



NATIONAL OPEN UNIVERSITY OF NIGERIA

SCHOOL OF MANAGEMENT SCIENCES

COURSE CODE:

COURSE TITLE:



MBF720
FINANCIAL MANAGEMENT II

Course Team

Dr. Ishola Rufus Akintoye (Developer/Writer) - UI
Dr. Sabastian Seddi Maimako (Editor) - UNIJOS
Dr. O J. Onwe (Programme Leader) - NOUN
Mr. Emmanuel. U. Abianga (Coordinator) - NOUN



NATIONAL OPEN UNIVERSITY OF NIGERIA

National Open University of Nigeria
Headquarters
14/16 Ahmadu Bello Way
Victoria Island
Lagos

Abuja Office
No. 5 Dar es Salaam Street
Off Aminu Kano Crescent
Wuse II, Abuja
Nigeria

e-mail: centralinfo@nou.edu.ng
URL: www.nou.edu.ng

Published By:
National Open University of Nigeria

First Printed 2012

ISBN: 978-058-652-8

All Rights Reserved

CONTENTS	PAGE
Introduction.....	1
What You Will Learn in This Course.....	1
Course Aim.....	1
Course Objectives.....	2
Course Materials.....	3
Study Units.....	3
The Assignment File.....	4
Tutor-Marked Assignment.....	4
Final Examination and Grading.....	4
Summary.....	4

Introduction

MBF720 Financial Management II is a semester work of three credit units. It will be available to all students taking the B.Sc. programme in the School Management Sciences.

This course of 16 units involves financial management as an aspect of management and finance which will be useful at both micro and macro organisational levels.

The course guide tells you what this course MBF 720 is all about, the materials you will need to ensure you get the best and succeed. Other pieces of information contained in the course include how to make use of your time and the information on tutor marked assignments. There will be tutorial classes. Full details concerning this will be conveyed to you at the appropriate time.

What You Will Learn in This Course

This course consists of concept of cost of capital, capital structure theory, dividend theory and policy, concept of operating and financial leverages, capital structure and the value of a firm, concept of projects, how feasible and viable a project is, project planning and appraisal. It also includes the risk and returns of projects, portfolio theory and how to finance small and medium scale enterprises. Finally, international financial management, which focuses on the importance of managing funds and finances in organisations, will be highlighted.

Course Aims

This course will expose you to the concept of cost of capital, capital structure theory, dividend theory and policy, how to analyse project ideas, portfolio theory and how to finance small and medium scale enterprises so that it can be applied to various businesses, enterprises and organisations.

The course will help you to value financial management as an aspect of management and finance. It is beneficial to small, medium and large scale organisations.

You will also learn how to handle finances, manage funds and avoid insolvency in various organisations.

The aim will be achieved in the following ways

- Explaining the concept of cost of capital and methods of calculating it.
- Identifying and discussing the capital structure theory and approaches of capital structure and the value of a firm.
- Discussing the concept of operating and financial leverages and the degree of leverages and also analysing leverage ratios.
- Explaining dividend theory and policy alongside the value of a firm
- Discussing projects, its feasibility and viability and project planning and appraisal.
- Analysing the risk involved in carrying out projects compared to the returns of the project.
- Analysing capital asset pricing model and portfolio theory with illustrations.
- Highlighting ways of financing small and medium scale enterprises
- Discussing what goes on in international financial management.

Course Objectives

At the end of this course, you should be able to:

- distinguish between equity capital, preference share capital and debt capital and analyse cost of equity capital considering dividend growth model, dividend yield model, price earning model and capital asset pricing model.
- explain the meaning of capital structure and different components of capital structure and relationship between cost of capital and risk and discuss factors that determine capital structure decisions.
- discuss operating and financial leverages and analyse leverage ratios
- explain the M-M Theory with taxation and Apply Pecking Order Theory in capital structuring and differentiate between debt and equity.
- discuss what dividend theory is all about, highlight factors determining the dividend decisions of a firm, explain dividend theories and policies and briefly discuss the impact of dividend policies on the value of the firm.
- explain the types of projects, highlight the importance of project, project idea and identification and discuss the capital investment process.

- give a detailed analysis on how to conduct feasibility studies and reports as well as the viability of projects and SWOT analysis, draw a project organisational structure.
- highlight the need for investment appraisal and explain the various appraisal techniques with calculations.
- give the meaning of risk, determine of risk and return of single asset, of two-assets portfolio, of three-assets portfolio and ascertain the optimal portfolio of two assets, minimisation of risk through diversification of portfolio
- give the meaning of small and medium scale enterprises; explain the features, problems of small scale industries, sources and finance of SME's and government measures to enhance the status of SMI's.
- define foreign exchange management, explain the determinants of exchange rates, how to hedge off the foreign exchange risk, describe the theories of foreign exchange determination, and how to calculate the exchange rate

Course Materials

1. The Course Guide
2. Study Units
3. Textbooks
4. The Assignment File

Study Units

There are 16 units in this course and you should study them carefully.

Module 1

- | | |
|--------|---|
| Unit 1 | Cost of Capital |
| Unit 2 | Capital Structure Theory |
| Unit 3 | Operating and Financial Leverages |
| Unit 4 | Capital Structure and Value of the Firm |
| Unit 5 | Degree of Leverages |

Module 2

- | | |
|--------|-----------------------------------|
| Unit 1 | Dividend Theory |
| Unit 2 | Dividend Policy and Value of Firm |
| Unit 3 | Projects |
| Unit 4 | Feasibility and Viability |
| Unit 5 | Project Planning |

Module 3

Unit 1	Project Appraisal
Unit 2	Risk and Return
Unit 3	Capital Asset Pricing Model
Unit 4	Portfolio Theory
Unit 5	Financing SME
Unit 6	International Financial Management

The Assignment File

There will be an assignment in each unit. The exercises are tailored to help you have a full understanding of the course. Practise these assignments carefully, it will help you assess the course critically, consequently increasing your knowledge of the course.

Tutor-Marked Assignment

In doing the tutor-marked assignments, you should apply what you have learnt in the content of the study units.

These assignments, which are four in number, are expected to be turned in to your tutor for grading. They constitute 30% of the total score.

Final Examination and Grading

At the end of the course, you will write an examination. It will attract the remaining 70%. This makes the total final score to be 100%.

Summary

MBF720. Financial Management II shows you some of the objectives, the needs and the benefits of financial management. Most importantly, it shows you how to handle finances and how to manage them no matter how small.

At the end of this course, you would have learnt how to make proper use of funds of an organisation so as to achieve maximum results in small scale, medium scale and large scale enterprises.

Course Code	MBF720
Course Title	Financial Management II

Course Team	Dr. Ishola Rufus Akintoye (Developer/Writer) - UI Dr. Sabastian Seddi Maimako (Editor) - UNIJOS Dr. O J. Onwe (Programme Leader) - NOUN Mr. Emmanuel. U. Abianga (Coordinator) - NOUN
-------------	--



NATIONAL OPEN UNIVERSITY OF NIGERIA

National Open University of Nigeria
Headquarters
14/16 Ahmadu Bello Way
Victoria Island
Lagos

Abuja Office
No. 5 Dar es Salaam Street
Off Aminu Kano Crescent
Wuse II, Abuja
Nigeria

e-mail: centralinfo@nou.edu.ng
URL: www.nou.edu.ng

Published By:
National Open University of Nigeria

First Printed 2012

ISBN: 978-058-652-8

All Rights Reserved

CONTENTS	PAGE
Module 1	1
Unit 1 Cost of Capital.....	1
Unit 2 Capital Structure Theory.....	14
Unit 3 Operating and Financial Leverages.....	27
Unit 4 Capital Structure and Value of the Firm.....	36
Unit 5 Degree of Leverages.....	43
Module 2	49
Unit 1 Dividend Theory.....	49
Unit 2 Dividend Policy and Value of Firm.....	56
Unit 3 Projects.....	66
Unit 4 Feasibility and Viability.....	71
Unit 5 Project Planning.....	74
Module 3	80
Unit 1 Project Appraisal.....	80
Unit 2 Risk and Return.....	93
Unit 3 Capital Asset Pricing Model.....	104
Unit 4 Portfolio Theory.....	113
Unit 5 Financing SMEs.....	123
Unit 6 International Financial Management.....	130

MODULE 1

Unit 1	Cost of Capital
Unit 2	Capital Structure Theory
Unit 3	Operating and Financial Leverages
Unit 4	Capital Structure and Value of the Firm
Unit 5	Degree of Leverages

UNIT 1 COST OF CAPITAL

CONTENTS

1.0	Introduction
2.0	Objectives
3.0	Main Content
3.1	Cost of Equity Capital (K_e)
3.2	Cost of Retained Earnings (K_r)
3.3	Cost of Preferred Capital (K_p)
3.4	Cost of Debt (K_d)
3.5	Weighted Average Cost of Capital
3.6	Convertible Loan Stocks
4.0	Conclusion
5.0	Summary
6.0	Tutor-Marked Assignment
7.0	References/Further Reading

1.0 INTRODUCTION

The management of a company has the paramount responsibility of directing and controlling the company in the best interest of the owners (shareholders) and the investors. However, the main objective of a business firm is to maximise the wealth of its shareholders in the long run.

The management is therefore expected to invest only in those projects which give a return in excess of cost of funds invested in the projects of the business. This cost of funds committed to the projects of the business is what is called the cost of capital. The cost of capital refers to the rate of return the company has to pay to various suppliers of funds in the company. It can be described as the minimum rate of return that a firm must earn on its investments so that market value per share remains unchanged.

In other words, it is the minimum required rate of return on the investment project that keeps the present wealth of shareholders

unchanged. There are variations in the costs of capital due to the fact that different kinds of investment assume different levels of risk which is compensated for by different levels of return.

However, because different sources are opened to a business firm when raising funds basically, equity and debt and the determination of cost of funds become a phenomenon. Cost of capital is also referred to as cut-off rate, target rate, hurdle rate, minimum required rate of return and standard return. It consists of risk-free return plus premium for risk associated with the particular business. Risk premium represents the additional return paid to the providers of capital and debt as regards the associated business and financial risks.

In the NPV (Net Present Value) method, an investment project is accepted if it has positive NPV. The project's NPV is calculated discounting its cash flows by the cost of capital referred to as discounting rate. However, in the Internal Rate of Return method (IRR), the investment project is accepted if it has an IRR that is higher or greater than the cost of capital.

Meanwhile, the capital composition of a company is very essential. The capital structure of a typical company will include the following types of long-term capital.

- Ordinary (Equity) Share Capital
- Preference Share Capital
- Retained Earnings
- Debentures and Bonds
- Term Loans from Financial Institutions and Banks

In determining the optimal finance combination of a company, you will need to calculate the cost of particular finance being used and also the combined cost of capital i.e. the Weighted Average Cost of Capital (WACC).

2.0 OBJECTIVES

At the end this unit, you should be able to:

- explain what the cost of capital is
- distinguish between equity capital, preference share capital and debt capital
- identify the cost of equity capital considering dividend growth model, dividend yield model, price earning model and capital asset pricing model
- explain the cost of retained earnings

- explain the cost of redeemable and irredeemable preference share capital
- explain the cost of redeemable and irredeemable debentures
- describe convertible loan stocks
- identify Weighted Average Cost of Capital (WACC) of various sources of finance.

3.0 MAIN CONTENT

3.1 Cost of Equity Capital (Ke)

This is the ordinary shareholder's required rate of return which equates the present value of the expected dividends with the market value of the share. It can also be defined as the minimum rate of return that a company must earn on the equity share capital financial portion of an investment project to maintain the market price of the shares. Different methods are used in calculating cost of equity. These include the followings.

