BBA 5321
Financial Management and Policy
Study Module

স্কুল অব বিজনেস
SCHOOL OF BUSINESS

বাংলাদেশ উন্মুক্ত বিশ্ববিদ্যালয়
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Introduction to Financial Management

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- Goals of Financial Management
- Functions of Financial Management

Lesson 1: Introduction

Lesson Objectives

After studying this lesson, you should be able to:

- have a clear idea about the concept of financial management;
- recognize different forms of business organizations; and
- know the concept of business ethics and corporate governance.

Financial Management

Business concerns need finance to meet their economic requirements. Whether they are big or small, they need finance to fulfill their business activities. Thus, any kind of business activity depends on finance. Hence, it can be called the lifeline of a business organization.

Financial management is an integral part of the overall management of a business organization. It is concerned with the duties of the financial managers in the business organization. It mainly deals with how to optimally make various financial decisions in a business, such as those about investment, capital structure, dividend policy, and working capital management, to achieve a set of given business objectives.

Thus, Financial Management refers to the proper management of the finance functions of a business or organization. In other words, financial management is a managerial activity that is concerned with the planning and controlling of a firm's financial resources.

Forms of Business Organizations

The key aspects of financial management are the same for all businesses, large or small, regardless of how they are organized. Still, its legal structure does affect some aspects of a firm's operations and thus must be recognized. There are three main forms of business organization.

These are:

(1) sole proprietorships;
(2) partnerships; and
(3) corporations.

The majority of businesses are operated as sole proprietorships, while most of the remainders are divided equally between partnerships and corporations. Because corporations conduct the most business, and because most successful proprietorships and partnerships eventually convert into corporations, here corporations are the main focus. Still, it is important to understand the major differences among the three types of firms.

A proprietorship is a business owned and operated by one individual. Going into business as a sole proprietor is easy. Proprietorships have two important advantages: firstly, they are easily and inexpensively formed, and secondly, they are subject to only a few government regulations. However, proprietorships also have two important limitations: firstly, proprietors have unlimited personal liability for the business's debts - which can result in losses that exceed the money they have invested in the company; and secondly, it is difficult for proprietorships to obtain large sums of capital. For these reasons, sole proprietorships are used primarily for small businesses. However, businesses are frequently started as proprietorships and then converted to corporations when their growth causes the disadvantages of being a proprietorship to outweigh the advantages.

A partnership is a legal arrangement between two or more people who decide to do business together. Partnerships are similar to proprietorships in that they can be established easily and inexpensively, and they are not subject to the corporate income tax. They also have the disadvantages associated with proprietorships: unlimited personal liability, difficulty raising capital, and limited lifespan. The liability issue is especially important because, under the

partnership law, each partner is liable for the business's debts. Therefore, if any partner is unable to meet his or her pro rata liability and the partnership goes bankrupt, then the remaining partners are personally responsible for making good on the unsatisfied claims.

A corporation is a legal entity created by a state, and it is separate and distinct from its owners and managers. Corporations have unlimited lives, their owners are not subject to losses beyond the amount they have invested in the business, and it is easier to transfer one's ownership interest (stock) in a corporation than one's interest in a non-incorporated business. These three factors make it much easier for corporations to raise the capital necessary to operate large businesses. The biggest drawback to incorporation is taxes: Corporate earnings are generally subject to double taxation—the earnings of the corporation are taxed at the corporate level, and then when after-tax earnings are paid out as dividends, those earnings are taxed again as personal income to the stockholders.

Business Ethics

Generally, Business Ethics are the Standards of conduct or moral judgment that apply to persons engaged in commerce. In their simplest form, ethics are the moral standards you rely on when you make a decision. They define what is right and wrong, and outline the kind of behavior that businesses should not engage in. A good set of ethics is key to making responsible decisions in a business environment.

A firm's commitment to business ethics can be measured by the tendency of its employees, from the top down, to adhere to laws, regulations, and moral standards relating to product safety and quality, fair employment practices, fair marketing and selling practices, the use of confidential information for personal gain, community involvement, and illegal payments to obtain business. In recent years, the business community in general and the financial community in particular have been developing and enforcing ethical standards. The goal of these ethical standards is to motivate business and market participants to adhere to both the letter and the spirit of laws and regulations concerned with business and professional practice.

The implementation of a proactive ethics program is believed to enhance corporate value. An effective ethics program can enhance corporate value by producing many positive benefits by reducing potential litigation and judgment costs, maintaining a positive corporate image, building shareholder confidence, and gaining the loyalty, commitment, and respect of the firm's stakeholders. Such actions enhance cash flow and reduce perceived risk, which can positively affect a firm's share price.

Corporate Governance

Corporate governance is the system used to direct and control a corporation. It defines the rights and responsibilities of the key corporate participants such as the shareholders, board of directors, officers and managers, and other stakeholders, as well as the rules and procedures for making corporate decisions.

It also typically specifies the structure through which the company sets objectives, develops plans for achieving them, and establishes procedures for monitoring performance. In a typical corporate governance structure, the stockholders (owners) elect a board of directors (their representatives), who in turn hire officers and managers (professional managers) to operate the firm in a manner consistent with the goals, plans, and policies established and monitored by the board on behalf of the shareholders. Typically, the board's policies specify ethical practices and provide for the protection of stakeholders' interests.

Hence, it involves balancing the interests of a company's many stakeholders, such as shareholders, management, customers, suppliers, financiers, government, and the community. Since corporate governance also provides the framework for attaining a company's objectives, it

encompasses practically every sphere of management, from action plans and internal controls to performance measurement, and corporate disclosure.

Review Questions

1. What is Financial Management?
2. Write the scope of Financial Management.
3. Why Financial Management is so important in a business organization? - Discuss.
4. What are the key differences between sole proprietorships, partnerships, and corporations?
5. How would you define business ethics?
6. Discuss the relationship between ethics and share price.
7. Describe the concept of corporate governance.

Lesson 2: Goals of Financial Management

Lesson Objectives

After studying this lesson, you should be able to:

- Identify the major goals and objectives of financial management.

Goals of Financial Management

An important question to consider is- How can one measure financial managers' performance to know if their decisions are efficient? There should be specific goals or objectives.

In general, firms (or business entities) employ real assets and other resources to produce outputs (which may be products or services) to earn profits. There is always a conflict between the two important goals of a firm. These are the maximization of profit and the maximization of shareholders' wealth.

Thus, what is the Goal of a Firm? Maximizing Profit or Maximizing Shareholders' Wealth?

To achieve the goal of profit maximization, a financial manager only takes actions that are expected to contribute to the firm's overall profits. Generally, corporations commonly measure profits in terms of earnings per share (EPS**),** which represents the amount earned during the accounting period on each outstanding share of common stock. EPS is calculated by dividing the period's total earnings available for the firm's common stockholders by the number of shares of common stock outstanding.

However, profit maximization is not a reasonable goal. It fails for many reasons: it ignores (1) the timing of returns, (2) cash flows available to stockholders, and (3) risk. Each reason is described further below:

1) It does not consider the timing of expected returns

Year	Cash Flows	
	Project A (tk.)	**Project B (tk.)**
1	10,000	4,000
2	8,000	5,000
3	2,000	11,000
Total	**20,000**	**20,000**

Table 1

The above table shows a firm that has two available investment projects having the same total returns of Tk. 20,000. Under the concept of maximization of profit and not considering the timing of cash flows, a financial manager may choose any one project. This ignores the Time Value of money. Here, Project A's cash flow in the 1st and 2nd year is higher than Project B's. The higher returns in the 1st and 2nd years could be reinvested to provide greater future earnings. The receipt of funds sooner rather than later is preferred.

2) It does not consider the cash flows available to stockholders

If the only objective was to maximize earnings per share, the firm would never pay a dividend. It could always improve EPS by retaining earnings and investing them at any positive rate of return, however small but the stockholders are deprived.

Furthermore, a higher EPS does not necessarily translate into a higher stock price. Firms sometimes experience earnings increments without any correspondingly favourable change in stock price. For example, a firm in a highly competitive technology-driven business could increase its earnings by significantly reducing its research and development expenditures. As a result, the firm's expenses would be reduced, thereby increasing its profits. But because of its lessened competitive position, the firm's stock price would drop, as many well-informed investors sell the stock in recognition of lower future cash flows. In this case, the earnings increase is accompanied by lower future cash flows and therefore a lower stock price.

3) Profit maximization also fails to account for risk

It is the chance that actual outcomes may differ from those expected. The prospective stream of earnings per share would be more risky if the firm undertakes a highly risky project.

	Cash Flows	
Year	**Project C (Tk.)**	**Project D (Tk.)**
1	2,000	500
2	-1,000	1,000
3	2,000	1,100
4	-3,000	1,500
5	6,500	2,000
Total	6,500	6,100

Table 2

In Table 2, suppose a firm has two available investment projects C and D. Project C has higher total cash flows than Project D. Under the concept of maximization of profit, since risk in cash flows is not considered, the financial manager will choose project C as it provides higher returns.

Here, it is given that Project C's cash flow in the 2nd and 4th years is negative, which is riskier.

In addition, a company will be more or less risky depending on the amount of debt in relation to equity in its capital structure. This financial risk also contributes to the overall risk to the investor. In general, stockholders are risk averse – that is they must be well compensated for bearing risk. Two companies may have the same expected EPS, but if the earnings stream of one is subject to considerably more risk than the earnings stream of the other, the market price per share of its stock may well be less.

Thus, How Does One Maximize Wealth?

Here, Share is one of the equal parts into which a company's capital is divided, entitling the holder to a proportion of the profits. Shares of common stock give evidence of ownership in a corporation. Shareholders wealth is represented by the market price per share of the firm's common stock, which, in turn, is a reflection of the firm's investment, financing and asset management decisions.

The idea is that the success of a business decision should be judged by the effect that it ultimately has on the share price. The objective of maximizing market price per share takes into account present and expected future earnings per share, the timing, duration and risk of these earnings, the dividend policy of the firm and other factors that bear on the market price of the stock, which are all shortcomings of profit maximization objectives.

The market price of a share serves as a barometer for business performance. This also indicates how well the management is doing on behalf of its shareholders. Because shareholders who are dissatisfied with the management's performance, may sell their shares and invest in another

company. This action if taken by other dissatisfied shareholders, will place downward pressure on the market price per share. Thus, the management must focus on creating value for shareholders.

Review Questions

1. What are the goals of Financial Management? Briefly discuss.
2. Why should a company concentrate primarily on wealth maximization instead of profit maximization? Discuss the reasons.

Lesson 3: Functions of Financial Management

Learning Objectives

After studying this lesson, you should be able to:

- Know the functions of financial management.

Functions/ Decisions of Financial Management

A financial manager has to concentrate on certain areas of finance. The decision function of financial management can be broken down into three major areas:

i. Investment Decision;
ii. Financing Decision; and
iii. Asset Management Decision.

Generally, a company's balance sheet is comprised of assets, liabilities, and equity. Assets include long-term and short-term assets and liabilities include long-term and short-term liabilities.

Among the decision functions of a financial manager, the Investment Decision is related to the firm's long-term assets whereas the Financing Decision is related to the long-term liabilities and equity and the Asset Management Decision is related to the current assets and current liabilities.

i) Investment decision:

The investment decision is the most important of the firm's three major decisions. This type of decision is also known as capital budgeting in finance. It includes the decision concerned with the acquisition, modification, and replacement of long-term assets such as plant, machinery, equipment, land, and buildings.

Long-term assets require a huge amount of capital outlay at the beginning but the benefits are derived over several periods in the future. Because the future benefits are not known with certainty, long-term investment proposals involve risks. The financial manager should estimate the expected risk and return of the long-term investment and evaluate the investment proposals in terms of both expected return and risk. The financial manager accepts the proposal only if the investment maximizes the shareholders' wealth.

ii) Financing decision:

The second important decision that a finance manager has to make is deciding the source of finance, which is known as the financing decision. It is also known as the capital structure decision. A company can raise finance from various sources such as by issuing shares, debentures or by taking loans and advances. Deciding how much to raise from which source is related to the financing decision.

Sources of finance can be mainly divided into two categories:

a) Owner's fund (Share capital and retained earnings); and
b) Borrowed funds (debentures, loans, bonds, etc.).

Share capital and retained earnings constitute owners' funds and debentures, loans, bonds, etc. constitute borrowed funds. The main concern of a finance manager is to decide how much to raise from owners' funds and how much to raise from borrowed funds. While making this decision, the finance manager compares the advantages and disadvantages of different sources of finance. The borrowed funds have to be paid back and involve some degree of risk whereas in the owners' fund, there is no fixed commitment of repayment and there is no risk involved. However, a finance manager prefers a mix of both types. Under the financing decision, the finance manager fixes a ratio of owner funds and borrowed funds in the capital structure of the company.

In addition, dividend policy must be viewed as an integral part of the firm's financing decision. A dividend decision is the decision on the allocation of earnings to common stockholders. It is concerned with deciding the portion of earnings to be allocated to common stockholders. The financial manager has three alternatives regarding dividend decisions:

- Pay all earnings as dividend;
- Retain all earnings for reinvestment; and
- Pay a certain percentage of earnings and retain the rest for reinvestment.

The financial manager must choose among the above alternatives. The choice should be optimum in the sense that it should maximize the shareholders' wealth. Retaining a greater amount of current earnings in the firm means fewer dollars will be available for current dividend payments. Thus, the value of the dividends paid to stockholders must therefore be balanced against the opportunity cost of retained earnings lost as a means of equity financing. To make this decision, the finance manager keeps in mind the growth plans and investment opportunities. If more investment opportunities are available and the company has growth plans then more is kept aside as retained earnings and less is given in the form of dividends, but if the company wants to satisfy its shareholders and has fewer growth plans, then more is given in the form of dividend and less is kept aside as retained earnings.

iii) Asset Management Decision:

The third important decision of the firm is the asset management decision. Working Capital Management is concerned with the management of the current assets. Working capital refers to the capital required for the day-to-day operations of the company.

One aspect of working capital management is the trade-off between profitability and risk (liquidity). There is a conflict between profitability and liquidity. If a firm does not have adequate working capital, i.e., it does not invest sufficient funds in current assets, it may become illiquid and consequently may not have the ability to meet its current obligations and thus invite the risk of bankruptcy. If the current assets are too large, the profitability is adversely affected. Thus, the financial manager should be more concerned with the management of current assets.

An example can help to clear the functions of a financial manager.

Suppose Mr X owns a bakery, he needs to buy ovens to bake the goods. Then deciding which type of oven is appropriate to serve his purpose is related to the Investment Decision. Thus, he has decided which type of oven is necessary for his business. Now to purchase that specific oven, he needs funds, or in other words, he has to finance from the cheapest source to purchase that specific oven. So which source or sources will he use? And why? Financing decisions deal with all these questions.

After he has identified the required asset to run the bakery, he has to identify the sources of funds to procure that asset and finally, he would have bought that asset. Then, he needs to manage that asset which is the oven so that it works properly. How to manage properly? Asset management decisions deal with these questions.

In this unit, you have learnt the concepts of financial management, business ethics, and corporate governance. You also learnt different forms of business organization, goals, and functions of financial management.

Review Questions

1. What are the major functions of the financial manager? What do these functions have in common?
2. Why is the dividend decision important for a financial manager?

Financial Statements and Analysis

2

Unit Highlights

- Concept of Financial Statement
- Financial Ratios
- Categories of Financial Ratios

Lesson 1: Concept of Financial Statement

Lesson Objectives

After studying this lesson, you should be able to:

- understand the concept of financial statements;
- know why financial statements are important for a company; and
- identify the contents of basic financial statements.

Financial Statements

Statutory financial reports (primarily known as financial statements) are very important for every corporation. Periodical reports are prepared for different levels of users. Generally, the guideline applied to prepare and maintain financial reports is known as the generally accepted accounting principles (GAAP). These accounting practices and procedures are authorized by the Financial Accounting Standards Board (FASB) – the rule-setting body.

Publicly owned corporations are usually required by the Securities and Exchange Commission (SEC), which is the national regulatory body that governs the sale and listing of securities, to provide their stockholders with the annual stockholder's report or financial report/statement. The stockholder's report/financial statement summarizes and documents a firm's financial activities for a specified period. Generally, it begins with a letter to the stockholders from the firm's president and/or chairman of the board to communicate from the management to the stockholders about the important effects on the firm during the period, management philosophy, corporate governance issues, strategies, and actions as well as plans for the coming period.

There are four (4) key financial statements prepared by a firm for reporting purposes. These are:

1) Balance Sheet;
2) Income Statement;
3) Statements of Retained Earnings; and
4) Statements of Cash Flows.

Balance Sheet

Balance Sheet is a summary statement that reflects a firm's financial position at a particular time, usually at the end of a year or a quarter. The statement equals the total assets and liabilities of a firm according to this formula:

Assets = Liabilities + Shareholder's Equity

In a balance sheet, an important distinction is made between short-term and long-term assets and liabilities. Current assets and liabilities are short-term assets and liabilities because they are expected to be converted into cash (current assets) or paid (current liabilities) within a year or less. All assets and liabilities other than Current assets and liabilities are considered long-term because they are expected to remain on the firm's books for more than a year.

ABC Company
Balance Sheet
As of December 31, 2021

	2021 (Tk.)
Assets	
Cash	20,000
Marketable securities	50,000
Accounts Receivable	72,000
Inventories	28,000
Total Current Assets	**170,000**
Land and Buildings	500,000
Machinery and equipment	100,000
Furniture's and fixtures	85,000
Vehicles	300,000
Others	55,000
Total Fixed Assets	**1,040,000**
Total Assets	**1,210,000**
Liabilities and Stockholders' Equity	
Accounts Payable	70,000
Notes Payable	52,000
Accruals	18,000
Total Current liabilities	**140,000**
Long term debt	425,000
Total liabilities	**565,000**
Common Stock (55,000 shares, Tk.10 par)	550,000
Paid in capital in excess of par on common stock	30,000
Retained earnings	65,000
Total Stockholders' equity	**645,000**
Total Liabilities and Stockholders' Equity	**1,210,000**

Table 1 shows the balance sheet of ABC Company for the fiscal year ending December 31, 2021. The assets are listed in the upper panel according to their relative degree of liquidity (that is their closeness to cash).

The most liquid assets are cash and cash equivalents, so they appear first. Marketable securities are very liquid short-term investments as these are viewed as a form of cash or near cash such as a Treasury bill or certificate of deposit, held by the firm. Total money owed to the firm by its customers on credit sales is known as Accounts receivable. Inventories include raw materials, work in process, and finished goods held by the firm, and fixed assets appear at the end because it is a long-term investment.

Liabilities and equity accounts are also listed from short-term to long-term. Current liabilities include accounts payable which represents amounts owed for credit purchases by the firm; Notes payable are the outstanding short-term loans, and accrual is the amounts owed for services for which a bill may not or will not be received. Stockholders' equity (categorized as Common stock (at par) and additional paid-in capital) represents the owner's claims on the firm. The preferred stock entry shows the historical proceeds from the sale of preferred stock. Retained earnings represent a company's cumulative profits after dividends, which means earnings that have been

retained in the firm. It is to be noted that retained earnings are not cash but rather have been utilized to finance the firm's long-term assets.

Example 1: A company has current assets of Tk. 800, net fixed assets of Tk.500, short-term debt of Tk.700 and long-term debt of Tk. 200. What is the shareholders' equity?

Solution: current assets of Tk. 800 + net fixed assets of Tk.500 - short-term debt of Tk.700 - long-term debt of Tk. 200 = Tk. 400.

Therefore, Shareholders equity is Tk. 400.

Income Statement –

Income Statement shows the financial summary of a firm over a specified period. It is also known as "profit and loss account" or "statement of revenue and expense". Specified periods include monthly, quarterly, semi-annually, and annually

ABC Company
Income Statement
For the year ended December 31, 2021

	2021 (Tk.)
Sales Revenue	550,000
Less: Cost of Goods Sold	165,000
Gross Profit	**385,000**
Less: Operating Expenses	
Selling Expense	26,950
General and administrative expenses	34,650
Lease expense	8,470
Depreciation expense	6,930
Total operating expense	**77,000**
Operating Profit	**308,000**
Less: Interest expense	76,500
Net profit before taxes	**231,500**
Less: Taxes (35%)	81,025
Pet profits after taxes	**150,475**
Less: Preferred stock dividend	-
Earnings available for common stockholders	**150,475**

Table 2 presents ABC Company's income statements for the years ended December 31, 2021. The Statement begins with the sales revenue which is the total amount of sales by the company during the period. Cost of goods sold includes all the costs related to producing the products that were sold during the period, and Gross profit is the difference between the sales revenue and cost of goods sold. Selling, administrative expenses as well as interest expenses are shown separately because these are periodic costs rather than product costs.

Example 2: In the year 2021, a company's cash sell was Tk. 60,000 and credit sell was Tk. 40,000. The cost of goods sold was reported at Tk. 60,000. So, find out the gross profit amount.

