance sheet of KARAPIEL Ltd. for the year 2019 revealed that non-current assets comprised (64%) of KARAPIEL Ltd. total assets for the year 2019, while current assets represented (36%) of total assets for the same year. The vertical common-size balance sheet displays also the financing structure of the company. Figures in the balance sheet discloses that (70%) of the company funding came from equity holders, while (30%) came from current and non-current liabilities.

2-2 Horizontal, analysis of financial statements

Under Horizontal Analysis, which is seen as a form of trends analysis, one shows the amounts of items on each financial statement relating to a particular period, as a percentage of corresponding amounts of the items on the financial statements of a base period.

That is:

$$\text{Item \%} = \frac{\text{Amount of an item in one period}}{\text{Amount of the same item in base period}} \times 100$$

Horizontal analysis focuses on trends and changes in financial statement items over time. Along with the dollar amounts presented in the financial statements, horizontal analysis can help a financial statement user to see relative changes over time and identify positive or possibly disturbing trends.

To explain how to perform the horizontal analysis of both the balance sheet and the income statement let's consider the previous example about KARAPIEL Ltd., but now

with additional information related to previous period (2018, Base period) (amounts in thousands of Syrian pounds).

The income statements of KARAPIEL Ltd. For the years 2019-2018

	2019	2018
Sales Revenue	**100000**	***80000***
Cost of goods sold	**(45600)**	*(32500)*
Gross profit	**54400**	***47500***
Selling, general, and administrative expenses	**(7500)**	*(4100)*
Depreciation expense	**(6000)**	*(6000)*
Operating profit	**40900**	***37400***
Interest expense	**(4500)**	*(4800)*
Income before tax	**36400**	***32600***
Provision for income taxes	**(4000)**	*(3000)*
Income from continuing operations	**32400**	***29600***
Earnings from discontinued operations, net of tax	**3500**	*1500*
Net income	**35900**	***31100***

The balance sheets of *KARAPIEL Ltd.* for the periods 2018 -2019(000)

	2019	**2018**
Current assets	180000	*164000*
Non-current assets	320000	*326000*
Total assets	**500000**	***490000***
Current liabilities	50000	*35000*
Noncurrent liabilities	100000	*105000*
Total liabilities	**150000**	***140000***
Equity	350000	*350000*
Total liabilities and equity	**500000**	***490000***

Required:

- Prepare the horizontal analysis of both the income statement and the balance sheet of KARAPIEL Ltd. taking 2018 as a base year.
- Briefly comment on your analysis?

Solution:

As mentioned above to prepare horizontal analysis of income statement we divide the amount of each item on the income statement in one period by the amount of the same item in the base period. The same applies to the horizontal analysis of the balance sheet.

Now let us prepare the horizontal income statement and balance sheet of KARAPIEL Ltd. taking 2018 as a base year.

Horizontal income statements of KARAPIEL Ltd. For the years 2019

	2019 SP (000)	2018 SP (000)	%
Sales Revenue	100000	*80000*	125
Cost of goods sold	(45600)	*(32500)*	140
Gross profit	**54400**	***47500***	**115**
Selling, general, and administrative expenses	(7500)	*(4100)*	183
Depreciation expense	(6000)	*(6000)*	100
Operating profit	**40900**	***37400***	**109**
Interest expense	(4500)	*(4800)*	94
Income before tax	**36400**	***32600***	**112**
Provision for income taxes	(4000)	*(3000)*	133
Income from continuing operations	32400	*29600*	109

Earnings from discontinued operations, net of tax	3500	*1500*	233
Net income	**35900**	***31100***	**115**

The horizontal balance sheet of KARAPIEL Ltd. as on 31Dec. 2019

	2019 (000) SP	**2018 (000) SP**	**%**
Current assets	180000	*164000*	110
Non-current assets	320000	*326000*	98
Total assets	**500000**	***490000***	102
Current liabilities	50000	*35000*	143
Noncurrent liabilities	100000	*105000*	95
Total liabilities	**150000**	***140000***	107
Equity	350000	*350000*	100
Total liabilities and equity	**500000**	***490000***	

2-3 Trends, analysis of financial statements

Trends analysis is a financial analysis technique that tries to find trends in the financial data by comparing the figures in a business financial statements over time, or with other businesses in the same industry.

Accordingly, another way of performing horizontal analysis of financial statements is by computing the increase or decrease in percentage terms of each item on any of the financial statements, from the prior year (or other base year). That is we first compute the change in each item on the financial statements in a particular period compared to the amount of the same item in the prior period (or any base period), we then express the increase or decrease in the item as a percentage by dividing the change in the item

by its amount in the base period and multiply the result by 100. Putting it differently the percentage change in financial statement item =

$$\% \text{ change in an item} = \frac{\text{Item value in current period - Item value in base period}}{\text{Item value in base period}} \text{ X } 100$$

Consider the first item in the income statement of KARAPIEL Ltd., sales revenue, its amount in 2019 (100000), while in 2018 its amount was (80000), giving a change in this item between the two period of (20000). After calculating the change in this item we then express this change as a percentage of the amount of the item in 2018 (80000), and the resulting percentage is (20000/80000) x 100 = 25%. We continue in the same way to prepare the horizontal analysis of the income statement. The same applies for the horizontal analysis of the balance sheet. The following are the results of trend analysis for both the income statement and the balance sheet of KARAPIEL Ltd.

The trend (horizontal) analysis of the income statements of KARAPIEL Ltd.2019 (base year 2018)

	Change (000)	% change
Sales Revenue	20000	25.0
Cost of goods sold	13100	40.3
Gross profit	6900	14.5
Selling, general, and administrative expenses	3400	82.9
Depreciation expense	0	-
Operating profit	3500	9.4
Interest expense	-300	6.3-
Income before tax	3800	11.7

Provision for income taxes	1000	33.3
Income from continuing operations	2800	9.5
Earnings from discontinued operations, net of tax	2000	133.3
Net income	4800	15.4

The trend (horizontal) analysis balance sheet of KARAPIEL Ltd.2019 (base year 2018)	Change	% change
Current assets	16000	9.8
Non-current assets	-6000	1.8-
Total assets	10000	2.0
Current liabilities	15000	42.9
Noncurrent liabilities	-5000	4.8-
Total liabilities	10000	7.1
Equity	0	-
Total liabilities and equity	10000	2.0

As can be seen from the trend income statement of KARAPIEL Ltd. the percentage increase in sales revenue in 2019 was 25% compared to 2018 Gross profit augmented by 14.5%, from (32500) in 2018 to (45600) in 2019. Operating expenses almost doubled in 2019 as compared to 2018, the percentage increase in those expenses was (82%). This seem to has an impact on the operating profit which increased by only (11.7%).

The trend analysis just described works well when comparing financial data for two periods. However, many users of financial statements prefer to review trends over more than two periods. This can be done by establishing the oldest period as the base period and compute future periods as a percentage of the base period. For example, suppose that Golden Med Pharma Ltd had the following net sales and operating income for each of the past five years

(in millions of Syrian Pounds SP):

	2019	**2018**	**2017**	**2016**	**2015**
Net sales	35,119	30,990	31,944	28,857	24,088
Operating income	8,449	8,231	8,446	7,252	6,308

Assuming that (2015) is the base year, the trend percentage is calculated for each year using the following formula:

Trend percentage = Current period ÷ Base period

Trend Analysis (2015 base year	**2019**	**2018**	**2017**	**2016**	**2015**
Net sales	145.9	128.6	132.4	119.9	100
Operating income	136.5	134.9	131.8	115.9	100

Compared to base year (2015) the percentage increase in net sales in 2019 was (45.9 %). The percentage increase in operating income in 2019 compared to the base year (2015) was (136.5).

2-4 Benefits and limitations of Vertical, horizontal, and trend analysis

2-4-1 advantages and disadvantages of Vertical analysis

Advantages of Vertical analysis: we can summarize the benefits of vertical analysis as follows:

It can be easily implemented and understood.

It assists analysts in comparing the numbers of a company between different time periods.

(trend analysis)

It helps in identifying where the company has put its resources.

It helps in understanding the percentage/share of the individual items and the structural comparison of components.

The analysis also helps in determining the relative weight of each account, and its share in the revenue generation.

Disadvantages of Vertical analysis:

It doesn't help taking firm decision owing to a lack of standard percentage or ratio regarding the components in the financial statements

It does not help measuring liquidity.

As a result of the lack of consistency in the ratio of the elements, it does not provide a quality analysis of the financial statements.

It is seen as a static analysis because it doesn't show the change in financial statement elements over time.

2-4-2 Advantages and disadvantages of horizontal analysis

Advantages of horizontal analysis: we can summarize the benefits of horizontal analysis as follows:

Horizontal analysis allows investors and analysts to see what has been driving a company's financial performance over a number of years, as well as to spot trends and growth patterns such as seasonality. In this sense it is considered a dynamic analysis.

It allows analysts to evaluate relative changes in different items over time, and predict them

into the future.

Disadvantages of horizontal analysis:

A disadvantage of **horizontal analysis** is that the aggregated information expressed in the financial statements may have changed over time and therefore will cause variances to creep up when account balances are compared across periods.

Horizontal analysis can also be used to misrepresent results. This can happen when the analyst modifies the number of comparison periods used to make the results appear unusually good or bad.

2-4-3 advantages and disadvantages of Trends analysis

Advantages of Trend Analysis:

It helps the analyst to make an appropriate comparison between two or more firms over a period of time. It can also be compared with industry average.

Trend analysis (in terms of percentage) is found to be more effective in comparison with the absolutes figures/data on the basis of which the management can take the decisions.

It helps to predict the future.

Trend analysis helps the analyst/and the management to understand the short-term liquidity position as well as the long-term solvency position of a firm.

Trend analysis also helps to measure the profitability positions of an enterprise or a firm over the years with the help of some related financial trend ratios (e.g. Operating Ratio, Net Profit Ratio, Gross Profit Ratio etc.).

Disadvantages of Trend Analysis:

It is not so easy to select the base year. Usually, a normal year is taken as the base year. But it is very difficult to select such a base year for the propose of ascertaining the trend. Otherwise, comparison or trend analyses will be of no value.

It is also very difficult to follow a consistent accounting principle and policy particularly when the trends of business accounting are constantly changing.

Historical data may not be an accurate representation of a **trend**. ...

It is very difficult to determine the cause of a **trend**.

For accurately and reliably analyzing a **trend**, large amount of data needs to be collected

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Questions

2-1 What is vertical analysis of financial statements*? (para. 2-1, 4min)*

2-2 What is horizontal analysis of financial statements*? (para. 2-2, 4 min.)*

2-3 *What are the main advantages of Vertical analysis? (para. 2-4-1, 3 min)*

2-4 *What are the main disadvantages of Vertical analysis? (para. 2-4-1, 3min)*

2-5 *What are the main advantages of horizontal analysis? (para. 2-4-2, 3min)*

2-6 *What are the main disadvantages of horizontal analysis? (para. 2-4-2, 3min)*

True/False

Read the following statements and choose (T) for true statements and (F) for false statements:

1- When each figure in a balance sheet is stated as a percentage of the total, it is termed as horizontal analysis. **(T / F)**

2- When financial statements of several years are analyzed, it is termed as vertical analysis. **(T / F)**

3- Reliability of financial analysis techniques depends upon the reliability of financial data. **(T / F)**

4- When ratios of previous years are compared with current years, they are called trend ratios. **(T / F)**

5- Vertical analysis of the balance sheet shows relative value of the various items. **(T / F)**

Multiple choices

1- Comparison of financial statements highlights the trend of the _____ of the business.

a) Financial position

b) Performance

c) Profitability

d) All of the above

2- *Financial Analysis techniques are used to analyze:*

a) The Balance sheet only

b) the income statement only

c) Either the balance sheet or the income statement

d) mainly the balance sheet and the income statement.

3. *If a business has $100,000 in total assets, which includes $35,000 in cash, $10,000 in inventory, and $55,000 in accounts receivable, what is the vertical analysis of total assets?*

Cash = 35%, Inventory = 10%, and Accounts Receivable = 55%

Cash = 10%, Inventory = 10%, and Accounts Receivable = 45%

Cash = 10%, Inventory = 10%, and Accounts Receivable = 55%

Cash = 35%, Inventory = 10%, and Accounts Receivable = 45%

Which of the following statements are true?
A) Vertical Analysis is also termed as dynamic analysis.
B) Horizontal analysis is also termed as dynamic analysis.
C) Horizontal analysis is a static analysis.

Both A and B

Both A and C

Both B and C

B only

Chapter Three: Profitability Analysis

3-1 The concept and importance of profitability

Profit is seen as the engine that drives the business. The efficiency of any business is measured by the amount of profit it generates. Without sufficient profit a business will not be able to survive in the long run. We have seen in chapters one and two that the financial statement, which shows the net profit for the accounting period is the income statement. Accordingly, from the accounting point of view, **profit** is the difference between total income and total expenses. It is the surplus of revenue over expenses. If total expenses are greater than the revenue there will be a loss.

In fact profit is a key motivation behind conducting business. Different users of accounting information are concerned with the profit generated by the business. These include the owners, investors, creditors, and government authorities.

The term **profitability** is sometimes used by some authors as a synonym for the term profit. However, there is a difference between the two. Terms. The term profitability has a sense of relatively, whereas the term profit is used in absolute sense. Profitability is defined as the ability of the firm to generate profits. It is a foundation to determine the operational efficiency of a business. Profitability is a standard for measuring the performance of a business and is an indication for the public approval of the goods or services provided by the business.

Profits and profitability play the same role in business as blood and pulsation in human being. The survival of a human being is not possible in the absence of adequate blood and

the ability to generate blood. The same may be applied to business. It is very difficult for a firm to survive without the prospectus and the capacity to get adequate profits.

To maximize the firm's profits there is a trade-off between return (profit) and risk. If more risk exist in a decision, the greater the expected profit. In other words, investors expect higher returns for risky investments.

We can summarize the importance of profitability as follows:

It helps in assessing the efficiency of business operations.

Earning a profit is **important** to a business because **profitability** impacts whether a company can secure financing from a bank.

Profitability attracts investors to fund the company's operations and grow its business.

Companies cannot survive without attaining profit.

Profitability analysis helps the external users of accounting information pertaining to particular business such as stock holders, bond-holders, potential investors, bankers and other creditors and government agencies in measuring its economic wealth by its earnings.

It should be noted that **profitability analysis** is used to critically analyze and understand the present and potential earning capacity of enterprises. In this sense **profitability analysis** can be defined as the process of using certain methods to systematically measure the trends of business profits.

The result of profitability analysis is of a particular importance to most users, such as potential creditors or owners, who are anticipating long-term commitments in the business,

as well as to management in order to judge its own effectiveness. Examining the current profitability of a firm provides information that helps predicting future profitability and the expected return from investing in the firm's equity securities.

The analysis of profitability of a business may be measured using different techniques. But a ratio technique is one of the best and the most understandable techniques. In the next paragraph we will discuss the main profitability ratios.

3-2 calculating and classification of profitability ratios

Profitability ratios are used to measure the operating efficiency of a business. The aim of these ratios is to help in assessing the sufficiency of profits earned by the company and to determine whether the profitability is increasing or decreasing.

Profitability ratios can be classified into two main categories, based on their relation to sales and to total assets:

- ✓ **Profits in relation to sales**

These ratios are used to measure whether the firm is able to make sufficient profit on each element of sales. If there is no sufficient margin of profit in sales then it is not easy for the firm to include its fixed charges on debt and to earn a profit for shareholders. The ratios in this category include:

Gross Profit Ratio:

This ratio is computed by dividing gross profit for the period (sales less cost of goods sold) by the amount of sales revenue that is:

$$\textbf{Gross profit ratio} = \frac{\textbf{gross profit}}{\textbf{Net Sales}} \times 100$$

Note that gross profit margin can be increased by raising prices or reducing production costs.

Operating Ratio:

This ratio is computed by dividing the operating cost by sales. As a formula it can be expressed as:

$$\textbf{Operating Ratio} = \frac{\textbf{Operating Cost}}{\textbf{Net Sales}} \times 100$$

Net Profit Margin:

This ratio is calculated by dividing operating profit (gross profit less selling, general, and administrative expenses) by sales. Operating profit is also referred to as earnings before interest and taxes (EBIT).

That is:

$$\textbf{Net Profit Margin} = \frac{\textbf{Net profit (EBIT)}}{\textbf{Net Sales}} \times 100$$

Net profit margin measures the profit generated after considering all expenses. Like gross profit margin, net profit margin should be compared over time and with the firm's industry peers.

Any profit figure shown as a subtotal in the income statement can be expressed as a percentage of sales revenue. For example, we can divide net operating profit by revenue and resulted percentage is known as **operating profit margin**. Pretax profit (EBT) can also be divided by net sales and the resulted ratio is known as **pretax margin**.

Assume that company (X) has net profit of $200,000 and company (Y) has $400,000 of net profit. This means that company (Y) generated twice as much profit as company (X), but was it more profitable? Assume further that Company (X) has $4,000,000 of sales revenue, and thus a net profit margin of 5 percent (200000/ 4000000) x100= 5%) and Company (Y) has $12,000,000 of sales revenue, and thus a net profit margin of 3.33 percent (400000/ 12000000) x100 = 3.33) . Expressing net profit as a percentage of sales explains the relationship: For each $100 of sales, company (X) earns $5 in net profit, whereas company (Y) earns only $3.33 for each $100 of sales. Thus, we can now answer the question of which company was more profitable in percentage terms: Company (X) was more profitable, as indicated by its higher net profit margin of 5 %.

Current account to saving account CASA Ratio:

This ratio is one of the profitability measures in banking industry. It measures the ratio of deposits in current and savings account as a % of total deposits.

The percentage of total bank deposits that are in a CASA is an important ratio to determine the profitability of a bank. The CASA ratio indicates how much of a bank's total deposits are in both current and savings accounts. The ratio can be calculated using the following formula:

$$CASA\ ratio = \frac{CASA\ \ deposits}{Total\ deposits}$$

A higher ratio means a larger portion of a bank's deposits are in current and savings accounts, rather than term deposit accounts. This is beneficial to a bank because it gets money at a lower cost. Therefore, the CASA ratio is an indicator of the expense to raise funds and, therefore, is a reflection of a bank's profitability or likelihood of generating profit.

Example (1-3):

The following are the Income statement and the balance sheet for MZT bank for the year ended 31/12/2019 (Figures in thousands of $):

The income statement for MZT bank for the year ended 31/12/2019

Revenue	
Interest income	100,000
Interest expense	(40,000)
Net interest income	60,000
Non-interest income	30,000
Total revenue	**90,000**
provisions for loan losses	5,000
Non-interest expenses	35,000
Total Expenses	**40,000**
Income before interest and tax (EBIT	50,000
Interest expense (on debts)	2,000
Income before tax (EBT)	48,000
Income tax expense	2,400
Net income	**45,600**

MZT Bank balance sheet as on 31/12/2019

Assets	
Property	120,000
Trading assets	40,000
Loans to customers	200.000
Deposits to the central bank	230,000
Total Assets	**590,000**
Equity and Liabilities	
Liabilities	
Loans from the central bank	**30000**
Deposits from customers	**220000**
Trading liabilities	**30000**
Misc. debt	**20000**
Equity	**390000**
Common and preferred shares	390000
Total Equity and Liabilities	**590,000**

The following additional information is extracted from the banks accounts:

- MZT Bank has in its total deposits $90 million in CASA deposits.