- Dividend Yield Method
- Dividend Growth Model
- Price Earning Method
- Capital Asset Pricing Model (CAPM)

Dividend Yield Method

Under this method, cost of equity is seen as the discounting rate that equates the present value of all expected future dividends per share with the current market price or the net proceeds of the sale of a share. Dividend valuation model states that: ex-dividend share price

$$= \frac{d_0 + \frac{d_1}{(1 + Ke)^1} + \frac{d_2}{(1 + Ke)^2} + \frac{d_n}{(1 + Ke)^n}}$$

Where, d = the constant dividend per share

Ke = Cost of equity share capital

n = year (time period)

Since this method assumes constant future dividend per equity share, then

$$MVe = \frac{d}{Ke}$$

$$\text{Therefore } K_e = \frac{d}{MVe}$$

Where MVe = ex-dividend market share price. This method does not allow for any growth rate in dividend but rather emphasises on future equity dividend expected to be constant.

SELF-ASSESSMENT EXERCISE 1

Ajegbe Ltd. is expected to disburse a dividend of 300k on each equity share of 100k. The current market price of share is 800k. Calculate the cost of equity capital as per dividend yield method.

Solution

$$K_e = \frac{d}{MVe} \quad d = 300k \text{ or } MVe = 800k$$

$$K_e = 300/800 = 0.375 = 37.5\%$$

SELF-ASSESSMENT EXERCISE 2

Odidere Ltd. issued 10,000 equity shares of 10k each at a premium of 2k each. The company has incurred issue expenses of N50. The equity shareholders expect the rate of dividend to be 18% p.a. Calculate the cost of equity share capital.

Solution

Since the equity shares are newly issued

$$K_e = \frac{d_i}{NP}$$

NP = Net proceeds of each equity share

$$d_i = 10 \times 0.18 = 1.8$$

$$NP = \frac{(10,000 \times 12) - 5000k}{10,000 \text{ equity shares}} = 11.50$$

$$K_e = \frac{1.80}{11.00} = 0.1565 \text{ or } 15.65\%$$

Note that the Market value per equity share is ex-div. Where the market value given is cum-div it should not be used. The amount of the dividend should be ascertained and deducted from the figure given to become ex-div.

Dividend Growth Model

In practice, yearly growth in dividend is expected. Dividend is not expected to remain unchanged in perpetuity. This method therefore makes provision for dividend growth.

Hence,

$$K_e = \frac{d_1}{MVe} + g$$

where d_1 = Expected dividend payable in year one per equity share

g = growth rate
BMVe = Market

d_1 which is the expected dividend payable in year one incorporates elements of growth. It is equal to the Latest/Current dividend paid plus growth in dividend.

$$d_1 = d_0 (1 + g)$$

where, d_0 = Latest / Current dividend paid

g = growth rate

$$\text{Therefore: } K_e = \frac{d_1}{MVe} + g \quad \text{OR} \quad \frac{d_0(1+g)}{MVe} + g$$

SELF-ASSESSMENT EXERCISE 3

OSU Nig Plc has an authorised share capital of 450 million of N1 each. 80% of the share capital had been issued and each share is currently valued at 320k. Dividend amounting to N16 million was recently paid. The estimated growth rate is 18%. Calculate the cost of equity capital.

Solution

Issued share capital = 80% of 50m = 40m shares = 40k

DPS = 16m / 40m shares

$$K_e = \frac{d_0(1+g)}{MVe} + g$$

$$K_e = \frac{40k(1.18) + 0.18}{320k}$$

$$K_e = 32.75\%$$

SELF-ASSESSMENT EXERCISE 4

The equity of Dangote Ltd. is traded in the market at 90k each. The expected current year dividend per share is 18k. The growth in dividend is expected at the rate of 6%. Calculate the cost of equity capital.

Solution

$$K_e = \frac{d_1}{MVe} + g = \frac{18 + 0.06}{90} = 0.20 + 0.06 = 0.26 \text{ or } 26\%$$

Estimating the Growth Rate

There are two methods of estimating the growth rate.

Dividend growth valuation method

Gordon's growth method/investment on earnings model.

Under Dividend growth valuation method:

$$g = \sqrt[n]{\frac{d_L}{d_B} - 1}$$

where g = growth rate

d_L = latest dividend

d_B = Base dividend

n = number of years

under Gordon's growth method

$$g = r \times b$$

where g = growth rate

r = return on investment

b = retention ratio/rate i.e. proportion of earnings retained.

SELF-ASSESSMENT EXERCISE 5

Given the following information about Obasanjo PLC

Issued shares of N1 each	N150, 000
Current dividend	6,158
Market value per share	3.42
Current earnings	62,858
Net assets	315,000
Dividend – 5 years ago	2,473

Estimate the dividend growth rate using
dividend growth valuation method
Gordon's growth method

Solution

$$g = \sqrt[n]{\frac{dL}{dB}} - 1$$

$$r = 5, dL = 6,158 \quad dB = 2,473$$

$$g = \sqrt[5]{\frac{6,158}{2,473}} - 1$$

$$g = \sqrt[5]{2.4900} - 1 = 20\%$$

NOTE: Where the dividends for the years are given year by year, then use n-1

(number of years data provided)

2) Gordon's

$$g = r \times b$$

$$r = \frac{62,858}{315,000} \times 100 = 20\%$$

$$b = \frac{62,858 - 6158}{62,858} = 90\%$$

$$g = 0.20 \times 0.90 = 18\%$$

Price Earning Method

This method incorporates the earnings per share (EPS) and the market price of the share. This is based in the assuring firm that the future earnings whether disbursed to the shareholders or ploughed back into the business will cause future growth in the earnings of the company as well as the increase in market prices of the share.

Therefore;

$$K_e = \frac{E}{M}$$

where E = Current earnings per share
M = Market price per share

Capital Asset Pricing Model

CAPM divides the required rate of return into two parts:

- Risk-free return
- Risk Premium

The risk premium is calculated by applying the project's beta factor (B) to the difference between the market return and the risk-free rates of the return.

$$K_e = R_f + B (R_m - R_f)$$

Where R_f = Risk-free rate of return
 R_m = Market portfolio's expected rate of return
 B = Risk measurement (Beta factor)
 $(R_m - R_f)$ = Market premium for risk
 $B(R_m - R_f)$ = Risk premium

3.2 Cost of Retained Earnings (Kr)

Retained earnings represent the funds accumulated over the years of the company by keeping part of the funds generated without distribution. It is the proportion of the total earnings of a company distributable to the equity shareholders but which is ploughed back into the business for further profitable investment opportunities. If the retained earnings are distributed among equity shareholders, the amount would have been reinvested to earn returns on it. The cost of retained earnings therefore is the return forgone by the equity shareholders and it is the opportunity cost of funds not available for reinvestment by the individual shareholders. The cost of retained earnings is therefore equivalent to

opportunity rate of earnings foregone by the equity shareholders. Hence, cost of equity includes retained earnings.

3.3 Cost of Preferred Capital (Kp)

The preference share capital represents the fixed dividend capital. It is easier to estimate because the interest received by the holder of the security is fixed by contract and will not fluctuate in amount. It may be redeemable or irredeemable. Redeemable preference shares are shares of the holders for which due sums are refunded at redemption in accordance with the terms under which the shares were issued and retained by the company.

Cost of Irredeemable Preference Shares

This is calculated as follows:

$$K_p = \frac{d}{MV_p}$$

where K_p = Cost of preference share capital
 d = Latest/Current dividend paid/payable
 MV_p = Market Value of preference shares ex-div

Cost of Redeemable Preference Shares

The cost of redeemable preference shares is the rate of interest (IRR) which equates the current market value with the discounted future cash receipts of the share.

$$MV_p = \frac{d_1}{(1+k_p)^1} + \frac{d_2}{(1+k_p)^2} + \frac{d_3}{(1+k_p)^3} + \dots + \frac{d_n}{(1+k_p)^n}$$

3.4 Cost of Debentures Capital

This is the minimum rate of return required by debenture holders in order to maintain their existing market value.

Cost of Irredeemable Debentures: It is given as:

$$K_d = \frac{I(1 - t)}{MV_d}$$

Where, K_d = Cost of debt capital
 I = Latest / Current interest paid/payable
 MV_d = Market value of debt ex-int
 t = Corporation tax rate

Cost of Redeemable debt

$$MVd = \frac{I_0(1-t)}{(1+kd)^1} + \frac{I_1(1-t)}{(1+kd)^2} + \dots + \frac{I_n(1-t)}{(1+kd)^n}$$

SELF-ASSESSMENT EXERCISE 6

XYZ Plc is financed by N10 million, 10% redeemable debentures currently quoted at N100 each. The debentures would be redeemed in 10 years time at par Corporation tax is at 30%. Calculate the cost of the debentures.

Solution

Yr	CF	DF @ 5%	PV	DF @ 5%	PV
0	(100)	1	(100)	1	(100)
1-10	10	7.7217	77	6.7101	67
1-10	(3)	7.7217	(23)	6.7101	(20)
10	100	0.6139	61	0.4632	46
			<u>15</u>		<u>(7)</u>

$$\begin{aligned}
 \text{Interpolation: IRR} &= R1 + \frac{(\text{Positive NPV})}{+NPV + -NPV} \times (R2 - R1) \\
 &= 5 + \frac{15}{22} \times (8-5) \\
 &= 7.05\%
 \end{aligned}$$

3.5 Weighted Average Cost of Capital (WACC)

This is also known as the composite cost of capital as it represents the aggregate of the costs of various sources of finance in use. Using WACC, the proportion of total capital coming from each source of finance is weighted. The weighted costs are then added to give the overall cost of capital that is known as the WACC. WACC derives its importance from the argument that it is not appropriate to use the cost of specific fund as the cost for a project, particularly where such projects are to be financed from the internal resources of the company.

- Method of Valuation
- Weight based on market value
- Weight based on book value

SELF-ASSESSMENT EXERCISE 7

Ade Cement Ltd. has the following Capital Structure:

Particulars	Market values	Book values	Cost %
Equity share capital	80	120	18
Preference share capital	30	20	15
Fully secured debentures	40	40	14

Calculate the company's weighted average cost of capital based on both market values and book values.

WACC based on market values

Type	MV	Cost	HASH Total
Equity	80	18%	14.4
Preference	30	15%	4.5
Debenture	40	14%	5.6
	<u>150</u>	<u>24.5</u>	

$$KW = \frac{HT}{MV} \times 100 = \frac{24.5}{150} \times 100 = 16.33\%$$

WACC based on book values

Type	MV	Cost	HASH
Total			
Equity	120	18%	21.6
Preference	20	15%	3.0
Debenture	40	14%	5.6
	<u>180</u>	<u>30.2</u>	

$$K_e = \frac{30.2}{180} \times 100 = 16.78\%$$

3.6 Convertible Loan Stocks

Convertible loan stocks are loan stocks that are changeable into ordinary shares at the option of the holder and under specific terms and conditions.

SELF-ASSESSMENT EXERCISE 8

Orimogunje Ltd. has issued 14% convertible debentures of N100 each. Each debenture will be convertible into 8 equity shares of N10 each at a premium of N5 per share. The conversion will take place at the end of 4 years. The corporate tax rate is assumed to be 40%. Assume that tax

savings occur in the same year that the interest payments arise. The flotation cost is 5% of the issue amount.

Calculate the cost of convertible debenture.

Solution

Yr	Particulars	CF	DF @ 14%	PV	DF @ 15%	PV
0	Net proceeds	(95)	1.000	(95.00)	1.000	(95.00)
1-4	Interest less $I(1-t)$	8.40	2.914	24.48	2.855	23.98
4	Conversion value	20	0.592	<u>71.04</u>	0.572	<u>68.64</u>
				<u>0.52</u>		<u>(2.38)</u>

$$K_d = 14 + \frac{0.52}{0.52 + 2.38} \times 1$$

$$14 + \frac{0.52}{2.9}$$

$$= 14 + 0.18 = 14.18\%$$

4.0 CONCLUSION

In this unit, you have learnt the different cost of capital with a number of illustrations and methods of calculating each cost of capital.