Solution: Cash sales Tk. 60,000 + Credit sales Tk. 40,000 - cost of goods sold Tk. 60,000 = Gross profit Tk. 40,000.

Therefore, the Gross profit amount is Tk.40, 000.

Statement of Retained Earnings -

The Statement of Retained Earnings reconciles the net income earned during a given year, and any cash dividends paid, with the change in retained earnings between the start and the end of that year. Table 3 shows a company's statement of retained earnings.

Company ABC **Statement of Retained Earnings** **For the year ended Dec 31, 2021**	
	Taka (,000)
Retained Earnings Balance (January 1, 2021)	1,012
Plus: Net Profits After Taxes (for 2021)	231
Less: cash dividends (paid during 2021)	
Preferred stock	10
Common stock	98
Total dividends paid	108
Retained Earnings Balance (December 31, 2021)	1,135

Statement of Cash Flows –

The statement of cash flows is a summary of a firms operating, investment and financing cash flows and reconciles them with changes in its cash and marketable securities during the period. Table-4 shows a company's statement of retained earnings.

Company A **Statement of Cash Flows** **For the year ended Dec 31, 2021**	
	Taka (,000)
Cash flow from Operating Activities	
Net profit after taxes	231
Depreciation	239
Increase in accounts receivable	-138
Decrease in inventories	11
Increase in accounts payable	112
Increase in accruals	45
Cash provided by operating activities	**500**
Cash flow from Investment Activities	
Increase in gross fixed assets	-347
Change in equity investments in other firms	0
Cash provided by investment activities	**-347**
Cash flow from financing activities	
Decrease in notes payable	-20
Increase in long-term debts	56
Changes in stockholders' equity	11
Dividend paid	-108
Cash provided by financing activities	-61
Net increase in cash and marketable securities	**92**

Notes to the Financial Statements – Explanatory notes are keyed to relevant accounts in the financial statements. These Notes to the Financial Statements provide detailed information on the accounting policies, procedures, calculations, and transactions underlying entries in the financial statements. Common issues are revenue recognition, income taxes, breakdowns of fixed asset accounts, debt and lease terms, and contingencies.

Review Questions

1. What is a financial statement?
2. Why financial statements are important for a company?
3. Discuss four important financial statements prepared by a firm for reporting purposes.
4. In the year 2021, a company's cash sale was Tk. 80,000 and the credit sale was Tk. 48,000. The cost of goods sold is reported as Tk. 61,000. Find out the gross profit amount.

Lesson 2: Financial Ratios

Lesson Objectives

After studying this lesson, you should be able to:

- know the concept of ratio analysis;
- explain the reason behind why the financial statement analysis using financial ratios is important;
- identify different users of financial ratios; and
- recognize the limitations of financial statement analysis.

Ratio Analysis:

Ratio Analysis involves methods of calculating and interpreting financial ratios to analyze and monitor the firm's financial condition and performance. This analysis is important because the comparison may prove more useful than their raw numbers.

Using Financial Ratio:

Financial ratios are designed to assist evaluate financial statements. Shareholders, creditors, and the firm's own management are the important parties who would want to use ratio analysis to know the firm's current and future level of risk and return, the short-term liquidity position of the company, and to monitor the firm's performance from period to period.

Generally, financial managers use financial ratios to evaluate company performance in two ways. The first type of comparison is called time series analysis or internal comparisons. It evaluates performance over time. Comparison of current to past performance, using ratios, enables analysts to assess the firm's progress. The second type of comparison is called cross-sectional analysis or external comparisons or benchmarking. It involves the comparison of different firm's financial ratios at the same point in time. Frequently, a firm will compare its ratio values to those of a key competitor or group of competitors that it wishes to emulate or with its industry. Moreover, a firm can do both the comparison types to assess the trend in the behaviour of the ratio in relation to the trend for the industry. That will be the most informative approach.

User of Financial Ratio:

Shareholders, creditors, and the firm's own management are the important parties who would want to use ratio analysis to know the firm's current and future level of risk and return, the short-term liquidity position of the company, and to monitor the firm's performance from period to period.

More specifically, there are four important Interested Parties. They are described in the following:

Firstly, Trade creditors. They use financial ratios to analyze the liquidity/short-term liquidity of the company. Secondly, Bondholders, generally use financial ratios to know the cash flow/ability to service debt over the long run. Thirdly, Investors generally use financial ratios to know the Present and expected future earnings (Profitability) and the stability of the company. Finally, the Management of a company uses financial ratios for Internal control which is to monitor the firm's performance from period to period.

Limitations of Financial Ratios:

There are some important limitations of financial ratios that analysts should be conscious of. These are discussed below:

- Many large firms operate different divisions in different industries. For these companies, it is difficult to find a meaningful set of industry-average ratios.
- Inflation may have badly distorted a company's balance sheet. In this case, profits will also be affected. Thus, a ratio analysis of one company over time or a comparative analysis of companies of different ages must be interpreted with judgment.
- Seasonal factors can also distort ratio analysis. Understanding seasonal factors that affect a business can reduce the chance of misinterpretation. For example, a retailer's inventory may be high in the summer in preparation for the back-to-school season. As a result, the company's accounts payable will be high and it's Return on Asset low.
- Different accounting practices can distort comparisons even within the same company (leasing versus buying equipment, LIFO versus FIFO, etc.).
- It is difficult to generalize whether a ratio is good or otherwise. A high cash ratio in a historically classified growth company may be interpreted as a good sign, but it could also be seen as a sign that the company is no longer a growth company and should command lower valuations.
- A company may have some good and some bad ratios, making it difficult to tell if it is a good or weak company.

In general, ratio analysis conducted in a mechanical, unthinking manner is dangerous. On the other hand, if used intelligently, ratio analysis can provide insightful information. Moreover, a firm can do both comparison types to assess the trend in the behaviour of the ratio in relation to the trend for the industry. That will be the most informative approach.

Review Questions

1. Discuss the reasons why the financial statement analysis using financial ratios is important.
2. Describe the concept of ratio analysis.
3. Who are the different users of financial ratios? Why do they use financial ratios?
4. Explain the potential problems with ratio analysis.

Lesson 3: Categories of Financial Ratios

Lesson Objectives

After studying this lesson, you should be able to:

- calculate ratios for assessing a company's liquidity;
- estimate ratios for assessing a company's solvency;
- determine ratios for assessing company management's effectiveness; and
- calculate ratios for assessing a company's position in the stock market.

Categories of Financial Ratios:

In this module, some commonly used financial ratios will be introduced because there is a huge number of possible ratios that can be calculated by dividing one number by another. These financial ratios can be grouped into the following categories:

a) Liquidity ratios;
b) Financial leverage ratios;
c) Turnover ratios;
d) Profitability ratios; and
e) Market ratios.

a) Liquidity Ratios:

The liquidity of a firm is measured by its ability to pay its short-term obligations as they are due without unnecessary stress. Liquidity refers to the solvency of the firms as a common precursor to financial distress and bankruptcy is low or declining liquidity. Thus, these ratios can provide early signs of cash flow problems. The two basic measures of liquidity are the current ratio and the quick ratio (acid test).

i. Current Ratio:

One of the most commonly cited financial ratios is the current ratio which measures the firm's ability to meet its short-term obligations. It is expressed as follows:

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

Generally, a higher current ratio indicates a better degree of liquidity. If a firm's cash flow is more predictable then a lower current ratio is acceptable.

ii. Quick (acid test) ratio:

The quick ratio is similar to the current ratio except that it excludes Inventory- least liquid Current Assets. This ratio provides a better measure of overall liquidity when a firm's inventory cannot be easily converted into cash. It is calculated as follows:

$$\textbf{Quick ratio (acid test)} = \frac{\textbf{(Current Assets - Inventory)}}{\textbf{Current Liabilities}}$$

Example 1: Cash is Tk. 5,000, Marketable Securities are Tk. 15,000, Accounts Receivables are Tk. 40,000, Inventory is Tk. 7,000 and Current Liabilities are Tk. 80,000. Find out the Current ratio and quick ratio.

Solution:

The current ratio is (5,000+15,000+40,000+7,000)/80,000 = 0.84.

The Acid Test Ratio is (5,000 + 15,000 + 40,000) – 7,000 / 80,000 = .75.

That is Tk.75 in liquid assets for each Tk. 1.00 in current liabilities

b) Asset Management or Activity or Turnover Ratios:

Asset management ratios measure how efficiently or intensively a company uses its assets to generate sales. The four basic measures of activity are the Inventory turnover, Average collection period, Average payment period, and Total Asset Turnover.

i) Inventory turnover:

This ratio measures the number of times that a company turns over (or sells) its inventory during a year. It can be calculated as follows:

$$\textbf{Inventory turnover} = \frac{\textbf{Cost of Goods Sold}}{\textbf{Inventory}}$$

Higher turnover rates are desirable. A high turnover rate implies that management does not hold onto excess inventories and the inventories are highly marketable. The resulting turnover is meaningful only when it is compared with that of other firms in the same industry or to the firm's past inventory turnover. Inventory turnover can be easily converted into an average age of inventory by dividing it into 365.

ii) Average collection period:

This ratio measures the number of times a company can convert its receivables into cash. The average collection period is calculated as follows:

$$\textbf{Average collection period} = \frac{\textbf{Accounts Receivable}}{\textbf{Average sales per day}}$$

$$= \frac{\textbf{Accounts Receivable}}{\frac{\textbf{Annual Sales}}{\textbf{365}}}$$

A low number of days are desirable. It is meaningful only when compared in relation to the firm's credit terms.

iii) Average payment period:

This calculation shows the average length of time a company's trade payables are outstanding before they are paid. A higher average payment period is desirable. It is calculated in the same manner as the average collection period:

$$\textbf{Average payment period} = \frac{\textbf{Accounts Payable}}{\textbf{Average purchase per day}}$$

$$= \frac{\textbf{Accounts Payable}}{\textbf{(Annual purchase} \div \textbf{365)}}$$

iv) Total Asset Turnover:

Total asset turnover measures how efficiently a company uses its assets to generate sales. Generally, the higher a firm's total asset turnover, the more efficiently its total assets have been used. It is calculated as follows:

$$\textbf{Total asset turnover} = \frac{\textbf{Sales}}{\textbf{Total asset}}$$

v) Fixed Asset Turnover:

This ratio measures how effectively a company uses its fixed assets like plant, equipment, etc. A higher total fixed turnover indicates a company's fixed assets have been used more efficiently. It is calculated as follows:

$$\textbf{Fixed Asset Turnover} = \frac{\textbf{Sales}}{\textbf{Net Fixed Assets}}$$

Example 2: Assume that a company always made a credit sale. In the year 2020, Sales are Tk. 480,000, the average receivable balance during the year is Tk. 40,000 and it has Tk. 20,000 allowance for sales returns. What is the company's accounts receivable turnover?

Solution:

Accounts Receivable Turnover is (Tk. 480,000 - Tk. 20,000) / Tk. 40,000 or 11.5. The company is able to turn receivables over 11.5 times during the year.

c) Profitability Ratios:

Without profit, it is not possible for a company to attract outside capital. Six frequently cited ratios of profitability are the gross profit margin, the operating profit margin, the net profit margin, Earnings per Share, Return on Total Assets (ROA), and Return on Equity (ROE).

i) Gross profit margin:

The gross profit margin measures how much profit is earned by a company without consideration of selling and administration costs. The ratio is calculated as follows:

$$\textbf{Gross profit margin} = \frac{\textbf{(Sales-Cost of Goods Sold)}}{\textbf{Sales}}$$

All other things held equal, a higher gross profit margin is desirable and indicates that a company is efficiently managing its cost of goods sold.

ii) Operating profit margin:

The Operating profit margin measures how much profit is earned by a company considering all costs and expenses, other than interest, taxed, and preferred stock dividends. A high operating profit margin is preferred. This ratio is calculated as follows:

$$\textbf{Operating profit margin} = \frac{\textbf{Operating profits}}{\textbf{Sales}}$$

iii) Net profit margin:

The Net profit margin measures how much profit is earned by a company considering all costs and expenses, including interest, taxes, and preferred stock dividends. The higher the firm's net profit margin, the better.Net profit margin is calculated as follows:

$$\textbf{Net profit margin} = \frac{\textbf{Earnings available for common stockholders}}{\textbf{Sales}}$$

iv) Earnings per Share (EPS):

The EPS generally expresses the earnings of a company on a "per share" basis. A high EPS in comparison to other competing firms is desirable. EPS is calculated as follows:

$$\textbf{Earnings per Share} = \frac{\textbf{Earnings available for common stockholders}}{\textbf{Number of shares of common stock outstanding}}$$

v) Return on Total Assets (ROA):

It is often called the return on investment (ROI) which measures the overall profitability from investment in assets. Higher rates of return are desirable. Return on Total Assets is calculated as follows:

$$\textbf{Return on Total Assets (ROA)} = \frac{\textbf{Earnings available for common stockholders}}{\textbf{Total Assets}}$$

vi) Return on Equity (ROE):

Equity investors are concerned with the rate of return that is being generated on their investment in the company. ROE measures the return earned on the common stockholders' investment in the firm. Generally, the owners are better off if this return is higher. Return on Equity is calculated as follows:

$$\textbf{Return on Equity (ROE)} = \frac{\textbf{Earnings available for common stockholders}}{\textbf{Common stock equity}}$$

Example 3:

Net Income is Tk. 60,000 and average total assets for the year are Tk. 500,000. Thus, what will be the return on assets?

Solution:

This gives a 12% return on assets, Net Income Tk. 60,000 / Average total assets Tk. 500,000 = .12.

d) Financial Leverage Ratios:

Financial Leverage ratios measure the firm's long-run ability to meet its obligations. Financial leverage is the magnification of risk and return through the use of fixed cost debt a firm uses. Generally, the more debt a firm uses in relation to its total assets, the greater its risk of being unable to meet its contractual debt payments.

i) Debt Ratio:

The debt ratio measures the proportion of creditors fund in a company's total assets. The higher this ratio, the greater the amount of other people's money being used to generate profits. The ratio is calculated as follows:

$$\textbf{Debt Ratio} = \frac{\textbf{Total Liabilities}}{\textbf{Total Assets}}$$

Here, total liabilities or debt includes both short-term liabilities and long-term liabilities. A low Debt Ratio would indicate that a company has sufficient assets to cover its debt load. Creditors and management favor a low Debt Ratio. The Debt Ratio is calculated as follows:

ii) Debt Equity Ratio:

This ratio compares the funds provided by creditors to the funds provided by shareholders. As more debt is used, the Debt-to-Equity Ratio will increase. That is company's fixed interest obligations with debt will increase and the risk increases as well. On the other hand, the use of debt can help improve earnings through tax savings. Thus, to maximize profit, there needs to be a balance between debt and equity. The Debt-to-Equity Ratio is calculated as follows:

$$\textbf{Debt-Equity Ratio} = \frac{\textbf{Total Debt (Liabilities)}}{\textbf{Total Equity}}$$

iii) Time Interest Earned Ratio (TIER):

This ratio is sometimes called the Interest Coverage Ratio which measures the firm's ability to make fixed interest payments. A high ratio is desirable from both creditors and management because it indicates that the company is better able to fulfill its interest obligations.

The ratio is calculated as follows:

$$\textbf{Time Interest Earned Ratio} = \frac{\textbf{Earnings before interest and taxes}}{\textbf{Interest Expense}}$$

Generally, this ratio is presented as times (X).

Example 4: Given the information below for Walton, calculate the firm's debt ratio and the times interest earned. How do Walton's practices compare to the industry? What are the implications of your findings?

Total debt	Tk.26,197
Equity	
Common stock	Tk.10,627
Retained earnings	Tk.13,164
Total liabilities and equity	**Tk.49,988**
Operating profits	Tk.2,314
Interest expense	Tk.793
Industry norms:	
Debt ratio	34.21%
Times interest earned	4.50X

Solution:

$$\text{Debt Ratio} = \frac{\text{Total debt}}{\text{Total liabilities and equity}} = \frac{\text{Tk. 26197}}{\text{Tk. 49988}} = 52.41\%$$

$$\text{Times interest earned} = \frac{\text{Interest expense}}{\text{Operating profits}} = \frac{\text{Tk.973}}{\text{Tk.2314}} = 2.92\ \text{X}$$

	Walton	Industry
Debt Ratio	52.41%	34.21%
Times interest earned	2.92X	4.50X

Walton uses significantly more debt financing than the average firm in the industry. The higher debt ratio implies that the firm has greater financial risk. Moreover, it also has a lower interest coverage which is the result of Walton borrowing more debt, resulting in a higher interest expense.

e) Market Value Ratios:

Market ratios relate to the firm's market value. These ratios give insight into how investors in the marketplace feel the firm is doing in terms of risk and return. They tend to reflect, on a relative basis, the common stockholders' assessment of all aspects of the firm's past and expected future performance.

i) Price /Earnings (P/E) ratio:

The P/E ratio measures how much an investor is willing to pay per dollar of current earnings. A high P / E Ratio would imply that investors are very optimistic (bullish) about the future of the company since the price (which reflects market value) is selling well above current earnings. A

low P / E Ratio would mean that investors view the company's future as poor and thus, the price the company sells for is relatively low when compared to its earnings. The P / E Ratio is calculated as follows:

$$\textbf{P/E ratio} = \frac{\textbf{Market price per share of common stock}}{\textbf{Earnings per share}}$$

ii) Market/Book (M/B) ratio:

Book Value per Share reflects historical costs. Therefore, the M/B ratio compares the market value of the firm's investment to its cost. A value of less than 1 could mean that the firm has not been successful overall in creating value for its stockholders. The ratio is calculated as follows:

$$\textbf{M/B ratio} = \frac{\textbf{Market value per share}}{\textbf{Book value per share}}$$

$$\textbf{and Book value per share} = \frac{\textbf{Common stock equity}}{\textbf{Number of shares of common stock outstanding}}$$

iii) Dividend Yields:

The percentage of dividends paid to shareholders in relation to the price of the stock is called the Dividend Yield. For investors interested in a source of income, the dividend yield is important since it gives the investor an indication of how much dividends are paid by the company. Dividend Yield is calculated as follows:

$$\textbf{Dividend Yield} = \frac{\textbf{Dividend per share}}{\textbf{Price of stock}}$$

Example 5: If a company's earnings per share is Tk. 3.00 and the stock is selling currently for Tk. 36.00 per share. Find the P/E ratio.

Solution:

P/E ratio = Selling price per share / Earnings per share = Tk. 36 / Tk. 3.

The P / E ratio is 12. That means the company is selling for 12 times earnings.

In this unit, you learnt the contents of basic financial statements and the importance of financial statements to different users. You also learnt how to calculate and explain the liquidity, activity, profitability, debt and market ratios to analyze a firm.

Review Questions

1. Describe the categories of financial ratios.
2. What is financial leverage?
3. What does the price/earnings (PIE) ratio measure? How does it relate to investor confidence in the firm's future? Is the P/E ratio a true measure of profitability?
4. Assume that a company always made a credit sale. In the year 2021, sales are Tk. 410,000, the average receivable balance during the year was Tk. 40,000 and we have Tk. 20,000 allowance for sales returns. What is the company's accounts receivable turnover?

7. Consider the following information:

Baker Corporation
Balance Sheet
December 31, 2022
(Tk. '000)

Cash and marketable securities	50	Accounts payable	250
Accounts receivable	200	Accrued liabilities	250
Inventory	250	Notes payable	500
Total current assets	500	Total current liabilities	1,000
Net fixed assets	1,500	Long-term debt	250
		Common stock	400
		Retained earnings	350
Total assets	2,000	Total liabilities and equity	2,000

Baker Corporation
Income Statement
for the Year Ended December 31, 2022
(Tk. '000)

Sales		1,000
Cost of goods sold (excluding depreciation)	550	
Other operating expenses	100	
Depreciation	50	
Total operating costs		700
Earnings before interest and taxes (EBIT)		300
Interest expense		25
Earnings before taxes (EBT)		275
Taxes (40%)		110
Net income		**165**

Calculate:

i. Current Ratio
ii. Quick Ratio
iii. Fixed Asset Turnover
iv. Total Asset Turnover
v. Debt Ratio
vi. Debt to Equity Ratio
vii. Return on Equity
viii. Net Profit Margin

Capital Budgeting Technique

3

Unit Highlights

- Introduction to capital budgeting
- Different concepts in capital budgeting
- Techniques used in capital budgeting

Lesson 1: Introduction to Capital Budgeting

Lesson Objectives

After studying this lesson, you should be able to:

- understand the concept of capital budgeting;
- know the importance of capital budgeting decisions;
- recognize the motives for capital expenditure; and
- identify the steps of capital budgeting.

Concept of Capital Budgeting:

The term "capital" refers to fixed assets used in production, whereas a 'budget' is a plan that details projected inflows and outflows in the future period. Thus, 'capital budget' is an outline of planned expenditures on fixed assets.