Required: Calculate CASA ratio

Solution:

$$\boldsymbol{CASA\ ratio} = \frac{90000}{12000}\ X\ 100 = 75\%$$

- ✓ **Profits in relation to Assets**

The profit is compared with the capital invested by owners and creditors. If the firm cannot make an adequate profit on its asset, it may be misusing its assets. The ratios in this category include the following main ratios:

Return on equity (ROE):

Return on equity (ROE) is a measure of financial performance calculated by dividing net profit after interest and tax (sales minus cost of goods sold, selling, general and administrative expenses, depreciation, interest, taxes, and other expenses) by shareholders' equity. It is known that shareholders' equity is equal to a company's assets minus its liabilities, ROE, therefore, is considered the return on net assets. ROE serves as a measure of how effectively management is using a company's assets to create profits.

$$\textbf{ROE} = \frac{\text{Net profit after interest and Tax}}{\text{Shoulders' Equity}} \times 100$$

Whether a ROE is considered satisfactory will depend on what is normal for the industry or company peers.

As a shortcut, investors can consider an ROE near the long-term average of the S&P 500 (14%) as an acceptable ratio and anything less than 10% as poor.

Return on Assets (ROA):

This ratio is sometimes called return on total assets (ROTA). It *shows* the percentage of profit

that a company earns in relation to its total assets. (ROA) measures the amount of profit made by a company per pound of its assets. Unlike return on equity (ROE), the measurement of (ROA) includes all of a company's assets – including those which arise from liabilities.

The (ROA) will vary widely across industries. For this reason, when using (ROA) as a comparative measure, it is best to compare it against a company's previous (ROA) figures or the (ROA) of a similar company.

(ROA) is calculated by dividing a company's **net income** (usually annual **income)** by its total assets, and is displayed as a percentage. There are two acceptable ways to calculate return on assets: using total assets on the exact date or average total assets, That is:

$$\textbf{ROA} = \frac{\text{Net profit after interest and Tax}}{\text{Total Assets (or average total assets)}} \times 100$$

Average ROA all industries

2019	2018	2017	2016	2015	2014
2.4%	0.8%	0.5%	0.2%	-0.2%	0.4%

Net Interest Margin (NIM)

This ratio is another profitability measure used in baking industry. NIM shows the difference between interest income generated by a bank and its interest expenses, and then expresses the net interest income as percentage of its total assets. Most of banks income and expenses is created by interest. Since the bank funds a majority of their operations through customer

deposits, they pay out a large total amount in interest expense. The majority of a bank's revenue is derived from collecting interest on loans.

The formula for net interest margin is:

$$\textbf{\textit{Net Interest Margin}}\ (\textbf{\textit{NIM}}) = \frac{(\textbf{\textit{Interest Income}} - \textbf{\textit{Interest Expense}})}{\textbf{\textit{Total Assets}}}$$

As an illustration Consider data provided in example (3-1), related to MZT bank, the (NIM) of the bank can be calculated as follows:

$$\textbf{\textit{Net Interest Margin}}\ (\textbf{\textit{NIM}}) = \frac{(\textbf{100,000} - \textbf{40,000})}{\textbf{590,000}} \text{ x } 100 = 10\%$$

3-3 Interpretation of profitability ratios

It is not enough to calculate the profitability ratios, but it is important to interpret these ratios. We will see what does each of the main ratios main:

- **Gross profit margin:** suppose that a company has a gross profit margin of 40%, what does this ratio mean? It means that the cost of goods sold consumes 60% of the overall sales of the company. 40% of the sales have to cover general and administrative expenses and net profit. So, the higher this ratio is, the higher are the chances of improvement in net profit margins.
- **Net profit margin:** This ratio indicates the proportion of sales revenue that translates into net profit. For example, a net profit margin of 35% means that every $1 sale contributes 35 cents towards the net profits of the business.

Return on assets: This ratio conveys how much net profit is generated by every dollar of investment in assets. Increasing return on the asset can simply mean that management is making the best use of the assets and vice-versa.

- **Return on Equity ROE** is more than a measure of profit; it's a measure of efficiency. An increasing ROE means that a company is growing its ability to generate profit without needing as much capital. It also indicates how well a company's management is deploying the shareholders' capital. In other words, the higher the ROE the better

3-4 Benefits and Limitations of Profitability Ratios

3-4-1 Benefits of Profitability Ratios

The profitability ratios discussed above have several advantages for analyzing a company's performance. The following is a summary of the benefits of the main profitability ratios:

Net profit margin is the most conclusive ratio:

If this ratio performs well in the current year, and the trend is also growing, then it is most likely that the company is on a right path. This ratio is described as a conclusive ratio, because if there are major issues with other ratios or the company's performance, it will have its impact on this ratio. It is a good idea to start the analysis by looking at this ratio.

Gross profit margin, checks basic operational efficiency of the business:

The main advantage of this ratio is that it helps the management to discover if there is a problem in the basic operations of the company. If this margin is not sufficient to cover the administrative and other overheads, the net profit margin is going to be low or negative.

Return on Assets (ROA) monitors the efficiency in utilizing the assets

The advantage of using this ratio is that the management can monitor and then control the utilization of assets. Efficient and effective use of assets has a direct impact on profitability. With efficient asset use, a company can creates a positive leverage effect by producing and selling more units against the same depreciation cost in the income statement.

Return on Equity (ROE) is the reason for equity holders to stay investing in the company:

This ratio, like the net profit margin, is one of the most widely used ratios. The advantage of this ratio is that it is comparable across the company's peer group. It helps you answer such questions as: How much return do you generate for the equity investors? Are you generating beyond the minimum required rate of return?

3-4-2 Limitations of Profitability Ratios

Profitability ratios have some drawbacks. The following is a summary of some of these disadvantages:

- Net profit margin fails to compare across different industries and percentage representation is misleading:
- Gross profit margin ratio can't rely upon as a standalone ratio, because it isn't the final figure in the income statement.
- Companies can manipulate the return on assets ratio by reducing the assets on the balance sheet, and the choice of depreciation method greatly affects this ratio.
- ROE may be subject to manipulation by some companies by performing the buyback of equity shares. By buying its shares a company reduces its shareholder's equity, thereby increasing its return on equity

Questions

3-1 Define the term profitability and clarify its importance*? (Para. 3-1, 4min.)*

3-2 *What are the main benefits of profitability ratios? (Para. 3-4-1, 4min.)*

3-3 *What are the main limitations of profitability ratios? (Para. 3-4-2, 5min.)*

True/False

Read the following statements and choose (T) for true statements and (F) for false statements

1. *Profitability ratios are seen as the engine that drives the business.*. **(T / F)**
2. ***Profitability*** *is the surplus of revenue over expenses*. **(T / F)**
3. ***Profitability*** *is a synonym for the term profit.*. **(T / F)**
4. **Profitability analysis** can be defined as the process of using certain methods to systematically measure the trends of business profits. **(T / F)**
5. **Profitability** attracts investors to fund the company's operations and grow its business **(T / F)**

Multiple choice questions

Read the following statements and chose the correct answer:

1- (ROE) is calculated by dividing net profit after interest and tax by _____**.**

a) Net sales

b) gross profit

c) Total assets

d) shareholder's equity

2- (ROTA) shows the percentage of profit that a company earns in relation to its_____.

a) Net assets

b) total assets

c) Sales revenue

d) none of the previous answers.

3- If sales revenue of a business at the end of the year 2019 was ($1,000,000) and its gross profit and net operating profit for the same period were (500,000 $) and (300,000$) respectively. Total assets at the end of the year 2019 was ($2.0000.000) based on this information gross profit margin ratio equals:

a) 50%

b) 30%

c) 200%

d) none of the previous answers.

4- If sales revenue of a business at the end of the year 2019 was ($1,000,000) and its gross profit and net operating profit for the same period were (500000 $) and (300,000$) respectively. Total assets at the end of the year 2019 was ($2.0000.000) based on this information net profit margin ratio equals:

a) 50%

b) 30%

c) 200%

d) none of the previous answers.

5- If sales revenue of a business at the end of the year 2019 was ($1,000,000) and its gross profit and net operating profit for the same period were (500,000 $) and (300,000$) respectively. Total assets at the end of the year 2019 was ($2.0000.000) based on this information ROTA equals:

a) 50%

b) 30%

c) 200%

d) none of the previous answers.

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Chapter four: Liquidity Analysis

4-1 The concept and importance of Liquidity

Liquidity analysis measures a company's ability to meet its short-term obligations. Liquidity measures how fast assets of a business are converted into cash. It can be defined as a business's the ability to convert its most liquid assets into cash so that it could settle its current liabilities as and when they become due.

Liquidity ratios are measures used to ascertain the ability of a firm to pay off its short-term obligations.

Liquidity has two dimensions—time and risk. The time dimension of liquidity is concerned with how fast an asset can be converted into cash, while the risk dimension is concerned with the degree of certainty with which an asset can be converted into cash without any sacrifice in its book value. Form this point of view, we can say that all assets have a degree of liquidity and cash and 'near cash' items are the most liquid assets.

The level of liquidity a business differs from one industry to another. Deciding whether a business has adequate liquidity entails an analysis of its past cash requirements, current liquidity position, and anticipated future funding needs.

Liquidity is of a special significance for all businesses. We can summarize the importance of short-term liquidity in the following points:

(a) A firm cannot take benefit of discounts offered by suppliers or cannot take advantage of various profitable opportunities without having sufficient liquidity.

(b) Lack of sufficient liquidity may cause business insolvency or bankruptcy.

(c) Shortage of liquidity makes a firm's management suffers from various problems in order to maintain the day-to-day operational activities.

(d) As a result of the lack of liquidity shareholders may not be paid their dividend in time.

(e) The relationship between the business and its debtors and creditors may be damaged due to lack of liquidity.

4-2 Calculating and classification of liquidity ratios

The liquidity can be measured by means of either absolute terms or relative terms.

(a) Absolute measurement of liquidity (Working Capital):

The amount of working capital is usually considered as an indicator of liquidity position. Some authors distinguish between the gross concept and the net concept of working capital. According to the gross concept **working capital** refers to total of current asses. On the other hand **net working capital** represents the difference between current assets and current liabilities of a business. It embodies money that's available to a company for its day-to-day operations. Net working capital can be calculated using the following formula:

Net working capital = Current assets - Current liabilities

It can also be calculated using the bottom part of the balance sheet. It represents that part of the current assets financed by long term financing sources (owners' equity or non-current liabilities) in this case working capital is calculated as follows:

Net working capital = (Owners' equity + non-current liabilities) – non-current -

Example (1-4): The following is a simplified balance sheet of ABC Company:

simplified balance sheet of ABC company			
Cash	**120,000**	**Accounts payable**	**60,000**
Marketable securities	**20,000**	**Accrued Expense**	**40,000**
Accounts receivables	**60,000**	**Notes payable**	**10,000**
Inventory	**100,000**	**Current portion of long term loans**	**40,000**
Total current assets	**300,000**	**Total current liabilities**	**150,000**
Non-current assets	**200,000**	**Non-current liabilities**	**100.000**
		Owner's equity	**250,000**
Total assets	**500,000**	**Total liabilities and equity**	**500,000**

Based on the information shown above working capital and net working capital for ABC company can be calculated as follows :

Working capital= Current Assets = 300,000

Net working capital= Current Assets - Current Liabilities

Net working capital = 300,000 – 150,000 = 150,000

Or:

Net working capital = (Owners' equity + non-current liabilities) – non-current -

Net working capital = (250,000 + 100,000) – 200,000= 150,000

It can be said that a firm having a higher amount of working capital enjoys better liquidity position than another business with a lower amount of working capital. However, measurement in absolute figure does not show the real situations.

(b) Relative Terms measurement of liquidity (liquidity Ratios):

The short-term liquidity is measured more accurately with the help of the following ratios than the working capital:

Current Ratio:

This ratio displays the relation between the amount of current assets and the amount of current liabilities. It is essentially a tool for measuring short-term liquidity position of firms. In other words, it may be stated that this ratio is used to measure the margin of safety of current assets over current liabilities that the management of a firm maintains in obtaining business finance from short-term sources. This ratio is calculated using the following formula:

$$\textbf{Current Ratio} = \frac{\textbf{Current Assets}}{\textbf{Current Liabilities}}$$

Based on the information presented above about (ABC) company current ratio can be calculated As follows:

$$\textbf{Current Ratio} = \frac{300{,}000}{150{,}000} = 2$$

Current ratio alone cannot be accepted as an indicator of a firm's liquidity without qualification. Because, there are some snags in it, e.g. the components of current assets and current liabilities may be window-dressed or lack in common 'standard' etc. But it does not mean that it is of no use. Besides, some of the limitations may be overcome by proper action. As the ratio has its link with the Working Capital it is also called Working Capital Ratio?

Quick Ratio:

This ratio measures a business liquidity using its most liquid assets, and therefore excludes inventories and prepaid expenses from its current assets.

Quick ratio reflects the fact that certain current assets—such as prepaid expenses, some taxes, and employee-related prepayments—represent costs of the current period that have been paid in advance and cannot usually be converted back into cash. It also reflects the fact that inventory might not be easily and quickly converted into cash, and that a company would probably not be able to sell all of its inventory for an amount equal to its carrying value, especially if it were required to sell the inventory quickly.

This ratio is also known as "acid-test ratio." It can be calculated using the following formula:

$$\text{Quick Ratio} = \frac{\text{Current Assets – inventories – prepaid expenses}}{\text{Current Liabilities}}$$

Using the information given above we can calculate Quick ratio for (ABC) company as follows:

$$\text{Quick Ratio} = \frac{300{,}000 - 100{,}000}{150{,}000} = 1.33$$

Cash ratio:

This ratio is a tougher liquidity measure than the other two liquidity ratios.

It is obtained by dividing the most liquid assets by current liabilities.

$$\text{Cash Ratio} = \frac{\text{Cash and cash equivalent}}{\text{Current Liabilities}}$$

Referring back to the (ABC) company example, cash ratio can be calculated as shown below:

$$\text{Cash Ratio} = \frac{(120000+20000)}{150000} = 0.93$$

Loan to Deposit Ratio (LDR):

This ratio is one of the liquidity ratios used in banks. It measures the bank's total credit in relation to its total deposits. This helps in analyzing the bank's liquidity position.

If the ratio is too high, it indicates that the bank may not have sufficient liquidity to cover any unexpected fund requirements. On the other hand, if the ratio is too low, the bank may not be earning as much as it could be. The ratio is calculated using the following formula:

$$\boldsymbol{LDR = \frac{Total\ Laons}{Total\ deposits}}$$

Normally, the ideal LDR is 80% to 90%. A LDR of 100% means a bank loaned one dollar to customers for every dollar received in deposits it received. It also means that a bank will not have significant reserves available for expected or unexpected contingencies.

Example (2-4):

Refer back to example (1-3) in chapter three related to MZT bank and calculate the LDR ratio for MZT for the year (2019):

Solution: as can be seen from the data provided in the example:

Total loans to customers = 200,000

Total Deposits from customers = 220,000

$$LDR = \frac{200{,}000}{220{,}000} \text{ x } 100 = 91\%$$

The LDR ratio of MZT is good as the typical LDR is between 80 to 90 %

The liquidity coverage ratio (LCR):

This ratio is a requirement under Basel III, whereby banks must hold an amount of high-quality liquid assets that's enough to fund cash outflows for 30 days.

LCR ratio is calculated using the following formula:

$$\textbf{\textit{Liquidity Coverage Ratio}} = \frac{High\ quality\ liquid\ asset\ amount\ (HQLA)}{Totak\ net\ cash\ flow\ amount}$$

The high-quality liquid assets include only those with a high potential to be converted easily and quickly into cash. Under Basel III, the three categories of liquid assets with decreasing levels of quality are level 1, level 2A, and level 2B. Highly liquid assets can include cash, treasury bonds or corporate debt.

Banks are required to maintain a minimum LCR of 100%, which means holding an amount of highly liquid assets that are equal or greater than its net cash flow, over a 30-day stress period.

Example (3-4):

Assume that MZT bank has high-quality liquid assets worth $55 million and $35 million in anticipated net cash flows, over a 30-day stress period.

Required: calculate LCR for MZT Bank.

$$\textbf{\textit{Liquidity Coverage Ratio}} = \frac{100}{80}\ x\ 100 = 157\%$$

Bank MTZ's LCR is 157%, which meets the requirement under Basel III

A drawback of the LCR is that banks are required to hold more cash, which might lead to fewer loans being issued to customers.

LCR helps banks and other financial institutions make sure that they have sufficient capital during short-term liquidity disruptions.

4-3 Interpretation of Liquidity ratios

After calculating liquidity ratios it is important to interpret them. We will see what does each of the main ratios means:

The higher the current ratio, the more liquid the company is. Generally, a **2: 1** current ratio is considered as normal (i.e. for every two Syrian Pounds of current assets there is only one Pound of current liability) and it expresses a comfortable financial position for most enterprises. For most industrial companies, 1.5 may be an acceptable current ratio.

Low values for the current ratio (values less than 1) indicate that a firm may have difficulty meeting current obligations. In contrast, if current ratio is too high (much more than 2), then the company may not be using its current assets or its short-term financing facilities efficiently. This may also indicate problems in working capital management.

Similarly, if the value of the quick ratio (acid-test) is less than 1, then it indicates that a company does not have adequate assets that can instantly be liquidated by the company to pay off all its current liabilities. In such a situation the company would probably be required to sell some of its other long-term assets to settle its short-term liabilities.

Concerning cash ratio, a cash ratio of 1 means that the company has the same amount of cash and cash equivalents as it has current liabilities. That is, in order to pay off its current liabilities, the company would have to use all of its cash and cash equivalents. A ratio above

(1) means that all the current liabilities can be paid with cash and cash equivalents. A ratio below 1 means that the company needs more than just its cash reserves to pay off its current liabilities.

As with most liquidity ratios, a higher cash coverage ratio means that the company is more liquid and can more easily fund its debt. Creditors are particularly interested in this ratio because they want to make sure their loans will be repaid.

- **Cash ratio:** Cash ratio is not as popular in financial analysis as current or quick ratios. It tells creditors and analysts the value of current assets that could quickly be turned into cash, and what percentage of the company's current liabilities these cash and near-cash assets could cover. There is no common norm for cash ratio. In some countries a cash ratio of not less than 0.2 is considered as acceptable. But ratio that is too high may show poor asset utilization for a company holding large amounts of cash on its balance sheet.

4-4 Benefits and Limitations of Liquidity Ratios

4-4-1 Benefits of Liquidity Ratios

The liquidity ratios discussed above have several advantages for analyzing a company's performance. The following is a summary of the benefits of the main liquidity ratios:

- **Current ratio** helps in measuring the short-term financial health of a company. It also shows the management's efficiency in meeting the creditor's demands. .
- **Quick ratio** is very simple to understand and straight forward as well. It excludes inventory and hence, is a more accurate measure of liquidity as compared to the current ratio.

- **Cash ratio** assists in the assessment of the cash richness of a company. It helps us measure the short-term financial strength of a company. It shows the management's efficiency in meeting the creditor's demands.

4-4-2 Limitations of liquidity Ratios

Liquidity ratios have some drawbacks. The following is a summary of some of these disadvantages:

Current ratio includes inventories in the calculation, which may lead to overestimation of the liquidity position. If the company has a high level of inventory, it will indicate that the company in an excellent liquidity position but, in reality, the company is in severe financial health. This makes current ratio insufficient to analyze the liquidity of the business as it depends on the amount of current assets instead of the quality of these assets.

Quick (acid test) ratio can't be used to compare various industries and can only be a measure of comparison for similar companies. It is also deeply dependent on accounts receivable and current liabilities which could be influenced by the company's management if they want. It doesn't take into consideration the time frame of payments. For example, some of the accounts receivables included in current assets may become bad debts that will never be recovered in the future or may include receivable recovered after more than a year which actually has a negative impact on the liquidity of the company whereas the quick ratio portrays otherwise.