5.0 SUMMARY

Cost of capital has been seen as the minimum required rate of return that a company must attain to maintain its market value and the value of its shares. The cost of equity capital is estimated by using different methods which include Dividend Yield Method, Dividend Growth Model, Price Earnings Method and Capital Asset Pricing Model. Dividend growth rate can be ascertained either by using dividend growth valuation model or Gordon's growth model. Cost of preference shares, cost of debts, cost of convertible loan stocks and weighted average cost of capital are also dealt with.

6.0 TUTOR-MARKED ASSIGNMENT

1. Discuss briefly the different approaches to the computation of the cost of equity.
2. How can you determine cost of equity in a growth company?
3. Cost of capital is the sum of the minimum for business risk plus a premium for financial risk. Explain

4. Retained earnings have no cost. Do you agree? Give reasons for your answer.
5. N1.10 million ordinary shares currently valued at 3.00k per share financed CAB Ltd. A dividend of N6 million is due for payment. Calculate the cost of equity capital.
6. Oluwole Nig Plc. is financed by 60 million ordinary shares currently valued at 156k per share.

The results of the last five financial years are as follows:

Yr	Earnings	Dividend
2004	N20m	N15.6m
2003	N18m	N15m
2002	N16m	N13.2m
2001	N15.4m	N12.3m
2000	N13.9m	N11.1m

Calculate the company's cost of capital.

7.0 REFERENCES/FURTHER READING

Aborode, R. (2005). *Financial Management*.

Drury, C. (1987). *Management and Cost Accounting*.

Ravi, M.K. (2007). *Financial Management* (6th Ed.) Taxmann Allied Services (P.) Ltd

Van Horne J.C. & Wachowicz J.M. (1996). *Fundamentals of Financial Management*.

UNIT 2 CAPITAL STRUCTURE THEORY

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Factors Determining Capital Structure Decisions
 - 3.2 Optimum Capital Structure
 - 3.3 Gearing and Financial Risk
 - 3.4 Capital Structure Approaches
 - 3.5 M-M Theory (Modern View)
 - 3.6 Arbitrage
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

Capital Structure ordinarily implies the proportion of debt and equity in the total capital of a company. In other words, Capital Structure of a company is made up of equity and debt. Capital Structure borders on how a company finances its operations and it is usually made up of ordinary share capital, preference share capital and debt capital.

Equity consists of the following: equity share capital, share premium, surplus profits, and reserves and so on. On the other hand, debt of a company may consist of all borrowings from the government statutory financial corporations and other agencies, term loans from banks and other financial institutions, debentures and all deferred payment liabilities. Ordinarily, increase in debt in the Capital Structure implies greater amount of interest payment. Therefore, Capital Structure theory becomes a topic of interest because the introduction of fixed interest debt in a company's Capital Structure increases its financial risk. This is partly due to the fact that interest must be paid whatever happens to earnings. Since acceptance of more debt means payment of greater amount of interest, the company must have to think twice about its effects on profitability.

2.0 OBJECTIVES

At the end this unit, you should be able to:

- explain the meaning of Capital Structure and different components of Capital Structure
- describe the relationship between the cost of capital and risk
- explain gearing and financial risk
- explain Optimum Capital Structure
- identify factors influencing Capital Structure decisions
- explain Net income and Net operating income approaches of capital structuring
- explain Modigliani and Miller's view on capital structuring without taxation
- describe Arbitrage process under MM theory.

3.0 MAIN CONTENT

3.1 Factors Determining Capital Structure Decisions

Control The number of equity shares held by an individual shareholder determines his level of control and voting rights in the company. When the shareholders do not wish to dilute their control, the company will rely more on debt funds. This is because by funding through equity the control of the existing shareholders will be threatened.

- **Growth.** Companies with high growth rate will require more funds for its expansion schemes which will be met through raising debt. The company will have to rely on debt than on equity and internal earnings.
- **Profitability.** A company with higher profitability will have low reliance on outside debt and it will meet its additional requirement through internal generation.
- **Government Policy Government.** Policies and regulations play a major role in a company's Capital Structure. Monetary and fiscal policies of government have strong implication on the Capital Structure decisions of a company.
- **Legal Provisions.** In raising equity capital, a company has to fulfill some certain legal terms and conditions which make equity capital funds more complicated than raising debt. A company may opt for debt in an attempt to sideline the cumbersome process.
- **Company Size.** The companies with small capital base will rely more on owners' funds and internal earnings. Large companies

have to depend on capital market to augment their capital base for continued operation.

3.2 Optimum Capital Structure

The optimum Capital Structure is that Capital Structure or combination of equity and debt that lead to the maximisation of the value of the firm. The optimum Capital Structure minimises the overall cost of the firm and maximises the value of the firm. The introduction of debt to Capital Structure increases the earnings per share as the interest on debt is tax deductible, which results in increase of share price. However higher levels of debt funds in Capital Structure results in greater financial risk, leads to higher cost of capital and depress the market price of company's share. The firm must therefore endeavour to achieve and maintain the optimum Capital Structure, not dispensing with the value maximisation objective of the firm.

3.3 Gearing and Financial Risk

A company is a geared company if there is debt in its Capital Structure. When fixed interest debt is introduced into a company's Capital Structure, the financial risk is increased. Financial risk is the increased risk of equity holders due to financial gearing. It does not arise from a company's investment; it is due solely to the Capital Structure or more specifically to the level of gearing. The financial risk of a company's Capital Structure can be measured by a gearing ratio. Gearing ratio shows the proportionate relationship between fixed interest and equity capital in the finance of a business.

Forms of Gearing

$$1^{\text{st}} \text{ Gearing Ratio} = \frac{\text{Fixed interest capital} + \text{Pref. Share Capital}}{\text{Shareholders funds}}$$

$$2^{\text{nd}} \text{ Gearing Ratio} = \frac{\text{Fixed interest capital} + \text{Pref. Share Capital}}{\text{Capital Employed}}$$

$$3^{\text{rd}} \text{ Gearing Ratio} = \frac{\text{Total Debt}}{\text{Shareholders funds}}$$

Total debt includes all liabilities of the company. It does not however include preference share which for this ratio is taken as part of the shareholders funds.

$$4^{\text{th}} \text{ Gearing Ratio} = \frac{\text{Interest on debt}}{\text{EBIT}}$$

Advantages of Debt Capital

1. The administrative and issuing costs are normally lower than raising equity capital.
2. It has cost advantage due to the ability to set debt interest against profit for tax purposes.
3. The pre-tax rate of interest is invariably lower than the return required by the equity capital suppliers.

3.4 Capital Structure Theories

There are two main theories about the effect of changes in gearing on the WACC and share value.

These are:

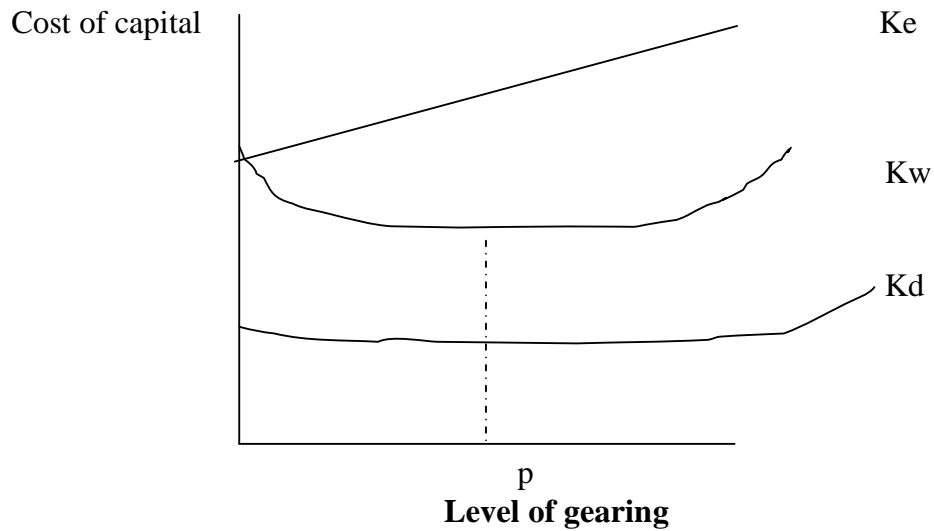
1. The Net Income Approach (Traditional view).
2. The Net Operating Income Approach.

Basic Assumptions of the Theory of Capital Structure

1. The gearing of a company is changed immediately by issuing debt to purchase shares or by issuing shares to purchase debt.
2. The company pays out all its earnings as dividends.
3. Business risk is constant regardless of how the company invests its funds.
4. Taxation and its effect on cost capital are ignored.
5. There are no transaction costs and a company can alter its Capital Structure without any transaction costs.

Net Income Approach

A decision about Capital Structure, according to this approach, is relevant to the valuation of the firm. This approach opined that an alteration in the Capital Structure of a firm causes change in the overall cost of capital (WACC) and also in the total value of the firm. This approach states that debt capital is cheaper than equity and that as such a company can increase its value by borrowing up to a reasonable limit. According to this approach, the value of the firm is equal to the market value of equity plus the market value of debt.

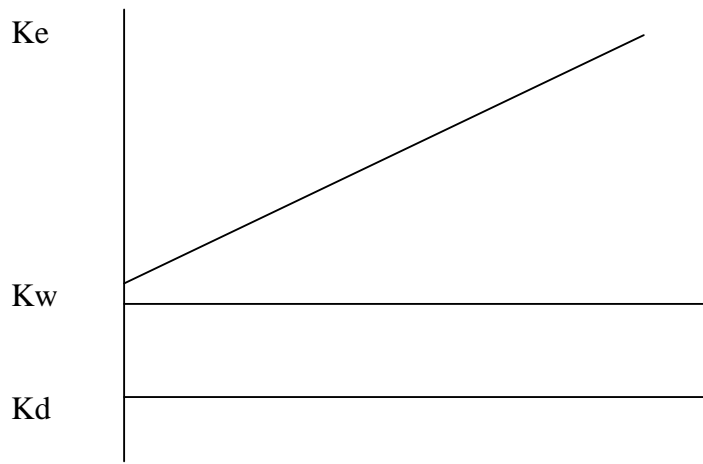


Under this approach, the following assumptions hold that:

1. the cost of debt will remain constant until a significant point is reached when it would start to rise.
2. the WACC will fall immediately an external source of finance is introduced and will be rising thereafter as the level of gearing increases.
3. the company's market value and the market per share will be maximised where WACC is at the lowest point (p).

Net Operating Income Approach

According to this approach, value of the firm is independent of its Capital Structure. It states that the way a company finances its operations is irrelevant in the determination of the company's market value. It assumes that the weighted average cost of capital remains unchanged irrespective of the level of gearing. It derives its strength from the assumption that, increase in debt capital increases the expected rate of return by the stockholders and the benefit of using relatively cheaper debt funds is offset by the loss arising out of the increase in cost of equity. Under this approach, optimal Capital Structure does not exist as WACC remains constant.



1. Cost of debt will remain constant regardless of the level of gearing.
2. The WACC will remain unchanged as the gearing increases.
3. The cost of equity will rise in such a way as to keep the WACC constant.

$$\text{The value of firm} = \frac{\text{EBIT}}{K_o}$$

$$\text{Value of Equity share} = \text{Value of firm} - \text{Value of debt}$$

Where EBIT = Earnings Before Interest and Tax

K_o = Overall cost of capital.

SELF-ASSESSMENT EXERCISE 1

A company has N10,000 debts at 10% interest and earns N10,000 a year before interest is paid. There are 4,500 issued shares and weighted average cost of capital of the company is 20%.

- a)
 - (i) What is the company's market value?
 - (ii) What is the cost of its equity capital?
 - (iii) What is the market value per share of its equity?
- (b) Suppose the company issues N10,000 additional debt at 10% interest to repurchase shares at the price calculated in (iii) above.