In a formal definition: capital budgeting is the process of evaluating and selecting long-term investments that are consistent with the firm's goal of maximizing the owner's wealth.

Therefore, capital budgeting is all about a financial manager's investment function. It includes the decision concerned with the acquisition, modification and replacement of long-term assets such as plant, machinery, equipment, land and buildings. A financial manager makes investment decisions using a capital budgeting technique. For example, suppose you own a bakery, you need to buy ovens to bake your goods. Then deciding which type of oven is appropriate to serve your purpose as well as the place to conduct the bakery business is related to investment decisions.

Let's have a look at another example - imagine that you were to start your own business. No matter what type of business you start, you would have to answer the following three questions in some form or another:

1. What long-term investments should you take on? That is, what lines of business will you be in and what sorts of buildings, machinery, and equipment will you need?
2. Where will you get the long-term financing to pay for your investment? Will you bring in other owners or will you borrow the money?
3. How will you manage your everyday financial activities such as collecting from customers and paying suppliers?

The first question concerns the firm's long-term investments. The process of planning and managing a firm's long-term investments is called capital budgeting. In capital budgeting, the financial manager tries to identify investment opportunities that are worth more to the firm than their cost to acquire.

Regardless of the specific investment under consideration, financial managers must be concerned with **how** much cash they expect to receive **when** they expect to receive it, and **how** likely they are to receive it. Thus, evaluating the ***size, timing***, and ***risk*** of future cash flows is the essence of capital budgeting. Whenever evaluating a business decision, the **size**, **timing**, and **risk** of the cash flows will be, by far, the most important things to consider.

Importance of Capital Budgeting Decisions:

Capital budgeting decisions are the most important investment decisions made by management. The goal of these decisions is to select capital projects that will increase the value of the firm, and if the value of the firm increases, its stock price appreciates. This is ultimately in line with the goal of maximization of shareholders' wealth. Capital budgeting decisions have been given greater emphasis due to the following reasons:

(a) Capital budgeting has long-term implications (Growth):

A firm's decision to invest in long-term assets has a decisive influence on the rate and direction of its growth. A wrong decision can prove disastrous for the continued survival of the firm. On the other hand, inadequate investment in assets would make it difficult for the firm to compete successfully and maintain its market share.

(b) Capital budgeting requires a large amount of funds (Funding):

Capital investment decisions require large amounts of funds which the majority of the firms cannot provide since they have scarce capital resources. As a result, investment decisions must be thoughtful, wise, and correct. Because a wrong/incorrect decision would result in losses and the same prevents a firm from earning profits from other investments as well due to the scarcity of resources.

(c) Capital budgeting is not reversible (Irreversibility):

Capital budgeting is not reversible. This means that once we make capital budgeting decisions, they are not easily reversible. This is because there may neither be any market for such second-hand capital goods nor is there any possibility of conversion of such capital assets into other usable assets. i.e., the only remedy is to dispose-off the same, sustaining a heavy loss to the firm.

(d) They are the most difficult decisions (complexity):

Investment decisions assess future events, which are difficult to predict. It is a complex problem to correctly estimate the future cash flow of an investment. External environment i.e., economic, political, and technological forces cause uncertainty in cash flow estimation.

(e) Risk

Long-term assets require huge amounts of capital outlay at the beginning but the benefits are derived over several periods in the future. Because the future benefits are uncertain, long-term investment proposals involve risks.

Motives for Capital Expenditure:

Generally, companies make capital expenditures for many reasons. The basic motives for capital expenditures are:

- to expand operations,
- to replace or renew fixed assets, or
- to obtain some other, less tangible benefit over a long period.

(1) Expansion: This motive involves increasing the production capacity of the firm, usually through the building or acquisition of major fixed assets. The expansion motive is usually geared towards increasing market share via additional sales capacity.

(2) Replacement: This involves replacing existing assets with new or more advanced assets, which provide the same function. Replacement is usually associated with an anticipated reduction in the cost of production rather than sales enhancement.

(3) Renewal: This includes rebuilding or overhauling existing assets to improve efficiency. Replacement and renewal both can easily be considered part of the *replacement process*.

Other reasons for making capital expenditures might be for intangibles that are expected to improve profitability. Some examples would be re-educating the workforce, undertaking an advertising campaign, or possibly carrying out government-mandated defensive investment aimed at internalizing negative social costs (e.g., spending on new EPA pollution control equipment).

Steps involved in Capital budgeting:

The capital budgeting process consists of five distinct but interrelated steps:

1. ***Proposal generation***. Proposals for new investment projects are made at all levels within a business organization and are reviewed by finance personnel. Proposals that require large outlays are more carefully scrutinized than less costly ones.

2. ***Review and analysis.*** Financial managers perform formal reviews and analyses to assess the merits of investment proposals.

3. ***Decision making***. Firms typically delegate capital expenditure decision-making on the basis of dollar limits. Generally, the board of directors must authorize expenditures beyond a certain amount. Often plant managers are given authority to make decisions necessary to keep the production line moving.

4. ***Implementation.*** Following approval, expenditures are made and projects implemented. Expenditures for a large project often occur in phases.

5. ***Follow-up.*** Results are monitored and actual costs and benefits are compared with those that were expected. Action may be required if actual outcomes differ from projected ones.

Each step in the process is important. Review and analysis and decision-making (Steps 2 and 3) consume the majority of time and effort, however. Follow-up (Step 5) is an important but often ignored step aimed at allowing the firm to improve the accuracy of its cash flow estimates continuously.

Review Questions

1. What is capital budgeting?
2. Describe the steps involved in capital budgeting.
3. Why capital budgeting decisions are important in a company? Discuss.
4. Discuss the motives for capital expenditure.

Lesson 2: Different concepts in capital budgeting

Lesson Objectives

After studying this lesson, you should be able to:

- identify the difference between capital expenditure and operating expenditure.
- be familiar with the concepts of unlimited funds, capital rationing, accept-reject decision, ranking approaches, cost of capital, conventional and non-conventional cash flow projects.

Capital expenditure and Operating expenditure

It is very important to know the difference between operating and capital expenditure in this unit.

Operating Expenditure:

An operating expenditure is an outlay of funds resulting in benefits received within 1 year.

Operating expenditure is made for a short-term period and for the purpose of the day-to-day activities of a business.

Examples of operating expenses include taxes, wages, utilities, business travel, rent, insurance costs, etc.

Capital Expenditure:

A capital expenditure is an outlay of funds by the firm that is expected to produce benefits over a period of time greater than 1 year. Capital expenditure is made for a long-term period.

Examples of capital expenditure include purchasing equipment, buying property, land, buying a patent, etc.

Generally, fixed-asset outlays are capital expenditures, but not all capital expenditures are classified as fixed assets. For example, A Tk. 5,000,000 outlay for a new machine with a usable life of 15 years is a capital expenditure that would appear as a fixed asset on the firm's balance sheet. But, a Tk. 5,000,000 outlay for an advertising campaign that is expected to produce benefits over a long period is also a capital expenditure but would rarely be shown as a fixed asset.

Difference between Mutually Exclusive and Independent Projects:

All investment projects are considered to be mutually exclusive or independent. An **independent project** is one where the decision to accept or reject the project does not affect any other projects being considered by the company. The cash flows of an independent project do not affect the cash flows of other projects or divisions of the business. An example of an Independent Project would be the decision to replace a company's computer system which would be considered independent of a decision to build a new factory.

Moreover, a **mutually exclusive project** is one where acceptance of such a project will affect the acceptance of another project. In mutually exclusive projects, the cash flows of one project can have an impact on the cash flows of another. Most business investment decisions fall into this category. An example of a mutually exclusive Project would be Starbucks' decision to buy Teavana which will most certainly have a profound effect on the future cash flows of the coffee business as well as influence the decision-making process of other future projects undertaken by Starbucks.

Difference between Unlimited Funds and Capital Rationing:

Unlimited Funds are the financial situation in which a firm can accept all independent projects that provide an acceptable return. Meanwhile, Capital Rationing is the financial situation in which

a firm has only a fixed number of dollars available for capital expenditures, and numerous projects compete for these dollars. Capital rationing implies that a firm does not have the resources necessary to fund all of the available projects. Thus, the available capital will be allocated to the set of projects that will benefit the firm and its shareholders the most.

Difference between Accept-Reject and Ranking Approaches:

Accept-Reject decision is the evaluation of capital expenditure proposals to determine whether they meet the firm's minimum acceptance criterion. That means there is an acceptance criterion that a financial manager must follow. Is it necessary to be careful whether the projects are independent or mutually exclusive? Under independent funding, we can accept all projects that are profitable assuming we have unlimited funding. Under mutually exclusive with unlimited funding, we will choose the most profitable one.

In addition, Ranking approach is the ranking of capital expenditure projects on the basis of certain predetermined measures, such as the rate of return or cost of capital. Thus, Ranking just means listing the projects in descending order based on profitability.

Difference between conventional and non-conventional cash-flow projects:

There are two possible patterns of cash flow for a project. One is the **Normal /Conventional Cash Flow Project.** It means Cost (negative CF) followed by a series of positive cash inflows. Simply, in Conventional cash flows, cash outflow occurs only once at the start of the project. Let's see an example. Suppose, when we take a loan from banks, we withdraw the whole amount from the account once and pay it back to the bank in installments till we pay off the full principal amount plus any interest due on it. This way cash outflow occurs only once while banks receive cash inflows in the form of installments.

Another one is the **Non-normal/Non-conventional Cash Flow Project.** In **non-conventional cash flows,** cash outflows occur one or more times in addition to the initial cash outflow. For example, when we request for cash line from banks to meet our day-to-day business needs, we withdraw only the required amount from the account and deposit again when we have the excess amount and this process goes on till the agreed period. After that, you may request the bank to renew the cash line facility if required or you can simply ask them to close the limit.

Cost of capital:

Generally**, the Cost of capital** is the minimum return that a capital budgeting project must earn for it to be accepted. That is, the average rate a firm pays investors for the use of its long-term money. Usually, firms raise money from two sources: debt and equity. A project is considered a good investment if it is expected to generate a return that is greater than the rate that must be paid to finance it.

Review Questions

1. Differentiate between capital expenditure and operating expenditure.
2. Discuss the concepts of unlimited funds and capital rationing.
3. What is the cost of capital? Why is it important in capital budgeting?
4. Distinguish between conventional and non-conventional cash flow projects.
5. Discuss the concepts of accept-reject decision and ranking approaches.
6. What's the difference between "independent" and "mutually exclusive" projects?

Lesson 3: Techniques used in capital budgeting

Lesson Objectives

After studying this lesson, you should be able to:

- be familiar with the techniques used in capital budgeting.
- differentiate between net present value and internal rate of return method.
- make capital budgeting decisions using different techniques.

Techniques used in Capital Budgeting:

Generally, large firms evaluate dozens, perhaps even hundreds, of different ideas for new investments each year. To ensure that the investment projects selected have the best chance of increasing the value of the firm, financial managers need tools to help them evaluate the merits of individual projects and rank competing investments. Many techniques are available for performing such analyses.

Generally, five important techniques are frequently used in capital budgeting. These include:

1. Payback period (PBP);
2. Discounted Payback period (DPBP);
3. Net Present Value (NPV);
4. Internal Rate of Return (IRR); and
5. Profitability Index (PI).

1. Payback period:

It is the number of years required to recover a project's cost. The payback period is one of the most widely used tools for evaluating capital projects. The payback period represents the number of years required to recover a project's cost. A project is accepted if its payback period is below a certain pre-specified threshold. This technique can serve as a risk indicator—the more quickly you recover the cash, the less risky is the project.

Strengths:

- Indicates a project's risk and liquidity.
- Easy to calculate and understand.

Weaknesses:

- Ignores the Time Value of Money.
- Ignores Cash Flows occurring after the payback period.

Decision Criteria:

Decision Rule:		
If	PBP is less than the maximum acceptable PBP	Accept the project.
If	PBP is greater than the maximum acceptable PBP	Reject the project.

Moreover, the length of the maximum acceptable PBP is determined by the management.

Computing the Payback Period

To compute the payback period, we need to know the project's cost and estimate its future net cash flows. The following Equation shows how to compute the payback period:

$$\text{PBP} = \text{Years before cost recovery} + \frac{\text{Remaining cost to recover}}{\text{Cash flow during the year}}$$

Example 1: Compute the Payback Period (PB) given a required return of 12% and the following net cash flows:

Year	Net Cash Flow (NCF)
0	(Tk. 20,000)
1	Tk. 6,000
2	Tk. 7,000
3	Tk. 8,000
4	Tk. 5,000
5	Tk. 4,000

Solution:

In this example, total cost amount is Tk. 20,000. In the second year, the cumulative cash flow amount is Tk. 13,000 but in the third year, the cumulative cash flow amount is Tk.21,000 which is higher than the initial cost amount. Therefore, payback occurs between two and three years:

$$\text{PBP} = 2 + \frac{\text{Tk. } 20{,}000 - \text{Tk. } 13{,}000}{\text{Tk. } 8{,}000} = 2 + \frac{\text{Tk. } 7{,}000}{\text{Tk. } 8{,}000} = 2.875 \text{ years}$$

Year	Net Cash Flow (NCF)	Cumulative NCF
0	(Tk. 20,000)	
1	Tk. 6,000	Tk. 6,000
2	Tk. 7,000	Tk. 13,000
3	Tk. 8,000	Tk. 21,000
4	Tk. 5,000	
5	Tk. 4,000	

Note: The PB period when the cash flows are in the form of an annuity is calculated as:

$$\text{PBP} = \frac{\text{Initial investment or Cost}}{\text{Periodic cash flow}}$$

Example 2: Johan Enterprises is considering a capital expenditure that requires an initial investment of Tk. 50,000 and returns after-tax cash inflows of Tk. 7,000 per year for 10 years. The firm has a maximum acceptable payback period of 8 years. Determine the payback period for this project and comment on the result.

Solution:

$$\text{PBP} = \frac{\text{Tk. } 50{,}000}{\text{Tk. } 7{,}000} = 7.14 \text{ years}$$

The firm has a maximum acceptable payback period of 8 years, and the project's payback period is 7.14 years, which is below the acceptable payback period. Therefore, Johan Enterprise should invest in this project.

There is no economic rationale that links the payback method to shareholder wealth maximization. If a firm has a number of projects that are mutually exclusive, the projects are selected in order of their payback rank: projects with the lowest payback period are selected first.

2. The Discounted Payback Period (DPBP):

DPBP uses discounted cash flows rather than raw Cash Flows. That means it takes into account the time value of money. This technique overcomes some shortcomings of PBP. Thus, it is better than the PBP technique.

The discounted payback period calculation calls for the future cash flows to be discounted by the firm's cost of capital. The major advantage of the discounted payback is that it tells management how long it takes a project to reach a positive NPV. However, this method still ignores all cash flows after the arbitrary cutoff period, which is a major flaw.

Example 3 - Compute the Discounted Payback Period (DPBP) given a required return of 12% and the following net cash flows:

Year	Net Cash Flow (NCF)
0	(Tk.20,000)
1	Tk.6,000
2	Tk.7,000
3	Tk.8,000
4	Tk.5,000
5	Tk.4,000

Solution: In this example, the net cash outflow or cost amount is Tk. 20,000. Now all the cash inflows have to be discounted at the required rate of return of 12% using a single amount present value formula:

$$\text{Present value (PV)} = \frac{\text{Future Value (FV)}}{(1+i)^n}$$

Year	Net Cash Flow (NCF)	Present Value of NCF @12%	Cumulative NCF
0	(Tk.20,000)		
1	Tk.6,000	Tk.5,357.14	Tk.5,357.14
2	Tk.7,000	Tk.5,580.36	Tk.10,937.50
3	Tk.8,000	Tk.5,694.24	Tk.16,631.74
4	Tk.5,000	Tk.3,177.59	Tk.19,809.33
5	Tk.4,000	Tk.2,269.71	Tk.22,079.04

$$\text{DPB} = 4 + \frac{\text{Tk. } 20{,}000 - \text{Tk. } 19{,}809.33}{\text{Tk. } 2{,}269.71} = 4 + \frac{\text{Tk. } 190.67}{\text{Tk. } 2{,}269.71} = 4.084 \text{ years}$$

The payback period may be helpful when comparing mutually exclusive projects. Given two similar projects with different paybacks, the project with the shorter payback is often, but not always, the better project.

Despite its shortcomings, the payback period rule is often used by large and sophisticated companies when they are making relatively minor decisions. There are several reasons for this. The primary reason is that many decisions simply do not warrant detailed analysis because the cost of the analysis would exceed the possible loss from a mistake. As a practical matter, an investment that pays back rapidly and has benefits extending beyond the cutoff period probably has a positive NPV.

3. Net Present Value:

It is a capital budgeting technique that is consistent in maximizing shareholder wealth. The method estimates the amount by which the benefits or cash flows from a project exceed the cost of the project in present value terms. The present value of a project is the difference between the present value of the expected future cash flows and the initial cost of the project. Accepting a positive NPV project leads to an increase in shareholder wealth while accepting a negative NPV

project leads to a decline in shareholder wealth. Projects that have an NPV equal to zero imply that management will be indifferent between accepting and rejecting the project.

More specifically, *NPV* is the present value of an investment project's net cash flows minus the project's initial cash outflow.

$$NPV = \sum_{t=1}^{T} \frac{CF_t}{(1+r)^t} - CF_0$$

Here, CF_t = cash flow at time t

r = Interest rate

t = period

CF_0 = cash flow at time 0

Or, the formula can also be presented in this way:

NPV = Present Value of cash inflows – Cost or cash outflow

= Net gain in wealth.

The NPV decision criteria can be summed up as follows:

Decision Rule:		
If	NPV > 0	Accept the project.
If	NPV < 0	Reject the project.

And, choose between mutually exclusive projects on the basis of a **higher NPV.**

Key Advantages-

- Uses the discounted cash flow valuation technique;
- Provides a direct measure of how much a capital project will increase the value of the firm; and
- Consistent with the goal of maximizing shareholder wealth.

Key Disadvantages-

- Difficult to understand without an accounting and finance background.

The present value of the future expected cash flows is compared with the required outlay or cost. If the asset's value exceeds its cost, the project should be accepted; otherwise, it should be rejected. Alternatively, the project's expected rate of return is compared with the rate of return considered appropriate for the project.

If a firm identifies an investment opportunity with a present value greater than its cost, the firm's value will increase. There is a very direct link between capital budgeting and stock values. Therefore, the more effective the firm's capital budgeting procedures, the higher its stock price.

Example 4 - Compute the Net Present Value (NPV) given a required return of 12% and the following net cash flows:

Year	Net Cash Flow$_t$
0	(Tk.20,000)
1	Tk.6,000
2	Tk.7,000
3	Tk.8,000
4	Tk.5,000
5	Tk.4,000

$$\text{NPV} = \frac{-20{,}000}{(1.12)^0} + \frac{6{,}000}{(1.12)^1} + \frac{7{,}000}{(1.12)^2} + \frac{8{,}000}{(1.12)^3} + \frac{5{,}000}{(1.12)^4} + \frac{4{,}000}{(1.12)^5}$$

$$\text{NPV} = -Tk.20{,}000 + Tk.5{,}357.14 + Tk.5{,}580.36 + Tk.5{,}694.24 + Tk.3{,}177.59 + Tk.2{,}269.71$$

$$\text{NPV} = -Tk.20{,}000 + Tk.22{,}079.04 = \text{Tk.}2{,}079.04$$

(Since the NPV>0, **the project should be accepted**).

Example 5: Consider the following two mutually exclusive investments. Calculate NPV at a discount rate of 7.5%. Which projects should be chosen?

Year	Cash Flow (A)	Cash Flow (B)
0	(75,000)	(75,000)
1	25000	45,000
2	40,000	40,000
3	70,000	20,000

Solution:

Project A:

$$\text{NPV} = \frac{25{,}000}{(1.075)^1} + \frac{40{,}000}{(1.075)^2} + \frac{70{,}000}{(1.075)^3} - \frac{75{,}000}{(1.075)^0}$$

= (23,256 + 34,613 + 20, 124) – 75,000
= Tk. 2,993

Project B:

$$\text{NPV} = \frac{45{,}000}{(1.075)^1} + \frac{40{,}000}{(1.075)^2} + \frac{20{,}000}{(1.075)^3} - \frac{75{,}000}{(1.075)^0}$$

= (41, 860 + 34,613 + 16,099) – 75,000
= Tk. 17,572

Both the project has positive net present value. But Project B has a greater net present value compared to Project A, therefore the company should choose Project B.

4. Internal Rate of Return (IRR):

The **IRR** is an important and legitimate alternative to the NPV method. The NPV and IRR techniques are similar in that both depend on discounting the cash flows from a project. When we use the IRR, we are looking for the rate of return associated with a project so we can determine whether this rate is higher or lower than the firm's cost of capital. IRR is the discount rate that equates the NPV of an investment opportunity with Tk.0 (because the present value of cash inflows equals the initial investment).