Cash ratio: There is great ambiguity regarding the instruments that can be considered a cash equivalent. Such confusion can end up giving misleading results. Furthermore, it does

not take into consideration the impact of the crisis on otherwise easily saleable securities. Although it only considers the most liquid form of assets, during the crisis even the cash equivalents are difficult to trade.

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Questions

4-1 Define the term liquidity and clarify its importance*? (para. 4-1)*

4-2 *What is working capital and how it can be calculated? (para. 4-2)*

4-3 *What are the main limitations of profitability ratios? (para. 3-4-2)*

True/False

Read the following statements and choose (T) for true statements and (F) for false statements

6- *Liquidity ratios are measures used to ascertain the ability of a firm to pay off its short-term obligations*. **(T / F)**

7- Liquidity has three dimensions—time, profitability and risk **(T / F)**

8- Different industries have similar levels of liquidity... (T / F)

9- A firm can take benefit of discounts offered by suppliers and take advantage of various profitable opportunities without having sufficient liquidity. (T / F)

10-Lack of sufficient liquidity may cause business insolvency **(T / F)**

Multiple choice questions

Read the following statements and chose the correct answer:

- A company has $40,000 in current assets, $10,000 in non-current assets, and $20,000 in current liabilities and $50,000 in non-current liabilities. What is its current ratio?

  a) 0.8

  b) 2

  c) 0.5

  d) none of the previous answers

- A company has $40,000 in current assets, $10,000 in non-current assets, and $20,000 in current liabilities and $50,000 in non-current liabilities. Working capital of the company equals:

  a) 20000

  b) 30000

  c) 10000

  d) none of the previous answers

- A company has $30,000 in cash, $10,000 in cash equivalents, and $20,000 in inventories, $20,000 in receivables and $40,000 in current liabilities. The current ratio of the company equals:

  a) 1. 5

  b) 1.

  c) 2

  d) none of the previous answers.

- A company has $30,000 in cash, $10,000 in cash equivalents, $20,000 in inventories, $20,000 in receivables and $40,000 in current liabilities. The quick ratio of the company equals:

  a) 1. 5

  b) 1.

  c) 2

  d) none of the previous answers.

- A company has $30,000 in cash, $10,000 in cash equivalents, $20,000 in inventories, $20,000 in receivables and $40,000 in current liabilities. The cash ratio of the company equals:

  a) 1. 5

  b) 1.

  c) 2

  d) none of the previous answers.

Chapter Five: Solvency Analysis

5-1 The concept of Solvency

We have previously seen that liquidity refers to a firm's ability to pay its short-term obligations; it also denotes to a company's capability to sell assets quickly to raise cash. Liquidity is, therefore, has a short-term emphasis. In this chapter we will focus on other measures of a firm's ability to pay its debt, but which have a focus on the long-term ability of the firm to pay its liabilities, namely, solvency measures.

Solvency can be defined as a firm's ability to meet its long-term financial commitments. Examining a company's ability to pay its long-term obligations (i.e., to make interest and principal payments) usually comprises an in-depth investigation of the components of its financial structure.

Solvency ratios are measures used to provide information regarding a company's financial health in the context of its debt obligations. They, additionally, provide information about the relative amount of debt in the company's capital structure and the adequacy of earnings and cash flow to cover interest expenses and other fixed charges as they come due.

A solvent company is one that owns more assets than its obligations; in other words, it has a positive net assets and a manageable debt load. Therefore, healthy companies are both solvent and possess adequate liquidity.

Insuring firm's solvency is essential to stay in business, because it demonstrates a company's ability to continue its operations into the foreseeable future. A firm that is insolvent will often enter bankruptcy.

Understanding solvency position of a business, in terms of the amount of debt in its capital structure, is important, because it helps assessing its risk and return characteristics, specifically its financial leverage.

Investors and other interested parties can use ratios to analyze a company's solvency.
Understanding a business's use of its debt can provide analysts with insight into the company's future business predictions because management's decisions about financing may signal their beliefs about a company's future. For example, the issuance of long-term debt to repurchase common shares may indicate that management believes the market is underestimating the company's prospects and that the shares are undervalued.
In the next paragraph we will discuss the main solvency ratios.

5-2 Calculating and classification of solvency ratios

Solvency ratios can be classified into two main types:

Debt ratios: these ratios measure the extent to which a firm uses debt to fund its operations, as well as its ability to pay for that debt. These ratios are important to investors, whose equity investments in a business could be put at risk if the debt level is too high. Lenders are also other users of these ratios. They use debt ratios to determine the extent to which loaned funds could be at risk.

The following are the main debt ratios:

- **Debt to Assets Ratio:**

  This ratio is calculated by dividing total debt (liabilities) by total assets. A high ratio implies that assets are being financed primarily with debt, rather than equity, and is considered to be a risky approach to financing. The ratio is calculated using the following formula:

$$\textbf{Debt to Assets Ratio} = \frac{\textbf{Total Debt (liabilities)}}{\textbf{Total Assets}}$$

A ratio greater than 1 shows that a company has more liabilities than assets. A high ratio also indicates that a company may be putting itself at a risk of failing to repay its loans when they come due. A ratio less than (1) denotes that a portion of a company's assets is funded by equity.

- **Debt-to-Equity ratio:** This ratio is calculated by dividing the total amount of debt by the total amount of equity. The ratio intends to show whether funding is coming from a reasonable proportion of debt. Lenders like to see a large equity proportion in a business. The ratio is calculated using the following formula:

$$\textbf{Debt to Equity Ratio} = \frac{\textbf{Total Debt (liabilities)}}{\textbf{Total equity}}$$

- **Equity ratio**. This ratio shows the proportion of a firm's assets financed by owner's equity. It can be calculated by dividing total equity by total assets as shown in the following formula:

$$\textbf{Equity Ratio} = \frac{\textbf{Total equity}}{\textbf{Total assets}}$$

To explain how to calculate each of the debt ratios consider the following example.

Example (5-1): The following is a simplified balance sheet of Karapeil Company:

simplified balance sheet of Karapeil company			
Current assets	**150,000**	**Current liabilities**	**60,000**
Non-current assets	**250,000**	**Long term loans**	**40,000**
		Total liabilities	**100,000**
		Capital	**200,000**
		Retained earnings	**100,000**
		Total equity	**300,000**
Total assets	**400,000**	**Total equity & liabilities**	**400,000**

Calculate the following ratios: Debt to Assets Ratio, Debt-to-Equity Ratio, Equity Ratio.

- Debt to Assets Ratio**:**

$$\text{Debt to Assets Ratio} = \frac{\text{Total Debt (liabilities)}}{\text{Total Assets}}$$

$$\text{Debt to Assets Ratio} = \frac{100}{400} = 0.25$$

Debt-to-Equity**:**

$$\text{Debt to Equity Ratio} = \frac{\text{Total Debt (liabilities)}}{\text{Total equity}}$$

$$\text{Debt to Equity Ratio} = \frac{100}{300} = 0.33$$

Equity Ratio:

$$\text{Equity Ratio} = \frac{\text{Total equity}}{\text{Total assets}}$$

$$\text{Equity Ratio} = \frac{300}{400} \quad 0.75$$

As can be seen from the calculations shown above, debt to assets ratio equals (*0.25),* which is less than (1) denoting that a significant portion of a company's assets is funded by equity. This result is further supported by the other two ratios, particularly equity ratio, which shows that (75%) of total assets at Karapel company are funded by equity.

Capital Adequacy Ratio: This ratio is mainly used in banks. It is a measurement of banks available capital expressed as a percentage of bank's risk weighted credit exposure. It is calculated using the following formula:

$$\boldsymbol{CAR = \frac{Tier-1\ Capital\ +\ Tier-2\ Capital}{Risk-Weighted\ Assets}}$$

Where:

Tier-1 capital, or core capital, comprises equity capital, ordinary share capital, intangible assets and audited revenue reserves. Tier-1 capital is used to absorb losses and does not require a bank to cease operations.

Tier-2 capital includes unaudited retained earnings, unaudited reserves and general loss reserves. This capital absorbs losses if the bank is liquidated. Tier-2 capital cushions losses in case the bank is winding up, so it provides a lesser degree of protection to depositors and creditors. It is used to absorb losses if a bank loses all its Tier-1 capital.

Risk-weighted assets are calculated by assigning a weight to all of the loans the bank has issued based on their degree of credit risk. For example, loans issued to the government are weighted at 0.0%, while those given to individuals are assigned a weighted score of 100.0%.

Currently, the minimum ratio of CAR is 8% under Basel II and 10.5% under Basel III. A CAR above the minimum requirements under Basel II and Basel III is considered high,

Example (5-2):

Assume that HSBC bank has $100 million in tier-1 capital and $50 million in tier-2 capital. It has loans that have been weighted and calculated as $500 million.

Required: Calculate the CAR of HSBC Bank and comment on your results?

The CAR is calculated using the following formula:

$$\boldsymbol{CAR = \frac{Tier-1\ Capital\ +\ Tier-2\ Capital}{Risk\ Weighted\ Assets}}$$

$$\boldsymbol{CAR = \frac{100+50}{500}} = 30\%$$

HSBC has a high CAR of (30%), which , is considered to be safer. As a result, HSBC is less likely to become insolvent if unexpected losses occur.

Coverage ratios: A firm has certain fixed payments to be made during a financial period, such as the interest on debts and the principal repayment. Coverage ratios focus on the income statement of a business and measure its capacity of being in a position to pay off such liabilities from the profit it is generating over a given period of time. These ratios are

useful in assessing a company's solvency. They indicate the number of times a firm's income or cash flows could cover interest charges. Coverage ratios include the following ratios:

Debt service coverage ratio.(DSCR) This ratio is calculated by dividing total net annual operating income by the total of annual loan payments. It measures the ability of a business to pay back both the principal and interest portions of its debt.

Unlike interest coverage ratio (DSCR) takes into consideration the entire amount of debt to be repaid in the given period of time, and then compares it with the profit figure in order to show how much coverage is available to the company. The ratio is calculated using the following formula:

$$\textbf{Debt service coverage ratio DSCR} = \frac{\textbf{Net Operating Income}}{\textbf{Total Debt to Service}}$$

Total debt to service includes principal repayments, interest payable and lease payments. Net operating income is the adjusted EBITDA i.e. Operating Revenue – Operating Expenses

Interest coverage ratio. This ratio is calculated by dividing earnings before interest and taxes by interest expense. The intent is to see if a business can at least pay for its interest payments when due, even if the balance of a loan cannot be repaid. This measure works well in cases where a loan is expected to be rolled over into a new loan when it reaches maturity.

Therefore, to calculate this ratio we use a profit figure that is prior to the charging of interest, normally earnings before interest and tax (EBIT). EBIT is used because it is after charging depreciation and amortization and therefore gives the amount of profit that can actually be

used to pay off the interest. This ratio is calculated using the following formula:

$$\textbf{Interest Coverage Ratio} = \frac{\textbf{Net Operating Income (EBIT)}}{\textbf{Interest Expense}}$$

Example (5-3):

Suppose a company has an EBIT of $30 million while the depreciation and amortization is $50 million. The debt that the company has to pay off this year is $50 million, while the total debt is $200 million and interest is charged at the rate of 5% p.a.

Interest Expense is calculated as follows:

Interest Expense = 0.05 x 200

Interest Expense = **$10 million**

Interest Coverage Ratio is calculated using the formula given below

Interest Coverage Ratio= EBIT/ Interest Expense

Interest Coverage Ratio = 30 / 10 = **3**

DSCR is calculated as:

DSCR = (30 + 50) / (50 + 10)

DSCR = **1.33**

As both the ratios are greater than 1, the company seems to be in a good financial position to fulfill its liabilities

5-3 Interpretation of solvency ratios

As we mentioned above, long-term creditors and shareholders are key parties interested in solvency ratios. These user groups of accounting information are interested in the long-term health and survival of the business. Consequently, after calculating debt ratios, analyst should provide users with his interpretation for the results to enable them making butter decisions. This paragraph presents a brief interpretation of the main solvency ratios.

Debt to Equity ratio:

Different industries have different debt to equity ratio benchmarks, as some industries tend to use more debt financing than others. A debt ratio of (0.5) indicates that there are half as many liabilities than there is equity. In other words, the assets of the company are funded 2-to-1 by investors to creditors. This means that investors own (66.6) cents of every dollar of company assets while creditors only own (33.3) cents on the dollar.

A debt to equity ratio of (1) would denote that investors and creditors have an equal portions in the business assets.

A lower debt to equity ratio usually suggests a more financially stable firm. Firms with a higher debt to equity ratio are considered more risky to both creditors and investors, as compared with firms that have a lower ratio.

Creditors consider a higher debt to equity ratio as risky because it means that the investors haven't financed the operations as much as creditors have. This could indicate that investors don't want to finance the business operations because the firm isn't performing well.

Equity Ratio:

Higher equity ratios are normally favorable for companies. A firm with higher investment levels by shareholders shows potential shareholders that it is worth investing in since so many investors are willing to finance it. A higher ratio also shows potential creditors that the firm is more sustainable and less risky to lend future loans.

Using equity to finance the firm is generally much cheaper than debt because of the interest expenses related to debt financing. Firms that have higher equity ratios should have less financing and debt service costs than firms with lower equity ratios.

As with all ratios, equity ratio depends on the industry. Exact ratio performance depends on industry standards and benchmarks.

Debt Ratio:

Debt ratio calculates total liabilities as a percentage of total assets. As with many solvency ratios, a lower ratio is more favorable than a higher ratio.

A lower debt ratio usually indicates a more stable business with the potential of longevity because a company with lower ratio also has lower overall debt. Each industry has its own benchmarks for debt, but (0.5) is reasonable ratio.

A debt ratio of 0.5 is often considered to be less risky. This denotes that the firm has twice as many assets as liabilities. In other words, this firm's liabilities are only 50 percent of its total assets. Basically, creditors own only half of the firm's assets and the shareholders own the remainder of the assets.

A ratio of (1) means that total liabilities equals total assets. In other words, the firm would have to sell off all its assets in order to pay off its liabilities. Obviously, this is a highly leverage firm. Once its assets are sold off, the business no longer can operate.

The debt ratio is a major solvency ratio because lenders are always concerned about being repaid. When firms borrow more money, their ratio increases, and creditors will no longer lend them money. Firms with higher debt ratios are better off looking to equity to finance their operations. Used in conjunction with other measures of financial health, the debt ratio can help investors determine a company's risk level.

5-4 Benefits and Limitations of Solvency Ratios

5-4-1 Benefits of Solvency Ratios

The solvency ratios have several advantages; the following are some of their benefits:

They provide useful information about the entity's financial structure.

They are easy to understand and to calculate.

They help investors and shareholders to understand deeply an entity's financial situation. ...

Solvency ratios are used by lenders and creditors when a business applies for a loan.

They help in understanding shareholder's earning. A high debt suggests that high interests are paid by the business, which in turn reduces profits significantly. A decrease in profit means a decrease in dividends paid to the ordinary shareholders.

They are used in financial analysis to enable potential investors to examine the health of a company. A high debt to equity ratio is an indication of low liquidity. It means that the entity is unable to finance its obligations through the cash and reserves and is dependent on the creditors. The probabilities of the entity to go bankruptcy are high.

5-4-2 Limitations of Solvency Ratios

Solvency ratios have some disadvantages, which can be summarized as follows:

Lack of future assessment, as they are used to evaluate past performance.

They provide the investors and shareholders with the past financial performance, which might not help them to make the right decision for the future.

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Web sites :

- https://www.educba.com/list-of-financial-ratios/
- https://www.myaccountingcourse.com/accounting-quizzes/multiple-choice

Questions

5-1 Define the term solvency and clarify its importance*? (para. 5-1, 3 min.)*

5-2 *Explain the concepts of* Tier-1 capital and Tier-2 capital used in CAR in Banks*? (para. 5-2-1, 5 min)*

5-3 *What are the main limitations of* solvency *ratios? (para. 5-4-1, 4 min)*

5-4 *What are the main limitations of* solvency *ratios? (para. 5-4-2, 4 min)*

True/false

Read the following statements and choose (T) for true statements and (F) for false statements

1. Solvency ratios are measures used to provide information regarding a company's financial health in the context of its debt obligations. **(T / F)**
2. A solvent company is one that owns less assets than its obligations; **(T / F).**
3. Understanding solvency position of a business, helps assessing its risk and return characteristics, specifically its financial leverage (T / F)
4. Debt ratios measure the extent to which a firm uses debt to fund its operations, as well as its ability to pay for that debt.. (T / F)
5. **Debt-to-assets ratio** intends to show whether funding is coming from a reasonable proportion of debt. **(T / F).**
6. Interest coverage ratio takes into consideration the entire amount of debt to be repaid in the given period of time. **(T / F).**

Multiple choice questions

Read the following statements and chose the correct answer:

- A company has $50,000 in current liabilities, $70,000 in non-current liabilities, 360,000$ in total assets, and $240,000 in equity. What is its Debt to Equity ratio?

  a) 0.8

  b) 2.

  c) 0.5

  d) none of the previous answers

- A company has $50,000 in current liabilities, $70,000 in non-current liabilities, 360,000$ in total assets, and $240,000 in equity. What is its Equity ratio?

  a) 20000.

  b) 30000

  c) 10000

  d) none of the previous answers

- A company has $50,000 in current liabilities, $70,000 in non-current liabilities, 360,000$ in total assets, and $240,000 in equity. What is its debt ratio?

  a) 1. 5

  b) 1.

  c) 2

  d) none of the previous answers.

- A firm's ability to meet its long-term financial commitments refers to the concept of :.?

  a) Liquidity

  b) Solvency

  c) Profitability

  d) Reliability

- Financial ratios that provide information about the adequacy of earnings and cash flow to cover interest expenses and other fixed charges as they come due are:

  a) Liquidity ratios

  b) Profitability ratios

  c) Solvency ratios

  d) Activity ratios

- The financial ratios that measure a business's capacity to pay off the interest on debts and the principal repayment from the profit it is generating over a given period of time are:.

  a) Overage ratios

  b) profitability ratios

  c) Debt ratios

  d) Liquidity ratios.

Chapter Six: Activity Analysis

6-1 The concept of asset management

Assets are the main element in the financial health of a business. Financial analysis is used as an important tool for controlling asset use decisions. The term **asset management** refers to the process of developing, operating, maintaining, and selling assets in a cost-effective manner. It is an important element that covers a wide range of tasks. They are represented in two directions: management of non-current and current assets.

The management of non-current assets aims at increasing the efficiency of the utilization of production facilities. On the other hand the management of current asset includes effectively managing the inventories of finished products and raw materials, accounts receivable, cash and the other current assets.

Activity ratios (asset management ratios) are financial ratios used to compare the assets of a company to its sales revenue. Activity ratios indicate how successful a company is in utilizing its assets to generate revenues. They show the ability of a company to translate its assets into sales.

Activity ratios are computed for different assets. Common examples of asset turnover ratios include fixed asset turnover, inventory turnover, accounts payable turnover ratio, accounts receivable turnover ratio. These ratios provide important insights into different financial areas of the company and highlight its strengths and weaknesses.

High asset turnover ratios are desirable because they mean that the company is utilizing its assets efficiently to produce sales. The higher the asset turnover ratios, the more sales the company is generating from its assets.

Although higher asset turnover ratios are preferable, but what is considered to be high for one industry, may be low for another. Therefore it is not useful to compare asset turnover ratios of different industries. Different industries have different requirements with regard to assets. It would be not suitable to compare a retailer, which requires little assets, to a manufacturing company, which needs large manufacturing facilities, plant and equipment.

Low asset turnover ratios mean inefficient utilization of assets. They mean that the company is not managing its assets effectively. They may also indicate that the assets are outdated. Companies with low asset turnover ratios are likely to be operating below their full capacity.