If the WACC remains unchanged:

- (i) Calculate the number of shares that were repurchased.

- (ii) What is the new cost of the equity capital?
 (iii) What is the new market value per share of its equity?

Solution

(a) (i) Earnings before interest and tax = N10,000
 WACC
 = 20%
 Market value of firm = $\frac{N10,000}{0.20} = N50,000$

(ii) Market value of firm = 50,000
 Less: Market value of debt = 10,000
 Market value of equity = 40,000

$$K_e = \frac{d}{MVe}$$

Dividend = Total earnings – Interest
 = N10,000 – N1,000 = N9,000

$$K_e = \frac{N9,000}{N40,000} \times 100 = 22.5\%$$

(iii) Market value per share = $\frac{N40,000}{4,500} = N8.89$

(b) (i) Number of repurchased shares = $\frac{N10,000}{N8.89} = 1,125$ shares

(ii) The new cost of equity capital

New market value = N40,000 – N10,000 = N30,000

New dividend = N9,000 – 10%(10,000) = N8,000

$$\text{New } K_e = \frac{N8,000}{N30,000} \times 100 = 26.67\%$$

(iii) New market value per share
 = $\frac{N30,000}{4,500 - 1,125} = \frac{N30,000}{3,375} = N8.89$

SELF-ASSESSMENT EXERCISE 2

Ota Ltd and Sango Ltd are identical in all respects including risk factors except for debt/equity mix. Ota Ltd. having issued 12% debentures of N3,000,000 while Sango Ltd. issued only equity capital. Both companies earn 24% before interest and taxes on their total asset of N5,000,000.

Assuming the corporate effective tax rate of 40% and capitalisation rate of 18% for an all-equity company. Compute the value of Ota and Sango Ltd. using:

Net Income approach and
Net Operating Income approach.

Solution

(i) Valuation of companies under Net Income approach:

<u>Particulars</u>	<u>Ota</u>	<u>Sango</u>
EBIT (5,000,000 x 0.24)	1,200,000	1,200,000
Less: Debenture interest @ 12%	<u>360,000</u>	<u> </u>
Profit before tax	840,000	1,200,000
Less: tax @ 40%	<u>336,000</u>	<u>480,000</u>
Net Income available to Equity shareholders i.e (dividend)	504,000 =====	720,000 =====

Market value of equity

$$MVe = \frac{d}{Ke}$$

Where d = Net income available to equity shareholder

Ke = Equity capitalisation rate

$$\text{Ota Ltd.} = \frac{504,000}{0.18} = \text{N2,800,000}$$

$$\text{Sango Ltd.} = \frac{720,000}{0.18} = \text{N4,000,000}$$

Market value of firm = MVe + MVd

Where MVe = Value of equity

MVd = Value of debt

$$\text{Ota} = 2,800,000 + 3,000,000 = \text{N}5,800,000$$

$$\text{Sango} = 4,000,000 + 0 = \text{N}4,000,000$$

(ii) Valuation of Companies under Net Operating Income Approach

Particulars

		<u>Ota</u>	<u>Sango</u>
Value of Firm = $\frac{\text{EBIT}}{K_o}$	$\frac{(1,200,000(1-0.4))}{0.18}$	4,000,000	4,000,000
Less: Value of debt	$(3,000,000 (1-0.4))$	1,800,000	
Value of Equity		<u>2,200,000</u>	<u>4,000,000</u>
Add: Value of debt		3,000,000	
Total Value of company		<u>5,200,000</u>	<u>4,000,000</u>

3.5 Modigliani and Miller Theory – MM's Theory

The original normative theory of company valuation and Capital Structure was put forward in form of a behavioural justification of the Net Operating Income approach by Franco Modigliani and Melton H. Miller (MM) in 1958. MM argues that a company's WACC remains unchanged at all levels of gearing, which implies that no optimal Capital Structure exists for a particular company. By using Arbitrage theory, they supported their argument that Capital Structure is irrelevant in determining the market value of a company. A change in debt-equity has no influence on the cost of capital and the market value of the firm.

Assumptions of the MM Theory

- The capital market is perfect. The implication is that cost of insolvency is nil, information is freely available to all investors, there are no limits of borrowing, and for every transaction there is a seller and a buyer.
- All securities are infinitely divisible.
- There are no transaction costs.
- Homogenous expectations. The investors have the same expectations, which are the same with that of the company.
- The debt is cheaper than equity. Increase in debt level will increase the cost of debt. The increased debt will increase the financial risk and expectations of the equity holders will be more. Thus, the WACC will remain constant for all levels of leverage.
- There are no personal taxes and corporate income taxes.
- All investors are only price takers.
- The stock markets are perfectly competitive.

M-M Theory: No Taxation

By MM Theory, the increase in cost of equity is just enough to offset the benefit of low cost debt when there is increase in the level of debt. Then average cost of capital is constant for all levels of leverage.

From the assumptions of the M-M theory, three propositions are set out:

Proposition I

This states that the market value of any firm is independent of its Capital Structure, altering the gearing ratio cannot have any effect on the company annual cash flow. Company's value is determined by the assets in which the company has invested and not how those assets are financed.

The value of the geared company is as follows:

$$MV_g = MV_u$$

$$MV_g = \frac{\text{Profit before interest}}{WACC}$$

$$MV_u = MV_g = \frac{\text{Earnings in ungeared company}}{K_u}$$

Where:

MV_g = Market value of a geared company
 MV_u = Market value of ungeared company
 K_u = Cost of equity in an ungeared company

Proposition II

The rate of return, required by shareholders increases in proportion to the debt-equity ratio. The cost of equity rises exactly in line with any increase in gearing to offset any benefits conferred by the use of cheap debt.

The cost of equity of a geared firm is calculated as follows:

$$K_g = K_u + [(K_u - K_d) \times \frac{D}{MV_g}]$$

Where:

K_g = Cost of capital in a geared company
 K_d = Cost of debt
 D = Value of Debt
 MV_g = Market value of a geared company

Proposition III

The cut-off rate for new investment will in all cases be average cost of capital and will be unaffected by the type of security used to finance the investment.

3.6 Arbitrage

The process of buying an asset or security in one market and selling the same in another market to derive benefit from the price differential is referred to as arbitrage. The arbitrage procedure involves that an investor will sell his shares in the company having the higher market value and move to the company having the lower market value lending or borrowing in order to carry out the arbitrage transaction. The word arbitrage is a technical term that refers to a situation where two identical commodities are selling in the same market for different prices. At equilibrium, the increase in demand will force up the price of the lower priced goods and increase in supply will force down the price of the high priced goods.

If two firms with same level of business risk but different levels of gearing sold for different values, then shareholders would move from over-valued firm to undervalued firm to maintain financial risk at the same level. The process of arbitrage would drive the price of the two firms to a common equilibrium total value.

Illustration:

The Capital Structure of XYZ Ltd. and PQR Ltd. are given below:

Particulars	XYZ	PQR
Equity capital	3,000,000	4,000,000
Debt 16%	<u>3,000,000</u>	<u> </u>
Total	6,000,000	4,000,000

Both companies are in the same class of business risk with earnings before interest of N1,800,000. Mr. X is holding equity of 5% in XYZ Ltd. He sold his shares and borrowed on interest at 16% p.a. Explain how Mr. X will be better off in switching his holding to PQR Ltd. under MM theory.

Solution

XYZ Ltd. profits available for distribution

	N
Profit before interest	1,800,000
Less: interest @ 16%	<u>480,000</u>
	1,320,000

Mr. X's share of profit $1,320,000 \times \frac{5}{100} = \text{N}66,000$

Value of shares sold = $\frac{5}{100} \times 3,000,000 = \text{N}150,000$

Value of shares to be bought in PQR = $\frac{5}{100} \times 4,000,000 = \text{N}200,000$

Amount borrowed = $200,000 - 150,000 = \text{N}50,000$

Mr. X's Net Gain

	N
Total earnings in PQR Ltd.	<u>1,800,000</u>
Mr. X's share in PQR ($1,800,000 \times \frac{5}{100}$)	90,000
Less: interest on personal loan ($80,000 \times \frac{16}{100}$)	<u>8,000</u>
Net earnings of X in PQR Ltd.	<u><u>82,000</u></u>

Net Gain = $\text{N}82,000 - \text{N}66,000 = \text{N}16,000$

Mr. X could increase his income by N16,000 while maintaining total risk at the same level.

4.0 CONCLUSION

In this unit, you have learnt the definition of Capital Structure, different theories of Capital Structure as well as the different types of Capital Structure.

5.0 SUMMARY

Capital Structure of a company consists of debt and equity components raised from long-term sources. The significant advantage of debt funds is fixed interest obligation and tax deductible. The debt equity ratio is a commonly used determinant of Capital Structure. In traditional approach, the optimum Capital Structure is determined at a profit where WACC is minimum and at this point the value of firm is maximised.

The net operating income approach on the other hand, states that the value of firm is independent of its Capital Structure. MM theory is considered as modern approach to Capital Structure. MM argue that the process of arbitrage will prevent the different market values for equivalent firms.

6.0 TUTOR-MARKED ASSIGNMENT

1. What are the factors to be considered in planning the Capital Structure of a company?
2. Critically examine the Net Income and Net Operating Income Approaches to Capital Structure.
3. Distinguish between Net Operating Income approach and MM Approach.
4. Briefly explain arbitrage notion of MM Theory.

7.0 REFERENCES/FURTHER READING

- Aborode, R. (2004). *Financial Accounting*. Lagos: Masterstroke Consulting.
- Isimoya, D.C. (1986). *Business Finance*. Yaba: Management Science Centre.
- Pandey, I.M. (1999). *Financial Management*. New Delhi: Vikas Publishing House PVT Ltd.
- Ravi, M.K. (2007). *Financial Management* (6th Ed.) Taxmann Allied Services Ltd.

UNIT 3 OPERATING AND FINANCIAL LEVERAGES

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Leverage Ratios
 - 3.2 Interest Cover and Income Gearing
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

Leverage refers to the ability of a firm to enhance returns to the owners in introducing long-term funds having a fixed cost. In other words, leverage is the employment of fixed assets or funds for which a firm had to meet fixed costs or fixed ratio of interest obligation, irrespective of the level of activities attained or the level of operating profit earned. Leverage ratios can be classified into two groups (a) Activity Leverage and (b) Structural Leverage.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the meaning of leverage
- describe the operation and financial leverages
- analyse leverage ratios
- describe what trading on equity' is
- distinguish between debt and equity
- identify the impact of gearing on cost of capital and EPS of the firm.

3.0 MAIN CONTENT

3.1 Leverage Ratios

- a) Activity Leverage.

This includes three ratios

- i. Operating Leverage.

- ii. Financial Leverage.
- iii. Total Leverage.

i. Operating Leverage.

This has to do with the normal operation of a firm. It arises from the operating activity of the firm. It relates to the sales and profit variations. Operating leverage is the responsiveness of firm's EBIT to the changes in sales value.

$$\text{i.e. Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}}$$

OR

Contribution
Operating Profit.

Operating leverage of a firm is determined by the fixed cost and variable cost mix of the firm. If the firm has high level of fixed cost and low variable cost, the operating leverage would be higher. The low operating leverage is dictated by high variable cost and low fixed cost. The percentage change in EBIT resulting from a percentage change in sales can be measured and this is called degree of operating leverage.

$$\text{Degree of Operating leverage} = \frac{\text{Percentage change in EBIT}}{\text{Percentage change in sales}}$$

$$\text{Or} = \frac{\% \Delta \text{EBIT}}{\% \Delta Q}$$

$$\text{Or} = \frac{Q(P - V)}{Q(P - V) - F}$$

Where, Q = Quantity produced and sold

P = Selling price per unit

V = Variable cost per unit

F = Operating fixed costs

Operating Leverage is present in the firm if

$$\frac{\% \Delta \text{EBIT}}{\% \Delta Q} > 1$$

$$\% \Delta Q$$

SELF-ASSESSMENT EXERCISE 1

Firms A and B manufactures the same product and their cost sheets are given below

	A	B
Units manufactured and sold	20,000	20,000
	N	N
Direct material	10	10
Direct labour	5	5
Variable overheads	<u>5</u>	<u>5</u>
	20	20
Contribution	<u>10</u>	<u>10</u>
Selling price		
	<u>30</u>	<u>30</u>

Assuming the fixed overheads of 100,000 and 150,000
Calculate the operating leverages for the two firms.