Simply, IRR is the discount rate that makes the NPV equivalent to zero.

$$NPV = \sum_{t=0}^{n} \frac{NCF_t}{(1 + IRR)^t} = 0,$$

The trial-and-error method is used to compute the IRR. The formula for calculating IRR:

$$\text{IRR} = \text{Lr} + \frac{\text{PVCI}_{@\,\text{Lr}} - \text{Cost}}{\text{PVCI}_{@\,\text{Lr}} - \text{PVCI}_{@\,\text{Hr}}} * (\text{Hr} - \text{Lr})$$

Where,

Here, Lr	=	Lower Discount Rate
Hr	=	Higher Discount Rate
PVCI $_{@\,Lr}$	=	Present Value at the lower discount rate
PVCI $_{@\,Hr}$	=	Present Value at the higher discount rate
Cost	=	Initial Investment

Accept-reject Decision:

Decision Rule:	Condition	Decision
If	IRR > cost of capital	Accept the project.
If	IRR<cost of capital	Reject the project.

And, choose between mutually exclusive projects on the basis of a **higher IRR.** These criteria guarantee that the firm will earn at least its required return. Such an outcome should increase the market value of the firm, and therefore the wealth of its owners.

Key Advantages-

- Intuitively easy to understand.
- Based on the discounted cash flow technique.

Key Disadvantages-

- With non-conventional cash flows, the IRR approach can yield no or multiple answers.
- A lower IRR can be better if a cash inflow is followed by cash outflows.
- With mutually exclusive projects, IRR can lead to incorrect investment decisions.

Example 6 - Compute the Internal Rate of Return (IRR) given a required return of 12% and the following cash flows:

Year	Cash Flows
0	(Tk.20,000)
1	Tk.6,000
2	Tk.7,000
3	Tk.8,000
4	Tk.5,000
5	Tk.4,000

Set the NPV equation equal to zero and solve for the IRR:

$$NPV = 0 = \frac{-20{,}000}{(1+IRR)^{0}} + \frac{6{,}000}{(1+IRR)^{1}} + \frac{7{,}000}{(1+IRR)^{2}} + \frac{8{,}000}{(1+IRR)^{3}} + \frac{5{,}000}{(1+IRR)^{4}} + \frac{4{,}000}{(1+IRR)^{5}}$$

At this point, unless you are using a financial calculator or spreadsheet, solving for the IRR is a trial-and-error process. That is, we would "plug" in different estimates for the IRR, work through the calculations, and determine if we have found the rate that causes NPV to equal Tk.0. We have already computed the NPV of this project at a 12% discount rate and found the NPV to be positive. In addition, we computed the NPV of the project at a discount rate of 17% and found the NPV to be negative. Therefore, we know that the IRR lies somewhere between 12% and 17% (in fact, we can see that the IRR is much closer to 17%).

Using a financial calculator, we find the IRR = 16.3757%.

Decision: Since the IRR > k (16.38% > 12%), the project should be accepted.

Note: The calculation of the project's IRR does not depend upon the required rate of return. The IRR is compared to the required rate of return to determine whether to accept or reject the project. Also, if a project's NPV is positive, its IRR will exceed the required rate of return. If a project's NPV is negative, its IRR will be below the required rate of return.

Example 6:

Consider the following two mutually exclusive investments. Calculate the IRR. Which projects should be chosen?

Year	Cash Flow (Project - A)	Cash Flow (Project - B)
0	(73,000)	(73,000)
1	35000	15,000
2	40,000	30,000
3	13,000	41,000

Solution:

Let's see step by step using the trial-and-error method to find IRR. Here, the two discount rates need to find where the present value of cash inflows will be below the cash outflow or cost, and the present value of cash inflows will be above the cash outflow or cost.

For Project A, the calculation of IRR is given below:

Project A

$$PVCI_{@10\%} = \frac{35{,}000}{(1.10)^1} \quad \frac{40{,}000}{(1.10)^2} \quad \frac{13{,}000}{(1.10)^3}$$

$$= \text{Tk. } 74{,}643$$

$$PVCI_{@12\%} = \frac{35{,}000}{(1.12)^1} \quad \frac{40{,}000}{(1.12)^2} \quad \frac{13{,}000}{(1.12)^3} \qquad (1.12)^1$$

$$= \text{Tk. } 72{,}391$$

$$IRR = 0.10 + \frac{74{,}643 - 73{,}000}{74{,}643 - 72{,}391} * (.12 - .10)$$

$$= 11.46\%$$

For Project B, the calculation of IRR is given below:

Project B

$$PVCI_{@6\%} = \frac{15,000}{(1.06)^1} + \frac{30,000}{(1.06)^2} + \frac{41,000}{(1.06)^3}$$

$$= \text{Tk. } 84,305$$

$$PVCI_{@8\%} = \frac{15,000}{(1.08)^1} + \frac{30,000}{(1.08)^2} + \frac{41,000}{(1.08)^3}$$

$$= \text{Tk. } 72,155$$

$$IRR = 0.06 + \frac{84,305 - 73,000}{84,305 - 72,155} * (0.08 - 0.06)$$

$$= 7.86\%$$

As the IRR of Project A is higher than the IRR of Project B, Project A should be selected.

5. Profitability Index (PI):

PI is simply equivalent to the present value of cash inflows divided by the initial cash outflow.

$$\textbf{Profitability Index} = \frac{\textbf{PV of future cahs flows}}{\textbf{Initial investment}}$$

Decision Rule:	Condition	Decision
If	PI is less than 1.0	**Reject** the project.
If	PI is greater than 1.0	**Accept** the project.

When the PI is greater than 1.0, it implies that the present value of cash inflows is greater than the initial cash outflow. In the case of mutually exclusive projects, a higher profitability index (PI) will be chosen.

Advantages:

- Closely related to NPV, generally leading to identical decisions.
- Easy to understand and communicate.

Disadvantages:

- May lead to incorrect decisions in comparisons of mutually exclusive investments.

Example - Compute the Profitability Index (PI) given a required return of 12% and the following net cash flows:

Year	Cash Flows
0	(Tk.20,000)
1	Tk.6,000
2	Tk.7,000
3	Tk.8,000
4	Tk.5,000
5	Tk.4,000

Solution:

$$\text{PV}_{\text{inflows}} = \frac{6{,}000}{(1.12)^1} + \frac{7{,}000}{(1.12)^2} + \frac{8{,}000}{(1.12)^3} + \frac{5{,}000}{(1.12)^4} + \frac{4{,}000}{(1.12)^5} = Tk.22{,}079.04$$

$$\text{PV}_{\text{outflows}} = Tk.20{,}000$$

$$\text{PI} = \left(\frac{\text{Tk. } 22{,}079.04}{\text{Tk. } 20{,}000} \right) = 1.104$$

Therefore, the project should be accepted as the PI > 1.0.

Review Questions

1. What are the acceptance criteria for the NPV technique? How are they related to the firm's market value?
2. What are the acceptance criteria for the IRR technique?
3. What is the payback period? How is it calculated?
4. What weaknesses are commonly associated with the use of the payback period to evaluate a proposed investment?
5. What is the financial manager's goal in selecting investment projects for the firm? Define the capital budgeting process and explain how it helps managers achieve their goals.

Problems:

1. Jordan Enterprises is considering a capital expenditure that requires an initial investment of Tk.42,000 and in returns after-tax cash inflows of Tk.7,000 per year for 10 years. The firm has a maximum acceptable payback period of 8 years.

   a. Determine the payback period for this project.
   b. Should the company accept the project? Why or why not?

2. Compute the PBP, DPBP, NPV, IRR and PI given a required return of 12% and the following net cash flows:

Year	Cash Flows
0	(Tk.23,000)
1	Tk.6,000
2	Tk.8,000
3	Tk.9,000
4	Tk.10,000
5	Tk.4,000

3. Consider the following two mutually exclusive investments. Calculate the IRR. Also calculate NPV at a discount rate of 10%. Which projects should be chosen?

Year	Cash Flow (A)	Cash Flow (B)
0	(73,000)	(73,000)
1	35000	45,000
2	40,000	30,000
3	70,000	20,000

Capital Budgeting Cash Flow

4

Unit Highlights

- Capital Budgeting Cash flow

Lesson 1: Capital Budgeting Cash flow

Lesson Objectives

After studying this lesson, you should be able to:

- have an idea about the concept of cash flow;
- know the difference between cash flow and profit;
- understand the concepts of expansion versus replacement cash flows, sunk costs and opportunity costs;
- recognize the components of cash flow; and
- recognize how cash flow is determined.

Concept of Cash Flow

Cash flow refers to the actual cash, as opposed to accounting net income that a firm receives or pays during a certain specified period. What the firm receives is known as cash inflows, while what the firm pays is known as cash outflow. The difference between cash inflows and cash outflows is considered the net cash flow.

Differences between Concepts of Cash Flow and Profit

Theoretically, two alternative criteria are available to quantify the benefits: (i) accounting profit and (ii) cash flows. The basic difference between them is primarily due to the inclusion of certain non-cash expenses in the profit and loss account, for instance, depreciation. Therefore, the accounting profit is to be adjusted for non-cash expenditure to determine the actual cash inflow. The cash flow approach of measuring future benefits of a project is superior to the accounting approach as cash flows are theoretically better measures of the net economic benefits of costs associated with a proposed project.

The firm must pay for the purchase of an asset with cash. This cash outlay represents a forgone opportunity to use cash in some other productive alternatives. Consequently, the firm should measure the future net benefits in cash terms. Only cash flows reflect the actual cash transactions associated with the project. Secondly, the use of cash flows avoids accounting ambiguities. Thirdly, the cash flow approach takes cognizance of the time value of the money whereas the accounting approach ignores it.

The Relevant Cash Flows

To evaluate capital expenditure alternatives, the firm must determine the relevant cash flows, which are the incremental after-tax cash outflow (investment) and the resulting subsequent inflows. The incremental cash flows represent the additional cash flows that are outflows or inflows and are expected to result from a proposed capital expenditure.

Major Cash Flow Components

The cash flows of any project having the *conventional pattern* can include three basic components: (1) an initial investment, (2) operating cash inflows, and (3) terminal cash flow. All projects, whether for expansion, replacement, renewal, or some other purpose, have the first two components. Some, however, lack the final component, terminal cash flow.

1. Initial Investment

Initial investment is the net cash outlay in the period in which an asset is acquired. A major element of the initial investment is the original value of the asset which comprises its costs and installation charges. When an asset is acquired for expanding revenues, it may require a lump sum investment in working capital. Thus, the initial investment will equal the gross investment plus an increase in net working capital.

Example 1: Raina Medical Inc. is considering replacing its existing computer system, which was purchased 2 years ago at a cost of Tk. 325,000. The system can be sold today for Tk.200000. It is being depreciated using a Modified Accelerated Cost Recovery System (MACRS) and a 5-year recovery period. A new computer system will cost Tk. 500000 to purchase and install. Replacement of the computer system would not involve any change in net working capital. Assume a 40% tax rate.

a. Calculate the book value of the existing computer system.
b. Calculate the after-tax proceeds of its sale for Tk. 200000.
c. Calculate the initial investment associated with the replacement project.

Solution:

(a) Calculation of Book Value of the existing computer system:

Book value of the machine at present (after deducting depreciation)	=	Cost	- Depreciation amount
	=	Tk. 325,000	- 325000 X (0.20 + 0.32)
	=		Tk. 156, 000

(b) Calculation of after-tax proceeds of the machines sale for Tk. 200,000

The sale price of an old machine		Tk. 200,000
(-) Book Value of old machine		Tk. 156, 000
Proceeds		Tk. 44,000
Taxes on proceeds	=	Tk. 44,000 X 0.40
	=	Tk. 17,600
After-tax proceeds	=	Tk. 200,000 - Tk. 17,600
	=	Tk. 182,400

(c) Calculation of Initial Investment:

Installed cost of new asset	Tk. 500,000
Cost of machine	
(+) Installation costs	
(-) After-tax proceeds from the sale of old assets	Tk. 182,400
(+/-) change in net working capital	0
Initial Investment	**Tk.317,600**

2. Annual Net Cash Flow/Operating Cash Inflows

An investment is expected to generate annual cash flows from operations after the initial cash outlay has been made. Cash flows should always be estimated on an after-tax basis. The net cash flows (NCF) are simply the difference between cash receipts and cash payments including taxes. NCF will mostly consist of annual cash flows occurring from the operation of an investment. However, it may also be affected by changes in net working capital and capital expenditure during the lifetime of the investment. NCF will be calculated as follows:

NCF = Revenues – Expenses – Taxes.

Example 2: Strong Tool Company has been considering purchasing a new lathe to replace a fully depreciated lathe that will last 5 more years. The new lathe is expected to have a 5-year life and depreciation charges of Tk.2000 in year 1; Tk.3200 in year 2; Tk.1900 in year 3; Tk.1200 in year 4; Tk.1200 in year 5; and Tk.500 in year 6. The firm estimates the revenues and expenses (excluding depreciation and interest) for the new and the old lathes to be as shown in the table presented below. The firm is subject to a 40% tax rate.

Year	New Lathe		Old Lathe	
	Revenue	Expenses (excluding depreciation and interest)	Revenue	Expenses (excluding depreciation and interest)
1	Tk. 40,000	30,000	35,000	25,000
2	Tk. 41,000	30,000	35,000	25,000
3	Tk. 42,000	30,000	35,000	25,000
4	Tk. 43,000	30,000	35,000	25,000
5	Tk. 44,000	30,000	35,000	25,000

a. Calculate the operating cash inflows associated with each lathe.
b. Calculate the incremental operating cash inflows resulting from the proposed lathe replacement.
c. Depict on a timeline the incremental operating cash inflows calculated in part b.

Solution:

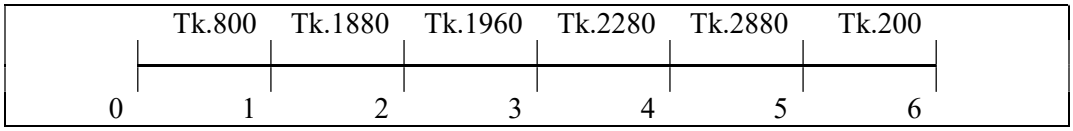
(a) Calculation of operating cash inflows associated with each lathe:

Year	Revenue	Expense (excluding depreciation and interest)	Profit before depreciation and tax	Depreciation	Net profit before tax	Taxes	Net profits after tax	Operating cash inflows
1	2	3	4 = 2-3	5	6 = 4-5	7= 6*40%	8 = 6-7	9 = 4-7
New Machine								
1	40,000	30,000	10,000	2,000	8,000	3,200	4,800	6,800
2	41,000	30,000	11,000	3,200	7,800	3,120	4,680	7,880
3	42,000	30,000	12,000	1,900	10,100	4,040	6,060	7,960
4	43,000	30,000	13,000	1,200	11,800	4,720	7,080	8,280
5	44,000	30,000	14,000	1,200	12,800	5,120	7,680	8,880
6	-	-	-	500	(500)	(200)	(300)	200
Old Machine								
1	35,000	25,000	10,000	-	10,000	4,000	6,000	6,000
2	35,000	25,000	10,000	-	10,000	4,000	6,000	6,000
3	35,000	25,000	10,000	-	10,000	4,000	6,000	6,000
4	35,000	25,000	10,000	-	10,000	4,000	6,000	6,000
5	35,000	25,000	10,000	-	10,000	4,000	6,000	6,000

(b) Calculation of incremental operating cash inflows

Year	New Lathe	Old Lathe	Incremental cash flows
	1	2	3 = 1-2
1	6800	6000	800
2	7880	6000	1880
3	7960	6000	1960
4	8250	6000	2250
5	8880	6000	2880
6	200	0	200

(c) Depict cash flows on a Time Line:



3. Terminal Cash Flow

Terminal Cash flows are the net cash flows that occur at the end of the life of a project, including the cash flows associated with: (i) the final disposal of the project and (ii) returning the firm's operations to where they were before the project was accepted. Consequently, the terminal cash flows include the salvage value and the tax impact of the disposition of the project. Any working capital account changes that occurred at the beginning of the project's life will be reversed at the end of its life.

Example 3:

Rush Industries is considering replacing a fully depreciated machine that has a remaining useful life of 10 years with a newer, more sophisticated machine. The new machine will cost Tk. 200,000 and will require Tk.30,000 in installation costs. It will be depreciated under MACRS (Modified Accelerated Cost Recovery System) using a 5-year recovery period. A Tk.25000 increase in net working capital will be required to support the new machine. The firm's manager plans to evaluate the potential replacement over 4 years. They estimate that the old machine could be sold at the end of 4 years at a net Tk.15000 before taxes; the new machine at the end of 4 years will be worth Tk.75000 before taxes. Calculate the terminal cash flow at the end of year 4 that is relevant to the proposed purchase of the new machine. The firm is subject to a 40% tax rate.

Solution:

After-tax proceeds from the sale of new asset:		
Proceed from the sale of the new machine	Tk. 75,000	
(-) Tax on sale (40%)	(Tk. 14360)	
		Tk. 60,640
(-) After-tax proceeds from the sale of old assets:		
Proceed from the sale of the old machine	Tk. 15,000	
(-) Tax on sale (40%)	(Tk. 6,000)	Tk. 9,000
(+) change in Net Working Capital		Tk. 25,000
Terminal Cash Flow		**Tk. 76,640**

Workings:

Book value of the new machine at the end of year 4:					
Book value of the machine at present (after deducting depreciation)		=	Cost	-	Depreciation amount
		=	Tk. 230,000	-	Tk. 230,000 X (0.20 + 0.32+0.19+0.12)
		=	Tk. 39,100		
The sale price of the new machine	Tk. 75,000				
(-) Book Value of new machine	Tk. 39,100				
Proceeds	Tk. 35,900				
Taxes on proceeds		=	Tk. 35,900 X 0.40		
		=	Tk. 14,360		

Expansion versus Replacement Cash Flows

Developing relevant cash flows is most straightforward in the case of *expansion decisions.* In this case, the initial investment, operating cash inflows, and terminal cash flow are merely the after-tax cash outflow and inflows associated with the proposed outlay.

The development of relevant cash flows for *replacement decisions is more* complicated; the firm must find the *incremental* cash outflows and inflows that will result from the proposed replacement. The initial investment in this case is the difference between the initial investment needed to acquire the new asset and any after-tax cash inflows expected from the liquidation today of the old asset (asset being replaced). The operating cash inflows are the difference between the operating cash inflows from the new asset and those from the old asset. The terminal cash flow is the difference between the after-tax cash flows expected upon termination of the new and the old assets.

All capital budgeting decisions can be viewed as replacement decisions. Expansion decisions are merely replacement decisions in which all cash flows from the old asset are zero. In light of this fact, the following discussions emphasize the more general replacement decisions.

Sunk Costs and Opportunity Costs

When estimating the relevant cash flows associated with a proposed capital expenditure, the firm must recognize any *sunk costs* and *opportunity costs.* These costs are easy to mishandle or ignore, particularly when determining a project's incremental cash flows.

Sunk costs are cash outlays that have already been made (i.e., past outlays) and therefore have no effect on the cash flows relevant to the current decision. As a result, *sunk costs should not be included in a project's incremental cash flows.*

Opportunity costs are cash flows that could be realized from the best alternative use of an owned asset. They therefore represent cash flows that will *not be realized* as a result of employing that asset in the proposed project. Because of this, any opportunity costs should be included as cash outflows when determining a project's incremental cash flow.

Questions for Review

1. Why is it important to evaluate capital budgeting projects based on incremental after-tax cash flows? How can expansion decisions be treated as replacement decisions? Explain.
2. What are sunk costs? What are opportunity costs? What effect does each of these types of costs have on a project's incremental cash flows?
3. What are the components of cash flows? Explain each of them.
4. How would you estimate cash flows? Explain the major ingredients involved in such an estimate.

Problem 1:

1. A machine currently in use was originally purchased 2 years ago for Tk.40,000. The machine is being depreciated under MACRS using a 5-year recovery period; it has 3 years of usable life remaining. The current machine can be sold today at a net of Tk.42,000 after removal and cleanup costs. A new machine, using a 3-year MACRS recovery period, can be purchased at a price of Tk.140,000. It requires Tk.10,000 to install and has a 3-year usable life. If the new machine is acquired, the investment in accounts receivable will be expected to rise by Tk.10,000, the inventory investment will increase by Tk.25,000, and accounts payable will increase by Tk.15,000.

Earnings before depreciation, interest, and taxes are expected to be Tk.70,000 for each of the next 3 years with the old machine and to be Tk.120,000 in the first year and Tk.130,000 in the second and third years with the new machine. At the end of 3 years, the market value of the old machine will equal zero, but the new machine could be sold at net Tk.35,000 before taxes. The firm is subject to a 40% tax rate.

a. Determine the *initial investment associated with the proposed replacement* decision.
b. Calculate the *incremental operating cash inflows for years 1 to 4 associated with* the proposed replacement. (*Note: Only depreciation cash flows must be considered* in year 4.)
c. Calculate the *terminal cash flow associated with the proposed replacement decision.* (*Note: This is at the end of year 3.)*
d. Depict on a timeline the relevant cash flows found in parts a, b, and c that are associated with the proposed replacement decision, assuming that it is terminated at the end of year 3.