6-2 The Importance of asset management

The importance of asset management can be summarized as follows

- The composition and efficiency of using business assets directly affect the final result of the enterprise's economic activity.
- Effective asset management can improve financial sustainability and increase the competitiveness of an enterprise.
- It creates a more efficient operation of the business.
- It allows managers to track the overall performance of their assets.

6-3 Calculation and the classification of activity ratios:

The calculation of activity ratios requires information from both the balance sheet and the income statement. They use information from the income statement in the numerator, while they use information from the balance sheet in the denominator. Because the income statement shows the financial performance of a business for a specific period (it measures what happened during a period), whereas the balance sheet displays the

financial position of the business at the end of the period, average balance sheet data are normally used for consistency. For example, to calculate inventory turnover, cost of goods sold (from the income statement) is divided by average inventory (from the balance sheet). It should be noted that the average of each of the balance sheet items, used in activity ratios, is typically calculated using only two figures: the beginning of the year and the end of the year. In this paragraph we will explain how to calculate the main activity ratios.

- **Inventory Turnover:**

This ratio is a measure of a firm's efficiency with respect to its processing and inventory management. It shows the number of times a company has sold and replaced its inventory during a certain period of time. It is calculated using the following formula:

$$\text{Inventory turnover} = \frac{\text{Average cost of goods sold}}{\text{Average Inventory}}$$

Example (6-1):

Golden Med Pharma has an opening inventory of (600) million SP at the beginning of the year 2019. And a closing inventory at the end of the year (2019) of (800) million. The cost of the goods sold in the income statement for the year ended 31/12/2019 was (1050) million. Based on this information the inventory turnover for Golden Med Pharma for the year 2019 is:

$$\text{Inventory turnover} = \frac{1050}{700} = 1.5 \text{ times}$$

This means that the inventory at Golden Med Pharma turned over (1.5 times) during the year 2019.

Inventory turnover indicates the resources tied up in inventory (i.e., the carrying costs) and can, therefore, be used to indicate inventory management effectiveness.

- **Days of Inventory on hand (DOH):**

This ratio is calculated by multiplying the inverse of the inventory turnover by (365). The result is the average inventory processing period, or the number of days of inventory, or days of inventory on hand (DOH):

$$\textbf{days of inventory on hand} = \frac{365}{\textbf{Inventory turnover}}$$

Example (6-2):

Using the information provided in the example (6-1), presented above, about Golden Med Pharma (DOH) is calculated as follows:

$$\textbf{days of inventory on hand} = \frac{365}{\textbf{1.5}} = \textbf{234 days}$$

This means that Golden Med Pharma took (234) days to sell its average balance of **inventory**. Or the company kept its average inventory for (234) days. The lower the DOH ratio is the better the performance of the business, which in turn indicates that it takes a shorter period to clear inventory.

A higher inventory turnover ratio implies a shorter period that inventory is held, and thus a lower DOH.

Receivables turnover ratio:

This ratio is computed by dividing the net credit sales during a period by average receivables. Accounts receivable turnover ratio simply measures how many times the receivables are collected during a particular period. It is a helpful tool to evaluate the liquidity of receivables. This ratio is calculated using the following formula:

$$\textbf{receivables turnover} = \frac{\textbf{Annual sales}}{\textbf{Average receivables}}$$

Average collection period

This ratio is also known as days of sales outstanding, it is calculated by taking the inverse of receivables turnover and multiplying it by 365. It represents the average number of days it takes for the company's customers to pay their debts:

$$\textbf{Average collection period} = \frac{\textbf{365}}{\textbf{Accounts receivables turnover}}$$

Example (6-3):

The following information is extracted from the accounting records of Golden Med Pharma,

for the year /2019/: Opening balance of accounts receivable (150000), closing balance of accounts receivable (50000), sales revenue (200000).

Required:

- Calculate accounts receivable turnover
- Calculate the average collection period (days of sales outstanding)

Solution:

$$\textbf{Accounts receivable turnover} = \frac{\textbf{Annual sales}}{\textbf{Average accounts receivables}}$$

$$\textbf{Accounts receivables turnover} = \frac{\textbf{200000}}{\textbf{100000}} = \textbf{2 times}$$

This means that Golden Med Pharma collected its average accounts receivable two times during the period.

$$\textbf{Average collection period} = \frac{\textbf{365}}{\textbf{Receivables turnover}}$$

$$\textbf{Average collection period} = \frac{\textbf{365}}{\textbf{2}} = \textbf{182.5 days}$$

This means that Golden Med Pharma required (182.5 days) to collect its average receivables balance during the period.

- **Payables turnover:**

A measure of the use of trade credit by the firm is the payables turnover ratio:

It is calculated using the following formula:

$$\textbf{Payables } \textit{turnover} = \frac{\textit{Net Annual purchases}}{\textit{Average } \textbf{Payables}}$$

You can use the inventory equation to calculate purchases from the financial statements as follows:

Purchases = ending inventory – beginning inventory + cost of goods sold

- **Number of days of payables:**

The inverse of the payables turnover ratio multiplied by 365 is the payables

Payment period or number of days of payables, which is the average amount of time it takes the company to pay its debts to payables. It can be calculated using the following formula:

$$\textbf{Number of days of payables} = \frac{\textit{365}}{\textit{Payables turnover}}$$

Example (6−4):

The following information is extracted from the accounting records of Kinda Pharma, for the year /2019/: Opening balance of accounts payable (250000), closing balance of accounts payable (150000), annual credit purchases (5000000).

Required:

- Calculate accounts payable turnover
- Calculate the average Payables payment period .

Solution

Average payables =(opening balance of payables + Closing balance of payables) / 2 = (250000+150000)/2= 200000

$$\textbf{Payables } \textit{turnover} = \frac{\textit{Net Annual purchases}}{\textit{Average } \textbf{Payables}}$$

Accordingly:

$$\textbf{Payables } \textit{turnover} = \frac{5000000}{200000} = \textbf{2.5 times}$$

This means that the company's accounts payable turned over 2.5 times during the period.

$$\text{Payables payment period} = \frac{365}{2.5} = 146 \text{ days}$$

This means that the company took 146 days to pay its payables

We have shown days calculations for payables, receivables, and inventory based on annual turnover and a 365-day year. If turnover ratios are for a quarter rather than a year, the number of days in the quarter should be divided by the quarterly turnover ratios in order to get the "days" form of these ratios.

- **Asset Turnover Ratio**

This ratio measures the amount of revenue a company generates per dollar of assets. The is calculated by dividing net sales of a company for a n accounting period, by the total or average assets of the company for the same period. A company with a high asset turnover ratio is considered more efficient than a company with a lower turnover ratio.

The ratio reveals how efficiently a company is in using its assets to generate sales.

Example (6-5):

The following information is extracted from the accounting records of Al Shark company, for the year /2019/: Total assets at the beginning of the year (7000,000), total assets at the end of the year (13,000,000), annual net sales (5000000).

Required: calculate Assets turnover ratio?

Solution

$$\textit{Assets turnover} = \frac{\textit{Annual sales}}{\textit{Average total assets}}$$

Accordingly:

$$\textit{Assets turnover} = \frac{5000000}{10000000} = 0{,}5$$

This means that for each one Syrian pound in assets Al-Shark Company generated 0.5 pound in net sales.

Loans-to-Assets Ratio: This ratio is used in banking industry. It can help investors obtain a complete analysis of a bank's operations. Banks that have a relatively higher loan-to-assets ratio derive more of their income from loans and investments, while banks with lower levels of loans-to-assets ratios derive a relatively larger portion of their total incomes from more-diversified, noninterest-earning sources, such as asset management or trading. Banks with lower loan-to-assets ratios may fare better when interest rates are low or credit is tight. They may also fare better during economic downturns. Loans to assets ratio can be calculated using the following formula:

$$Loans\ to\ assets\ = \frac{Loans\ provided\ to\ customers}{Total\ assets}$$

High loans to assets ratio might indicate two things:

Bank is at higher risk because loans are less liquid assets than other financial assets.

Loans are usually the most profitable assets of the bank, and it is highly expected that bank with high 'loans to assets ratio' will have higher 'net interest income'.

Example (6-6): refer back to example (1-3) and calculate the Loans to Assets ratio for MZT

Bank:

You can see from MZT example that Loans to customers = 200,000 , while total assets = 590,000 accordingly :

$$Loans\ to\ assets\ = \frac{200{,}000}{590{,}000} = \mathbf{34}\%$$

6-4 Interpretation of activity ratios

Activity ratios provide important insights into different financial areas of the company and highlight its strengths and weaknesses.

High asset turnover ratios are desirable because they mean that the company is utilizing its assets efficiently to produce sales. The higher the asset turnover ratios, the more sales the company is generating from its assets.

Although higher asset turnover ratios are preferable, but what is considered to be high for one industry, may be seen low for another. Therefore it is not useful to compare asset turnover ratios of different industries, because different industries have different requirements regarding assets. It would be unwise to compare an ecommerce store which requires little assets to a manufacturing organization which requires large manufacturing facilities, plant and equipment.

Low asset turnover ratios mean inefficient utilization of assets. They mean that the company is not managing its assets wisely. They may also indicate that the assets are outdated. Companies with low asset turnover ratios are likely to be operating below their full capacity.

6-5 Benefits and limitations of Activity ratios

The main advantage of activity ratios is the same as any financial ratio; they provide company-specific asset information to investors and managers, in a form that is easily comparable, to enable them discover asset management successes and failures. For example, if the asset turnover ratio suddenly descents, it could indicate that an asset has become obsolete to operations and should be sold.

However, some authors criticized the activity ratios. They considered as being don't measure how well a company is earning profits. It only measures how well a company is generating sales. Higher sales may or may not get translated to increase in profits.

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- KAPLAN Schweser. 2019, **Financial reporting and analysis** , CFA program exam prepar Level 1.

Questions

1- ***Define the following terms: Asset management, current asset management, and non-current asset management, Activity ratios? (5min.)***

2- ***Discuss the benefits and the limitations of Activity ratios? (par.6.5, 6min)***

True/False

1- Asset turnover is the process of developing, operating, maintaining, and selling assets in a cost-effective manner (**True/False**)

2- The management of non-current assets aims at increasing the efficiency of the utilization of production facilities. (**True/False**)

3- ***Activity ratios (asset management ratios)*** *are financial ratios used to compare the assets of a company to its sales revenue* (**True/False**)

4- *Activity ratios show the ability of a company to translate its assets into profit.* (**True/False**)

5- Low asset turnover ratios are desirable because they mean that the company is utilizing its assets efficiently to produce sales (**True/False**)

6- The higher the asset turnover ratios, the more sales the company is generating from its assets.. (**True/False**)

7- Although higher asset turnover ratios are preferable, but what is considered to be high for one industry, may be low for another. (**True/False**)

8- It is useful to compare asset turnover ratios of different industries. (**True/False**)

9- Companies with low asset turnover ratios are likely to be operating below their full capacity. (**True/False**)

10-Effective asset management can improve financial sustainability and increase the competitiveness of an enterprise. (**True/False)**

Multiple choice Questions

1- The calculation of activity ratios requires information from:

A. only the balance sheet.

B. only the income statement.

C. both the balance sheet and the income statement.

D: non-of the previous answers

2- To calculate inventory turnover, cost of goods sold (from the income statement) is divided by:

A. average inventory.

B. The closing balance of the inventory.

C. The opening balance of the inventory.

D: non-of the previous answers

3- The following formula (365/ inventory turnover) refers to:

A. days of inventory on hand ratio.

B Average collection period.

C. receivables turnover.

D: non-of the previous answers

4- The following formula (annual sales/ average receivables) refers to:

A. days of inventory on hand ratio.

B Average collection period.

C. receivables turnover.

D: non-of the previous answers

5- Average collection period is calculated as follows:

A. annual sales/ average payables

B. annual sales/ average receivables.

C. 365/ average payables

D: non-of the previous answers.

Exercises

The following are the income statement and the Balance sheet of KINDA PHARMA for the year ended 31 Dec. 2019:

The income statements of KINDA PHARMA for the years 2018 and 2019

	2019 .000 $	2018 .000 $
Sales Revenue	**100000**	***80000***
Cost of goods sold	**45600**	***32500***
Gross profit	**54400**	***47500***
Selling, general, and administrative expenses	7500	*4100*
Depreciation expense	6000	*6000*
Operating profit	**40900**	***37400***
Interest expense	4500	*4800*
Income before tax	36400	*32600*
Provision for income taxes	4000	*3000*

Income from continuing operations	**32400**	***29600***
Earnings (losses) from discontinued operations, net of tax	3500	*1500*
Net income	**35900**	***31100***

The balance sheets of KINDA PHARMA for the years 2018 and 2019

	2019 $ 000		2018 $ 000	
Current assets		**180000**		***164000***
Cash & cash equivalent	50000		74000	
Receivables	70000		*50000*	
Inventories	60000		*40000*	
Noncurrent assets (net)		**320000**		***326000***
Property plant and equipment	300000		*305000*	
Intangible assets	20000		*21000*	
Total assets		**500000**		***490000***
Current liabilities		**50000**		***35000***
Accounts payable	50000		35000	
Noncurrent liabilities		**100000**		***105000***
Long term loans	100000		*105000*	
Total liabilities		**150000**		***140000***
Equity		**350000**		***350000***
Total liabilities and equity		**500000**		***490000***

Required:

1- Calculate the following ratios: Inventory turnover, Days inventory on hand. Receivables turnover, average collection period, payable turnover, payables payment period, asset turnover.

2- Briefly comment on your results.

Solution*:*

2019				
Inventory turnover	sales revenue	100000	2	times
	Average inventory	50000		
Average inventory	open +closing		50000	
	2			
Days inventory on hand	365		182.5	days
	Inventory turnover			
receivables turnover	sales revenue		1.6667	times
	average receivables			
average receivables	open +closing		60000	
	2			
average collection period	365		219	days
	average receivables			
payable turnover	sales revenue		2.35	times
	average payable			
average payable	open +closing		42500	
	2			
payable payment period	365		155.13	days
	average payable			

Chapter Seven: Integrated Financial Ratio Analysis

7-1 The Overall Ratio Picture

In previous chapters we explained separately each type of financial ratios (activity, liquidity, solvency, and profitability ratios). Financial ratios have been traditionally used by analysts to examine the different aspects of a business. However, these ratios are often used without regard to how these ratios interact with each other to provide an overview of business's performance. Therefore, to ascertain the overall position and performance of a company, it is important to examine a variety of financial ratios—not a single ratio or category of ratios in isolation. Practice shows that the information from one ratio category can be helpful in answering questions raised by another category and that the most accurate overall picture is generated by integrating information from all sources. In this chapter we will discuss the concept and importance of integrated ratio analysis, and explain DuPont analysis.

Before going further in our discussion about integrated financial analysis, let us consider the following example that illustrates how calculating different ratios may lead to contradictory results:

Example (7-1):

The following information is liquidity ratios related to KINDA pharma for the year 2019:

Year	**2019**	**2018**	**2017**
Current ratio	2.1	1.9	1.6
Quick ratio	0.8	0.9	1.0

The ratios shown above present a conflicting picture of the company's liquidity. Based on the increase in its current ratio from 1.6 to 2.1, an analyst may conclude that the company appears to have strong and improving liquidity; however, based on the decline of the quick ratio from 1.0 to 0.8, its liquidity seems to be deteriorating. Because both ratios have exactly the same denominator, current liabilities, the difference must be the result of changes in some asset that is included in the current ratio but not in the quick ratio.

7-2 The concept and importance of integrated financial ratio analysis:

As mentioned above using the different ratio categories separately will not give sufficient information about firm's performance. Integrated financial analysis is used as a technique to provide better view about firms' performance. It is defined as "a structure or framework for considering the interaction of financial ratios with particular emphasis on the drivers of performance and their relation to performance measures" (Needles, Frigo and Powers, 2004 p: 118).The performance measures are reflected ultimately in a return that is compared with a benchmark cost of capital. If the return exceeds cost of capital then the value has been created, if the return is less than cost of capital then value has been destroyed.

7-3 DuPont Analysis

ROE measures the return a company generates on its equity capital. To understand what drives a company's ROE, a useful technique is to decompose ROE into its component parts. (Decomposition of ROE is sometimes referred to as **DuPont analysis** because it was developed originally at that company.)

Decomposing ROE involves expressing the basic ratio (i.e., net income divided by average shareholders' equity) as the product of component ratios. Because each of these component ratios is an indicator of a distinct aspect of a company's performance that affects ROE, the

decomposition allows us to evaluate how these different aspects of performance affected the company's profitability as measured by ROE.

DuPont analysis, also known DuPont model, is a financial ratio based on return on equity that is used to analyze a firm's ability to increase its return on equity. **The DuPont analysis** model provides a more accurate assessment of **the** significance of changes in a company's ROE by focusing on **the** various means that a company has to increase **the** ROE figures. **The** means include **the** profit margin, asset utilization and **financial** leverage (also known as **financial** gearing) It breaks down the return on equity ratio to explain how companies can increase their return for investors. Accordingly, the analysis focuses on three components of the return on equity (ROE) ratio:

- Profit margin
- Total asset turnover
- Financial leverage.

Financial leverage, or the equity multiplier, is an indirect analysis of a company's use of debt to finance its assets. Assume a company has $10,000 of assets and $2,500 of owner's equity. Accounting equation will tell us that the company also has $7,500 in debt (assets - liabilities = equity). If the company borrows more money to buy assets, the ratio will continue to increase. The accounts used to calculate financial leverage are both balance sheet accounts, so analysts will divide average assets by average equity rather than the balance at the end of the period. Financial leverage is calculated as follows:

$$\textbf{Financial leverage} = \frac{\textbf{Average total assets}}{\textbf{Average equity}}$$

$$\text{Financial leverage} = \frac{10{,}000}{2{,}500} = 4$$

We will discuss leverage analysis in details later in separate chapter in this book.

Meanwhile let us see how to decompose the ROE into its main components.

As you know return on equity is calculated as follows:

ROE = Net income / Average shareholders' equity

We can decompose ROE using simple algebra to illustrate the relationship between ROE and ROA. Expressing ROE as a product of only two of its components, we can write:

$$\textbf{ROE} = \frac{\textbf{Net income}}{\textbf{Average shareholders' equity}}$$

That is

$$\textbf{ROE} = \frac{\textbf{Net income x}}{\textbf{total asset}} \quad \frac{\textbf{total asset}}{\textbf{Average shareholders' equity}}$$

Which can be interpreted as?

ROE = ROA × Leverage

Just as ROE can be decomposed, the individual components such as ROA can be decomposed. Further decomposing ROA, we can express ROE as a product of three component ratios as follows:

$$\text{ROE} = \frac{\text{Revenue}}{\text{total asset}} \times \frac{\text{Net income}}{\text{Revenue}} \times \frac{\text{total asset}}{\text{Average shareholders' equity}}$$

Accordingly, DuPont analysis equates (ROE) to profit margin, assets turnover, and financial leverage. That is:

ROE = Profit Margin x Assets Turnover x Financial Leverage

DuPont model was developed to analyze the ROE and the effects that different business performance measures have on this ratio. The aim is to analyze the variable causing the current (ROE). For example, if investors are unsatisfied with a two ROE, the management can use this formula to pinpoint the problem area whether it is a lower profit margin, asset turnover or poor financial leveraging. Once the problem is determined, management can attempt to correct deviations.