Solution

	A	B
	N	N
Contribution for 20,000 units	200,000	200,000
Less: Fixed overheads	<u>100,000</u>	<u>150,000</u>
EBIT		
	100,000	50,000
Contribution		
	200,000	200,000
EBIT	100,000	50,000
Operating leverage	2	4

Firm A's operating leverage is twice of B as the fixed overheads are higher. The higher the operating leverage ratio the more risky the situation.

(ii) Financial Leverage

This has to do with the financing activities of a firm. It refers to the use of debt in the Capital Structure. The financial leverage is an indicator of responsiveness of firm's EPS to the changes in its profit before interest and tax. When this ratio is considered along with the operating ratio, it gives a fair idea about the firm's earning, its fixed costs and the fixed interest expenses. The degree of financial leverage is an attribute of the firm's exposure to financial risk.

$$\text{Financial Leverage} = \frac{\text{EBIT}}{\text{EBT}}$$

Where EBIT = Earnings Before Interest and Tax
EBT = Earnings Before Tax

The degree of financial leverage is expressed as follows:

$$\begin{aligned} \text{DFL} &= \frac{\text{Percentage change in EPS}}{\text{Percentage change in EBIT}} \\ \text{Or} &= \frac{\% \Delta \text{EPS}}{\% \Delta \text{EBIT}} \quad \text{or} \quad \frac{\Delta \text{EPS}/\text{EPS}}{\Delta \text{EBIT}/\text{EBIT}} \end{aligned}$$

EPS is estimated as below:

$$\text{EPS} = \frac{(\text{EBIT} - I) (1 - t) - D_p}{N}$$

Thus Degree of financial leverage can also be expressed as follows:

$$\text{DFL} = \frac{\text{EBIT}}{(\text{EBIT} - I) (1 - t) - D_p}$$

Where I = Interest on long-term debt

t = Corporate tax rate

Dp = preference dividend.

SELF-ASSESSMENT EXERCISE 2

The following information is available for Orimogunje Ltd. for the year ended 31st March, 2005.

Interest on debt	N400, 000
Preference dividend	N200, 000
Corporate tax	40%

Calculate the degree of financial leverage.

- (i) if EBIT is N1,000,000
- (ii) if EBIT is N1,500,000

Solution

$$\text{DFL} = \frac{\text{EBIT}}{\text{EPS}} = \frac{\text{EBIT}}{(\text{EBIT} - I) (1 - t) - D_p}$$

$$\begin{aligned} \text{(i)} \quad \text{DFL} &= \frac{1,000,000}{(1,000,000 - 400,000) (1 - 0.4) - 200,000} = \frac{1,000,000}{600,000 (0.6) - 200,000} \\ &= \frac{1,000,000}{160,000} = 6.25 \end{aligned}$$

$$\text{(ii)} \quad \text{DFL} = \frac{1,500,000}{1,100,000 (0.6) - 200,000}$$

Favourable or unfavourable financial leverage can arise depending on the firm's earnings on the assets and fixed financing cost paid. It is favourable when the firm earns more on the assets purchased than the fixed financing cost paid. On the contrary, excess of financing costs over profits results in unfavourable or negative leverage. Higher financial leverage means higher EBIT resulting in higher EPS, if other things (variables) remain the same. Financial leverage generally raises expected EPS, but it also increases the riskiness of securities as the debt-asset ratio rises. Financial leverage has its impending effect on a firm's WACC and value.

Increase in financial leverage will reduce WACC and bring about increase in the market price of equity shares and value of the firm. On the contrary, decrease in financial leverage will cause increase in WACC and decline in the value of the firm.

(iii) Total Leverage

Total leverage may be defined as the potential use of fixed costs, both operating and financial which magnifies the effect of sales volume change on the EPS of the firm. The total leverage is also called "Combined Leverage". Total leverage degree can be calculated as follows:

$$DTL = \text{Operating Leverage} \times \text{Financial Leverage}$$

$$\text{Or} = \frac{\text{Contribution}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}}$$

$$\text{Or} = \frac{\text{Contribution}}{\text{EBT}} \quad \text{or} = \frac{\Delta \text{EPS}/\text{EPS}}{\Delta Q/Q}$$

Substituting the value EPS:

$$QTL = \frac{Q(P - V)}{Q(P - V) - F - I - \frac{Dp}{1 - t}}$$

(b) Structural Leverage

This encompasses ratios that express the relationship between owner's capital and outsider's stake in the firm. These ratios are also called capital gearing ratios. They are:

1. Debt-Equity ratio
2. Total debt-equity ratio
3. Debt-Net worth ratio.

1. Debt-Equity Ratio.

This ratio is the most significant of leverage ratios as it gives the composition of the long-term funds of the firm in terms of the stake of the owners and outsiders in the business.

$$\frac{\text{Long term Debt}}{\text{Shareholder funds}}$$

Shareholder funds include equity capital and free reserves. A high ratio indicates large outside stake in the business. The preference capital is usually excluded from long term debt but if the ratio is to show effect of use of fixed interest sources on earnings available to the shareholders then, it is to be included. On the other hand, if the ratio is to examine financial solvency, then preference shares shall form part of the capital.

2. Total Debt-Equity Ratio

Here, total debt includes not only long-term debt but also current liabilities.

$$\frac{\text{Long-term Debt} + \text{Short-term liabilities}}{\text{Shareholders Funds}}$$

The inclusion of current liabilities in debt-equity ratio is justified by the fact that the sundry creditors can exert pressure on the management.

3. Debt-Net worth Ratio.

This ratio relates to the long-term debt with the network of the firm, that is, the capital and free reserves less intangible assets.

$$\frac{\text{Long-term Debt}}{\text{Net worth}}$$

This ratio is justified on the basis that it excludes invested capital in fictitious assets like deferred expenditure.

3.2 Interest Cover and Income Gearing

This ratio is calculated to analyse the company's ability to meet interest obligations. It is measured as a ratio of profit before interest and tax to interest charges.

$$\frac{\text{Profit Before Interest and Tax}}{\text{Interest Charges}}$$

The inverse of the interest cover is called income gearing indicating the proportion of pre-tax earnings committed to prior interest charges.

$$\frac{\text{Interest charges}}{\text{Profit before interest and tax}} \times 100$$

Capital Gearing Ratio

This ratio is the proportion of the fixed return capital to the total capital. It is given as:

$$\frac{\text{Fixed Return capital}}{\text{Total Capital}}$$

$$= \frac{\text{Long-term debt} + \text{Preference Capital}}{\text{Long-term debt} + \text{Preference Capital} + \text{Equity Capital} + \text{Reserves}}$$

SELF-ASSESSMENT EXERCISE 3

Busayo and Papa Ltd.'s balance sheet shows the following structure of finance for the year ended 31st March, 2009.

	N
Equity share capital (5,000,000 of N1 each)	5,000,000
Pref. Share capital (12%) (100,000 share of N10 each)	1,000,000
Share premium	2,000,000
General Reserve	1,500,000
Non-Convertible Debentures (14%)	4,000,000
Current Liabilities	<u>500,000</u>
Total assets	14,000,000

The profit earned during the year before interest payments and tax at 40% amounted to N3, 400,000. Board of Directors recommends a dividend at 18% on equity shares.

You are required to calculate

- Capital gearing ratio
- Income gearing ratio

Solution

(a) Capital gearing ratio = Long-term debt + Pref. Capital

Long-term debt + Pref. Capital + Equity Capital + Reserves

$$\frac{40 + 10}{40 + 10 + 50 + 20 + 15} \times 100 = \frac{50}{135} = 37.04\%$$

The gearing ratio is small and the company's financial risk is lesser.

(b) Income Gearing ratio

$$= \frac{\text{EBIT}}{\text{Fixed Interest}} = \frac{34}{5.60} = 6.07 \text{ times}$$

4.0 CONCLUSION

In this unit, you learnt the definition of leverage, analysis of leverage ratios and the distinction between debt and equity.

5.0 SUMMARY

The fixed interest debt component is used in total Capital Structure to enhance the return to the equity shareholders. But the risk will increase in times of unfavourable business condition.

Leverage refers to the ability of a firm to employ long-term funds having a fixed interest to enhance returns to the owners.

It is expressed as Contribution/Net Profit:

If the operating leverage is higher, the company is subjected to greater degree of business risk.

Financial leverage refers to the use of debt component in Capital Structure and the effect of payment of fixed interest on firm's profitability. It is EBIT / EBT.

The higher the combined leverage the firm is subjected to, the greater the risk which includes both business risk and financial risk.

6.0 TUTOR-MARKED ASSIGNMENT

1. Explain the concept of operating and financial leverage.
2. Distinguish between Structural leverage and financial leverage.

3. Distinguish between Structural leverage and Capital gearing ratio.
4. Given that the fixed expenses of Busayo and Papa is N400, 000;

Calculate:

- a. operating leverage
- b. financial leverage
- c. total leverage
- d. interest cover

7.0 REFERENCES/FURTHER READING

Drury, C. (1987). *Management and Cost Accounting*.

Pandey, I.M. (1999). *Financial Management*. New Delhi: Vikas Publishing House PVT Ltd.

Ravi, M.K. (2007). *Financial Management* (6th Ed.). Taxmann Allied Services (P.) Ltd.

UNIT 4 CAPITAL STRUCTURE AND VALUE OF THE FIRM

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 MM Theory with Corporate Taxation
 - 3.2 MM Theory with Personal Taxation
 - 3.3 Pecking Order Theory
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

In unit 2, MM theory was treated with the tax relief being ignored. The assumption that there is no corporate tax is unrealistic for a corporate firm. From this perspective, MM has modified their theory by considering tax relief available to a company when the debt component is existing in the Capital Structure.

2.0 OBJECTIVES

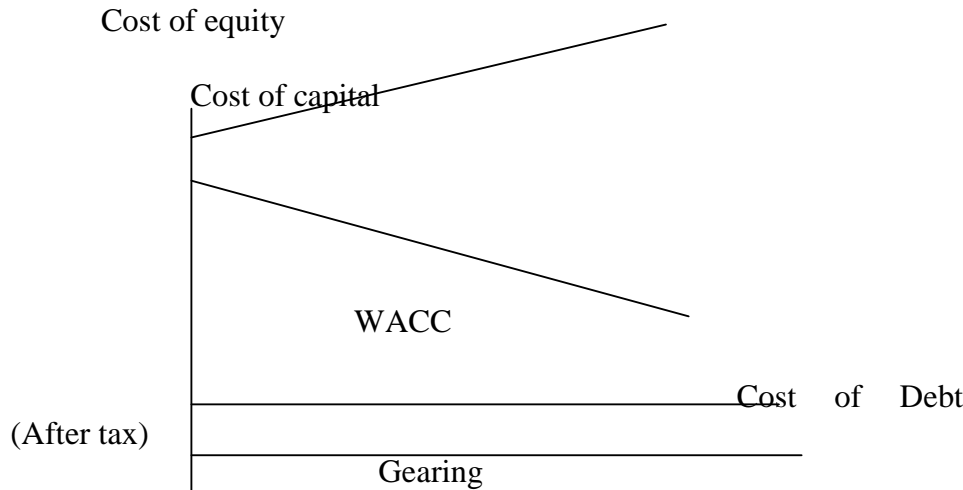
At the end of this unit, you should be able to:

- explain the M-M Theory with taxation.
- analyse the application of Pecking Order Theory in capital structuring
- describe the Modified Pecking Order suggested by Myers.