Note: MACRS Depreciation Table:

Table 1: MACRS Half-Year Convention

Depreciation Rate for Recovery Period						
Year	**3-year**	**5-year**	**7-year**	**10-year**	**15-year**	**20-year**
1	**33.33**	**20.00**	**14.29**	**10.00**	**5.00**	**3.750**
2	**44.45**	**32.00**	**24.49**	**18.00**	**9.50**	**7.219**
3	**14.81**	**19.20**	**17.49**	**14.40**	**8.55**	**6.677**
4	**7.41**	**11.52**	**12.49**	**11.52**	**7.70**	**6.177**
5		**11.52**	**8.93**	**9.22**	**6.93**	**5.713**
6		**5.76**	**8.92**	**7.37**	**6.23**	**5.285**
7			**8.93**	**6.55**	**5.90**	**4.888**
8			**4.46**	**6.55**	**5.90**	**4.522**
9				**6.56**	**5.91**	**4.462**
10				**6.55**	**5.90**	**4.461**
11				**3.28**	**5.91**	**4.462**
12					**5.90**	**4.461**
13					**5.91**	**4.462**
14					**5.90**	**4.461**
15					**5.91**	**4.462**
16					**2.95**	**4.461**
17						**4.462**
18						**4.461**
19						**4.462**
20						**4.461**
21						**2.231**

2. A plant's base price is Tk. 1,40,000 and it would cost another Tk. 30,000 to modify it for special use. It would be sold after 3 years for Tk. 60,000. Use of the plants would require an increase in net working capital of Tk. 8,000. The plant would have no effects on revenue, but it is expected to save Tk. 50,000 per year in before-tax operating costs. The firm's marginal tax rate is 40%.

a) What is the initial investment outlay of the plant?
b) What are the incremental operating cash flows in years 1, 2, and 3?
c) What is the terminal cash flow in year 3?

Cost of Capital

5

Unit Highlights

- Concept of cost of capital
- Determination of costs of specific sources of capital

Lesson 1: Concept of cost of capital

Lesson Objectives

After studying this lesson, you should be able to:

- know the concepts of cost of capital & other related costs;
- understand the significance of the cost of capital; and
- identify the factors influencing the cost of capital.

Concept of cost of capital:

The cost of capital is an extremely important financial concept. It acts as a major link between the firm's long-term investment decisions and the wealth of the firm's owners as determined by the market value of their shares.

The goal of the firm is to maximize shareholders' wealth and financial managers achieve this goal by investing in risky projects that add value to the firm. Cost of capital is the rate of return that financial managers use to evaluate all possible investment opportunities to determine which ones to invest in on behalf of the firm's shareholders.

The **cost of capital** is the rate of return that a firm must earn on its project investments to maintain the market value of its stock. It can also be thought of as the rate of return required by the market suppliers of capital to attract their funds to the firm. If the risk is held constant, projects with a rate of return above the cost of capital will increase the value of the firm, and projects with a rate of return below the cost of capital will decrease the value of the firm.

Significance of Cost of Capital:

Financial managers of firms should know the cost of the firms' specific sources of finance to judge the available investment opportunities for planning their capital structure. To increase the value of the firm, an investment must earn more than the cost of funds necessary to finance the investment. The knowledge of the cost of capital is also useful to financial management in deciding about the method of financing at a given time. Although cost is an important factor in such a decision; but equally important are the considerations of retaining control or avoiding risk.

Factors Influencing Cost of Capital Determination:

The factors influencing the determination of cost of capital are discussed as follows**:**

(i) ***Business Risk:*** Business risk is that which occurs from operating the business of a firm. It is influenced among others, largely by fixed costs incurred. The higher the fixed costs, the greater will be the business risk and vice-versa. It is one of the important factors that influence the determination of the cost of capital. The more the business risk, the higher will be the cost of capital.

(ii) ***Financial Risk:*** Financial risk occurs when an enterprise is unable to satisfy its financial obligations. The risk that reduces the financial resources of a firm is known as financial risk. The more the financial risk, the higher will be the cost of capital.

(iii) ***Tax Aspect:*** Tax aspect, income tax as well as VAT also influence the determination of the cost of capital of a firm.

(v) ***Capital Structure Composition:*** Capital structure composition i.e. debt-equity mix also affects the determination of the cost of capital of a firm.

(vi) ***Dividend Policy:*** Dividend policy and Dividend payout and profit retention policies of a firm also influence the determination of the cost of capital.

Review Questions

1. What is the cost of capital?
2. Discuss the significance of the cost of capital.
3. Describe the factors influencing the cost of capital.

Lesson 2: Determination of costs of specific sources of capital

Lesson Objectives

After studying this lesson, you should be able to:

- understand the techniques of computation of cost of capital;
- identify the problems involved in determining the cost of capital; and
- know the methods used in the computation of different sources of cost of capital.

The Cost of Specific Sources of Capital:

Long-term financing supports the firm's fixed-asset investments. There are four basic sources of long-term funds for the business firm: long-term debt, preferred stock, common stock, and retained earnings.

Not every firm will use all of these sources of financing, but most firms will have some mix of funds from these sources in their capital structures. Although a firm's existing mix of financing sources may reflect its target capital structure, it is ultimately the marginal cost of capital necessary to raise the next marginal dollar of financing that is relevant for evaluating the firm's future investment opportunities.

1. Cost of Long-term Debt

The cost of long-term debt, k_i, is the after-tax cost today of raising long-term funds through borrowing. For convenience, it is assumed that the funds are raised through the sale of bonds. Net Proceeds: Most corporate long-term debts are incurred through the sale of bonds. The net proceeds from the sale of a bond, or any security, are the funds that are received from the sale. Floatation costs are the total costs of issuing and selling a security minus the net proceeds from the sale. These costs apply to all public offerings of securities debt, preferred stock, and common stock. They include two components: (1) *underwriting costs - compensation* earned by investment bankers for selling the security, and (2) *administrative costs - issuer* expenses such as legal, accounting, printing, and other expenses.

Before Tax Cost of Debt

The before-tax cost of debt, k_d, for a bond, can be obtained in any of these ways- (i) quotation, (ii) calculation, or (iii) approximation.

(i) Using Cost Quotations

When the net proceeds from the sale of a bond equal its par value, the before cost would just equal the coupon interest rate. For example, a 10 per cent coupon interest rate bond whose net proceeds are equal to the bond's Tk.1,000 par value, we have a before-tax cost, *kd,* of 10 per cent. A second quotation that is sometimes used is the *yield* to maturity on a similar risk bond. For example, if a similar risk bond has a YTM of 9.7 per cent, this value can be used as the before-tax cost of debt, k.

(ii) Calculating the Cost

This approach finds the before-tax cost of debt by calculating the *internal rate of return (IRR)* on the bond cash flows. From the issuer's point of view, this value can be referred to as the *cost to maturity* of the cash flows associated with the debt.

(iii) Approximating the Cost

The before-tax cost of debt, *kd,* for a bond with a Tk.1,000 par value can be approximated by using the following equation:

$$k_d = \frac{I + \frac{\$1{,}000 - N_d}{n}}{\frac{N_d + \$1{,}000}{2}}$$

Where,

I = annual interest in dollars

N_d = net proceeds from the sale of debt (bond)

n = number of years to the bond's maturity

After-tax Cost of Debt

The *specific cost* of debt must be stated on an after-tax basis. Because interest on debt is tax deductible, it reduces the firm's taxable income.

Here is the equation: $k_i = k_d \times (1 - T)$

Example 1:

A manufacturing company is interested in measuring its cost of debt. The firm is in the 40% tax bracket. The current investigation has gathered the following data: The firm can raise debt by selling Tk. 1000 par value, 10% coupon interest rate, 10-year bonds on which annual interest payments will be made. To sell the issue, an average discount of Tk. 30 per bond must be given. The firm must also pay floatation costs of Tk. 20 per bond.

Solution:

Here, Net Proceed, Nd = Par value – Discount per bond – Flotation cost per bond
=Tk. 100 - Tk. 30 - Tk. 20
=Tk. 950

Coupon interest amount = Tk. 1000 * 10% Tk. 100

The before-tax cost of debt: $k_d = \frac{100 + \frac{1000 - 950}{10}}{\frac{950 + 1000}{2}} \times 100$

= 10.78%

The after-tax cost of debt:

Cost of debt after tax =10.78% * (1 - 40%)
=6.46%

2. Cost of Preferred Stock:

Preferred stock represents a special type of ownership interest in the firm. It gives preferred stockholders the right to receive their *stated* dividends before any earnings can be distributed to common stockholders. Because preferred stock is a form of ownership, the proceeds from its sale are expected to be held for an infinite period. However, the one aspect of preferred stock that requires clarification at this point is dividends.

Calculating the Cost of Preferred Stock

The **cost of preferred stock, kp,** is the ratio of the preferred stock dividend to the firm's net proceeds from the sale of the preferred stock- that is, the relationship between the "cost" of the preferred stock, in the form of annual dividend, and the amount of funds provided by the preferred stock issue. The net proceeds represent the amount of money to be received minus any floatation costs. The following equation gives the cost of preferred stock, kp, in terms of the annual dollar dividend Dp, and the net proceeds from the sale of the stock, Np:

$$k_p = \frac{D_p}{N_p}$$

Because preferred stock dividends are paid out of the firm's after-tax cash flows, a tax adjustment is not required.

Example 2:

A firm can sell 11% (annual dividend) preferred stock at its Tk. 100 per share par value. The cost of issuing and selling the preferred stock is expected to be Tk. 4 per share. Calculate the firm's cost of preferred stock.

Solution:

Here, Dividend = Par value * dividend rate
=Tk. 100 * 11%
=Tk. 11

Calculation of Cost of Preferred Stock:

Kp = Dividend / Net Proceed x 100
= Tk.11 / (Tk. 100 - Tk. 4) x 100
= 11.46%

3. The Cost of Common Stock

The cost of common stock is the return required on the stock by investors in the marketplace. There are two forms of common stock financing: (1) retained earnings and (2) new issues of common stock. As a first step in finding each of these costs, we need to estimate the cost of common stock equity.

Finding the Cost of Common Stock Equity

The cost of common stock equity, k, is the rate at which investors discount the expected dividends of the firm to determine its share value. Two techniques measure the cost of common stock equity capital: (i) One uses the constant growth valuation model; the other relies on the (ii) capital asset pricing model (CAPM).

(i) Using the Constant Growth Valuation (Gordon) Model

The constant growth valuation model or the Gordon model, is based on the widely accepted premise that the value of a share of stock is equal to the present value of all future dividends (assumed to grow at a constant rate) over an infinite time horizon. The key expression is presented in the following equation:

$$P_0 = \frac{D_1}{k_s - g}$$

Where,

P_0= value of common stock
D_1= per share dividend expected at the end of year 1
k_s = *required* return on common stock
g = constant rate of growth in dividends

Solving the equation for k_s. results in the following expression for the cost of *common stock equity:*

$$k_s = \frac{D_1}{P_0} + g$$

This equation indicates that the cost of common equity can be found by dividing the dividend expected at the end of year 1 by the current price of stock and adding the expected growth rate. Because common stock dividends are paid from after-tax income, no tax adjustment is required.

Example 3:

The firm's common stock is currently selling for Tk.80 per share. The firm expects to pay cash dividends of Tk. 6 per share next year. The firm's dividends have been growing at an annual rate of 6%, and this rate is expected to continue in the future. The stock will have to be underpriced by Tk.4 per share, and floatation costs are expected to amount to Tk.4 per share. Calculate the cost of common equity.

Solution:

Here, Dividend, D_1	=	Tk. 6
Net Proceed, P_0	=	Selling price per share - floatation cost per share - discounted amount per share
	=	Tk. 80 - Tk. 4 - Tk. 4
	=	Tk. 72

Cost of Common Equity,

K_S or K_e	=	$(D_1 / P_0) + g$	x 100
	=	(Tk. 6 / Tk. 72) + .06	x 100
	=	14.33%	

(ii) Using the Capital Asset Pricing Model (CAPM)

The **capital asset pricing model (CAPM)** describes the relationship between the required return, or cost of common stock equity, *k,* and the non-diversifiable risk of the firm as measured by the beta coefficient, *b.* The basic CAPM is given in the following equation:

$$k_s = R_F + [b \times (k_m - R_F)]$$

Where,

R_F = risk-free rate of return

k_m = market return; return on the market portfolio of assets

By using CAPM, the cost of common stock equity is the return required by investors as compensation for the firm's non-diversifiable risk, measured by beta.

Example 4:

If the 3-month T-bill rate is currently 5%, the market risk premium is 9%, and the firm's beta is 1.20; find the firm's cost of retained earnings.

Solution:

$$K_e = 5\% + 1.2\ (9\%)$$
$$= 15.80\%$$

4. The Cost of Retained Earnings:

Dividends are paid out of a firm's earnings. Their payment, made in cash to the common stockholders, reduces the firm's retained earnings. If a firm needs common stock equity financing of a certain amount, it could issue additional common stock in that amount and still pay dividends to its stockholders. Alternatively, the firm could increase common stock equity by retaining the earnings (not paying the cash dividends) in the needed amount. In a strict accounting sense, the retention of earnings increases common stock equity in the same way that the sale of additional shares of common stock does. Thus, the **cost of retained earnings,** k_r, to the firm is the same as the cost of an *equivalent fully subscribed issue of additional common stock.* Stockholders therefore find the firm's retention of earnings acceptable only if they expect that it will earn at least their required return on the reinvested funds.

Viewing retained earnings as a fully subscribed issue of additional common stock, it can set the firm's cost of retained earnings, k_r, equal to the cost of common stock equity as given by the following equation:

$$k_r = k_s$$

It is *not necessary to adjust the cost of retained earnings for floatation costs* because by retaining earnings, the firm "raises" equity capital without incurring these costs.

Example 5:

Mahdi & Sons' common stock currently trades at Tk.30 a share. It is expected to pay an annual dividend of Tk.3.00 per share at the end of the year (D1 is Tk.3.00), and the constant growth rate is 5 per cent a year. What is the company's cost of common equity if all of its equity comes from retained earnings?

Solution:

Here, Dividend, D_1	=	Tk. 3
Market Price, P_0	=	Tk. 30
Growth rate, g	=	5%

Cost of Retained Earnings:

$$Kr = (D_1 / P_0) + g \quad \times 100$$
$$= (\text{Tk. } 3 / \text{Tk. } 30) + .05 \quad \times 100$$
$$= 15\%$$

The Weighted Average Cost of Capital (WACC):

The weighted average cost of capital (WACC), K_a reflects the expected average future cost of funds over the long run. It is found by weighting the cost of each specific type of capital by its proportion in the firm's capital structure.

Calculating the Weighted Average Cost of Capital (WACC)

The calculation of the weighted average cost of capital (WACC) is performed by multiplying the specific cost of each form of financing by its proportion in firm's capital structure and summing the weighted values. As an equation weighted average cost of capital, *k,,* can be specified as follows:

$$k_a = (w_i \times k_i) + (w_p \times k_p) + (w_s \times k_{r \text{ or n}})$$

Where,

w_i = proportion of long-term debt in capital structure

w_p =proportion of preferred stock in capital structure

w_s = proportion of common stock equity in capital structure

$w_i + w_p + w_s = 1.0$

Example 6:

Suppose the costs of the various types of capital found for Duchess Corporation to be as follows:

Cost of debt, k_i= 5.6 %
Cost of preferred stock, k_p- 10.6%
Cost of common stock, k_r, = 13.0%

Find WACC for Duchess corporation. The company uses the following weights in calculating its weighted average cost of capital:

Source of capital	Weight
Long-term debt	40%
Preferred stock	10%
Common stock equity	50%
Total	100%

Solution:

Calculation of the weighted average cost of capital (WACC):

Source of capital	Weight	Cost	Weighted cost
	(i)	(ii)	(i) * (ii) * 100
Long-term debt	.40	.056	2.2%
Preferred stock	.10	.106	1.1
Common stock equity	.50	.13	6.5
Totals			9.8%
Weighted average cost of capital =			9.8%

Book Value versus Market Value

Book value weights use accounting values to measure the proportion of each type of capital in the firm's financial structure. Market value weights measure the proportion of each type of capital at its market value. Market value weights are appealing because the market values of securities closely approximate the actual dollars to be received from their sale.

In addition, the long-term investment cash flows to which the cost of capital is applied are estimated in terms of current as well as future market values. *Market value weights are clearly preferred over book value weights.*

Example 7:

A company has on its books the following figures and specific cost of each source of capital:

Source of Capital	Book Value (Tk.)	Market Value (Tk.)	Specific cost (%)
Debt	4,00,000	3,80,000	5
Preference Capital	1,00,000	1,10,000	8
Equity Capital	6,00,000	--------	15
Retained Earnings	2,00,000	12,00,000	13
	13,00,000	16,90,000	

Required:

Determine WACC using i) Book Value weights and ii) Market Value Weights. How are they different? Can you think of a situation where WACC would be the same using either of the weights?

Solution:

a) Determination of WACC using Book Value Weights

Source of Capital	Book Value	Specific Cost	Total Costs
Debt	4,00,000	0.05	20,000
Preference Capital	1,00,000	0.08	8,000
Equity Capital	6,00,000	0.15	90,000
Retained Earnings	2,00,000	0.13	26,000
	13,00,000		1,44,000

$$\therefore\ k_0 = \frac{\text{Total costs}}{\text{Total amount of Capital}} \times 100 = \frac{1,44,000}{13,00,000} \times 100 = 11.10\%$$

b) Determination of WACC using Market Value Weights

Source of Capital	Market Value (Tk.)	Specific Cost	Total Costs (Tk.)
Debt	3,80,000	.05	19,000
Preference Capital	1,10,000	.08	8,800
Equity Capital	9,00,000 (a)	.15	1,35,000
Retained Earnings	3,00,000 (a)	.13	39,000
	16,90,000		2,01,800

$$K_0 = \frac{\text{Total Costs}}{\text{Total Capital}} \times 100 = \frac{2,01,800}{16,90,000} \times 100 = 11.90\%$$

The K_0 based on market value is greater than the K_0 based on book value. Because the market value of equity funds is considerably larger than their book value. Since this source of funds has a higher cost, the overall cost of capital increases.

* The WACC would be the same with book value weights and market value weights when there is no difference between book value and market value of sources used in raising the capital.

(a) Total market value of equity shares and retained earnings is apportioned three-fourths and one-fourth respectively on the basis of their book values.

Example 8:

Dubby Corporation is contemplating the issuance of a 10% preferred stock that is expected to sell for Tk.87 per share value. The cost of issuing and selling the stock is expected to be Tk.5 per share. Find the cost of the preferred share.

Solution:

The dividend is Tk.8.70 (10% x Tk.87). The net proceeds price (N_p) is Tk.82 (Tk.87 - Tk.5).

$$rP = \frac{D_P}{N_P} = \frac{Tk.8.70}{Tk.82} = 10.6\%$$

The cost of the preferred share is 10.6%.

Example 9:

Assume a firm has just paid a dividend of Tk.2.50 per share, expects dividends to grow at 10% indefinitely, and is currently selling for Tk.50.00 per share. Find the cost of common share.

Solution:

First, D_1 = Tk.2.50 (1+.10) = Tk.2.75, and

$$r_s = \frac{D_1}{P_0} + g$$

$r_s = \frac{Tk.2.75}{Tk.50.00} + .10 = 15.5\%$. The cost of common share is 15.5%.

Example 10:

Suppose the 3-month T-bill rate is currently 5.0%, the market risk premium is 9%, and the firm's beta is 1.20, what will be the firm's cost of retained earnings?

Solution:

$r_s = r_F + b (r_M - r_F)$.
$r_s = 5.0\% + 1.2 (9.0\%) = 15.8\%$. The firm's cost of retained earnings will be 15.8%.

Review Questions

1. What is the cost of debt? How it is calculated?
2. Discuss the methods used in the determination of the cost of the following types of capital - (a) Debt; (b) Equity; (c) Retained Earnings; and (d) Overall capital.
3. Define book value and market value.
4. What is the Weighted Average Cost of Capital (WACC)?

Problems:

1. A company has on its books the following figures and specific cost of each source of capital**:**

Source of Capital	Market Value (Tk.)	Specific cost %
Debt	7,00,000	5.2
Preference Capital	5,00,000	8.3
Equity Capital	6,00,000	15
Retained Earnings	2,00,000	13
	20,00,000	

Required:

Determine the Weighted Average Cost of Capital (WACC) for the firm.