Example (7-2):

Suppose that you have two companies ZAIN Pharma and KINDA Pharma. Both companies operate in the same industry, and they have the same return on equity ratio of (45%). DuPont analysis can be used to show the strengths and weaknesses of each company. Each company has the following ratios:

ZAIN 45% = 0.30 x 5 x 0.30 = 0.45

KINDA 45% = 0.15 x 6 x 0.50 = 0.45

As can be seen from the example both companies have the same ROE (45%), but the two companies' operations may be completely different from each other. ZAIN Pharma is generating sales while maintaining a lower cost of goods sold as evidenced by its higher profit margin. But the company has difficult time turning over large amounts of sales.

KINDA Pharma is selling products at a smaller margin, but it is tuning over a lot of products. This is evident from its low profit margin and extremely high asset turnover.

The model helps investors to compare similar companies like these with similar ratios. Investors can then evaluate perceived risks with each company's business model.

The benefits of DuPont model can be summarized as follows:

- Decomposing ROE is useful in determining the reasons for changes in ROE over time for a given company and for differences in ROE for different companies in a given time period.
- DuPont Analysis formula can assess whether the lower ROE is due to low-profit margin, low asset turnover or poor leverage. It, therefore, provides information that can be used by management to determine which areas they should focus on to improve ROE.
- It shows why a company's overall profitability, measured by ROE, is a function of its efficiency, operating profitability, taxes, and use of financial leverage.
- DuPont analysis shows the relationship between the various categories of ratios discussed earlier in this book and how they all influence the return on investment of the owners.

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Questions

7-1 Define the term integrated ratio analysis and clarify its importance? *(para. 7-2, 4min)*

7-2 *What are the main benefits of* DuPont model? *(para. 7-2, 4min.)*

True/False Questions

1- Financial ratios are often used without regard to how these ratios interact with each other to provide an overview of business's performance. (**True/False)**

2- Using the different ratio categories separately will give sufficient information about firm's performance. (True/**False)**

3- Integrated financial analysis is used as a technique to provide better view about firms' performance. (**True/False)**

Multiple choice Questions

1- The following information is related to (AZ) company.

Year	**2019**	**2018**
Current ratio	2.3	1.5
Quick ratio	0.7	1

Based on this information, the liquidity of (AZ) in 2019 compared to 2018:

A. Increased significantly

B. Decreased significantly.

C. Remained the same.

D. The ratios provide contradictory results about liquidity.

2- The framework used for considering the interaction of financial ratios with particular emphasis on the drivers of performance and their relation to performance measures, refers to the concept of :

A. financial reporting

B. DuPont Analysis.

C. **Assets Turnover x Financial Leverage**

D. None of the previous answers

3- DuPont analysis equates (ROE) to :

A. Net profit margin only.

B. Average total assets divided by total equity.

C. **Assets Turnover x Financial Leverage**

None of the previous answers.

Exercises

The following information is related to (MT) (.000 $):

Average Total assets	***100.000***	
Profit margin	***0.2***	
Average equity	***50.000***	
Sales revenues	***150000***	

Required:

- ***Calculate assets turnover, and financial leverage ratios***
- ***Calculate the DuPont analysis ratio?***

Chapter Eight: Equity and Credit Analysis

8-1 The Concept of Equity Analysis

One of the main applications of financial analysis is the selection of securities as part of the equity portfolio management process. Financial analysts are interested in valuing a security to determine its merits for inclusion or retention in a portfolio. The valuation process goes through several stages, including:

1. understanding the business and the existing financial profile
2. forecasting company performance
3. selecting the appropriate valuation model
4. converting forecasts to a valuation
5. making the investment decision

Financial analysis assists in providing the basic information to complete the first two steps of this valuation process: understanding the business and forecasting performance.

Equity analysis includes the evaluation of a firm's performance and valuing its equity in order to measure its relative attraction as an investment. Analysts use a variety of methods to value a company's equity. The focus in this book will be on equity analysis using valuation ratios.

8-2 Valuation Ratios

Valuation ratios have long been used in investment decision making. **A valuation ratio** displays the relationship between the market value of a company or its equity and

some essential financial metric (e.g., earnings**).** A valuation ratio intends to show the price paid for some stream of earnings, revenue, or cash flow (or other financial metric)**.** A well-known example is the **price to earnings ratio** (P/E ratio)—probably the most widely cited indicator in discussing the value of equity securities—which relates share price to the earnings per share (EPS). Additionally, some analysts use other market multiples, such as price to book value (P/B) and price to cash flow (P/CF). The following are the main valuation ratios:

- ✓ **Price-to-Earnings Ratio (P/E):** The P/E ratio expresses the relationship between the price per share and the amount of earnings attributable to a single share. This ratio tells us how much investor is willing to pay for one dollar of earnings in a company. The higher the ratio, the more investors are willing to spend. It can be calculated as follows:

$$\textbf{Price-to-Earnings Ratio P/E} = \frac{\textbf{Market value per Share}}{\textbf{Earnings per share (EPS)}}$$

Earnings per share (EPS) ratio are calculated as a company's profit divided by the outstanding shares of its common stock. The higher a company's EPS, the more profitable it is considered.

Earnings per share = (net income / number of shares outstanding)

Different industries have substantially different P/E ratios; so, it is important to compare a company's P/E ratio to that of its industry.

Example (8-1):

Kinda Pharma stock price closed at 110 Syrian Pound (SP) on September 16, 2018. The company's profit for the financial year ending January 31, 2018, was 100.64 million SP, and its number of shares outstanding was 2.1 million shares. Its EPS can be calculated as 100.64 million SP / 2.1 million = 47.92 SP. Kinda Pharma P/E ratios: is, therefore

$$\textbf{Price-to-Earnings Ratio P/E} = \frac{110}{47.92} = 2.295$$

Because P/E ratios are calculated using net income (the revenue minus cost of sales, operating expenses, and taxes), the ratio can be sensitive to non-recurring earnings or one-time earnings events. In addition, because net income is generally considered to be more susceptible to manipulation than are cash flows, analysts may use **price to cash flow** as an alternative measure—particularly in situations where earnings quality may be an issue...

Price-to-Cash Flow Ratio – P/CF:

The price-to-cash flow (P/CF) ratio is a stock valuation indicator that measures the value of a stock's price relative to its operating cash flow per share. The ratio uses operating cash flow which adds back non-cash expenses such as depreciation and amortization to net income. It is especially useful for valuing stocks that have positive cash flow but are not profitable because of large non-cash charges. It can be calculated as follows:

$$\textbf{Price-to- Cash Flow P/CF} = \frac{\textbf{Market value per Share}}{\textbf{Operating cash flow per share (CF)}}$$

The operating cash flow used in the ratio is obtained through a calculation of the trailing 12-month operating cash flows generated by the firm divided by the number of shares outstanding.

The price-to-cash flow ratio measures how much cash a company generates relative to its stock price, rather than what it records in earnings relative to its stock price, as measured by the price-earnings ratio. The price-to-cash flow ratio is considered a better investment valuation indicator than the price-earnings ratio, due to the fact that cash flows cannot be manipulated as easily as earnings, which are affected by depreciation and other non-cash items. To illustrate how to calculate the (P/CF) ratio consider the following example:

Example 8-2:

Assume that Gadak co. has share price of $5 and 50 million shares outstanding. The company has an operating cash flow of $100 million in a given year. Its operating cash flow per share is as follows:

$$\textbf{CF per share} = \frac{100}{50} = 2$$

Accordingly,

$$\text{P/CF} = \frac{5}{2} = 2.5$$

This means that the company's investors are willing to pay $2.5 for every dollar of cash flow, or that the firm's market value covers its operating cash flow 2.5 times.

It should be noted that there is no optimal level of this ratio, as its level depends on the sector in which a firm operates and its stage of maturity. However, a low

(P/CF) ratio may indicate that the stock is undervalued, while a higher ratio may suggest potential overvaluation.

- ✓ **Price to Book Value Ratio (P/B):** This ratio compares a company's market capitalization, or market value, to its book value. Specifically, it compares the company's stock price to its book value per share (BVPS). The market capitalization (company's value) is its share price multiplied by the number of outstanding shares. The book value is the total assets - total liabilities and can be found in a company's balance sheet. This ratio is often interpreted as an indicator of market judgment about the relationship between a company's required rate of return and its actual rate of return. The (P/B) ratio can be calculated using the following formula:

$$\textbf{P/B ratio} = \frac{\textbf{Market value per Share}}{\textbf{Book value per share (BVPS)}}$$

A ratio greater than one would indicate that the future profitability of the company is expected to exceed the required rate of return, and values of this ratio less than one indicate that the company is not expected to earn excess returns.

The (P/B) ratio has been preferred by investors for decades and is widely used by market analysts. Usually, (P/B) ratio less than 1.0 is seen a good, indicating a potentially undervalued stock. However, investors often consider stocks with a P/B value under 3.0. It is important to note that it can be difficult to pinpoint a specific numeric value of a "good" P/B ratio when determining if a stock

is undervalued and therefore, a good investment. Ratio analysis can vary by industry, and a good P/B ratio for one industry may be a poor ratio for another. To illustrate this ratio let us consider the following example:

Example 8-3: Assume that the balance sheet of a company shows total assets of $200 million and total liabilities of $150 million. The book value of that company would be simply:

Total assets – total liabilities = ($200M - $150M = $50 M).

Assume further that the company has 10 million shares outstanding, in this case the book value per share (BVPS) = ($ 50M / 10M shares =5)

Now if the share price is $10, then the P/B ratio would be:

P/B = share price / BVPS = 10 / 5 = 2

This means that the market price is valued at twice its book value.

8-3 Industry-Specific Ratios

Financial ratios can help as indicators of important aspects of a company's performance and value. However, aspects of performance that are considered important in one industry may be irrelevant in another. Industry-specific ratios reflect industry differences. Industry-specific metrics can be especially important to the value of equity in early stage industries, where companies are not yet profitable.

Furthermore, some industries are subject to special regulations—particularly in the financial sector. Companies operating in these industries are often required to comply with specific regulatory ratios. In this section we will discuss some of these ratios related to the banking industry.

Capital Adequacy ratio: we have already discussed this ratio in chapter 5.

Non-Performing Loans to All Loans Ratio (Bad Loans ratio) This ratio indicates the percentage of nonperforming loans a bank has on its books.

Loans can be classified as nonperforming if the borrower defaults on the loan, declares bankruptcy or loses the income she needs to repay the debt. A nonperforming loan is a loan the bank says will not recover

This ratio should be about 1 to 3 percent. However, a figure of more than 10 percent indicates the bank has serious problems collecting its debts

The total amount of the loan, not just the outstanding loan balance when the loan was considered nonperforming, counts toward the NPL total. NPL ratio can be calculated as follows:

$$\text{NPL Ratio} = \frac{\text{Total NPL}}{Total\ outstanding\ Loans}$$

Example 8-4: refer back to MZT balance sheet presented in Example (1-3), and assume that within the total loans to customers of (200,000) , a customer borrowed a loan of (4,000), of which 2,000 were paid, but went 90 days behind on his payments with $2,000 still due.

Required: calculate NPL ratio for MZT?

$$\text{NPL Ratio} = \frac{4{,}000}{200.000} = 2\%$$

Reserve Ratio (cash reserve ratio):

The reserve ratio is the portion of reservable liabilities that commercial banks must hold, rather than lend out or invest. This is a requirement determined by the central bank of a country. The minimum amount of reserves that a bank must hold on to is referred to as the **reserve requirement**, and is sometimes used synonymously with the reserve ratio.

The Reserve Ratio is calculated using the following Formula:

Reserve Ratio=Deposits x Reserve Requirement

Example 8-5: refer back to MZT balance sheet presented in Example (1-3), and assume that the Central Bank determined the reserve ratio to be 8%.

Required: calculate the reserve ratio of MZT?

Reserve Ratio=Deposits from customers x Reserve Requirement

Reserve Ratio = 220,000 x 8%= 17600

Statutory Liquidity Ratio (SLR): Every nation has a certain monetary authority that is responsible for the functioning of banks. Banks are required to maintain a minimum percentage of their net demand and time liabilities with them at the end of every business day, in the form of gold, cash, government bonds or other approved securities. This minimum percentage is called Statutory Liquidity Ratio.

8-4 The concepts of credit risk and credit analysis

Credit risk is the risk of loss resulted from a debtor's failure to make a promised payment. For example, credit risk of a bond is the risk that the obligor (the issuer of the bond) is not able to pay interest and principal according to the terms of the bond indenture (contract).

Credit analysis is the method by which one calculates the creditworthiness of a business or organization. It is used to evaluate the ability of a company to meet its financial obligations.

Several ratios are used to evaluate the credit risk of a firm. The most popular ratios are **coverage ratios,** which measure the coverage that income, cash, or assets provide for debt or interest expenses. The higher the coverage ratio is the greater the ability of a company to fulfill its financial obligations. Coverage ratios include the following ratios:

Interest coverage ratio (ICR):

Debt Service Coverage Ratio (DSCR):

We have previously discussed these ratios in details in chapter (5).

8-5 The Credit Rating Process

A credit rating is a quantified assessment of the creditworthiness of a borrower in general terms or with respect to a particular debt or financial obligation. A credit rating can be assigned to any entity that seeks to borrow money—an individual, corporation, state or provincial authority, or sovereign government.

Credit rating process is used by credit rating agencies to assess and communicate the probability of default by an issuer on its debt obligations (e.g., commercial paper, notes, and bonds). A credit rating can be either long term or short term and is an indication of the rating agency's opinion of the creditworthiness of a debt issuer with respect to a specific debt security or other obligation. Where a company has no debt outstanding, a rating agency can also provide an issuer credit rating that expresses an opinion of the issuer's overall capacity and willingness to meet its financial obligations.

The rating process involves both the analysis of a company's financial reports as well as a broad assessment of a company's operations.

The credit evaluation process by any analyst includes many of the following procedures performed by analysts at credit rating agencies:

- Meeting with management, typically including the chief financial officer, to discuss, for example, industry outlook, overview of major business segments, financial policies and goals, distinctive accounting practices, capital spending plans, and financial contingency plans.
- Tours of major facilities, time permitting.
- Meeting of a ratings committee where the analyst's recommendations are voted on, after considering factors that include: Business risk, including the evaluation of operating environment; industry characteristics (e.g., cyclicality and capital intensity); success factors and areas of vulnerability; and company's competitive position, including size and diversification
- Financial risk, including: the evaluation of capital structure, interest coverage, and profitability using ratio analysis, and the examination of debt covenants.

- Evaluation of management.
- Monitoring of publicly distributed ratings—including reconsideration of ratings due to changing conditions.
- In assigning credit ratings, rating agencies emphasize the importance of the relationship between a company's business risk profile and its financial risk. The company's business risk profile determines the level of financial risk appropriate for any rating category.
- When analyzing financial ratios, rating agencies normally investigate deviations of ratios from the median ratios of the universe of companies for which such ratios have been calculated and also use the median ratings as an indicator for the ratings grade given to a specific debt issuer. This so-called universe of rated companies' changes constantly and any calculations are obviously affected by economic factors as well as by mergers and acquisitions.

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Questions

8-1 Define the term Equity analysis*? (para. 8-2, 3min.)*

8-2 *What is credit risk and credit analysis? (para. 8-4,4min)*

8-3 *Clarify the meaning of credit risk rating process? (para. 8-5, 4min)*

True/False Questions

1- Forecasting company performance is one of the stages of valuation process of securities (**True/False)**

2- Credit analysis is the evaluation of a firm's performance and valuing its equity in order to measure its relative attraction as an investment. (**True/False)**

3- A coverage ratio displays the relationship between the market value of a company or its equity and some essential financial metric (e.g., earnings**).** (**True/False)**

4- Price to earnings ratio is one of the valuation ratios. (**True/False)**

5- Price-to-Cash Flow Ratio is one of the coverage ratios (**True/False)**

6- Industry-specific ratios reflect industry differences (**True/False)**

Multiple choice Questions

1- (Net income / Number of shares outstanding) is the formula used to calculate:

A. Earnings per share

B. Price to earnings ratio.

C Price-to-Cash Flow Ratio

D: non-of the previous answers

2- A lower Interest Coverage ratio ICR indicates that :

A. Less operating profits are available to meet interest payments.

B. More operating profits are available to meet interest payments.

C. The company is more capable of meeting its interest obligations,.

D: non-of the previous answers

3- Which of the following statements is incorrect concerning the Earning per share ratio:

A. It is a measure of credit risk.

B. It is calculated as a company's profit divided by the outstanding shares of its common stock

C. The higher a company's EPS, the more profitable it is considered.

D: The lower a company's EPS, the less profitable it is considered.

4- The following formula (Market value per Share / Operating cash flow per share) refers to:

A. Earnings per share

B. Price to earnings ratio.

C Price-to-Cash Flow Ratio

D: non-of the previous answers

5- The ratio that compares a company's market capitalization, or market value, to its book value is:

A. Interest Coverage ratio (ICR)

B. Price to earnings ratio.

C Price-to-Cash Flow Ratio

D: non-of the previous answers.

Exercises

The following are the income statement and the Balance sheet of GOLDEN PHARMA for the years 2018-2019:

The income statements of GOLDEN PHARMA for the years 2018 and 2019

income statement	**2,019 .000 $**	**2,018 .000 $**
Sales Revenue	**200,000**	**160,000**
Cost of goods sold	**95,500**	**65,000**
Gross profit	**104,500**	**95,000**
Selling, general, and administrative expenses	7,500	4,100
Depreciation expense	6,000	6,000
Operating profit	**91,000**	**84,900**
Interest expense	4,500	4,800
Income before tax	86,500	80,100
Provision for income taxes	4,000	3,000
Income from continuing operations	**82,500**	**77,100**
Earnings (losses) from discontinued operations, net of tax	3,500	1,500
Net income	**86,000**	**78,600**

The balance sheets of GOLDEN PHARMA for the years 2018 and 2019

The balance sheet	2019 $ 000		2018 $ 000	
Current assets		**250000**		***210000***
Cash & cash equivalent	90000		75000	
Receivables	70000		*55000*	
Inventories	90000		*80000*	
Noncurrent assets (net)		**350000**		***360000***
Property plant and equipment	300000		*305000*	

Intangible assets	50000		*55000*	
Total assets		**600000**		***570000***
Current liabilities		**64000**		***36400***
Accounts payable	64000		36400	
Noncurrent liabilities		**100000**		***105000***
Long term loans	100000		*105000*	
Total liabilities		**164000**		**141400**
capital (10000 shares @ 35)	**350000**		***350000***	
net income	**86,000**		**78,600**	
Total equity		**436,000**		***428,600***
Total liabilities and equity		**600,000**		***570,000***

- Market value per share and the book value per share in 2019 equals (50 $), and (44$) respectively.
- **Operating cash flow per share (CF) in 2019 is (10)**

Required:

1- Calculate the following ratios: EPS, Price-to earnings ratio (P/E), Price to book value. Price to cash flows P/CF, Interest coverage ratio ICR, and Debt Service Coverage Ratio (DSCR) for the year 2019.

2- Briefly comment on your results.

Solution:

Earnings per share =	**net income**	86,000	8.60
	number of shares outstanding	10000	

Price-to Earning P/E	**Market value per Share**	**50**	**5.81**
	Earnings per share (EPS)	**8.60**	

This means that the company's investors are willing to pay $5.81 for every dollar of earning.

Price-to- Cash Flow P/CF =	**Market value per Share**	**50 = 5**
	Operating cash flow per share	**10**

This means that the company's investors are willing to pay $5 for every dollar of cash flow, or that the firm's market value covers its operating cash flow 5 times.

Price to book value: P/B	**Market value per Share**	50	=1.14
	Book value per share	44	

This means that the company's investors are willing to pay $1.14 for every dollar of book value.