3.0 MAIN CONTENT

3.1 MM Theory with Corporate Taxation

Here, the MM theory demonstrates a situation of a firm where corporate taxation is put under consideration. The tax burden on the company will lessen to the extent of relief available on interest payable on the debt, which makes the cost of debt cheaper and reduces the WACC of the firm to the lowest where Capital Structure of a company has debt component.



As the level of gearing increases, the WACC will be reducing and the company's market value will be maximised at 100% level of gearing. The increase in the value of the company is the present value of further tax relief referred to as a tax shield. They assumed that the value of the geared company will always be greater than an ungeared company with similar business risk, but only by the amount of debt-associated tax saving of the geared company. So, at equilibrium price the market value of a geared company is equal to the market value of its ungeared counterpart plus the debt assisted tax shield.

At equilibrium

$$MV_g = MV_u + Dt$$

Where,

MV_g = Market value of the geared company

MV_u = Market value of an ungeared company

D = Market value of debt capital

t = Corporate tax rate

Cost of Capital of a Geared Company

$$K_g = (K_e \times \% \text{ of Equity}) + (1 - t) (K_d \times \% \text{ of Debt})$$

Where

K_g = WACC

K_e = Cost of Equity capital

K_d = Cost of debt capital (Pre-tax)

Cost of Equity Capital of a Geared Company

$$K_{eg} = K_u + (1 - t) (K_u - K_d) \times \frac{D}{E}$$

Veg

Where,

K_{eg} = Cost of Equity capital in a geared companyK_u = Cost of capital of an ungeared companyK_d = Cost of debt capital (Pre-tax)

D = Debt capital

t = Corporate tax rate

SELF-ASSESSMENT EXERCISE 1

Mr. Fash Ltd. has the following Capital Structure:

	N
Equity Capital	3,000,000
Debt (16%)	<u>6,000,000</u>
	9,000,000

Corporate tax rate is 40%. The cost of equity is assumed to be 24%.

Calculate the WACC of the company.

Solution

$$K_g = (24\% \times \frac{30}{90}) + (1 - 0.4) (16\% \times \frac{60}{90}) = 8\% + 6.4\%$$

$$= 14.4\%$$

WACC of a geared company in a tax world is also given as:

$$K_w(g) = K_w(u) \left[\frac{1 - T \frac{D}{E}}{1} \right]$$

K_w(g) = WACC of ageared companyK_w(u) = WACC of an ungeared companyV_d = Market value debtV_e = Market value of Equity

T = Corporation tax rate

SELF-ASSESSMENT EXERCISE 2

Yar'Adua owns 1% of the equity of Atiku Plc a geared company with 1m N1 ordinary shares having a market value of N1.10 per share and N600,000 10% debentures valued at N80. Yar'adua transfers his funds to Obasanjo Plc, an ungeared company. Both firms are in the same type of business susceptible to the same degree of business risk and both firm generate income before debenture interest of N200, 000.

Obasanjo Plc is financed by 1.2 million N1 ordinary shares with a market value of N1.05 per share.

Yar'adua on selling his shares in Atiku Plc would have to borrow sufficient funds in order to buy 1% of Obasanjo Plc.

You are required to calculate:

Yar'adua's present income from Atiku Plc.

His income on switching funds to Obasanjo Plc.

The gain to Yar'adua on switching

The equilibrium position (Assuming only Obasanjo Plc's equity changes in value).

Solution

	Atiku Plc	Obasanjo Plc
	N	N
Equity		
	1,100,000	1,260,000
Debt		
	<u>480,000</u>	<u>-</u>
	<u>1,580,000</u>	<u>1,260,000</u>
EBIT		
	200,000	200,000
Less: Interest		
	<u>60,000</u>	<u>-</u>
	140,000	200,000
Less: Tax at 40%		
	<u>56,000</u>	<u>80,000</u>
Dividend		
	<u>84,000</u>	<u>120,000</u>

Yar'adua's present income in Atiku plc = 1% of 84,000 = N840

	N
(b) To invest 1% in Obasanjo plc = 1% of 1,260,000	12,600
Sales in Atiku plc 1% of 1,100,000	<u>11,000</u>
To borrow	<u>1,600</u>
Income from Obasanjo plc 1% of N120,000	1,200
Less: Interest N1600 x 12.5%	<u>(200)</u>
	<u>1,000</u>

Note: The interest rate on borrowing = Kd
 Kd (Cost of debt) is pre-tax
 Kd used is pretax i.e. $Kd = \frac{I}{MVd}$ as against
 $Kd = \frac{I(1-t)}{MVd}$
 $Kd = \frac{10}{80} = 12.5\%$

(c) Gain on switching funds	
Net income after switching	1,000
Income before switching	<u>840</u>
	<u>160</u>
(d) Equilibrium position	
$MVg = MVu + Dt$	

Since it is Obasanjo plc's market value that must change

$$\begin{aligned}
 MVu &= MVg - Dt \\
 MVu &= 1,580,000 - (480,000 \times 0.4) \\
 &= 1,580,000 - 192,000 \\
 &= 1,388,000
 \end{aligned}$$

3.2 Mm Theory with Personal Taxation

MM theory considered only corporate taxes. However, Miller (1977) included the effect of personal as well as corporate taxes in Capital Structure theory. He argued that the existence of tax relief on debt interest but not on equity dividends would make debt capital more attractive than equity capital to companies. Companies must be ready to offer a higher return on debt in order to attract greater supply of debt.

When the company offers an after-personal-tax return on debt at least equal to the after-personal-tax return on equity, equity supply will switch over to debt supply to the company. This is based on the assumption that interest payments on debt are allowed as a tax deduction whereas dividends on equity capital are not allowed for tax deduction.

3.3 Pecking Order Theory

This theory was proposed by Donaldson in 1961 and modified by Meyers in 1984. The theory asserts that a company's Capital Structure is more dependent on internal cash flows, cash dividend payment and acceptable investment opportunities ($NPV > 0$).

This theory states that when a company wants to finance its long-term investments, it selects by following a well defined order of preference with respect to the sources of finance it uses. At the initial stage, the firm will prefer to use internally generated funds. If the internal funds are insufficient to meet its investment requirements then it will prefer raising external funds in the form of term loans and then non-convertible debentures and bonds and then convertible debt instruments.

The last to be considered is in the form of new equity capital. This theory says therefore that:

- firms prefer internal financing to external financing
- if firms choose external financing, they will issue the safest security first i.e. they will choose debt before equity financing.
- as a firm source for external funds, it will follow the pecking order of securities.

Pecking Order Assumptions.

- There are no costs involved in using internally generated funds.
- It is expensive to raise external funds.
- Raising of debt is relatively cheaper than raising of equity funds.
- Raising of term loans from banks and financial institutions is cheaper than issuing debt securities for raising finances.
- Issue of equity capital involves relatively high issue cost.
- Servicing of debt funds is cheaper than servicing of equity funds.

4.0 CONCLUSION

In this unit, you learnt the definitions of management, the three dimensions of management, and the need for management and the levels of management.

5.0 SUMMARY

Originally, MM theory has ignored the corporate and personal taxation, but later Miller modified the theory by considering tax relief available to a geared firm.

As per Pecking order theory, if the firms require external financing they will issue the safest security first in order of term loans, unsecured debentures, secured debentures, convertible debentures, preference shares, convertible preference shares and finally in the form of new equity shares.

6.0 TUTOR-MARKED ASSIGNMENT

1. How are corporate taxation and personal taxation incorporated in MM theory?
2. Write short notes on Pecking Order theory of Capital Structure.
3. Sango Ltd. has earnings before interest and tax (EBIT) of N3,000,000 and a 40% tax rate. Its required rate of return on equity in the absence of borrowing is 18%. In the absence of personal taxes, what is the value of the company in an MM world?

With no leverage.

With N4, 000,000 in debt.

With N7, 000,000 in debt.

7.0 REFERENCES/FURTHER READING

Drury, C. (1987). *Management and Cost Accounting Ltd.*

Ravi, M.K. (2007). *Financial Management* (6th Ed.) Taxmann Allied Services Ltd.

Ravi, M.K. (2007). *Financial Management* (6th Ed.) Taxmann Allied Services.

UNIT 5 DEGREE OF LEVERAGES

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Distinction between Debt and Equity
 - 3.2 Trading on Equity
 - 3.3 Gearing
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

In unit 3, the meaning and various forms of leverages have been considered. This unit further discusses the degree of leverage especially how it affects the return to the equity shareholders. Finally, distinction between debt and equity will be made.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the meaning of trading on equity
- analyse the impact of gearing on cost of capital and EPS of the firm
- distinguish between debt and equity.

3.0 MAIN CONTENT

3.1 Distinction between Debt and Equity

- a. Debt and equity are different on the following grounds.
- b. Debt capital is repayable to the providers while equity capital is not repayable.
- c. The interest on debt is mandatory but dividends on equity are not compulsory.
- d. Interest on debt is tax deductible while dividend on equity is not.
- e. Introduction of debt in a firm's Capital Structure increases the financial risk. However, equity cannot increase a firm's financial risk.
- f. Debt has a relatively cheaper issuing cost.
- g. With the issue of debt, there is no control dilution; whereas, new issue of equity may lead to control dilution.

- h. Debt has a less future financing flexibility compared to equity.
- i. It is often easier to issue debt to financial institutions than equity.

3.2 Trading on Equity

Trading on equity refers to the practices by which a firm uses borrowed funds and preference capital carrying a fixed charge in a way to obtain a higher return to the equity shareholders. The concept of trading on equity has direct impact on shareholders wealth because all investing, financing and dividend decisions are taken in view of maximisation of wealth of the owners. The debt funds are less risk bearing compared to equity funds since the providers of debt have prior claims on income and assets of the firm over equity holders.

While the financial leverage explains the impact of EPS, trading on equity shows the impact on equity capital. It is calculated by taking difference of rate of return on equity capital by having equity and debt components in Capital Structure to rate of return on equity by having only equity share capital in the Capital Structure.

Illustration

Profitability Statement of Onikoko Ltd.

Financial Alternatives

	A1	B1	C1
	Nm	Nm	Nm
Total Assets			
	<u>600</u>	<u>600</u>	<u>600</u>
Equity share capital	600	400	200
12% Debentures			
	<u>-</u>	<u>200</u>	<u>400</u>
	<u>600</u>	600	600
Earnings before interest and tax	200	200	200
Less: interest on debentures @ 12%			
	<u>-</u>	<u>24</u>	<u>48</u>
Earnings before tax	200	176	152
Less: tax @ 40%			
	<u>80</u>	<u>70.4</u>	<u>60.8</u>
	<u>120</u>	<u>105.6</u>	<u>91.2</u>
Return on equity	20%	26.4%	45.6%

In alternative A where there is no debt component, the company can earn only 20% return on equity. In B, by having debt component, the return on equity increases. In C, it rises further but it is important to note that if the debt component exceeds the desired level, the firm is prone to financial risk and bankruptcy risk.

3.3. Gearing

This term refers to the amount of debt finance a company uses relative to its equity finance. A company is highly geared where there is high level of debt component in its Capital Structure. It can be calculated with the help of debt-equity ratio or capital gearing ratio i.e. (long-term debt/capital employed).

There are some problems associated with high level of gearing.