2. The Heuser Company's currently outstanding bonds have an **8** per cent coupon and a 12 per cent yield to maturity. Heuser believes it could issue new bonds at par that would provide a similar yield to maturity. If its marginal tax rate is 35 per cent, what is Heuser's after-tax cost of debt?

3. Adiv Industries can issue perpetual preferred stock at a price of Tk. 49.50 a share. The stock would pay a constant annual dividend of Tk.3.88 a share. What is the company's cost of preferred stock, r_p?

4. Javits & Sons' common stock currently trades at Tk.44 a share. It is expected to pay an annual dividend of Tk.6.00 a share at the end of the year (D_1Tk.6.00), and the constant growth rate is 5 per cent a year. What is the company's cost of common equity if all of its equity comes from retained earnings?

   If the company were to issue new stock, it would incur a 10 per cent floatation cost. What would the cost of equity from new stock be?

5. A firm has the following data: Target capital structure of 46 per cent debt, 3 per cent preferred, and 51 per cent common equity; Tax rate 40%; r_d 7%; r_p 7.5%; and r_s 11.5%. Assume the firm will not be issuing new stock. What is this firm's WACC?

6. A manufacturing company is interested in measuring its cost of debt. The firm is in the 40% tax bracket. The firm can raise debt by selling Tk. 1000 par value, 11% coupon interest rate, 9-year bonds on which annual interest payments will be made. To sell the issue, an average discount of Tk. 32 per bond must be given. The firm must also pay floatation costs of Tk. 17 per bond.

Capital Structure

6

Unit Highlights

- Capital Structure
- Capital Structure Decision
- Optimal Capital Structure Determination

Lesson 1: Capital Structure

Lesson Objectives

After studying this lesson, you should be able to:

- understand the concepts of capital structure and financial structure; and
- realize the goal and significance of capital structure

Concept of capital structure:

Capital structure is one of the most complex areas of financial decision-making because of its interrelationship with other financial decision variables.

Some authors use the term in a narrow sense while others use the term in a broader sense. In a narrow sense, the authors of financial management define capital structure as the relative proportion of the long-term securities a firm has used and its equity capital. While, in a broader sense, some authors define capital structure as the permanent financing of a firm represented by long-term debts plus preferred stock and net worth. Net worth represents the equity capital, reserves and surplus, retained earnings and other funds of the ordinary or equity shareholders or stockholders. Thus, every definition whether in a narrow sense or in a broader sense, has referred to long-term debt and equity capital.

Concept of Capital Structure Decision:

The capital structure decision determines the ownership of the providers of finance. Therefore, it can be said that capital structure decision involves two main tasks namely planning of capital structure and financing of capital structure. Planning of capital structure includes fixation of capitalization policy i.e., policy governing the amount of total capital required for the enterprises to achieve their financial objectives. Fixation of an ideal capitalization is of crucial importance to every enterprise, whether manufacturing or service rendering, in the one hand; and whether large scale or medium/ small scale, on the other. This is because in the case of enterprises especially in the manufacturing ones, a huge amount of capital, both fixed and working is required to establish and to run successfully the operations of the enterprises.

Financing of capital structure includes the proper selection of the composition of fixed capital, both equity and debt. Both equity and debt forms of capital have certain advantages to the firm and a model capital structure requires that a balance needs to be maintained between debt and equity**.** That is, it is not the choice between debt or/and equity finance; but the determination of their correct mix which attracts the attention of the financial management of the firms.

Concept of Financial Structure:

Financial structure may be defined as the total financing of the firm representing permanent financing in the forms - of long-term debt, preferred stock, and common equity including net worth as well as temporary financing in the forms of short-term loans and credits. Financial structure refers to the way the firm's assets are financed; it is the entire liabilities side of the balance sheet of the firm**.** A firm procures its permanent fixed capital in the forms of long-term debt, preference share capital, equity share capital, retained earnings/undistributed profits and reserves and surplus. Again, it procures short-term working capital in the forms of short-term loans, credits for goods, credit for expenses etc. Each of these is an individual component which taken together would constitute a firm's financial structure. In the ultimate analysis, the financial structure may be divided into three main categories viz., owner's equity/net worth, debt capital and other short-term credits.

Difference between Capital Structure and Financial Structure:

The main distinctions between Capital Structure and Financial Structure are tabled as follows:

Capital Structure	Financial Structure
i. Definition The capital structure represents only the permanent source of financing.	i. Definition Financial structure represents both the permanent and temporary source of financing.
ii. Nature It denotes the left-hand/ upper side of the Balance Sheet. Thus, it represents capital and debt.	ii. Nature It denotes the right-hand/lower side of the Balance Sheet. Thus, it represents property and assets.
iii. Importance It is important from the viewpoint of capital and long-term debt.	iii. Importance It is important from the viewpoint of property and assets.
iv. Total/part financing It is part of total financing.	iv. Total/part financing It is the total or whole financing.

Goals and Significance of Capital Structure:

The ultimate goal of the capital structure of a firm is to formulate its debt-equity policy in such a way that maximizes the value of the firm. In order to achieve the main goal, the sub-goals of capital structure are as follows**:**

i. To increase the equity shareholders' stock price by determining an ideal debt-equity mix;
ii. To take advantage of favourable financial leverage;
iii. To avoid using high risky debt capital in capital structure; and
iv. To take advantage of corporate tax.

Review Questions

1. What do you mean by Capital Structure?
2. What do you mean by Financial Structure?
3. Distinguish between Capital Structure and Financial Structure.
4. What are the goals of Capital Structure?
5. Discuss the significance of Capital Structure.

Lesson 2: Capital Structure Decision

Lesson Objectives

After studying this lesson, you should be able to:

- understand the main factors affecting the capital structure of a firm;
- know the concept of Optimum Capital structure;
- discuss the features of Optimum Capital structure; and
- identify the factors influencing Optimum capital structure.

The capital structure decision is one of the significant managerial decisions. The firms will have to plan their capital structure initially at the time of its establishment and subsequently, whenever funds have to be raised to finance investment a capital structure decision is involved. A demand for raising funds generates a new capital structure since a decision has to be made as to the quantity and form of financing. The decision will involve an analysis of the existing capital structure and the factors, which will govern the decision at present. The new financing decision may affect the debt-equity mix. The debt-equity mix has implications for the shareholders' earnings and risk, which, in turn, affects the cost of capital and market value of the firm.

Factors Affecting Capital Structure Decisions

A. Quantitative/ Financial Factors

i) Profitability Aspect

This determinant is the top-most one while determining the capital structure of the enterprises. This signifies that enterprises with higher profitability will prefer debt capital as compared to equity capital. This is because of the fact that interests on debt get exemption from tax burden and also because of comparatively cheaper source of capital and lower floatation costs involved in obtaining debt. On the other hand, enterprises with lower or negative profitability, having no other alternative, will resort to equity capital.

ii) Growth Rate

The enterprises with a higher growth rate will prefer debt capital as compared to equity capital. This is because of the comparatively lower floatation cost involved in obtaining debt capital than issuing common stock and a comparatively cheaper source of capital. On the other hand, the enterprises with lower, no or negative growth rates, having no other alternative, will resort to equity capital.

iii) Liquidity Aspect

The enterprises with reasonable liquidity, neither too low nor too high will prefer debt capital to equity capital because of the advantages of debt capital of the enterprises mentioned earlier. On the other hand, the enterprises with either too low or too high liquidity, having no other alternative, will go for equity capital.

iv) Relative Costs of Sources of Fund

Since the authors of corporate finance hold the view that the effective cost of debt capital is comparatively cheaper; the enterprises should prefer debt capital rather than equity capital; other conditions like availability of funds, reasonable liquidity and higher profitability and growth rate remain the same.

v) Stability of Sales/ Investments

The enterprises with more stable sales/ investments will prefer debt capital to equity capital because of the benefits attached to debt capital. On the other hand, the enterprises with less or unstable sales/ investments, having no other alternative, will go for equity capital.

vi) Financial Risk

Financial risk is another important determinant while designing the capital structure of the enterprises. The enterprises with higher financial risk should use lower debt capital and higher equity capital. On the other hand, enterprises with lower financial risk should use higher debt capital and lower equity capital.

(vii) Corporate Tax

The advantage of the presence of debt in capital structure in the world of corporate taxes is that interest payments on debt are deductible as an expense. They elude taxation at the corporate level, whereas dividends on equity or retained earnings are not deductible for tax purposes. Consequently, the total amount of payments available for debt holders and equity holders is greater if debt is employed in capital structure. Corporate taxes create an incentive for the debt holders through the deduction of interests as an expense. Therefore, one of the main reasons of using debt in capital structure of a firm is that interest on debt is deductible from calculation of taxable income, which lowers the effective cost of debt.

viii) Operating Risk

Operating risk or business risk, emanating from operating/ business leverage is influenced, among other things, largely by fixed costs. The more the fixed costs, the more will be the operating risk and vice-versa. The firms with higher operating risk should use lower debt and higher equity and vice-versa.

B. Qualitative/ Non-financial factors

i) Availability of Fund

The determination of capital structure of corporate industrial firm is largely influenced by the availability of fund, both home and abroad. If requisite fund is easily available in the capital market on reasonable terms and conditions; the management of a firm may design its capital structure in a targeted manner. On the other hand, if the fund is not easily available in the capital market with reasonable terms and conditions, the management will not be in a position to design its capital structure in a desired way. Funds may be procured from two main sources viz., internal sources and external sources. Internal sources include retained earnings/ accumulated profits, reserves and surplus and accumulated depreciation. The availability of such internal sources mainly depends on profits earned and policies relating to dividend and retention and reserves and surplus. External sources include**:** equity share capital, preference share capital, and long-term debts. The availability of such sources mainly depends on the efficient capital market of the country, which is examined under the sub-point state of capital market.

ii) Proper Timing

Closely related to flexibility in determining the issue of securities is the factor of timing. Proper timing of security issues often brings substantial savings. Since it is known that securities market is dynamic, the management has to make fair expectation regarding its future trends. After considering the factors of risk, income and control regarding the choice of a financing alternative, the management may still pause in its decision if it feels that by waiting for a certain period, the debenture or share issues can be made at a favorable price. The question of timing is equally relevant when issuing preference shares and debentures. The Enterprises which can follow proper

timing while procuring their requisite fund are in a better position to employ debt capital with comparatively less cost of capital in their capital structure. On the other hand, in the enterprises where proper timing cannot be followed in the procurement of requisite fund, the use of debt capital may become comparatively costly to these enterprises.

iii) State of Capital Market

Capital markets are an integral part of developed and industrialized economies. It augments the process of economic development in a number of ways namely**:** i) encouraging savings, ii) attracting more savers and users into the investment process, iii) helping mobilization of non-financial resources, iv) attracting external resources, and v) offering financial innovations to match the diverts and changing needs of savers and users, etc. In fact, the capital market supplies cash capital as a long-term basis to industrial entrepreneurs who, in turn, use the same for procuring other factors of production. When more factors of production are in use, more production is created, and as such, by supplying capital, a capital market helps create more productive capacity in the economy.

iv) Control of Business

The issue of ordinary shares involves the problem of control since each new share adds one new vote. To the extent that the additional issue of ordinary shares is made to new shareholders as against the existing shareholders, there is a dilution in the control of the existing shareholders. On the other hand, the debt or debenture issue and preference share do not affect the control of the existing group. The preference shareholders may have a right to elect a minority of directors in the event of lapse in dividend payment but this does not involve a major upset in control. The impact of debt capital versus equity capital on the management's control position can influence the determination of capital structure. If the management has majority voting control but is not in a position to issue any more common stock/ share, it chooses debt capital in capital structure. On the other hand, management may decide to employ equity capital in capital structure if the firm's financial position is so weak that the use of debt might lead to serious risk of default.

v) DFIs' Recommendation

The capital structure of a private sector corporate industrial firm is also influenced by the DFIs' recommendation. Therefore, the DFIs' recommendation plays a vital role in designing the capital structure of corporate firms. If any DFIs recommend favorably to any firm for any bank loan, it becomes easy for that firm to employ more debt capital in its capital structure. On the other hand, if any DFI's recommendation is not favourable to any firm, the firm, having no other alternative, will use equity capital.

vi) Regulatory Framework of SEC

The regulatory framework of the SEC also influences the capital structure determination of the private sector corporate industrial firms if they are members of DSE/ CSE. That is, the rules and regulations as framed by the SEC will influence the capital structure determination. Hence, if these rules and regulations are not conducive to the enterprises; they prefer debt capital to equity capital. On the other hand, if these rules and regulations are favourable to the enterprises; they will prefer equity capital to debt capital.

vii) Restriction by Lenders

This determinant also influences the determination of the capital structure of the enterprises using debt capital. In that case, the borrowers cannot borrow beyond the lenders' restrictions.

viii) Chief Executives' Values and Philosophy

This determinant may also influence the capital structure determination of a private-sector corporate firm. If the chief executive's values and philosophy are positive for the use of debt capital, the enterprise will prefer debt capital. On the other hand, if the chief executive's values and philosophy are not positive for the use of debt capital, the firm will not prefer debt capital.

Concept of Optimum Capital Structure:

The optimal capital structure strikes a balance between risk and return to achieve our ultimate goal of maximizing the price of the stock. However, it will become apparent that determining the exact optimal capital structure is not a science; so after analyzing several factors, a firm establishes a target capital structure which it believes is the optimal capital structure. Therefore, target capital Structure refers to the mix of debt, preferred stock and common equity with which the firm plans to finance its investments.

Features of an optimal capital structure/factors influencing optimum capital structure:

The features of an optimal capital structure differ from firm to firm, depending on the nature, size, products and markets, environments, specific and general etc. However, the following may be the general features of an optimal capital structure**:**

- ***Return*****:** The capital structure of a company should be the most advantageous. Subject to other considerations, it should generate maximum returns to the shareholders without adding additional costs to them.
- ***Risks*****:** The use of excessive debts threatens the solvency of a firm. To the point, if debt does not add significant risk, it should be used; otherwise, its use should be avoided. Risk may be of two types, namely operating risk and financial risk. These types of risks, either negative or large enough than the standard norm of 2, as considered by some authors are regarded as unfavorable, thereby, leading to financial distress.
- ***Flexibility*****:** The capital structure of a firm should be financially flexible in the sense that the firm is able to raise capital on reasonable terms under adverse conditions. Moreover, it should be possible for a company to adapt its capital structure with a minimum cost and delay if warranted by a changed situation. It should also be possible for the company to provide funds whenever needed to finance its profitable activities.
- ***Capacity*****:** The capital structure should be determined within the debt capacity of the company, and this capacity should not be exceeded. The debt capacity of a company depends on its ability to generate future cash flows. It should have enough cash to pay creditors' fixed charges and principal sum.
- ***Control*****:** The effect of debt versus stock on a management's control position can influence capital structure. Management may decide to use equity if the firm's financial situation is so weak that the use of debt might be subjected to serious risk of default because if the firm goes into default, the managers will almost surely lose their jobs. However, if too little debt is used, management runs the risk of a takeover. Thus, control considerations could lead to the use of either debt or equity, the type of capital that best protects management will vary from situation to situation. In any event, if management is at all insecure, it will consider the control situation.
- ***Tax position*****:** A major reason for using debt is that interest is deductible, which lowers the effective cost of debt. However, if most of a firm's income is already sheltered from taxes by depreciation tax shields, by interest on currently outstanding debt, or by tax loss carried

forward, its tax rate will be low. Thus, the additional debt will not be as advantageous as it would be to a firm with a higher effective tax rate.

- ***Management attitude:*** Some managers are more aggressive than others are; hence some firms are more inclined to use debt in an effort to boost profits. This factor does not affect the true optimal, or value-maximizing, capital structure, but it does influence the manager-determined target capital structure.
- ***Sale stability*****:** A firm whose sales are relatively stable can safely take on more debt and incur higher fixed charges than a company with unstable sales. Utility companies, because of their stable demand, have historically been able to use more financial leverage than industrial firms have.
- ***Asset structure:*** Firms whose assets are suitable as security for loans tend to use debt rather heavily. General-purpose assets that can be used by many businesses make good collateral, whereas special-purpose assets do not.
- ***Growth rate*****:** Other things remaining the same, faster-growing firms must rely more heavily on external capital. Further, the floatation costs involved in selling common stock exceed those incurred when selling debt, which encourages rapidly growing firms to rely more heavily on debt. At the same time, however, these firms often face greater uncertainty, which tends to reduce their willingness to use debt.
- ***Profitability*****:** One often observes that firms with very high rates of return on investment use relatively little debt. Although there is no theoretical justification for this fact, one practical explanation is that very profitable firms such as Intel, Microsoft, and Coca-Cola simply do not need to do much debt financing. Their high rates of return enable them to do most of their financing with internally generated funds.
- ***Lender and rating agency attitudes*****:** Regardless of managers' analysis of the proper leverage factors for their firms, lenders' and rating agencies' attitudes frequently influence financial structure decisions. In the majority of cases, the corporations discuss their capital structure with lenders and rating agencies and give much weight to their advice.
- ***Market conditions*****:** Conditions in the stock and bond markets undergo both long- and short – run changes that can have an important bearing on a firm's optimal capital structure. For example, during the credit crunch, the junk bond market dried up, and there was simply no market at a "reasonable" interest rate for any new long-term bonds rated below triple B. Therefore, low-rated companies in need of capital were forced to go to the stock market, or the short-term debt-market, regardless of their target capital structures. When conditions eased, however, these companies sold bonds to get their capital structures back on target.
- ***Firm's internal conditions*****:** A firm's internal condition can also have a bearing on its target capital structure. For example, suppose a firm has just completed an R & D program, and it forecasts higher earnings in the immediate future. However, the new earnings are not yet anticipated by investors, hence are not reflected in the stock price.

  This company would not want to issue stock – it would prefer to finance with debt until the higher earnings materialize and are reflected in the stock price. Then, it could sell an issue of common stock, retire the debt, and return to its target capital structure.

All the above-discussed features of capital structure are also known as factors influencing the optimum capital structure of a firm.

Review Questions

1. Discuss the main factors affecting the capital structure of a firm.
2. What are the quantitative factors influencing the capital structure of a firm?
3. Discuss the qualitative factors influencing the capital structure of a firm.
4. What do you mean by optimum Capital structure?
5. Identify the features of optimum Capital structure.
6. What are the important factors influencing Optimum capital structure?

Lesson 3: Optimal Capital Structure Determination

Lesson Objectives

After studying this lesson, you should be able to:

- understand how to determine optimal capital structure; and
- know about the technique of EBIT-EPS Analysis.

Optimal Capital Structure Determination

The following two techniques are applied in the determination of an optimal capital structure**:**

*a) **Traditional Approach***

Under the traditional approach, optimal capital structure is that point where the weighted average cost of capital (WACC) is the minimum. Algebraically:

$K_0 = K_e \,.\, W_e + K_d \,.\, W_d$

Where k_0 = WACC; k_e = equity capitalization rate; w_e = weights of equity capital to total capitalization; k_d = rate of interest on debt and w_d = weights of debt to total capitalization.

Let's examine some basic financial relationships. It is generally believed that *the* value of *the firm* is maximized when the cost *of* capital is minimized. By using a modification of the simple zero-growth valuation model, we can define the value of the firm, V, with the following Equation:

$$V = \frac{EBIT \times (1 - T)}{k_a}$$

Where,

EBIT = earnings before interest and taxes
T = tax rate
k_a = weighted average cost of capital

If we assume that EBIT is constant, the value of the firm, V, is maximized by minimizing the weighted average cost of capital, k. Here, the weighted average cost *of* capital, k, results from a weighted average of the firm's debt and equity capital costs. At a debt ratio of zero, the firm is 100percent equity financed. As debt is substituted for equity and as the debt ratio increases, the weighted average cost of capital declines because the debt cost is less than the equity cost (ki < k). As the debt ratio continues to increase, the increased debt and equity costs eventually cause the weighted average cost of capital to rise.

*b) **MM Approach***

Under the MM approach, the cost of capital remains constant and the cost of equity increases linearly with the debt. The equity capitalization rate is calculated as follows**:**

$K_e = K_0 + (K_0 - K_d)$ debt/equity

Technique of EBIT-EPS Analysis

The EBIT-EPS analysis, as a method to study the effect of leverage, essentially involves the comparison of alternative methods of financing under various assumptions of EBIT. A firm has the choice to raise funds for financing its investment proposals from different sources in different proportions. For instance, it can (i) exclusively use equity capital, (ii) exclusively use debt;(iii) exclusively use preference capital; (iv) use a combination of (i) and (ii) in different proportions; (v) a combination of (i),(ii), and (iii)in different proportions; (vi) a combination of (i) and (iii) in

different proportion, and so on. The choice of the combination of the various sources would be one which, given the level of earnings before interest and taxes, would ensure the largest EPS.