Interest coverage ratio (ICR):	**Earnings before interest and tax EBIT**	**91,000**	**20.22**
	Interest expense	**4,500**	

This means that the company can pay its interest payments 20.22 times with its operating profit.

$$\textbf{(DSCR)} = \frac{\textbf{EBITDA}}{\textbf{Interest + Principal}} \quad \frac{\textbf{97,000}}{\textbf{104,500}} \quad \textbf{0.92823}$$

The **DSCR** ratio shows that the company can repay its debt service 0.92823 times with its operating income. However, because the **DSCR** ratio is less than (1) this means that the company is unable to service its current debt obligations with operating income alone.

Chapter Nine: Segment Reporting and Analysis

9-1 The concept of segment reporting

A company may have many different businesses, may do business in many different geographical areas, or may have significant number of customers. Analyzing a company with various business lines is difficult because of the inherent differences in the financial structures, risk characteristics, etc. among the different lines. Combining the financial results for all the lines tends to obscure the true picture.

Gaining a detailed understanding of a company requires an evaluation of the performance of its business segments (subsidiary companies, operating units, or simply operations in different geographic areas). Although companies are not required to provide full financial statements for segments, both IFRS and US GAAP require segment information to be provided in a company's financial statements.

Segment reporting is the reporting of the operating segments of a company in the disclosures accompanying its financial statements.

The objective of segment reporting is to provide information to investors and creditors regarding the **financial** results and position of the most important operating units of a company, which they can use as the basis for decisions related to the company.

IFRS8 identified an operating segment as it is a component of an entity that:

- Engages in business activities from which it may earn revenues and incur expenses.

- Whose operating results are regularly reviewed by the entity's chief operating decision maker to make decisions about resources to be allocated to the segment and assess its performance?
- For which discrete financial information is available.

9-2 The requirements of segment reporting:

Segment reporting is required for public companies, and is not required for privately held ones.

Financial Accounting Standards Board (FASB) requires that all segments of a company's business align with the company's reporting structure. A company does not need to report all of its business segments, however. According to U.S. Generally Accepted Accounting Principles (GAAP), public companies must report a segment if it accounts for 10% of total revenues, 10% of total profits, or 10% of total assets.

IFRS 8 Operating Segments, issued by IASB, requires particular classes of entities (essentially those with publicly traded securities) to disclose information about their operating segments, products and services, the geographical areas in which they operate, and their major customers. It requires disclosures that enable users to evaluate the nature and financial effects of the business activities in which it engages and the economic environment in which it operates.

Companies may internally report business results in a variety of ways (e.g., product segments and geographical segments). Companies identify the segments for external reporting purposes considering the definition of an operating segment and using factors such as what information is reported to the board of directors and whether a manager is

responsible for each segment. Companies must disclose the factors used to identify reportable segments and the types of products and services sold by each reportable segment.

For each reportable segment, the following should also be disclosed:

- a measure of profit or loss;
- a measure of total assets and liabilities22 (if these amounts are regularly reviewed by the company's chief decision-making officer);
- Segment revenue, distinguishing between revenue to external customers and revenue from other segments.
- interest revenue and interest expense;
- cost of property, plant, and equipment, and intangible assets acquired;
- depreciation and amortization expense;
- other non-cash expenses;
- income tax expense or income; and
- share of the net profit or loss of an investment accounted for under the equity method

9-3 Segment ratios

Based on the limited segment information that companies are required to present, a variety of useful ratios can be computed for business segments to evaluate how units within a business are doing. These ratios include segment margin, segment turnover, segment ROA, and segment debt ratios. The following is a brief discussion of these ratios and their interpretations.

✓ **Segment margin:**

This ratio is calculated using the following formula:

$$\textbf{Segment margin} = \frac{\textbf{Segment profit (loss)}}{\textbf{Segment revenue}}$$

This ratio measures the operating profitability of the segment relative to revenues.

- ✓ **Segment turnover:**

This ratio is calculated using the following formula:

$$\textbf{Segment Turnover} = \frac{\textbf{Segment revenue}}{\textbf{Segment assets}}$$

This ratio measures the overall efficiency of the segment, i.e., how much revenue is generated per unit of assets.

- ✓ **Segment ROA:**

This ratio is calculated using the following formula:

$$\textbf{Segment ROA} = \frac{\textbf{Segment profit (loss)/}}{\textbf{Segment assets}}$$

This ratio measures the operating profitability of the segment relative to assets.

- ✓ **Segment debt ratio**:

This ratio is calculated using the following formula:

$$\textbf{Segment debt ratio} = \frac{\textbf{Segment liabilities}}{\textbf{Segment assets}}$$

This ratio examines the level of liabilities of the segment, i.e., its solvency.

Example (9-1):

Golden Pharma Ltd. has four production lines (segments): Tablets, Capsule, Vial, and Serum. The following data is extracted from the accounting record of the company for the years 2018-2019:

Golden Pharma data						
Segments (product lines) $(000)	2018			2019		
	Assets	Operating Income	Revenue	Assets	Operating Income	Revenue
Tablets	7,500	1200	8500	8000	1,300	8,700
Capsule	3,500	350	3000	2800	700	2,500
Vial	10,000	500	2700	10200	600	3,000
Serum	4,500	250	800	5000	200	1000
Business Line Total	25,500	2,300	15000	25,600	2,800	15,200

Required: Calculate the following ratios and briefly comment on your results: Segment revenue to total, segment turnover, Segment ROA, Segment Margin.

Solution:

Product lines $ (000)	2019				2018			
	Segment Revenue of total	Segment Margin	Segment ROA	Segment turnover	Segment Revenue of total	Segment Margin	Segment ROA	Segment turnover
Tablets	57.24%	14.94%	16.25%	1.09	56.67%	14.12%	16.00%	1.13
Capsule	16.45%	28.00%	25.00%	0.89	20.00%	11.67%	10.00%	0.86
Vial	19.74%	20.00%	5.88%	0.29	18.00%	18.52%	5.00%	0.27
Serum	6.58%	20.00%	4.00%	0.20	5.33%	31.25%	5.56%	0.18
Business Total	100. %	18.42%	10.94%	0.59	100. %	15.33%	9.02%	0.59

The Capsule segment was the most profitable in 2019 as measured by margin and ROA; however, in 2019 the segment did not grow as fast as the company's other segments. In 2018, the segment represented 20% of total segment revenues, but in 2019 the percentage was only 16.45%.

The company's largest segment by revenue, (Tablets) had the lowest margin in 2019 but a much higher segment ROA than the (Vial) and (Serum) segments. Vial and Serum segments are the second highest segments in terms of segment margin but lowest in turnover (an indicator of efficiency, i.e., the ability to generate revenue from assets). As a result, Vial and Serum segments had the lowest segment ROA.

9-4 Benefits and limitations of segment ratios

Information provided about business segments helps users of financial statements in:

(a) Gaining better understanding of the company performance.

(b) Better assessment of the risks and returns associated with the investment.

(c) Make more informed judgments about the enterprise as a whole.

Information about the different types of products and services an enterprise produces and the different geographical areas in which it operates would be useful in the following respects:

- ✓ **Allocation of Resources**: Segment information would be useful in improving the allocation of scarce resources in an economy. Lack of information creates uncertainty in the investment market and thus makes the investment market inefficient.
- ✓ **Investment and Credit Decisions:**

  Segment information is useful in investment and credit decisions. It helps users of financial statement in analyzing the uncertainties surrounding the timing and amount of expected cash flows—and therefore, the risks—related to an investment or a loan to an enterprise that operates in different industries and markets. Banks are interested in segment information for short-term loans to disclose areas of weakness such as unprofitable products or markets that absorb rather than produce funds for meeting debts.
- ✓ **Equilibrium in Share Prices:**

  The segment reporting would tend to adjust the prices of company shares according to information released. Some research found an influence of segment data on company share prices.

  However segment reporting has several limitations.

  Arguments against disclosure of information about segments of a diversified company generally emphasize practical difficulties. The opponents acknowledge the importance of segment reporting for investors.

However, the critics point out two basic problems:

(i) Misunderstanding likely to be found among investors about segment information

(ii) Potential detriment to the reporting company of disclosing information about individual segments.

Some arguments advanced against segment reporting may be listed as follows:

Investment by investors and creditors is made in a company and not in its individual segments. Therefore investors require information for the company as a whole for making proper decisions.

Segment reporting may be subject to data manipulation if the information is reported in the "through management's eyes" style. This gives company leaders more freedom in how it determines how segments are constructed and what metrics are reported.

References

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Questions

9-1 *Clarify the meaning* segment reporting*? (para. 9-1, 4min)*

9-2 *What are the main segment reporting requirements? (para. 9-2, 5min)*

9-3 *Discuss the main* Benefits and limitations of segment ratios *(para. 9-4, 5min)*

True/False Questions

1. Gaining a detailed understanding of a company requires an evaluation of the performance of its business segments (**True/False)**
2. operating segments is the reporting of a company in the disclosures accompanying its financial statements. (**True/False)**
3. Both IFRS and US GAAP require segment information to be provided in a company's financial statements. (**True/False)**
4. The objective of segment reporting is to provide information to investors and creditors regarding the **financial** results and position of the most important operating units of a company to help them making better decisions. (**True/False)**
5. IFRS8 identified an operating segment as it is a component of an entity that: Engages in business activities from which it may earn revenues and incur expenses.
6. **(True/False)**
7. According to IFRS8, for each reportable segment, a measure of profit and loss should be disclosed (**True/False)**
8. Segment reporting is required for both public companies, and privately held ones. (**True/False)**

9. Segment margin = Segment profit or loss/ Segment Assets. (**True/False**)

10. . One of the benefits of Segment ratios is that to provide better understanding of the company performance. (**True/False**)

11. Segment information is not useful in improving the allocation of scarce resources in an economy. (**True/False**)

Multiple choice Questions

1- Segment ratio that measures the operating profitability of the segment relative to revenues is:

A. Segment Margin.

B. Segment turnover .

C Segment debt ratios .

D: Non-of the previous answers.

2- Segment ratio that measures the overall efficiency of the segment, i.e., how much revenue is generated per unit of assets. is:

A. Segment Margin.

B. Segment turnover .

C Segment debt ratios .

D: Non-of the previous answers.

3- Segment ratio that measures the operating profitability of the segment relative to assets is:

A. Segment Margin.

B. Segment turnover .

C Segment debt ratios .

D: Non-of the previous answers.

4- Segment ratio that examines the level of liabilities of the segment, i.e., its solvency is:

A. Segment Margin.

B. Segment turnover .

C Segment debt ratios .

D: Non-of the previous answers.

Chapter Ten: Break-Even Analysis

10-1 An Overview Of Cost Behavior:

The term **Cost** can be defined as the amount of resources, measured in monetary terms, used for the purpose of producing goods or rendering services. Cost elements include three main items, material costs, labor costs, and overhead. Cost elements can be classified according to different criteria.

An important classification of cost elements, which has a managerial importance, is the classification of costs according to their relation with the level of activity. According to their relation with the level of activity cost elements can be classified into Fixed, variable and semi-fixed or semi-variable costs. Level of activity is usually expressed using an activity base, which is a measure of what causes the incurrence of a variable cost. Examples of activity measure include: number of units produced, number of labor hours worked, number of machine hours… etc.

- **Fixed costs**: are all costs whose total dollar amount remains constant as the activity level changes. Example of these costs includes depreciation of non-current assets, rent costs... etc. Total fixed cost remains the same even when activity level changes within the relevant range. While the fixed cost per unit goes down as the activity level goes up. The following graph shows the relationship between activity level and fixed costs.
- **Variable costs**: are all the cost elements whose total amount varies with a direct proportion with the changes of the level of activity. Variable cost per unit remains the same over wide ranges of activity. For example total costs of active materials in a pharmaceutical production facility depends on the number of units produced. While

the active material cost per unit remains the same over the relevant range of activity.

- **Semi-variable costs**: these costs are sometimes called **mixed costs**. They are costs that contain variable and fixed components. For example, your electricity bill contains two components; part of it is fixed and charged to all bills regardless of the amount of electricity consumed. And another variable part related to the amount of kilo watt hours consumed.

Understanding cost behavior is essential for the understanding of BEA. The following section will introduce the concept of break-even analysis and the calculation of the break-even point.

10-2 The Calculation of Brake Even Point:

Break-Even analysis (**BEA**) (or Cost-volume-profit analysis) is one of the important managerial tools that are used for planning and decision making. It highlights the interrelationships of costs, quantity sold, and price.

Break-even point is the amount of sales at which a company will attain no profit and incur no loss, In other words it is the point of zero profit. There are two frequently used approaches to finding the break-even point in units: Equation method, and Contribution margin method. We will first discuss these two approaches to find the BEP in units, and then see how each can be expanded to determine the number of units that must be sold to earn a targeted profit. The initial decision in implementing BEA is the determination of just what a unit is. For manufacturing firms, the answer is obvious. For example a beer production factory may define a unit as the bottle of beer. Service firms face a more difficult choice. **Syrian Railway** may define a unit as a passenger mile or a one-way trip.

Before explaining the two approaches for calculating the break-even point, it is essential to understand the contribution margin concept.

Contribution Margin (CM) is the amount remaining from sales revenue after variable expenses have been deducted. CM is used first to cover fixed costs, and any remaining CM contributes to net operating income.

To clarify the concept of CM consider the income statement of XMZ Company for Beer production:

Contribution income statement of XMZ company for Beer production for the year 2019

Sales (5000 bottles @) 50$)	$ 250,000
Less: Variable expenses (5000@ 30$)	150,000
Contribution margin	100,000
Less: Fixed expenses	80,000
Net operating income	$ 20,000

You can see from the contribution income statement of XMZ that the total contribution margin at the level of activity (5000 bottles) was (100,000 $). This contribution margin covered the total fixed expenses of (80,000), and the remaining contribution of (20,000) went to net operating income.

Sales, variable expenses, and contribution margin can also be expressed on a per unit basis. Accordingly, the contribution margin per unit can be calculated using the following formula:

contribution margin per unit = Selling price per unit - Variable costs per unit

Using the above mentioned information of XMZ we can calculate the contribution margin per unit as follows:

Contribution margin per unit = 50- 30 = 20 $ per unit

This means that each unit sold contributes (20$) to cover the fixed costs and to attain profit.

We can also calculate the contribution margin ratio as follows:

$$\text{CM Ratio} = \frac{\text{Total contribution margin}}{\text{Total Sales}} \times 100$$

CM ratio (or contribution to sales ratio) indicates the **level of contribution** that is included in sales revenue or selling price.

In XMZ company example the CM ratio = (100000/ 250000) x100 = 40%

This means that each 100 $ increase in sales results in a total contribution margin increase of 40$.

Let us now explore the two approaches for calculating the BEP in units.

10-2-1 calculating the BEP using the Equation method:

You know that the net profit or income is calculated using the following formula:

Profits = (Sales –Variable expenses) – Fixed expenses

OR:

Sales	**=**	**Variable expenses**	**+ Fixed expenses +**	**profits**

At the BEP profits = Zero

Using the XMZ company information we find:

50 Q	**=**	**30 Q**	**+ 80000 +**	**0**

20 Q = 80000 ⇒ Q = 4000 bottles annually

Where:

Q = Number of bottles sold

$50 = Unit selling price

$30 = Unit variable expense

$80,000 = Total fixed expense.

The results mean that XMZ Company needs to sell (4000 bottles of beer to break even. (to attain no profit, or incur no loss)

10-2-2 Calculating the BEP using the contribution margin method:

The contribution margin method has two key equations: The number of units sold to break even, which can be calculated as follows:

$$\textbf{Break-even point in units sold} = \frac{\textbf{Fixed expenses}}{\textbf{CM per unit}}$$

Where: CM per unit = selling price per unit – variable cost per unit

The other equation is to calculate the to Break-even point in $, which can be calculated as follows:

$$\text{Break-even point in total sales \$} = \frac{\textbf{Fixed expenses}}{\textbf{CM ratio}}$$

Or **BEP in total sales = BEP in units x selling price per unit**

It can be noted from the formula that a company that has low fixed costs will have a low break-even point of sale. For an example, a company has a fixed cost of (zero) will automatically have broken even upon the first sale of its product.

The contribution margin method can be illustrated using data from (XMZ) company:

$$\text{Break-even point in units sold} = \frac{\text{Fixed expenses}}{\textbf{CM per unit}} = \frac{80000}{(50\text{-}30)} = 4000 \text{ units annually}$$

Break-even point in total sales = 4000 x 50 = 200,000 $.

Example (10-1):

The following estimated data provided by financial experts related to Product Z in a company. The variable costs per unit of product Z is estimated to be $2, and the selling price per unit is estimated to be $6. The fixed costs are estimated to be $1,000 per year

Required:

1. Use the above information to calculate budgeted sales revenue and budgeted costs when planned production is 300 units per year.
2. What is budgeted profit (or loss) at this level?

3. What is the breakeven point (in units)?
4. What is CM ratio of this product – explain the meaning?
5. What is the breakeven revenue ($)?

Solution:

1. At (300) units level of production

   Budgeted sales revenue = 300 x 6= 1800$

   Budgeted cost = (300 x 2) + 1000= 1600$

2. Budgeted profit (or loss) at (3000 units) level = total sales revenue – total cost

   = (300 x 6) – ((300 x 2) + 1000) = 1800 - 1600 = 200 $ of profit

3. Breakeven point (in units) = (1000 / (6-2)) = 250 Units
4. CM ratio of this product = CM per unit / selling price

   ((6-2) / 6)*100 = 67 % it means that every 100 $ of sales revenue contribute 67 $ to cover fixed costs and attain profit.

5. Breakeven revenue ($) = BEP in units x selling price per unit

   Breakeven revenue ($) = 250 x 6 = 1500 $.

It worth mention that Breakeven analysis is useful for the following reasons:

It helps to define unused capacity of the business once the breakeven is reached. This will help to show the maximum profit on a particular product/service that can be generated.

It helps to determine the change in profits if the price of a product is altered.

It helps to determine the amount of losses that could be sustained if there is a sales downturn.

10-3 Target Profit Analysis

Breakeven analysis can be used to calculate the level of sales that is necessary to earn a target profit figure. To achieve this simply we add the targeted profit to the fixed costs in the BEP formula, this is because the contribution required should cover both the fixed costs and the targeted profit.

The budgeted sales in units required to achieve the targeted profit is calculated using the following formula:

$$\text{Target Profit (Sales units)} = \frac{\text{Fixed Costs + Target Profit}}{\text{Contribution per unit}}$$

The budgeted sales revenue required to achieve the targeted profit is calculated using the following formula:

$$\text{Target Profit (Sales revenue)} = \frac{\text{Fixed Costs + Target Profit}}{\text{CM ratio}}$$

Example (10-2): using the data of example (10-1) calculate the sales revenue and sales units required to generate a target profit of $320?

$$\text{Target Profit (Sales revenue)} = \frac{\text{Fixed Costs + Target Profit}}{\text{CM ratio}} = \frac{1000+320}{0.67}$$

= 1970 **.14 $**

$$\text{Target Profit (Sales units)} = \frac{\text{Fixed Costs + Target Profit}}{\text{Contribution per unit}} = \frac{1000+320}{4}$$

= 330 **Units**

10-4 Margin of Safety

The Margin of Safety measures the difference between budgeted sales and breakeven sales. It is the excess of budgeted (or actual) sales over the break-even volume of sales. It can be expressed as percentage and shows the fall in budgeted sales that can be tolerated before breakeven point is reached. This is a key measure of risk because management know that any fall beyond breakeven point means the product will become loss making.