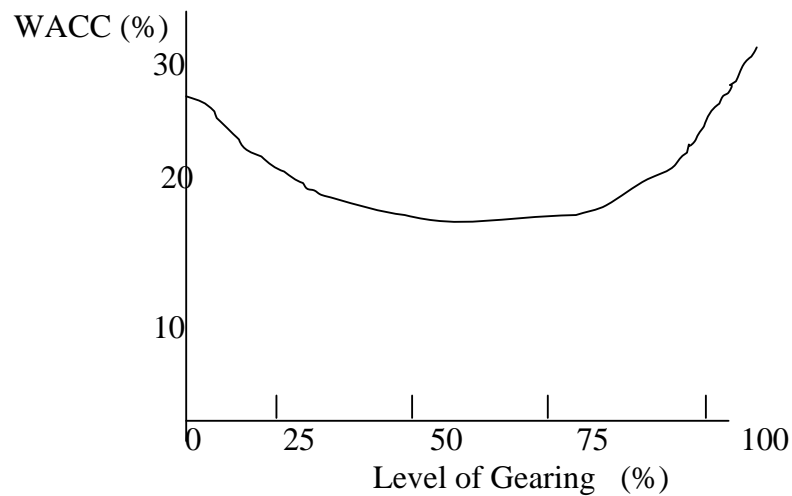
- a. A highly geared company is subject to financial risk.
- b. There is an increased possibility of bankruptcy risk.
- c. Due to high levels of financial and bankruptcy risk a firm is exposed to, its equity shares stock market prices will be quoted less.
- d. The profitability and earnings of the company will be threatened due to changes in interest rates of different debt components.

If the level of gearing increases, the expected return of equity shareholders will also increase along with the increase in financial risk and bankruptcy risk. The expectation of providers will also be more to compensate for taking higher levels of financial risk and bankruptcy risks.

Gearing and cost of capital

Empirically, the proportion of debt in a firm's Capital Structure has relatively little impact on the cost of capital.

Graphically



So long as the existing gearing of the company is within the optimum range say 30% and 60%, the proportion of debt in a company's Capital Structure has little effect on a company's cost of capital.

Gearing and EPS

Gearing has considerable effect on the earnings attributable to the equity shareholders. A highly geared firm must earn enough profits to cover the interest on debt before any profit is made available for distribution to the equity holders.

Illustration

Dauda Ltd. is setting up a project with a cost of N5, 000,000. It is considering the following three alternatives for financing the project.

Alternatives	1	2	3
Equity			
	5,000,000	4,000,000	2,000,000
Debt (15%)			
	=	<u>1,000,000</u>	<u>3,000,000</u>
	5,000,000	5,000,000	5,000,000

The company estimated earnings per year is N2, 000,000, and the corporate tax is 40%. Calculate the earnings per share in the three different alternatives.

Solution

	1	2	3
	N	N	N
Earnings before interest and tax	2,000,000	2,000,000	2,000,000
Less: Interest 15%			
	=	<u>150,000</u>	<u>450,000</u>
	2,000,000	1,850,000	1,550,000
Less: Corporate tax 40%	<u>800,000</u>	<u>740,000</u>	<u>620,000</u>
Net profit after interest and tax	<u>1,200,000</u>	<u>1,110,000</u>	<u>930,000</u>
EPS	2.4	2.8	4.65

From the above illustration, high levels of gearing leads to an increase in EPS for equity shareholders. Meanwhile, the debt in Capital Structure increases the risk of equity shareholders.

4.0 CONCLUSION

In this unit you have learnt the meaning of trading on equity, distinction between debt and equity as well as the impact of gearing on cost of capital and EPS of a firm.

5.0 SUMMARY

The debt component should be used in Capital Structure to enhance the return to the equity shareholders which is termed trading on equity. Also, gearing represents the ratio which shows the proportion of debt capital in a firm's Capital Structure relative to its equity finance.

6.0 TUTOR-MARKED ASSIGNMENT

1. Define sources of law in your own words.
2. Write short notes on trading on equity.
3. What are the differences between debt and equity capital?
4. Explain briefly the impact of gearing on the cost of capital of a firm.
5. Explain briefly the impact of gearing on the earnings of a firm.

7.0 REFERENCES/FURTHER READING

Aborode, R. (2005). *Financial Management*.

Drury, C. (1987). *Management and Cost Accounting. Modern Civil Procedure Law*. Lagos: Dee-Sage Nigeria Limited.

RavI, M.K. (2007). *Financial Management* (6th Ed.) Taxmann Allied Services Ltd.

Van–Horne, J.C. & Wachowicz, J.M. (1996). *Fundamentals of Financial Management*.

MODULE 2

Unit 1	Dividend Theory
Unit 2	Dividend Policy and Value of Firm
Unit 3	Projects
Unit 4	Feasibility and Viability
Unit 5	Project Planning

UNIT 1 DIVIDEND THEORY

CONTENTS

1.0	Introduction
2.0	Objectives
3.0	Main Content
3.1	Factors Determining the Dividend Decisions
3.2	Dividend Supremacy or Relevancy Theory
3.3	Dividend Irrelevancy Theory
3.4	Other Theories of Dividend
4.0	Conclusion
5.0	Summary
6.0	Tutor-Marked Assignment
7.0	References/Further Reading

1.0 INTRODUCTION

Dividend theory (Policy) tries to provide answers to the following question. Which is better out of the payment of dividend now or the retention of earnings for capital gain? This theory explores the possibility of attaining an optimum dividend payout ratio that maximises the combined value of dividends paid plus capital gain. Dividend policy has been considered very important in the firm's objective of maximising shareholders wealth. Dividends paid out to the shareholders represents cash outflow which depletes the available cash resources. The reduction in the available cash will have implication on the investment opportunities of the firm because investment projects of the firm also heavily depend on the available cash resources.

The financial manager of a company therefore has a role of striking a balance between dividend payout and retention of earnings, though the two serve the same purpose of maximising the shareholders' wealth. While retained earnings are used to finance expansion, dividends payment increases the purchasing power of the shareholders. Although dividend and retained profits move in opposite directions they still go hand in hand. It is impossible to formulate one without having an effect

on the other. A company must watch the profit distributed to the shareholders (dividends) to satisfy the minimum required internally generated funds to take care of investment opportunities and also it must restrict its self-financing through retained profits at least to the extent that it must satisfy a minimum requirement for dividends.

2.0 OBJECTIVES

At the end this unit, you should be able to:

- explain what dividend theory is all about
- analyse the factors determining the dividend decisions of a firm
- describe the MM theory of dividend irrelevancy and
- dividend relevancy suggested by Gordon and Walter and
- correlate their theories on dividend policy.

3.0 MAIN CONTENT

3.1 Factors Determining the Dividend Decisions

a. **Legal Provisions:** Company law allows the payment of dividend only out of distributable profits, calculated on conventional accounting principles.

- Profits arising from the use of the company properly, although it is a wasting asset
- Revenue reserves
- Realised profit on a fixed asset sold

These are distributable profits to the shareholders. It is illegal to distribute dividend out of capital (Section 379 – 382 of CAMD). As per the provisions, a company must transfer a certain percentage of profits of current year to reserves before declaring a dividend.

b. **Liquidity:** A company will be unable to pay a dividend if cash is not available to do so. A company requires cash in order to pay dividend. The liquidity position of the company will influence the dividend payout of a particular year. It is noteworthy that the availability of cash only induces dividend payout a company may borrow e.g. through bank overdraft to meet up with dividend requirements if cash is not available.

c. **Government:** Government through some guidelines restricts the amount of dividend payable to shareholders by restricting dividend payment to a certain percentage of the profits after tax. However, from 1988, dividend payment has been deregulated.

- d. **Internal re-investment opportunities:** When a company is faced with viable investment opportunities to be financed by only external funds which is not available or only available by submitting strict business terms on conditions or by incurring high transaction costs, then the company may have to fore-go the payment of dividend. Dividend may have to be restricted to provide financing for such investments.
- e. **Loan redemption.** If debentures or preference share capital are due for redemption, it will require funds and might cause a reduction in the level of dividend payout.
- f. **The risk factor.** Where a company is high in business and financial risk inherent, it may have to offer higher dividend rates in order to encourage investors to undertake the risk involved.
- g. **Taxation.** Shareholders in high income bracket will be required to receive their returns in the form of capital profit because of the high tax rate their high incomes may be subjected to but shareholders in low income bracket will be pleased to receive annual returns as high as expected since they are indifferent.
- h. **Level of inflation.** As the level of inflation rises, shareholders would expect commensurate increase in dividends.
- i. **Control.** If a high level of dividend is paid, a company might be forced to issue new share capital to raise finance. This can have the effect of reducing the control of the company by existing shareholders. If control is a significant factor, dividend payouts are liable to be relatively low.
- j. **Dividend policy of similar companies.** In dividend decisions, companies tend to follow the policy of a similar company.

3.2 Dividend Supremacy or Relevancy Theory

The proponents of this theory, Professor Walter, J.E. and Gordon M.J. (1959), argued that dividends were all that mattered in the determination of share prices.

It is based on the following fundamental theory of share values.

The market value of a company's shares depends on the following parameters.

- (i) The size of dividends paid
- (ii) The growth rate in dividends
- (iii) The shareholders' required rate of return.
- (iv) The growth rate in dividends depends on return on investment and the rate of earnings retained.
- (v) Shareholders will want their company to pursue a retention policy that maximises the value of their shares.

Assumptions of Dividend Relevancy Theory

- a. The firm finances all investments through retained earnings.
- b. The firm maintains constant IRR and WACC.
- c. All earnings are either distributed as dividends or reinvested internally immediately.
- d. The corporate tax does not exist.

3.3 Dividend Irrelevancy Theory

In 1961, Franco Modigliani and Melton H. Miller (M-M) argued against the claim that an active dividend policy should be pursued as a means of maximising shareholders wealth. Their argument is that the value of a firm is unaffected by dividend policy and that in a tax-free world, shareholders are indifferent between dividends and capital gains. They presented the following points to strengthen their arguments:

If earnings were distributed as dividends, each existing shareholder would gain the exact amount paid to him in terms of income but would suffer a proportionate loss in the form of reduction in his relative share of the company. This is so because the absence of retained earnings implied that new shares or loan stocks would have to be issued to finance an internal investment programme. On the other hand, earning retention will cause the value of existing shares to appreciate since new investment would be financed without resulting to supplementary issues. So, shareholders should be indifferent between payment of dividend and retained earnings.

When a firm adopts a dividend policy, it may be to the detriment of the shareholders by way of jeopardising their consumption preference. If a firm pays more cash dividends than an investor needed for immediate consumption, he would return the surplus by buying extra shares with the fund. If fewer dividends are declared, he could attain his consumption level by selling a proportionate fraction of his total shares in the market. Therefore, shareholders should be indifferent between payment of dividend and retained earnings.

MM pointed out that investors are indifferent as to the manner in which the returns are obtained, dividends or capital gains. The changes in dividend payments represent a signal to investors concerning management's assessment of the future earnings and cash flows of the company.

They argued that if a company with investment opportunities decides to pay a dividend, so that retained earnings are insufficient to finance all the investments, obtaining additional funds from outside sources would

make up the shortfall in funds. The consequent loss of value in the existing shares, as a result of obtaining finance instead of using retained earnings is exactly equal to the amount of the dividend paid. A company should therefore be indifferent between paying a dividend and retained earnings.

Assumptions of the MM theory

- a. There is perfect capital market where investors act rationally and have access to perfect and costless information.
- b. No floatation cost on securities issued by a company.
- c. Risks of uncertainty do not exist.
- d. No taxation. Or if there is taxation, the same tax rate is applicable to capital gain and dividend income.
- e. The company will maintain a fixed investment policy.

3.4 Other Theories of Dividend

Active theory of dividends

Under this theory, dividends are accorded priority before the company will commit itself to its capital needs. It follows therefore that viable projects can be undertaken only after the payment of dividends.

Residual theory of dividends

According to this theory, a firm should execute all positive NPV projects before giving consideration to the payment of dividends. Before funds could be used in dividend payment, the firm must ensure that all viable projects have been undertaken.