EPS Indifference Analysis

The EPS indifference point is the point at which EPS is the same regardless of whether the firm uses debt or common stock. At a low level of sales, EPS is much higher if stock rather than debt is used. In operational terms, if the expected level is to exceed the indifference level of EBIT, the use of a fixed-charge source of funds (debt) would be advantageous from the viewpoint of EPS, that is, financial leverage will be favorable and lead to an increase in the EPS available to the shareholders. The capital structure should include debt. If, however, the expected level of EBIT is less than the indifference point, the advantage of EPS would be available from the use of equity capital.

Considering risk in the EBIT – EPS Analysis

When interpreting EBIT–EPS analysis, it is important to consider the risk of each capital structure alternative. The assessment of risk can be performed by using ratios. As financial leverage (measured by the debt ratio) increases, we expect a corresponding decline in the firm's ability to make scheduled interest payments (measured by the times interest earned ratio).

Basic shortcoming of EBIT-EPS Analysis

The most important point to recognize when using EBIT–EPS analysis is that this technique tends to concentrate on *maximizing earnings* rather than maximizing owner wealth as reflected in the firm's stock price. The use of an EPS-maximizing approach generally ignores risk. If investors did not require risk premiums (additional returns) as the firm increased the proportion of debt in its capital structure, a strategy involving maximizing EPS would also maximize stock price. However because risk premiums increase with increases in financial leverage, the maximization of EPS *does not* ensure owner wealth maximization. To select the best capital structure, firms must integrate both return (EPS) and risk (via the required return, *rs*) into a valuation framework consistent with the capital structure theory.

Example– 1:

Suppose a firm has a capital structure exclusively comprising ordinary shares amounting to Tk. 10,00,000. The firm now wishes to raise an additional Tk. 10,00,000 for expansion. The firm has four alternative financial plans**:**

(A) It can raise the entire amount in the form of equity capital.
(B) It can raise 50 per cent as equity capital and 50 per cent as 5% debentures.
(C) It can raise the entire amount as 6% debentures.
(D) It can raise 50 per cent equity capital and 50 per cent as 5% preference capital.

Further, assume that the existing EBIT is Tk. 1,20,000, the tax rate is 35 per cent, outstanding ordinary shares are 10,000, and the market price per share is Tk. 100 under all the four alternatives.

Which financing plan should the firm select?

Solution:

TABLE: EPS under Various Financial Plans

	Financing plans			
	A	**B**	**C**	**D**
EBIT	**Tk.1,20,000**	**Tk.1,20,000**	**Tk.1,20,000**	**Tk.1,20,000**
Less interest	-	25,000	60,000	-
Earnings before taxes	1,20,000	95,000	60,000	1,20,000
Taxes	42,000	33,250	21,000	42,000
Earnings after taxes	78,000	61,750	39,000	78,000
Less preference dividend	-	-	-	25,000
Earnings available to ordinary shareholders	78,000	61,750	39,000	53,000
Number of shares	20,000	15,000	10,000	15,000
Earnings per share EPS)	3.9	4.1	3.9	3.5

The calculations in the above table reveal that given a level of EBIT of Tk. 1,20,000, the financing alternative B, which involves 75 per cent ordinary shares and 25 per cent debt, is the most favorable with respect to EPS. Another disclosure of the table is that although the proportion of ordinary shares in the total capitalization under financing plan D is also 75 per cent, that is, equal to plan B, EPS is considerably different (lowest). The difference in plans B and D is due to the fact that interest on debt is tax-deductible while the dividend on preference shares is not. With a 35 per cent income tax, the explicit cost of preference shares would be higher than the cost of debt.

Choosing the Optimal Capital Structure

Creating a wealth maximization framework for use in making capital structure decisions is not easy. Although the two key factors return and risk can be used separately to make capital structure decisions, integration of them into a market value context provides the best results. This section describes the procedures for linking the return and risk associated with alternative capital structures to market value to select the best capital structure.

Linkage

To determine its value under alternative capital structures, the firm must find the level of return that must be earned to compensate investors and owners for the risk being incurred. That is, the risk associated with each structure must be linked to the required rate of return. Such a framework is consistent with the overall valuation framework developed and applied to capital budgeting decisions.

The required return associated with a given level of financial risk can be estimated in several ways. Theoretically, the preferred approach would be to first estimate the beta associated with each alternative capital structure and then use the CAPM (capital asset pricing model) to calculate the required return, k, a more operational approach involves linking the financial risk associated with each capital structure alternative directly to the required return. Such an approach is similar to the CAPM-type approach for linking project risk and required return (RADR). Here it involves estimating the required return associated with each level of financial risk, as measured by a statistic such as the coefficient of variation of EPS. Regardless of the approach used, one would expect that the required return would increase as the financial risk increases.

Estimating Value

The value of the firm associated with alternative capital structures can be estimated by using one of the standard valuation models. If, for simplicity, we assume that all earnings are paid out as

dividends, we can use a zero-growth valuation model. The model is restated here with EPS substituted for dividends because in each year, the dividends would equal EPS:

$$P_0 = \frac{EPS}{K_s}$$

By substituting the estimated level of EPS and the associated required return, *k.,* into the above Equation, we can estimate the per-share value of the firm, PO*

Maximizing Value versus Maximizing EPS

Throughout this text, the goal of the financial manager has been specified as maximizing owner wealth, not profit. Although there is some relationship between the level of expected profit and value, there is no reason to believe that profit-maximizing strategies necessarily result in wealth maximization. It is therefore the wealth of the owners as reflected in the estimated share value that should serve as the criterion for selecting the best capital structure.

Example 2:

Rowshan Nut Company has collected the data in the following table with respect to its capital structure, expected earnings per share, and required return.

Capital structure debt ratio	Expected Earnings Per Share (EPS)	Estimated required return, K_s
0%	Tk. 3.12	13%
10	3.90	15
20	4.80	16
30	5.44	17
40	5.51	19
50	5.00	20
60	4.40	22

Required:

(a) Compute the estimated share value associated with each of the capital structures.
(b) Determine the optimal capital structure based on (1) maximization of expected earnings per share and (2) maximization of share value.
(c) Which capital structure do you recommend? Why?

Solution:

(a) Calculation of estimated share value associated with each of the capital structures:

Capital structure debt ratio	Expected Earnings Per Share (EPS)	Estimated required return, ks	Estimated Share Value
1	2	3	4 = 2/3
0%	Tk. 3.12	0.13	Tk. 24
10	3.90	0.15	26
20	4.80	0.16	30
30	5.44	0.17	32
40	5.51	0.19	29
50	5.00	0.20	25
60	4.40	0.22	20

(b) Using the table in part (a): 1. Maximization of EPS: 40% debt ratio, EPS = Tk. 5.51 per share and 2. Maximization of share value: 30% debt ratio, share value = Tk. 32

(c) Recommend a 30% debt ratio because it results in the maximum share value and is therefore consistent with the firm's goal of owner wealth maximization.

Some Other Important Considerations

Because there is no practical way to calculate the optimal capital structure, any quantitative analysis of capital structure must be tempered with other important considerations.

Review Questions

1. Discuss the techniques used to determine optimal capital structure.
2. What is the technique of EBIT-EPS Analysis?
3. What are the shortcomings of EBIT-EPS Analysis?

Problems:

1. Rahat Corporation has a capital structure exclusively comprising ordinary shares amounting to Tk. 20,00,000. The firm now wishes to raise an additional Tk. 10,00,000 for expansion. The firm has four alternative financial plans**:**

(A) It can raise the entire amount in the form of equity capital.
(B) It can raise 50 per cent as equity capital and 50 per cent as 6% debentures.
(C) It can raise the entire amount as 6% debentures.
(D) It can raise 60 per cent as equity capital and 40 per cent as 7% preference capital.

Further, assume that the existing EBIT is Tk. 1,30,000, the tax rate is 37 per cent, outstanding ordinary shares are 11,000, and the market price per share is Tk. 110 under all the four alternatives.

Which financing plan should the firm select?

2. Roushan Company has collected the data in the following table with respect to its capital structure, expected earnings per share, and required return.

Capital structure debt ratio	Expected Earnings Per Share (EPS)	Estimated required return, ks
0%	Tk. 3.50	13%
10	3.90	16
20	4.90	17
30	5.64	18
40	6.51	23
50	5.00	21
60	4.80	22

Required:

(a) Compute the estimated share value associated with each of the capital structures.
(b) Determine the optimal capital structure based on (1) maximization of expected earnings per share and (2) maximization of share value.
(c) Which capital structure do you recommend? Why?

Leverage and Dividend Policy

7

Unit Highlights

- Leverage
- Measurement of Leverage
- Dividend Policy

Lesson 1: Leverage

Lesson Objectives

After studying this lesson, you should be able to:

- know the concept of leverage;
- identify the types of leverage; and
- learn about breakeven analysis.

Concept of Leverage

Leverage refers to the effects that fixed costs have on the returns that shareholders earn. By "fixed costs" we mean costs that do not rise and fall with changes in a firm's sales. Firms have to pay these fixed costs whether business conditions are good or bad. These fixed costs may be operating costs, such as the costs incurred by purchasing and operating plant and equipment, or they may be financial costs, such as the fixed costs of making debt payments. Generally, leverage magnifies both returns and risks. A firm with more leverage may earn higher returns on average than a firm with less leverage, but the returns on the more leveraged firm will also be more volatile.

In business, leverage is a process of conscious risk assumption. Leverage may occur in varying degrees. The greater the degree of leverage, the greater the risk. But, at the same time, it increases the possibility of a higher rate of return to the shareholders. Therefore, the use of borrowed capital in order to produce more gain for the residual shareholders is called trading on equity or leverage.

In the same way, managers can influence leverage in their decisions about how the company raises money to operate. The amount of leverage in the firm's capital structure—the mix of long-term debt and equity maintained by the firm— can significantly affect its value by affecting return and risk. The more debt a firm issues, the higher its debt repayment costs, and those costs must be paid regardless of how the firm's products are selling. Because leverage can have such a large impact on a firm, the financial manager must understand how to measure and evaluate leverage, particularly when making capital structure decisions.

Types of Leverage

Broadly, there are two types of leverage namely operating and financial. The leverage associated with investment activities is referred to as operating leverage; whereas, leverage associated with financing activities is called financial leverage.

(i) ***Operating leverage*** involves the use of fixed operating costs, and not variable costs, to raise operating income or earnings before interest and taxes.

Whereas,

(ii) ***financial leverage*** involves the use of funds for which the firm pays a fixed cost in the hope of increasing the return to common stockholders. The leverage of a firm is essentially related to profit performance of the firm. It is the relationship between the equity share capital and debt capital showing valuable measures for a decision maker.

(iii) ***Combined or Total leverage*** is the product of both the operating and the financial leverages. Several different combinations of operating and financial leverages can produce the same degree of combined leverage. In addition to the aforesaid leverages, there is another type of leverage known as capital leverage. The degree to which debt and preferred stock are used in the financial structure is called capital leverage.

Breakeven Analysis

Firms use **breakeven analysis,** also called *cost-volume-profit analysis,* (1) to determine the level of operations necessary to cover all costs and (2) to evaluate the profitability associated with various levels of sales. The firm's **operating breakeven point** is the level of sales necessary to *cover all operating costs. At that point, earnings before interest and taxes (EBIT) equal Tk.0.1*

$$Q = \frac{FC}{P - VC}$$

The first step in finding the operating breakeven point is to divide the cost of goods sold and operating expenses into fixed and variable operating costs. *Fixed costs* are costs that the firm must pay in a given period regardless of the sales volume achieved during that period. These costs are typically contractual; rent, for example, is a fixed cost. Because fixed costs do not vary with sales, we typically measure them relative to time. For example, we would typically measure rent as the amount due *per month*. *Variable costs* vary directly with sales volume. Shipping costs, for example, are a variable cost. We typically measure variable costs in dollars per unit sold.

The following table 6 hours the three types of Leverage concepts in detail and general Income Statement format:

Opening Leverage	Sales Revenue Less: Cost of Goods Sold Gross Profits Less: Operating Expenses	
	Earnings before interest and taxes (EBIT)	Total Leverage
Financial Leverage	Less: Interest Net Profit before taxes Less: Taxes Net Profit after taxes Less: Preferred Stock dividends Earnings available for common Stockholders Earnings Per Share (EPS)	

Algebraic Approach

Using the following variables, the algebraic representation shown below:

$EBIT = (P \times Q) - FC - (VC \times Q)$

Or

$EBIT = Q \times (P - VC) - FC$

P = sale price per unit
Q = sales quantity in units
FC = fixed *operating* cost per period
VC = variable *operating* cost per unit

Review Questions

1. Discuss the concept of leverage.
2. What are the different types of leverage? Discuss each one.
3. What is breakeven analysis or cost-volume-profit analysis? Why do firms use breakeven analysis?
4. What is the operating breakeven point? How do changes in fixed operating costs, the sale price per unit, and the variable operating cost per unit affect it?
5. What is operating leverage? What causes it? How is the degree of operating leverage (DOL) measured?
6. What is financial leverage? What causes it? How is the degree of financial leverage (DFL) measured?

Lesson 2: Measurement of Leverage

Lesson Objectives

After studying this lesson, you should be able to:

- determine the level of Operating Leverage;
- find the level of financial leverage; and
- measure the level of total leverage.

Measurement of Operating Leverage

Operating leverage reflects the extent to which fixed assets and associated fixed costs are utilized in the business firms. A firm's operating costs may be classified into three groups, namely-(i) Variable costs, which tend to vary to the level of activity; (ii) Fixed costs, which tend to remain constant under certain given conditions; and (iii) Semi-variable costs, which are partly variable and partly fixed. This leverage is related to fixed costs and shows the impact of changes in sales revenue on operating income. In practice, no firm likes to operate under high operating leverage in its uncertain market and unstable economy and business nature; because in such a situation a small rise in sales may enhance profits considerably; while a small decline in sales likewise may sharply reduce and even wipe out EBIT.

The degree of operating leverage (DOL) is the measure of the operating leverage. It may be defined as the operating change in EBIT, which takes place as a result of a percentage change in sales volume. It can be measured as follows:

(i) $$DOL = \frac{\text{Percentage Change in Operating Income}}{\text{Percentage Change in Sales Volume}} > 1$$

or

(ii) $$DOL = \frac{Q(S-V)}{Q(S-V)-F}$$

$$Q\,(S - V) - F$$

Where Q is the units of output,

S is the unit selling price,
V is the unit variable cost and
F is the total fixed costs.

or

(iii) $$DOL = \frac{\text{Contribution Margin (C.M)}}{\text{EBIT}}$$

Where, Contribution Margin = Sales - Variable Costs

Such C. M. is to cover fixed costs and earnings. Since, C. M. = EBIT + Fixed Costs; hence the above formula can also be expressed as follows:

(iv) $$DOL = \frac{\text{EBIT+Fixed costs}}{\text{EBIT}}$$

The value of DOL must be greater than 1. If the value is exactly equal to 1; there exists no operating leverage. The higher the degree of operating leverage, the greater the degree of operating risk and vice-versa. Operating risk is the risk of the firm not being able to cover its fixed operating costs. The larger their magnitude, the greater the sales volume required to cover its fixed costs.

Measurement of Financial Leverage

Financial leverage is the magnification of the effect of changes in EBIT on the earnings per share of the common stock. Financial leverage arises when fixed costs-bearing securities are used in the capital structure of the firm. Examples of fixed costs bearing securities are: (i) long-term debt including debentures, bonds, etc. and (ii) preference share capital. Long-term debts bear a fixed rate of interest; while preference share capital bears a fixed rate of dividends. Financial leverage occurs when fluctuation in EBIT is accompanied by disproportionate fluctuation in the firm's earnings per share. The degree of financial leverage (DFL) is the proper measure of financial leverage. It may be defined as the ratio of percentage change in earnings per share available for common stockholders that is associated with a given percentage change in EBIT. Therefore, DFL can be expressed as follows:

$$\text{DFL} = \frac{\text{Percentage Change in EPS}}{\text{Percentage Change in EBIT}} > 1$$

Alternatively, DFL can be measured at any level of operating profit –

$$\text{DFL} = \frac{\text{EBIT}}{\text{EBIT- Interest}} > 1$$

or, $$\text{DFL} = \frac{\text{EBIT}}{\text{EBT}} > 1$$

[EBIT – 1 = EBT **]**

Like the degree of operating leverage, DFL should be more than 1. The higher the DFL, the greater the financial risk involved and vice-versa.

Measurement of Combined Leverage

Combined leverage measures the interaction between the firm of both operating and financial leverages. Therefore, if a firm uses a considerable amount of both operating and financial leverage, even small changes in the level of sales will produce wide fluctuations in earnings per share. That is, combined leverage compares changes in sales revenues with changes in EBT. Hence, this leverage combines operating and fixed charges and gives rise to a separate leverage combining the effect of both operating and financial leverages.

The degree of combined leverage (DCL) or degree of total leverage (DTL) is the measure of combined leverage, which can be computed by multiplying the two leverages as follows:

DCL = DOL x DFL

A number of different combinations of operating and financial leverages could produce even the same DCL. Hence, to some degree, firms can make trade-offs between operating and financial leverages. A firm having a high degree of operating leverage is likely to use financial leverage to a lesser extent. Alternatively, a firm having a low degree of operating leverage might seek a high degree of financial leverage. Thus, maintaining an ideal situation would demand that a proper balance between operating and financial leverages is to be kept to maintain the risk profile of the firm within reasonable limits and maximize return to the shareholders.

Example - 1

Van Auken Lumber's 2020 income statement is shown here**:**

VAN AUKEN LUMBER:
INCOME STATEMENT FOR DECEMBER 31, 2020
(THOUSANDS OF DOLLARS)

Sales	Tk.36,000
Cost of goods sold	(25,200)
Gross profit	Tk.10,800
Fixed operating costs	(6,480)
Earnings before interest and taxes	Tk. 4,320
Interest	(2,880)
Earnings before taxes	Tk.1,440
Taxes (40%)	(576)
Net income	Tk. 864
Dividends (50%)	Tk. 432

i. Compute the degree of operating leverage (DOL), degree of financial leverage (DFL) and degree of total leverage (DTL) for Van Auken Lumber.
ii. Interpret the meaning of each of the numerical values you computed in part a.
iii. Briefly discuss some ways Van Auken can reduce its degree of total leverage.

Solution:

$$DOL = \frac{\text{Contribution Margin}}{\text{EBIT}}$$ Where: Contribution Margin = Sales – VC

$$= \frac{(36000-25200)}{4320} = \frac{10800}{4320} = 2.5 \text{ times}$$

$$DFL = \frac{\text{EBIT}}{\text{EBIT-Interest}} = \frac{4320}{4320-2880} = \frac{4320}{1440} = 3 \text{ times}$$

DTL = DOL×DFL = 2.5×3 = 7.5 times

b) DOL equals 2.5 times appears to be higher, thereby signifying a greater degree of operating risk in the case of Van Auken Lumber. Similarly, DFL equals 3 times seems to be higher; thereby implying a greater degree of financial risk in the case of the firm. Lastly, DTL equals 7.5 times, which is much higher; thereby signifying a greater total risk in the case of the firm.

c) The degree of total leverage of the firm can be reduced by (i) increasing contribution margin, (ii) decreasing interest amount, and (iii) increasing EBIT or decreasing interest amount.

Review Questions

1. What are various measures of leverage? Explain each of them.
2. How would you compute the following types of leverages?
   a) DOL; b) DFL; and c) DTL?
3. What is meant by the term leverage? How are operating leverage, financial leverage, and total leverage related to the income statement?
4. What is the general relationship between operating leverage, financial leverage, and the total leverage of the firm? Do these types of leverage complement one another? Why or why not?

Problem 1:

Adiv Corporation's 2021 income statement is shown here**:**

ADIV CORPORATION
INCOME STATEMENT FOR DECEMBER 31, 2021
(THOUSANDS OF DOLLARS)

Sales	Tk.36,000
Cost of goods sold	(25,200)
Gross profit	Tk.10,800
Fixed operating costs	(6,480)
Earnings before interest and taxes	Tk. 4,320
Interest	(2,880)
Earnings before taxes	Tk.1,440
Taxes (40%)	(576)
Net income	Tk. 864
Dividends (50%)	Tk. 432

i. Compute the degree of operating leverage (DOL), degree of financial leverage (DFL), and degree of total leverage (DTL) for Adiv Corporation.
ii. Interpret the meaning of each of the numerical values you computed in part a.
iii. Briefly discuss some ways Adiv Corporation can reduce its degree of total leverage.

Lesson 3: Dividend Policy

Lesson Objectives

After studying this lesson, you should be able to:

- Understand the concept and objectives of dividend policy of a corporate firm;
- Identify the factors that influence the dividend policy of a corporate firm;
- Understand the major types of dividend policy of a corporate firm;
- Know the pros and cons of various forms of dividends of a corporate firm;
- Grasp the significance and implications of stock splits, dividend reinvestment and share repurchase plans; and
- Identify the significance and forms of stability of dividends.