The margin of safety can be expressed in terms of the number of units sold. In this case it can be calculated using the following formula:

Margin of Safety units = Budgeted Sales - Breakeven sales

The margin of safety can be expressed as a **percentage of** budgeted sales. margin of safety percentage can be calculated using the following formula:

$$\text{Margin of Safety as \%} = \frac{\text{Budgeted Sales - Breakeven sales}}{\text{Budgeted Sales}} \times 100$$

Example (10-3):

Calculate the margin of safety and margin of safety percentage for example 1; assuming that the budgeted level of activity is (300 units)

Margin of Safety units = Budgeted Sales - Breakeven sales

Margin of Safety units = 300 - 250 = 50 units

$$\text{Margin of Safety as \%} = \frac{\text{Budgeted Sales - Breakeven sales}}{\text{Budgeted Sales}} \times 100$$

$$\text{Margin of Safety as \%} = \frac{300 - 250}{300} \times 100 =$$

Margin of Safety as % = 16.67%

The results indicate that the budgeted sales of the product can decrease by (50 units), or by 16.67% from budgeted sales, before stopping making profit.

Margin of Safety is an indicator of how risky a project is. It can be used to judge the risk associated with different projects. The higher the margin of safety of a project, the less risky it is. In contrast, the lower the margin of safety of a project, the higher the risk associated with the project.

Finally, it should be noted that BEA is sometimes described as a crude, oversimplified model of cost behavior. The following assumptions are its weaknesses.

- The selling price per unit is constant at all levels of activity

- The variable cost per unit is constant at all levels of activity.
- Total fixed costs do not change across all levels of production.
- All units produced are sold in the period (i.e. there are no changes in the levels of inventory).

References

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- *Thomas R. Robinson, Hennie van Greuning, Elaine Henry, Michael A. Broihahn; (2009),* ***International Financial Statement Analysis Workbook****, CFA Institute., John Wiley & Sons, Inc., Hoboken, New Jersey.*

Questions

10-1 Define the following terms: fixed costs, variable cost, semi fixed/variable costs? (para. 10-1, 4min)

10-2 What is the break-even point and how it can be calculated? (para. 10-1,5 min)

10-3 What are the main weaknesses of BEA (para. 10-4, 4min.)

True/False Questions

1. Total fixed costs remain constant within the relevant range at different levels of activity (**True/False)**
2. Fixed cost per unit deceases when the level of activity decreases. (**True/False)**
3. Variable cost per unit remains constant within the relevant range at different levels of activity (**True/False)**
4. The higher the margin of safety of a project, the more risky it is. **(True/False)**
5. One of the limitations of BEA is that it assumes that total fixed costs do not change across all levels of production. (**True/False)**
6. **Mixed costs** are sometimes called variable costs. **(True/False)**
7. Contribution margin per unit = total cost per unit – variable cost per unit. (**True/False)**
8. A company that has low fixed costs will have a low break-even point. (**True/False)**
9. Breakeven Analysis helps to determine the change in profits if the price of a product is altered. (True/False)

10. Breakeven analysis is used to predict the amount of sales required to achieve a targeted profit. (**True/False)**

Multiple choice Questions

Read the following statements and chose the correct answer from the list

1- Variable cost is:

A. a cost changes as the related activity changes.
B. a cost is allocated to products
C. a cost is used in setting selling prices
D. None of the previous answers.

2- The three most common cost behavior classifications are:

A. variable costs, product costs, and sunk costs
B. fixed costs, variable costs, and semi-variable costs
C. variable costs, period costs, and differential costs
D. variable costs, sunk costs, and opportunity costs

3- Costs that remain constant in total dollar amount as the level of activity changes are *called*

A. fixed costs.
B. mixed costs
C. variable costs
D. None of the previous answers

4- Costs that vary in total in direct proportion to changes in an activity level are called

A. *fixed costs*
B. *mixed costs*
C. *variable costs*.
D. *None of the previous answers*

5- - Which of the following costs is a mixed cost?

A. *Salary of a factory supervisor*
B. *Electricity costs of $2 per kilowatt-hour*
C. *Rental costs of $5,000 per month plus $.30 per machine hour of use*.
D. *Straight-line depreciation on factory equipment*

6- If fixed costs related to a product are $300,000, the selling price per unit is $105, and the variable costs per unit are $55, what is the break-even point (units)?

A. 3,500 units
B. 3,158 units
C. 14,000 units
D. 6,000 units.

7- If fixed costs related to a product are $300,000, the selling price per unit is $105, and the variable costs per unit are $55, what is the contribution margin per unit?

A. 160
B. 50.
C. 105
D. None of the previous answers.

8- If fixed costs related to a product are $300,000, the selling price per unit is $105, and the variable costs per unit are $55, what is the margin of safety if the budgeted sales are (8000 units)?

A. 3000 units
B. 2000 units.
C. 4000 units
D. None of the previous answers.

9- If fixed costs related to a product are $300,000, the selling price per unit is $105, and the variable costs per unit are $55, what is the margin of safety percentage if the budgeted sales are (8000 units)?

A. 25%.
B. 50%.
C. 37.5%
D. None of the previous answers.

10 If fixed costs related to a product are $300,000, the selling price per unit is $105, and the variable costs per unit are $55, what is the break-even sales (units) if the variable costs are increased by $25?

A. 3,500 units
B. 6,000 units
C 12,000 units.
D None of the previous answers

Exercise

The following estimates are related to Product (**M**) in a manufacturing company. The variable costs per unit of the product is ($200), and the selling price per unit is estimated to be ($600). The fixed costs are estimated to be $100,000 per year

Required:

1- Use the above information to calculate budgeted sales revenue and budgeted costs when planned production is 400 units per year.
2- What is budgeted profit (or loss) at this level?
3- What is the breakeven point (in units)?
4- What is CM ratio of this product – explain the meaning?
5- What is the breakeven revenue ($)?

Chapter Eleven: Leverage Analysis

11-1 The Concept of Leverage:

Some businesses are debt-free; however, most companies have, at some time, borrowed money to finance its assets, such as buying equipment or constructing new buildings. The main challenge that faces investors is determining whether the organization's debt level is sustainable.

The key question that arises in this context is whether financing business's assets using debt is harmful? In certain cases, borrowing may be a positive indicator of a company's financial health. Consider a firm that wants to build a new plant in order to meet the increased demand for its products. It may finance the production buildings and equipment costs using loans and incurs interest charge. However, it expects future sales to be more than the associated costs, and because interest expenses are tax-deductible debt can be a cheaper way to finance assets than equity.

The problem arises when the use of debt, also known as leveraging, becomes excessive. With interest payments taking a large portion of sales revenue, a firm will have less cash to fund its main activities. Large debt loads can make businesses vulnerable to higher risk levels during an economic depression.

In general, investors may use borrowed capital as a source to fund investments in firm's asset in order to generate returns on risk capital. The word 'leverage', originated from physics, is frequently used in financial management. The objective of leverage is to gain higher financial benefits compared to the fixed charges payable, as it happens in physics i.e., gaining larger benefits by using lesser amount of force.

In this sense **leverage** is an investment strategy, which relies on the use of borrowed money—specifically, the use of various financial instruments or borrowed capital—to finance a project or an investment in order to increase the potential return of an investment. It can be seen as a firm's ability to employ new asset or funds to create better returns or to reduce costs. The higher the leverage is the higher the profits and the vice -versa. But a higher leverage clearly implies higher outside borrowings and hence higher risk. An investment or a project is referred to as "highly leveraged," if it has more debt than equity.

There are three main types of leverage: Financial leverage, Operating leverage and combined or total leverage. In the following sections we will explain each of these types of leverage.

11-2 Financial Leverage

Financial leverage indicates the extent to which a business relies on the debt that it has issued and how it is using debt as a part of its financing strategy. In other words financial leverage reflects the business's reliance on borrowings.

Financial leverage is mainly related to the financial activities which encompass rising of funds from the sources for which a firm has to incur fixed charges, such as interest expenses, loan fees etc. It involves the use of funds obtained at a fixed cost in the hope of increasing the return to the equity shareholders. Examples of such sources of finance comprise long-term debt (i.e., debentures, bonds etc.) and preference share capital.

Long term debt capital bears a contractual fixed rate of interest and its payment is compulsory regardless of the financial results of the firm.

Positive financial leverage arises when a firm earns more on the assets purchased with the funds, than the fixed cost of their use, while negative leverage occurs when the firm does not earn as much as the funds cost.

Thus shareholders gain where the firm earns a higher rate of return and pays a lower rate of return to the supplier of long-term funds. The difference between the earnings from the assets and the fixed cost on the use of funds goes to the equity shareholders.

Financial leverage is associated with financial risk. Financial risk refers to risk of the firm not being able to cover its fixed financial costs due to variation in EBIT. With the increase in financial charges, the firm is also required to raise the level of EBIT necessary to meet financial charges. If the firm cannot cover these financial payments it can be forced into liquidation.

There are several ratios used to calculate the financial leverage. These ratios are sometimes called equity or debt ratios; they measure the overall debt load of a company and compare it with the assets or equity. This shows how much of the company assets belong to the shareholders rather than creditors. When shareholders own a majority of the assets, the company is said to be less leveraged. When creditors own a majority of the assets, the company is considered highly leveraged.
The most commonly used financial leverage ratios include:

- Debt Ratio
- Debt to Equity Ratio
- Equity Ratio
- Degree of financial leverage (DFL) ratio

We discussed earlier in this book the first three ratios. We will focus in this section on the degree of financial leverage (DFL). (DFL) ratio is used to measure the extent to which a company's earnings per share (EPS) is sensitive to variations in its operating income, as a result of changes in its capital structure. The degree of financial leverage (DFL) measures the percentage change in EPS for a unit change in operating income, also known as earnings before interest and taxes (EBIT).

Higher (DFL) indicates more volatile earnings. Since interest is usually a fixed expense, leverage increases returns and EPS. This is good when operating income is rising, but it can be a problem when operating income is under pressure.

DFL is calculated using the following formula:

$$\textbf{DFL} = \frac{\textbf{\%change in EBIT}}{\textbf{\%change in EPS}}$$

DFL can also be represented by the equation below:

$$\textbf{DFL} = \frac{\textbf{EBIT}}{\textbf{EBIT - interest}}$$

The higher the DFL, the more volatile earnings per share (EPS) will be. Since interest is a fixed expense, leverage magnifies returns and EPS, which is good when operating income is rising but can be a problem during tough economic times when operating income is under pressure.

DFL is invaluable in helping a company assess the amount of debt or financial leverage it should choose in its capital structure. If operating income is relatively stable, then

earnings and EPS would be stable as well, and the company can afford to take on a significant amount of debt. However, if the company operates in a sector where operating income is quite volatile, it may be prudent to limit debt to easily manageable levels.

The use of financial leverage varies greatly by industry and by the business sector. There are many industry sectors in which companies operate with a high degree of financial leverage, such as retail stores, airlines, utility companies, and banking institutions. Unfortunately, the excessive use of financial leverage by many companies in these sectors has played a vital role in forcing a lot of them to bankruptcy.

Example (11-1):

Assume that RC company has sales revenue of $1,200,000 in year 2019. While it's operating expenses in year 2019 were $350,000., with interest expense of $100,000. The company has (1 million) shares outstanding. (Ignore the effect of taxes.)

Required:

-Calculate EPS, DFL, and comment on your results.

$$\textbf{EPS} = \frac{\textbf{EBIT} - \textbf{interest expense}}{\textbf{Number of shares outstanding}} =$$

EBIT = 1,200,000 – 350,000 = $850,000

$$\textbf{EPS} = \frac{\textbf{850,000} - \textbf{100 ,000}}{\textbf{1,000,000}} = \textbf{0.75}$$

$$DFL = \frac{EBIT}{EBIT - interest}$$

$$DFL = \frac{850{,}000}{850{,}000 - 100{,}000} \qquad 1{,}13$$

This means that for every 1% change in EBIT or operating income, EPS would change by 1.13%.

11-3 Operating Leverage:

Operating leverage can be defined as the capability of the firm to use its fixed expenses to generate better returns.

Operating leverage measures a firm's fixed costs as a percentage of total costs, in an effort to calculate how well a company uses its fixed costs to generate profits.

It refers to the use of fixed operating costs such as depreciation, rent, salaries etc., in the operations of a firm. But it does not include interest on debt capital. It measures a firm's ability to use fixed operating cost to magnify effects of changes in sales on its operating profit (EBIT).

Operating leverage is used to evaluate the breakeven point of a business, as well as the likely profit levels on individual sales.

Recall that costs in a firm are classified according to their relation to volume of activity into three types:

- **Variable cost** that tends to vary in direct proportion to the change in the volume of activity,
- **Fixed costs** which tend to remain fixed irrespective of changes in the volume of activity within a relevant range and during a defined period of time,
- **Semi-variable or Semi-fixed costs** which are partly fixed and partly variable.

The higher the proportion of fixed operating costs as compared to variable costs, the higher is the operating leverage, and vice versa. leverage occurs when a firm incurs fixed costs which are to be recovered out of sales revenue irrespective of the volume of business in a period.

When a company has ***high operating leverage***, then a large proportion of its costs are fixed costs. In this situation, the company makes a large profit on each incremental sale, but must attain sufficient sales volume to cover its large fixed costs. If it can do so, then the entity will make a major profit on all sales after it has covered its fixed costs. However, profit will be more sensitive to changes in sales volume.

On the other hand, when a company has ***low operating leverage***, then a large proportion of its costs are variable costs. In this situation, the company makes a smaller profit on each incremental sale, but does not have to generate much sales volume in order to cover its lower fixed costs. It is easier for this type of company to earn a profit at low sales levels, but it does not earn outsized profits if it can generate additional sales.

If there is no fixed cost in the total cost structure, then the firm will not have an operating leverage. In that case, the operating profit or EBIT varies in direct proportion to the changes in sales volume.

Operating leverage is associated with operating risk or business risk. The higher the fixed operating costs, the higher the firm's operating leverage and its operating risk. Operating risk is the degree of uncertainty that the firm has faced in meeting its fixed operating cost where there is variability of EBIT.

It arises when there is volatility in earnings of a firm due to changes in demand, supply, economic environment, business conditions etc. The larger the magnitude of operating leverage, the larger is the volume of sales required to cover all fixed costs.

A quantitative measure of the sensitivity of a firm's operating profit to a change in the firm's sales is called the **degree of operating leverage (DOL)**. The degree of operating leverage of a firm at a particular level of output (or sales) is simply the percentage change in operating profit over the percentage change in output (or sales) that causes the change in profits.

The earnings before interest and taxes (i.e., EBIT) changes, with the increase or decrease in the sales volume. Operating leverage is used to measure the effect of variation in sales volume on the level of EBIT.

Degree of operating leverage can be calculated using the following formula:

$$\text{DOL} = \frac{\text{\%change in EBIT}}{\text{\%change in sales revenue}}$$

It can alternatively be measured using the following formula:

$$\textbf{DOL} = \frac{\textbf{Contribution margin}}{\textbf{Operating Income}}$$

Or:

$$\textbf{DOL} = \frac{\textbf{Sales – variable costs}}{\textbf{Sales – variable costs - fixed costs}}$$

The DOL ratio helps analysts determine what the impact of any change in sales will be on the company's earnings.

Example (11-2):

Assume that RC company has $1000, 000 in sales in year 2018 and $1,200,000 in sales in year 2019. In year 2018, the company's operating expenses were $300,000, while in year 2019; the operating expenses were $350,000.

Required:

-Calculate, DOL, and comment on your results.

Solution:

Year 2018 EBIT = $1,000,000−$300,000=$700,000

Year 2019 EBIT = $1,200,000−$350,000=$850,000

After that, the percentage change in the EBIT values and the percentage change in

the sales figures are calculated as follows:

Percentage change in EBIT:

% change in EBIT =	**(850,000 - 700,000) x 100**	= 21.4%
	700,000	

The percentage change in sales:

$$\% \text{ change in Sales} = \frac{(\mathbf{1{,}200{,}000 - 1{,}000{,}000}) \times \mathbf{100}}{\mathbf{1{,}000{,}000}} = 20\ \%$$

Finally, the DOL ratio is calculated as follows:

$$\mathbf{DOL} = \frac{21.4\%}{20\ \%} = \mathbf{1.07}$$

This means that a (1%) in sales revenue will generate **(1.07 %)** change in EBIT.

The value of degree of operating leverage must be greater than 1. If the value is equal to 1 then there is no operating leverage.

Operating leverage has special managerial significance. Its importance can be summarized as follows:

1. It gives an idea about the impact of changes in sales on the operating income of the firm.
2. High degree of operating leverage magnifies the effect on EBIT for a small change in the sales volume.
3. High degree of operating leverage indicates increase in operating profit or EBIT.

4. High operating leverage results from the existence of a higher amount of fixed costs in the total cost structure of a firm which makes the margin of safety low.

5. High operating leverage indicates higher amount of sales required to reach break-even point.

6. Higher fixed operating cost in the total cost structure of a firm promotes higher operating leverage and its operating risk.

7. A lower operating leverage gives enough cushions to the firm by providing a high margin of safety against variation in sales.

8. Proper analysis of operating leverage of a firm is useful to the finance manager.

If fixed costs are higher in proportion to variable costs, a company will generate a high operating leverage ratio and the firm will generate a larger profit from each incremental sale. A larger proportion of variable costs, on the other hand, will generate a low operating leverage ratio and the firm will generate a smaller profit from each incremental sale. In other words, high fixed costs means a higher leverage ratio that turn into higher profits as sales increase. This is the financial use of the ratio, but it can be extended to managerial decision-making,

11-4 Combined leverage

Firms can combine both financial leverage and operating leverage; the resulting leverage is called combined leverage. Each form of leverage accomplishes different business goals. Financial leverage reflects total company financial risks while operating leverage measures business operating risk. Merged together, combined leverage calculates total business risk.

Degree of combined leverage (DCL) multiplies DOL by degrees of financial leverage (DFL) weighted by the ratio of %change in earnings per share (EPS) over %change in sales. It is calculated using the following formula:

% change in EPS = DOL x DFL

$$\textbf{DCL} = \frac{\textbf{\% change in EPS}}{\textbf{\% change in sales}}$$

Referring back to RC example presented above. We found DOL for the year 2019 was (**1.07 %**) while the DFL for the same period was (**1, 13**), accordingly the DCL for RS company for the year 2019 can be calculated as follows:

DCL = = *1.07* x *1,13* = 1,209

This means that for every (%1) increase in sales RC company will have (1,209 %) increase in its EPS.

In the absence of financial leverage, our firm's degree of total leverage would have been equal to its degree of operating leverage for a value of (1.07) (remember, DFL for a firm with no financial leverage equals (1). We see, however, that the firm's financial leverage magnifies its DOL figure by a factor of 1.13 to produce a degree of total leverage equal to 1.209.

It should be noted that a firm that has a relatively high level of combined leverage is considered as riskier than a firm with less combined leverage because high leverage indicates more fixed costs to the firm.

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Questions

11-1 Clarify the concept of leverage (para. 11-1, 4min)

11-2 What is the financial leverage? (para. 11-2, 4min)

11-3 What is the operating leverage ? (para. 11-3, 4min)

True/False

1. *The objective of leverage is to gain higher financial benefits compared to the fixed charges payable* (**True/False)**
2. An investment or a project is referred to as "highly leveraged," if it has less debt than equity. (**True/False)**
3. The higher the leverage, the lower the profits and the vice -versa. (**True/False)**
4. The higher the margin of safety of a project, the more risky it is. (**True/False)**
5. Higher leverage implies higher risk. (**True/False)**

Multiple choice Questions

Read the following statements and chose the correct answer from the list

1. The following formula : **EBIT / (EBIT – interest) is used to calculate**:

   A. DFL
   B. DOL
   C. EPS
   D. DCL.

2. The following formula (% change in **EBIT** / % change in **sales revenue) is used to calculate**::

A.DFL
B.DOL.
C.EPS
D. DCL.