Concept and Objectives of Dividend Policy

The objective of the firm is to maximize the wealth of the shareholders/ stockholders. Sound and successful investment decisions generate positive net cash flow, which is used either for payment of interest or dividends or retention within the firm to finance new investments. Dividend refers to the business concerns net profits distributed among the shareholders. The important aspect of a dividend decision is to determine the amount of earnings to be distributed to the shareholders, on one hand, and the amount to be retained in the firm, on the other. The dividend decision is regarded as the financing decision since the payment of cash dividends reduces the amount of cash available for investment and the firm may have to make a new issue of shares or debt.

Dividend decision is the core of financial management since it affects the capital structure decision and, in turn, the investment decision of that firm. The most significant aspect of the dividend policy is to determine the amount of earnings to be distributed to the shareholders and the amount to be retained in the firm. Retained earnings are the most important internal sources of financing the growth of the firm. On the other hand, dividends are considered desirable from the shareholders' point of view, as they tend to increase their current wealth. Dividends constitute the use of the firm's funds. A firm intending to pay dividends also needs the funds to finance its investment opportunities and will have to use external sources of financing namely, issue of new common shares/ stocks or issue of debt. The dividend policy of the firm thus, has its effects on both the long-term financing and wealth of the shareholders. As a result, the firm's decision to pay dividends may be shaped by the following two possible viewpoints:

Long-term Financing Decision

When a dividend decision is treated as a long-term financing decision, the net earnings of the firm may be considered as a source of long-term funds. With this approach, dividends will be paid only when the firm does not have profitable investment opportunities. A firm should reinvest its earnings if the prospective returns are greater than that of the shareholder's cost of capital or required rate of return. If corporate managers can maximize the market value of the firm by manipulating dividend payments, then they should do so. The firm grows at a faster rate when it accepts highly profitable investment projects. External equity could be raised to finance investments. But the retained earnings are preferable because, unlike external equity, they do not have any floatation costs. The distribution of cash dividends causes a reduction in internal funds available to finance profitable investment opportunities and thus, either constrains the growth or requires the firm to find other costly sources of financing. Thus, earnings may remain undistributed as a part of a long-term financing decision. The dividends paid to shareholders represent a distribution of earnings that cannot be profitably reinvested by the firm. With this approach, the dividend decision is viewed merely as a residual decision.

Wealth Maximization Decision

One may argue that capital markets are not perfect; therefore, shareholders are not indifferent between dividends and retained earnings. Because of the market imperfections and uncertainty, shareholders may give a higher value to the near future than the future dividends and capital gains. Some authors hold that one dollar of the current dividend is worth approximately three dollars of retained cash flows in the form of capital gains and future dividends. Thus, the payment of current dividends may significantly affect the market price of the share. Higher dividends increase the value of the shares and low dividends reduce the same value. In order to maximize wealth under uncertainty, the firm must pay enough dividends to satisfy investors. Under conditions of uncertainty, it is argued that shareholders are not indifferent to split between dividends and retention. Since dividends are more certain than capital gains, it is believed that the shareholders are ready to pay a higher price for a share paying current dividends as compared to another firm within the same risk class but paying lower dividends. Thus, the rate of return required by the shareholders would rise with a percentage of retention.

Forms of Dividend: Cash and Stock

The usual practice is to pay dividends in cash. Another option is the payment of the bonus shares or stock dividends.

Cash Dividend

Most companies pay dividends in cash. Sometimes cash dividends may be supplemented by a bonus issue (stock dividend). A company should have enough cash in its bank account when cash dividends are declared. If it does not have enough bank balance, arrangements should be made to borrow funds. When the company follows a stable dividend policy, it should prepare a cash budget for the coming period to indicate the necessary funds which would be needed to meet the regular dividend payments of the company. It is relatively difficult to make cash planning in anticipation of dividend needs when an unstable policy is followed.

The cash account and the reserve account of a company will be reduced when the cash dividend is paid. Thus, both the total assets and the net worth of the company are reduced when the cash dividend is distributed. The market price of the share drops in most cases by the amount of the cash dividend distributed.

Stock Dividend (Bonus Shares)

An issue of bonus shares represents a distribution of shares in addition to the cash dividend (known as stock dividend in the U.S.A.) to the existing shareholders. This has the effect of increasing the number of outstanding shares of the company. The shares are distributed proportionately. Thus, a shareholder retains his proportionate ownership of the company. For example, if a shareholder owns 100 shares at the time when a 10 per cent (i.e., 1:10) bonus issue is made, he will receive 10 additional shares. The declaration of the bonus shares will increase the paid-up share capital and reduce the reserves and surplus (retained earnings) of the company. The total net worth is not affected by the bonus issue. A bonus issue represents a recapitalization of the owners' equity portion, i.e., the reserves and surplus are merely an accounting transfer from reserves and surplus to paid-up capital.

Implications of Stock Dividend and Stock Split:

Definition of Stock Dividend and Stock Split

A stock dividend refers to a dividend which is paid in the form of additional shares of stock rather than cash. However, a stock split is an action taken by a firm to increase the number of shares outstanding. It is nothing but splitting of existing shares into more shares. Stock split can be of any size – for example, the stock could be split 2 for 1, 3 for 1, 4 for 1, or in any other way.

Stock Dividend vs. Stock Split

A stock split is a method to increase the number of outstanding shares through a proportional reduction in the par value of the share. A stock split affects only the par value in the number of outstanding shares, the shareholders' total fund remains unaltered. As with stock dividends, the total net worth does not change and the number of outstanding stocks increases substantially with the stock split. The stock dividend and stock split are similar except for the difference in their accounting treatment. In the case of stock dividends, the balance of the reserves and surplus account decreases due to transfer to the equity capital and the share premium accounts. The par value per stock remains unaffected, with a stock split, the balance of the equity accounts does not change, but the par value per stock changes. The earnings per share will be diluted and the market price per share will fall proportionately with the stock split. However, the total value of the holdings of a stockholder remains unaffected by a stock split.

Reasons for Stock Split

The following are reasons for splitting a firm's common stock:

i. To make trading in shares attractive
ii. To signal the possibility of higher profits in the future
iii. To give higher dividends to the shareholder

The following paragraph discusses each of the reasons briefly:

i. **To make trading in shares attractive:** The main purpose of a stock split is to reduce the market price of the stock in order to make it attractive to investors. With a reduction in the market price of the stock, the stocks of the company are placed in a more popular trading range.

ii. **To signal the possibility of higher profits in the future**: The stock splits are used by the company management to inform the investors that the company is expected to earn higher profits in future. The market price of the high–growth firm's stocks increases very fast.

iii. **To give a higher dividend to the shareholder**: When the stock is split, seldom does a company reduce or increase the cash dividend per share proportionately. However, the total dividends of a shareholder increase after a stock split.

Effects of Stock Dividend and Stock Split

Stock dividend and stock split can have their effects on the Balance Sheet and prices of the firms which are examined below**:**

Balance Sheet effects: Although the economic effects of stock split and stock dividends are virtually identical, accountants treat them somewhat differently. For example, on a 2-for-1 stock split, the shares outstanding become doubled and the stock's par value becomes halved. With a stock dividend, the par value is not reduced, but an accounting entry is made transferring capital from the retained earnings account to common stock and paid in capital accounts. The transfer from retained earnings is calculated as follows**:**

Dollars transferred from retained earnings

=[(Number of shares outstanding) × (Stock dividend as a per cent) × (The market price of the stock)]

Price Effects: Several empirical studies have examined the effects of stock splits and stock dividends on stock prices. These studies suggest the investors' view on stock splits and stock dividends for what they are – *simply additional pieces of paper*. If stock dividends and splits are accompanied by higher earnings and cash dividends, then investors will bid up the price of the stock. However, if stock dividends are not accompanied by increases in earnings and cash dividends, the dilution of earnings and dividends per share causes the price of the stock to drop by the same percentage as the stock dividend. Thus, the fundamental determinants of price are the underlying earnings and cash dividends per share, and stock splits and stock dividends merely cut the pie into thinner slices.

Dividend Reinvestment and Share Repurchase Plans

Most large companies offer dividend reinvestment plans whereby stockholders can automatically reinvest dividends received in the stock of the paying corporation. It is a plan that enables a stockholder to automatically reinvest dividends received back into the stock of the paying firm. There are two types of dividend reinvestment plans, referred to as "drips"**:** (i) plans that involve only old stock that is already outstanding and traded in the financial markets, and (ii) plans that involve newly issued stock.

Instead of dividends, a company can repurchase its stock. There are three methods of share repurchase: (i) fixed price tender offers, (ii) Dutch-option tender offers, and (iii) open market purchases. Of these three methods, the second one is the most widely used by companies. In the absence of a tax differential between capital gain and dividend, the monetary value of share repurchase or cash dividend should be the same.

Factors Affecting Dividend Policy:

The factors determining the dividend policy of a firm, for the purpose of exposition, are classified into the following**:**

(a) Dividend payout (D/P) ratio, (b) Stability of dividends, (c) Legal, contractual and internal constraints and restrictions, (d) Owner's considerations, (e) Capital market considerations, and (f) Inflation.

Elaboration of each factor is given below:

(a) Dividend Payout (D/P) Ratio

A major aspect of the dividend policy of a firm is its dividend payout (D/P) ratio, that is, the percentage share of the earnings distributed to the shareholders as dividends.

Dividend policy involves the decision to pay earnings or to retain them for reinvestment in the firm. The retained earnings constitute a source of financing. The payment of dividends results in the reduction of cash, and therefore, is a depletion of total assets. To maintain the asset level, as well as to finance investment opportunities, the firm must obtain funds from the issue of additional equity or debt. If the firm is unable to raise external funds, its growth will be affected. Thus, dividends imply an outflow of cash and lower future growth. In other words, the dividend policy of the firm affects both the shareholders' wealth and the long-term growth of the firm. The optimum dividend policy should strike the balance between current dividends and future growth which maximizes the price of the firm's shares. The D/P ratio of a firm should be determined concerning two basic objectives – maximizing the wealth of the firm's owners and providing sufficient funds to finance growth.

(b) Stability of Dividends

The second major aspect of the dividend policy of a firm is the stability of dividends. The investors favor a stable dividend as much as they favor the payment of dividends (D/P ratio). The term *dividend stability* refers to the consistency or lack of variability in the stream of dividends. In more precise terms, it means that a certain minimum amount of dividend is paid out regularly.

(c) Legal, Contractual, and Internal Constraints and Restrictions

The dividend decision is also affected by certain legal, contractual, and internal requirements and constraints. The legal factors stem from certain statutory requirements, the contractual restrictions arise from certain loan covenants, and the internal constraints are the result of the firm's liquidity position.

Legal Requirements: Legal stipulations do not require a dividend declaration but they specify the conditions under which dividends must be paid. Such conditions pertain to (i) capital impairment, (ii) net profits, and (iii) insolvency.

(d) Contractual Requirements

Important restrictions on the payment dividend may be accepted by a firm when obtaining external capital either by loan agreement, a debenture indenture, a preference share agreement or a lease agreement. Such restrictions may cause the firm to restrict payment of cash dividends until a certain level of earnings has been achieved or limit the amount of dividends paid to a certain amount or percentage of earnings.

(e) Internal Constraints

These factors are unique to a firm which includes (i) liquid assets, (ii) growth prospects, (iii) financial requirements, (iv) availability of funds, (v) earnings stability, and (vi) control.

(f) Owner's Considerations

The dividend policy of a firm is likely to be affected by the owner's considerations of: (i) the tax status of the shareholders, (ii) their opportunities for investments, and (iii) dilution of ownership. The firm must aim at dividend policy which has a beneficial effect on the wealth of the majority of the shareholders.

(g) Capital Market Considerations

If a firm has only limited access to capital markets, it is likely to follow a low dividend payout ratio. They are likely to rely more heavily on retained earnings as a source of financing their investments. Firms which lean heavily on financial institutions for raising funds declare a minimum dividend so that they can remain on the eligible list of these institutions.

Major Types of Dividend Policy:

There are various types of dividend policy; some are discussed below:

1. Residual Dividend Policy

It is a policy in which the dividend paid is set equal to the actual earnings as reduced by the amount of retained earnings necessary to finance the firm's optimal capital budget. The basis of the policy is that the investors prefer to have the firm retain and reinvest earnings rather than pay them as dividends.

2. Stable Dividend Policy

Such dividend policy refers to the payment of a specific amount of dividend each year or periodically increasing the dividends at a constant rate. In such a policy, the annual Taka dividend is relatively predictable by investors.

3. Constant Payout Ratio Policy

Such a dividend policy refers to the payment of a constant percentage of earnings as dividends each financial year. But in practice, because a firm's earnings will surely fluctuate, this policy would mean that the amount of dividend would also vary.

4. Payment of Regular Dividend Plus Extra

A policy of paying a low regular dividend plus a year-end extra in good years is a compromise between a stable dividend and a constant payout rate. Such a policy gives the firm flexibility, yet investors can count on receiving at least a minimum dividend. Therefore, it is the supplemental dividend paid in good years and excess funds are available for distribution as Stability of Dividends. Stability or regularity of dividends is considered a desirable policy by the management of most companies in practice. Shareholders also seem generally to favor this policy and value stable dividends higher than fluctuating ones. All other things being the same, a stable dividend may have a positive impact on the market price of the share.

Stability of dividends sometimes means regularity in paying some dividends annually, even though the amount of dividends may fluctuate over years, and may not be related to earnings. There are several companies which have records of paying some dividends for a long unbroken period. More precisely, the stability of dividends refers to the amounts paid out regularly.

Three distinct forms of such stability may be distinguished:

1. Constant dividend per share or dividend rate.
2. Constant payout.
3. Constant dividend per share plus extra dividend.

1. Constant Dividend per Share or Dividend Rate

Many companies follow the policy of paying a fixed amount per share or fixed rate on paid-up capital as dividends every year, irrespective of the fluctuations in the earnings. This policy does not imply that the dividend per share or dividend rate will never be increased. When the company reaches new levels of earnings and expects to maintain it, the annual dividend per share (or dividend rate) may be increased. The earnings per share and the dividend per share relationship under this policy is depicted in Figure 26.1

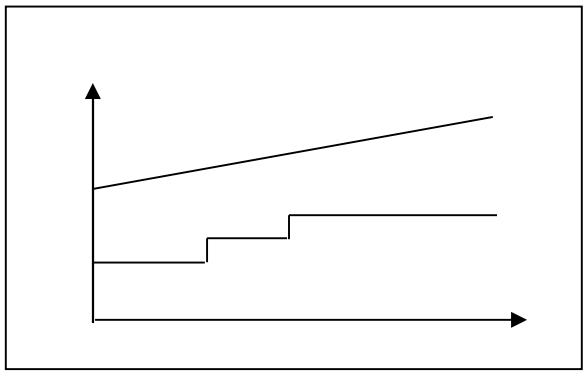


Figure- 7.1: Constant dividend per share policy

It is easy to follow this policy when earnings are stable. However, if the earnings pattern of a company shows wide fluctuations, it is difficult to maintain such a policy. With earnings fluctuating from year to year, it is essential for a company which wants to follow this policy to build up surpluses in years that are higher than the average earnings to maintain dividends in

years of below-average earnings. In practice, when a company retains earnings in good years for this purpose, it earmarks this surplus as a *reserve for dividend equalization*. These funds are invested in current assets like tradable (marketable) securities, so that they may easily be converted into cash at the time of paying dividends in bad years.

2. Constant Payout

The ratio of dividends to earnings is known as the payout ratio. Some companies may follow a policy of Constant Payout Ratio, i.e., paying a fixed percentage of net earnings every year. With this policy, the amount of dividends will fluctuate in direct proportion to earnings. If a company adopts a 40 per cent payout ratio, then 40 per cent of every Taka of net earnings will be paid out. For example, if the company earns Tk. 2 per share, the dividend per share will be Tk. 0.80 and if it earns Tk. 1.50 per share the dividend per share will be Tk. 0.60. The relation between the earnings per share and the dividend per share under this policy is exhibited in Figure 2.6.2.

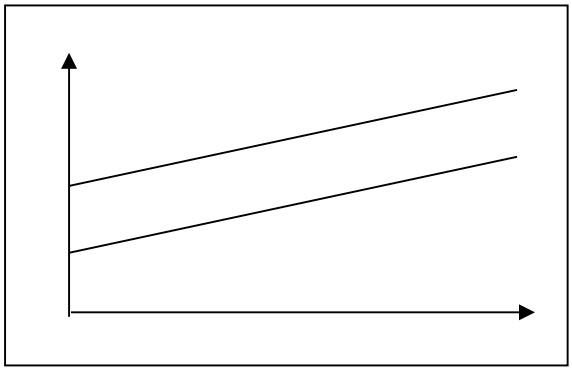


Figure-7.2: Dividend policy of Constant Payout ratio

This policy is related to a company's ability to pay dividends. If the company incurs losses, no dividends shall be paid regardless of the desires of shareholders. Internal financing with retained earnings is automatic when this policy is followed. At any given payout ratio, the amount of dividends and the additions to retained earnings increase with increasing earnings and decrease with decreasing earnings. This policy does not put any pressure on a company's liquidity since dividends are distributed only when the company has profits.

3. Small Constant Dividend per Share plus Extra Dividend

Under the constant dividend per share policy, the amount of dividend is set at a high level, and this policy is usually adopted by companies with stable earnings. For companies with fluctuating earnings, the policy to pay a minimum dividend per share with a step-up feature is desirable. The small amount of dividend is fixed to reduce the possibility of ever missing a dividend payment. By paying extra dividends (many companies in Bangladesh pay an interim dividend followed by a regular, *final dividend*). In periods of prosperity, an attempt is made to prevent investors from expecting that the dividend represents an increase in the established dividend amount. This type of policy enables a company to pay a constant amount of dividend regularly without default and allows a great deal of flexibility for supplementing the income of shareholders only when the company's earnings are higher than usual, without committing itself to make larger payments as a part of the future fixed dividend. Certain shareholders like this policy because of the certain cash flow in the form of regular dividends and the option of earning extra dividends occasionally.

We have discussed three forms of stability of dividends. Generally, when we refer to a stable dividend policy, we refer to the first form of paying a constant dividend per share. A firm pursuing a policy of stable dividend, as shown in Figure-7.1, may command a higher price for its

shares than a firm which varies its dividend amount with cyclical fluctuations in the earnings as depicted in Figure-7.2.

Significance of Stability of Dividends:

The stability of dividends has several advantages as discussed below**:**

- Resolution of investors' uncertainty;
- Investors' desire for current income;
- Institutional investors' requirements; and
- Raising additional finances.

Resolution of Investors' Uncertainty

When a company follows a policy of stable dividends, it will not change the amount of dividends if there are temporary changes in its earnings. Thus, when the earnings of a company fall and it continues to pay the same amount of dividends as in the past, it conveys to investors that the future of the company is brighter than suggested by the drop in earnings. Similarly, the amount of dividends is increased with increased earnings level only when it is possible to maintain it in the future. On the other hand, if a company follows a policy of changing dividends with cyclical changes in earnings, shareholders would not be certain about the amount of dividends.

Investors' Desire for Current Income

There are many investors, such as old and retired persons, women, etc., who desire to receive regular periodic income. They invest their savings in the shares intending to use dividends as a source of income to meet their living expenses. These investors who desire to receive a regular dividend income will prefer a company with stable dividends to one with fluctuating dividends.

Institutional Investors' Requirements

Shares of the company are not only purchased by individuals but also by financial, educational and social institutions and unit trusts. In Bangladesh, financial institutions such as BSB, BSTK, and ICB are some of the largest investors in corporate securities. Every company is interested in having these financial institutions on the list of their investors. These institutions generally invest in the shares of those companies which have a record of paying regular dividends. A company which has a history of adopting an erratic dividend policy may not be preferred by these institutional investors. Thus, to cater to the requirements of institutional investors, a company prefers to follow a stable dividend policy.

Raising Additional Finance

A stable dividend policy is also advantageous to the company in its efforts to raise external finances. A stable and regular dividend policy tends to make the share of a company a quality investment rather than a speculation. Investors purchasing these shares intend to hold them for long periods of time. The loyalty goodwill of shareholders towards a company increases with a stable dividend policy.

Review Questions

1. Discuss the concept of dividend policy.
2. What are the objectives of the dividend policy of a corporate firm?
3. Discuss the factors that influence the dividend policy of a corporate firm.
4. What are the major types of dividend policy of a corporate firm? Discuss.
5. Write two pros and cons of various forms of dividends of a corporate firm.
6. Discuss the significance and forms of stability of dividends.

7. From a managerial standpoint, how do a firm's liquidity and borrowing ability affect its dividend-payout ratio?
8. Define a stock dividend and a stock split. What is the impact of each on share value?
9. Are stock dividends valuable to investors? Why or why not?
10. If we wish to raise the share price, is it a good idea to have a reverse stock split? Explain.
11. If stock repurchase has a favourable tax effect, why would a company ever want to pay a cash dividend?
12. Is dividend policy a type of financing decision or is it a type of investment decision? Explain.

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