3. The following formula (% change in **EPS** / % change in **sales revenue) is used to calculate**::

A.DFL
B.DOL.
C.BEP
D. DCL.

4. The following formula ((**EBIT –interest expense) / number of shares outstanding) is used to calculate**::

B.DFL.
B.DOL.
C.EPS.
D. DCL.

5. The following data is related to MDC company in 2019 : % change in EBIT compared to 2018 is (0. 82) , % change in EPS compared to 2018 is (0. 75) % change in sales revenue compared to 2018 is (0.70) . What is the DCL for MDC company:

A. 1.071.
B. 1.093
C. 1.171
D. None of the previous answers

6. The following data is related to MDC company in 2019 : % change in EBIT compared to 2018 is (0. 82) , % change in EPS compared to 2018 is (0. 75) % change in sales revenue compared to 2018 is (0.70) . What is the DOL for MDC company:

A. 1.071.
B. 1.093
C. 1.171.
D. None of the previous answers

7. The following data is related to MDC company in 2019 : % change in EBIT compared to 2018 is (0. 82) , % change in EPS compared to 2018 is (0. 75) % change in sales revenue compared to 2018 is (0.70) . What is the DFL for MDC company:

A. 1.071.
B. 1.093.
C. 1.171.
D. None of the previous answers

Chapter Twelve: Prospective Analysis And Forecasting Financial Failure

12-1 Introduction to Forecasting

Prospective analysis represents the last stage in the financial statement analysis process. It starts after the historical financial statements have been properly adjusted to accurately reflect the economic performance of the company.

Prospective analysis includes forecasting of the balance sheet, income statement and statement of cash flows.

In its general meaning forecasting is the prediction of what will happen in the future based on a certain set of conditions that could be related to the past or present data. It includes developing future predictions based on an in-depth analysis of different trends. It is a step by step process that ends by providing information to decision makers in organizations regarding the future aspects of a business, around which strategies are formulated and planning is done.

In the field of finance, financial managers use different financial forecasting techniques to make accurate prediction of future trends. The resulting statements are known as financial statement forecasts.

Under financial forecasting, the predictors develop future estimates with the help of statements such as the estimated income statement, estimated cash flow statement, etc.

A company estimates cover two main things in a financial forecast:

Future Income

Future Expenses

Financial forecasts, help identifying the level of production, the finance required, the working capital needed, the long-term operational efficiency of the business, and expected growth in sales and profitability. Ultimately, financial forecast helps in making critical investment decisions and also, controlling the uncertain events and associated risks.

Both budgeting and forecasting are tools that help firms plan for their future. However, the two techniques are noticeably different in many aspects. One key difference is that budgets usually cover one year, while forecasts are usually updated monthly or quarterly. Through forecasting, a company is able to adjust its budget and allocate more funds to a department, as needed, depending on predictions, indicating that budgets depend on the forecast.

12-2 Preparing financial statement forecasts

As mentioned above financial forecasting is concerned with estimating a business's future performance. Historical performance data is used to predict future trends.

The process of financial forecasting goes through several steps and uses several methods and techniques. In the following sections we will discuss the steps of forecasting and its methods and techniques. For simplicity and given the objectives of the graduate program, the focus will be on forecasting the income statement.

12-2-1 Steps of Forecasting

Preparing a set of financial statement forecasts requires predicting the firm's future operating, investing, and financing activities. In this forecasting approach, called business activity-based forecasting approach, the analyst will be able to identify the

necessary sequence of steps to predict the three principal financial statements into the future. The specific sequence of steps used for forecasting financial statements may vary depending on the reason for forecasting. However, the following seven-step sequence forecasting may be suitable for most forecasts of financial statements:

- **Step 1** Project revenues from sales and other operating activities.
- **Step 2** Project operating expenses (for example, cost of goods sold and selling, general, and administrative expenses) and derive projected operating income.
- **Step 3** Project the operating assets (for example, cash; marketable securities; receivables; inventory; property, plant, and equipment; investments; and intangible assets) that will be necessary to support the level of operations projected in Steps 1 and 2. Also project the operating liabilities that will result from the normal business operations (for example, accounts payable and accrued expenses).

  Step 4 : Project the financial leverage, financial assets, and common equity capital (for example, short-term and long-term debt, common shareholders' equity except for retained earnings, and any financial assets available to service debt or equity claims) that will be necessary to finance the net operating assets projected in Step 3. In addition, define the financing costs (such as interest expense) that will result from the financial liabilities and any investment income that will be generated from financial assets (such as interest income) in the firm's capital structure. From projected operating income from Step2, subtract interest expense and add interest income.

  STEP 5: predict nonrecurring gains or losses (if any) and derive estimated

income before tax. Subtract the projected provision for income taxes to derive projected net income. Subtract expected dividends from net income to obtain the expected change in retained earnings. Also predict any other comprehensive income items.

STEP 6 Check whether the estimated balance sheet is balanced. If it is not in balance, the predicted financial structure may need adjustment. For example, if projected assets exceed projected liabilities and equities, the firm may be required to raise capital through additional short- or long-term debt or equity issuances. Alternately, if projected liabilities and equities exceed projected total assets, the firm may be able to pay down debt, increase dividends, or repurchase stock. Steps 4 and 5 must be repeated until the balance sheet is in balance.

STEP 7 Derive the projected statement of cash flows from the projected income statement and the changes in the projected balance sheet amounts.

12-2-2 Methods and Techniques of Financial Forecasting

There are two types of methods used to develop financial forecasting; these are qualitative methods and quantitative methods.

Qualitative financial forecasting methods

Qualitative methods use non-quantifiable data in forecasting a firm's results. In this type of methods managers focus on the consumer's opinion or expert judgment in order to get appropriate predictions.

Qualitative methods are generally used when past data is not available. For example, it would be sensible to research consumer's preferences while launching a new product in the market.

There are several qualitative methods that can be used to make business forecast the following are some of these methods.

Executive Opinion:

The opinions of the main staff are valuable source for data that can be used in forecasting. For example, the sales persons, who are in direct contact with the customers, are more familiar with their needs and requirements.

Under this method, the opinions of experts of different areas of the organization such as production, sales, purchasing, and operations are taken into consideration as a basis for predicting the future.

The forecasts in this method are reviewed beforehand to fulfill customer expectations.

Market Research:

An alternative qualitative method for forecasting is market research method. In this method managers can conduct a complete market research where a sample of current and future customers will be selected to discuss whether the customers would like to buy a new product or a new variant of the existing product or not, and then predict the demand of a particular good or service. However, this method of forecasting is considered expensive.

Delphi Method:

This technique is a structured method. It depends on identifying a facilitator to insure the whole process of deriving the forecasts from a set of experts.

The first step of this method includes the gathering of data using questionnaires. Multiple rounds are performed. Data is analyzed at each stage, and the result of preceding rounds forms the basis of the next round. The process of collecting and analyzing iterations continues until they reach a consensus.

This method is preferred by managers for long-term forecasts only, given the amount of time

and effort needed.

Reference class forecasting:

This method is based upon human judgment. Under this technique, the forecaster estimates the future consistent with similar scenarios in other places or times.

The manager makes the judgment based on the expected outcomes of a planned action in the future.

Scenario Writing:

In this method the team creates the most likely scenarios in accordance with various other scenarios. At the beginning, the forecaster calculates the expected results of different scenarios and then develops the most likely scenarios.

Sales-force Polling:

This method depends on the in-depth knowledge of the sales force about customer behavior. This knowledge helps in improving the product or the service according to the customer's expectations. The forecaster calculates the average of sales force polling to derive future estimates.

Quantitative Financial Forecasting Methods:

In this type of methods, the forecasters use past observations to generate forecasts. Usually, a forecaster manipulates and analyzes the existing quantitative data through various quantitative and statistical tools to arrive at the most accurate results.

In this section we will discuss the main quantitative methods.

Causal Methods:

In the causal method or, cause and effect method, the forecaster studies the relationship of one variable with another relevant variable. Consequently, a change in one item causes the same change in another.+

The regression analysis is a widely used causal method. It can further be divided into:

Simple Linear Regression Method

The simple linear regression focuses on the distribution of two variables. Here, the forecaster studies the bivariate distributions and calculates the estimated values of the dependent variable according to the values of the independent variable.

Multiple Regression Method:

It is an extension of the simple regression method where a variable is dependent on more than one variable/factor.

For instance, sales could depend on more than just one variable. The analysis of one or more of those factors determines the sales forecasts. Some other examples of the causal financial forecasting techniques are.

Days Sales Financial Forecasting Technique:

In this technique the forecaster, firstly computes the days' sales and then examines its relations to other items of the balance sheet. It assists in arriving at the balance sheet forecast. Therefore, one can identify the requirement of funds and take actions accordingly.

Percentage of Sales Financial forecasting technique:

This technique covers the way for getting a clear picture of the expected future sales with which a manager can forecast the financial requirements of the firm. Any change in the sales will have much effect on other variables of the balance sheet particularly, the assets and liabilities.

Thus, it's crucial to make the sales forecast and establish its relationship with other variables as accurately as possible.

In this method all of a business's accounts (such as costs of goods sold, inventory, and cash) are calculated as a percentage of sales. Those percentages are then applied to future sales

estimates to project each line item's future value. This method is one of the widely used financial forecasting techniques. Thus, we will focus on this method, and will illustrate how to use it to prepare the income statement forecast later in this section.

Time Series Methods:

This is another popular quantitative method. It involves the gathering of data over different periods for identifying trends. Then, the forecaster analyzes the trends to derive the forecasts mainly for the short-term. For example, simple averaging and exponential smoothing are popular time-series techniques.

To illustrate how to prepare an income statement forecast using the percentage of sales method lets conceder the following example:

Example (12-1):

The following are the income statements of Arapiles company for the years 2018 -2019:

Karapiel Income statements (figures in thousands of SP))	**2018**	**2019**
Sales	**40400**	47200
Cost of gods sold	27000	31000
Gross profit	**13400**	16200
Selling , general and administrative expenses	9000	9500
Depreciation	1100	1100
Interest expense	500	550
Income before tax	**2800**	5050
Income tax expense	900	1200
Income (loss) from extraordinary items and discontinued operations	400	1400
Net income	**2300**	**5250**

Selected Ratios in percent	**2018**	**2019**
sales growth		16.83
Gross profit margin	33.12	34.32
Selling, general and administrative expense/Sales	33.33	30.05
Income tax expense/Pretax income	32.14	23.76

Depreciation expense/ as percentage Gross prior-year PP& E	5. 5	6.0
Interest expense/Prior-year long-term debt	5	5.2

Given that the closing balance of PP&E at the end of the year 2019 was 23,000 (beginning-balance of 2020), and the closing balance of interest bearing debt at the end of the year 2019 was (10500).

Required:

Prepare an income statement forecast using percentage of sales method.

Solution:

The forecasting process begins with an expected growth in sales. In this example we use historical trends to predict future levels. We calculate the sales growth rate in 2019 and use it as a base to predict sales as follows.

$$\text{Sales growth rate in 2019} = \frac{(47200 - 40400) \times 100}{(40400)} = 16.83\ \%$$

The gross profit margin of Karapiel has increased slightly to 34.32% of sales. For the year 2020, we assume 34.32%, the most recent gross profit margin as projected percentage. In practice, gross profit margin estimate will be influenced, partly, by the strength of the economy and the level of competition in the markets. Selling, general, and administrative (SG&A) expenses have also remained constant at about 33% of sales. Thus, SG&A expense for the year 2020 is estimated to be 30.05% of sales. In practice, we might examine individual expense items and estimate each item

separately. For a manufacturing company like Karapiel, trends in wage and occupancy costs and advertising expenses require greater investigation.

Another important line item in the income statement, which should be projected separately, is the depreciation expense. It is a fixed expense and is dependent on the amount of depreciable non-current assets. In recent years, Karapiel has reported depreciation expense of (6. %) of the balance of beginning-of-year gross property, plant, and equipment (PP&E). Thus, depreciation rate is estimated to be 6 % of the 2019 property, plant, and equipment (PP&E) balance, the most recent experience. Similarly, the ratio of interest expense relative to beginning of- year interest-bearing debt is estimated to be 5.2%. In practice, our estimates will incorporate projections of future levels of long-term interest rates. Finally, tax expense as a percentage of before tax income in 2019 was 23.76%, the most recent level of used in our projection.

Accordingly, the projected Income statement for the year 2020 is shown as follows:

Karapiel projected Income statements (figures in thousands of SP) for the year 2020

	forecasting step	2020
Sales	1	55,145
Cost of gods sold	3	36,218
Gross profit	2	18,927
Selling , general and administrative expenses	4	16,899
Depreciation expense	5	1380
Interest expense	6	546
Income before tax	7	102
Income tax expense	8	24
Income (loss) from extraordinary items and discontinued operations	9	
Net income	10	78

An illustration for the estimation of each item in the projected income statement for the year 2020 is shown in below:

	Step number
predicted sales = 47200 * 16.83% = 55145	1
Gross profit margin = 55145 * 34.32% = 18927	3
cost of goods sold = 55145 - 18927 = 36218	2
SG&A expense = 55145 * 30.65%= 16899	4
Depreciation expense= 23000*6.% = 1380	5
Interest expense = 10500 * 5.2%= 546	6
Income before tax = 2-4-5-6	7
Income tax expense= 102 * 23.76%= 24	8
Non	9
Net income = net income before tax - tax expense + other income = 78	10

12-3 The concept of financial failure

Intense competition resulting from open markets and the complexity of business environment has exposed companies to different threats that increased the risks of corporate financial failure.

Thus, understanding factors that may lead to financial failure is of great importance.

This section and the remaining sections discuss the concept of financial failure and introduce the different models for predicting financial failure.

Different factors may have an adverse impact on firms' activities that can cause their final disappearance. This in turn led to diversity and difficulties in defining the concept of financial failure. Accounting and finance literature addresses many definitions of the concept of financial failure, It is defined as the inability of a firm to pay its debts as a result of inadequacy of its working capital. In other words, financial failure is the situation in which a firm goes bankrupt due to its inability to fulfill its current liabilities. Financially failed firms cannot meet their obligations nor have

difficulty in fulfilling their obligations in time. Accordingly, a firm is said to have been failed when any of the following events have occurred: bankruptcy, bond default, an overdraft of bank account, events signifying an inability to pay debts as they come due, entrance into a bankruptcy proceeding, an explicit agreement with creditors to reduce debts.

There are several indicators of financial failure the following are some of these indicators:

- Insufficient returns on invested funds in the company.
- High financial leverage and a heavy reliance on borrowing, mainly current liabilities.
- The company's inability to repay loans on due dates.
- The company's inability to cope with technical developments and following traditional means of activities characterized by low efficiency and effectiveness, especially under conditions of intense competition.
- The fluctuation of the financial ratios at successive periods.
- Frequent delays in payment of financial obligations.
- Change in accounting policies, methods or auditor.
- Accounting and finance literature also identified several reasons for firms' financial failure. These include:
- Poor management and lack of board effectiveness.
- Board's failure to engage with important risks or what is called board risk blindness.
- Poor leadership on ethos and culture.
- Poor communications with subordinates.

- Excessive complexity at the level of operations and management**.**
- Inappropriate incentives.
- An inability on the part of internal audit or risk management teams to report on risks originating from higher levels in their organizations' hierarchy.
- Bad marketing strategies

The risk of financial failure has encouraged researchers in the field of accounting and finance to examine this problem. The great interest in the subject has led to the development of several quantitative and descriptive models that tried to predict the likelihood of financial failure in an attempt to help organization to prevent its occurrence. The remaining sections of this chapter will briefly introduce the main Univariate and multivariate models for predicting financial failure.

12-4 Univariate Model

The financial failure of a company can have a devastating influence on most of the users of financial statements including investors, customers, creditors, employees, lenders, and general public. Consequently, users of financial statements are usually concerned with predicting on whether a company will fail, and when it will fail. They can forecast the financial position of an organization using several models used in accounting and finance literature.

Failure prediction models are defined as those models that give a probability of failure or a credit score to firms under study over a given time horizon.

In the Univariate model only one variant is used to predict corporate failure. Such models however have less power to predict successfully financial failure.

12-5 Multivariate Model

As mentioned earlier many studies in accounting and finance literature tried to develop multivariate models to predict financial failure. In multivariate models several factors are used to predict financial failure.

In this book we will focus on one of the main traditional models of predicting financial failure namely Altman Z score.

Altman (2002) tested the suitability of the Z-Score model developed in 1968 to predict financial failure in troubled economic conditions, based on changes in the economy and corporations, across three different time periods. He used 86 firms for 1969 to 1975, 110 firms for 1979 to 1995 and 120 firms for 1997 to 1999. He proved that the Z-Score developed in 1968 was precise, convenient and reliable. In addition, Gearhead and Georgia (2015) identified bankrupt and non-bankrupt companies by using the Z-Score model for 27 companies in the Romanian stock market of 2008. The study found that nearly 52% (14 of the 27 companies) of the Romanian companies faced financial problems and were threatened with bankruptcy.

Altman's 1968 model took the following form:

$$\mathbf{Z = 0.012X1 + 0.014X2 + 0.33X3 + 0.006X4+X5}$$

where:

X1=Working capital/total assets;

X2=Retained earnings/ total assets;

X3=Earnings before interest and taxes/total assets;

X4=Market value of equity/book value of total liabilities;

X5=Sales/total assets.

The higher value of (Z) refers to the integrity of the financial position of the company, while a low value implies the possibility of financial failure. Under this model, companies can be classified into three categories according to their ability to continue, and these categories are: -Class A: companies are able to continue, if the value of the (Z) (3.0) and bigger. -Class B: companies at risk of financial failure, which could potentially bankrupt, if the value of the (Z) (1.81) and less. a Class C: companies that is difficult to give a firm decision on them and that assessor needs to detailed study, when the value of (Z) is greater than (1.81), and less than (3.0) is called gray area. Using the above Z-score Altman used a cut-off Z-score of 2.675 resulting in 6% and 3% type I and type II error respectively for sample firms a year prior to failure. An attempt to predict bankruptcy two years in advance, increase the type I and type II errors to 28% and 6% respectively.

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Questions

12-1 Clarify the concept of forecasting (para. 12-1, 5min.)

12-2 What are the main steps of forecasting? (para. 12-2, 4min)

12-3 What are the main qualitative forecasting techniques? (para. 12-2-2,4min)

True/False Questions

1. Prospective analysis includes forecasting of the balance sheet, income statement and statement of cash flows. (**True/False)**
2. Prospective analysis represents the first stage in the financial statement analysis process.. (**True/False)**
3. In its general meaning financial failure is predicting what will happen in the future based on a certain set of conditions that could be related to the past or present data (**True/False)**
4. Both budgeting and forecasting are tools that help firms plan for their future.. (**True/False)**
5. The first step in financial forecasting is to project revenues from sales and other operating activities. (**True/False)**

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Multiple choice Questions

Read the following statements and chose the correct answer from the list

1- Which of the following is not a step of preparing financial statement forecasts:

A. Project revenues from sales and other operating activities.

B. Project operating expenses

C. Project the operating assets

D. Recording financial transactions.

2- Which of the following is not one of the qualitative methods of financial forecasting:

A. Executive Opinion
B. Market Research
C. Time Series Methods.
D. Reference class forecasting

3- The following information is available from the accounting records of Royal Co.

	2018	**2019**
Sales	**60000**	75000
Cost of gods sold	**40000**	70000

Given this information the sales growth is:

A. 25%.
B. 67.68%
C. 75%
D. Non- of the previous answers

4- According to Altman model a company is classified in Class A : (as able to continue) , if the value of the (Z) score is

A. (3) or bigger:
B. (1.81) and less
C. greater than (1.81), and less than (3.0)
D. (2) or bigger.

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