100% payout theory

Rubner (1966) registered his opinion through this theory. This theory advocates a policy of 100% payout: The argument is that shareholders prefer dividends and that 100% payout should be made to individuals.

100% retention theory

Clarkson and Elliot (1969) put forth their argument that given taxation and transaction costs, dividends are a luxury that neither shareholders nor companies can afford and hence the firm can follow a dividend policy of 100% retention.

Investor rationality theory

This theory is based on the psychological preferences of individual investor. The investor can select dividend payout ratio that conforms to his/her desired consumption level.

Tax differential theory

According to this theory, dividends are effectively taxed at higher rates than capital gains. Investors therefore require higher rates of return on stocks with high dividend yields. A firm should pay a low (or zero) dividend in order to minimise its cost of capital and maximise its value.

4.0 CONCLUSION

In this unit, you have learnt about what dividend theory is all about. You are now conversant with the theories of dividend policy and factors that determine the dividend decision of a firm.

5.0 SUMMARY

Dividend depletes the cash resources which can otherwise be available for investment in profitable projects. Dividend policy determines the distribution of net cash flows generated from successful trading between dividend payments and corporate retentions. Before a company determines its dividend policy, it should consider certain factors. MM argued that share value is a function of the level of corporate earnings. If there is a higher dividend payout, the firm should issue new shares which will depress the stock market price of the share. The reduction in value of share is just equal to the dividend distributed per share.

6.0 TUTOR-MARKED ASSIGNMENT

1. Explain the relationship between earnings, cash flows and dividend payouts.
2. Write short notes on:
 - a. dividend payout ratio.
 - b. dividend yield ratio.
 - c. price earning ratio.
3. What are the assumptions of dividend relevancy theory?
4. Discuss the various dividend determinants.
5. Explain the basic tenets of dividend irrelevancy theory.

7.0 REFERENCES/FURTHER READING

Aborode, R. (2005). *Financial Management*.

Drury, C. (1987). *Management and Cost Accounting*.

Ravi, M.K. (2007). *Financial Management* (6th Ed.) Taxmann Allied Services (P.) Ltd.

VanHorne, J.C. & Wachowicz, J.M. (1996). *Fundamentals of Financial Management*.

UNIT 2 DIVIDEND POLICY AND VALUE OF FIRM

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 4.0 Main Content
 - 3.1 Dividend Policies
 - 3.2 Dividend Relevancy Theory – Gordon Growth
 - 3.3 Valuation Model and Walters Valuation Model
 - 3.4 Dividend Payment Procedure
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

The dividend policy of a firm has been given ample recognition that different theories emanated to prove its relevancy in the determination of the value of firm. M-M, by their theory, opined that dividend irrelevancy theory decried the important role entrusted with dividend policy by Dividend Relevancy Theory. They argued that whatever dividend decisions taken by a firm will have no influence on its share value.

However, we are now much concerned with the Dividend Relevancy Theory. This theory claims that a company can increase its value by determining and attaining an optimum dividend value of dividends paid plus capital gain. The dividend relevancy theory applies two models.

- 1) Gordon Growth Valuation Model
- 2) Walter's Valuation Model

The important dividend policies generally followed by corporate firms are as discussed below.

2.0 OBJECTIVES

At the end this unit, you should be able to:

- explain the impact of dividend policies on value of firm
- analyse various dividend policies
- analyse Gordon Growth Valuation Model
- analyse Walter's Valuation Model
- describe the dividend payment procedure.

3.0 MAIN CONTENT

3.1 Dividend Policies

Constant dividend payout policy

This policy is also known as 'Constant payout ratio method'. By this method, a fixed percentage of the net earnings are paid every year. If earning varies, the amount of dividends also varies from year to year. The company follows a regular practice of retained earnings because there is always a constant gap between earnings per share and dividend per share.

Constant dividend rate policy

This advocates the payment of dividend at constant rate even when earnings vary from year to year. This may be possible only when the earnings pattern of the company does not show wide fluctuation.

Multiple dividend increase policy

This is a policy of very consistent but very small dividend increases to give the illusion of movement and growth. This policy gives a sense of hope to the investors as the market reward consistently increases.

Regular dividend plus extra dividend policy

This policy favours the division of the announced dividends of a firm into a regular and extra dividend. The regular dividend is the dividend that will continue at the announced level. The extra dividend payment will be made as circumstances permit.

Uniform cash dividend plus bonus shares policy

Under this policy, a minimum rate of dividend per share is paid in cash plus bonus shares issued out of accumulated reserves. However, the issue of bonus from shares depends on the amount kept in reserves over a period say 3 or 5 years.

3.2 Dividend Relevancy Theory

This theory incorporates two models.

- 1) Gordon's Growth Valuation Model
- 2) Walter's Valuation Model

Gordon's Growth Valuation Model

This model stems out of dividend situation with growth. Dividend relevancy theory takes cognizance of a situation where it is assumed that there is no growth in dividend. Here the market value of a firm is given by the present value of the future dividends paid out to shareholders. Ideally, dividend is expected to grow. The Gordon growth model is a theoretical model used to value ordinary equity shares. The main proposition of the model is that the value of a share reflects the value of future dividends accruing to that share. Hence, the dividend payments and its growth are relevant in valuation of shares.

Assumptions of Gordon Growth Model

1. The firm is an all equity firm i.e. the firm is not geared.
2. Retained earnings is the only source of financing
3. Future annual growth rate dividend is expected to be constant
4. The growth rate of the firm is the product of retention rate and its return on investments
5. Corporate taxes do not exist
6. The retention rate to remain constant.

In valuation of share,

$$MVe = \frac{Do (1+g)}{Ke - g} = \frac{D1}{Ke - g}$$

where MVe = Current ex-dividend market price of share

Do = Current years dividend

D1 = Expected dividend

Ke = Cost of equity, capital

g = Expected future growth rate of dividends

Meanwhile, the model has been criticised on the following grounds.

1. The constant dividend growth and earnings growth are fallacy
2. The model implies that if Do is zero, the value of share is zero
3. The model ignores the allowance for corporate taxation
4. The capital gains are ignored by the model

SELF-ASSESSMENT EXERCISE 1

Baba Ijebu Ltd. is an established company having its share quoted in the major stocks exchanges. Its share current market price after dividend distributed at the 21% p.a. having a paid up capital of 500,000 of 10k each. Annual growth rate in dividend expected is 3%. The expected rate of return on its equity capital is 16%.

Calculate the value of Baba Ijebu Ltd.'s share based on dividend growth model.

Solution

$$MVe = \frac{Do (1+g)}{Ke - g}$$

$$\text{Dividend distributed} = \frac{5000,000k \times 21}{100} = 1,050,000$$

$$MVe = \frac{1,050,000 (1 + 0.03)}{0.16 - 0.03} = 8,319,231k$$

$$\text{Value per share} = \frac{8,319,231}{500,000} = 16.64k$$

SELF-ASSESSMENT EXERCISE 2

The shares of a gas company are selling at N20 per share. The firm had paid dividend @ N2 per share last year.

- i) Determine the cost equity capital of the company
- ii) Determine the estimated market price of the equity share if the anticipated growth rate of the firm (a) rises to 8% (b) falls to 3%

Solution

$$i) \quad Ke = \frac{Do (1 + g)}{MVe} + g$$

$$Ke = \frac{2(1 + 0.05)}{20} + 0.05 = 15.5\%$$

$$ii) \quad a. \quad \text{If the growth rate raises to 8\%}$$

$$MVe = \frac{2(1 + 0.08)}{0.155 - 0.08} = N28.8$$

$$b. \quad \text{If growth rate falls to 3\%}$$

$$\frac{2(1 + 0.03)}{0.155 - 0.03} = \frac{2.06}{0.155 - 0.03} = 16.48$$

SELF-ASSESSMENT EXERCISE 3

Ogbogbon Ltd. is foreseeing a growth rate of 12% per annum in the next 2 years. The growth rate is likely to fall to 10% for the third year and fourth year. After that the growth rate is expected to stabilize at 8% per annum. If the last dividend paid was N1.50 per share and the investor's required rate of return is 16%, find out the intrinsic value per share of Ogbogbon Ltd. as of date.

Solution

Years	0	1	2	3	4	5
Discount factor @ 16%	1	0.86	0.74	0.64		0.550.48

Calculation of Present Value of Dividend

i) @ 12% p.a in the first 2 years

$$=[1.88 (1.1) \times 0.64] + [1.88 (1.1)^2 \times 0.55] = 1.32 + 1.25 = 2.57$$

ii) Market value of equity share at the end of 4th year

$$P_4 = \frac{D_5}{K_e - g}$$

Where P_4 = Market price of equity share at the end of 4th year
 D_5 = Dividend in 5th year
 g = Growth rate
 K_e = required rate of return

$$P_4 = \frac{2.28(1+0.08)}{0.16 - 0.08} = N30.75$$

$$\text{Present value of } P_4 = 30.75 \times 0.55 = N16.91$$

$$\text{Intrinsic value of equity share} = 2.83 + 2.57 + 16.91 = N22.31$$

Illustration

PS Plc expects to achieve earnings next year of N2.4m and these will continue in perpetuity without any growth at all, unless a proportion of earnings are retained. If the company retains $\frac{2}{3}$ of its earnings, an annual growth rate in earning and dividends of 9% p.a. in perpetuity could be achieved.

Alternatively, if the company were to retain $\frac{2}{3}$ of its earnings, an annual growth rate in earnings and dividends of 12% p.a. in perpetuity could be achieved. The return currently required by PS Plc shareholders is 16%.

If retentions of 1/3 were made, the required return would rise to 19% and if retentions were 2/3 of earnings, the return required would be 24%.

Required:

- a) No retention

$$K_e = \frac{d}{MVe}$$

$$MVe = \frac{d}{K_e}$$

$$MVe = \frac{2,400,000}{0.16} = \text{N15m}$$

- b) Retention $\frac{1}{3}$ Growth 9% p.a

$$K_e = \frac{d_0(1+g)}{MVe} + g$$

$$MVe = \frac{d_0(1+g)}{K_e - g}$$

$$MVe = \frac{1,600,000}{0.19 - 0.09} = \text{N16m}$$

- c) Retention $\frac{2}{3}$ growth 12% p.a

$$MV_c = \frac{800,000}{0.24 - 0.12} = \text{N6,666,667}$$

3.3 Walter's Valuation Model

Walter argued that retention influence stock price only through their effect on future dividends. The model recognises the importance of internal rate of return and cost of capital for valuation of shares and dividend decisions. The optimum dividend policy of a firm by this model is determined by the relationship of rate of return on firm's investment and cost of equity capital. Under this model, the determination of expected market price on a share is given as:

$$Mr = \frac{D + r_a(E - D)}{r_c}$$

where Mr = Current market price of equity share

E = Earnings per share

D = Dividend per share

$(E - D) = \text{Retained earnings per share}$

$r_a = \text{Rate of return on firm's investment}$

$r_c = \text{Cost of equity capital.}$

Walter's model implies that:

- a) If $r_a > r_c$ i.e. if the firm can earn higher IRR than cost of capital, the firm can return the earnings. When $r_a > r_c$, the price per share increases as the dividend payout ratio decreases. The optimal payout ratio when $r_a > r_c$ is nil (zero) because shareholders would accept low dividends.
- b) When $r_a < r_c$ i.e. the cost of capital is more than firm's IRR, the optimum dividend policy would be to distribute the entire earnings as dividend. When $r_a < r_c$, the price per share increases and the dividend payout ratio increases. Shareholders would vote for higher dividend so that they can utilize the more profitable investment opportunities.
- c) If $r_a = r_c$ i.e. If IRR of the firm is equal to its cost of capital, the price per share does not vary with changes in dividend payout ratio. The optimal payout ratio is irrelevant and it does not matter whether the earning is retained or distributed.

Assumptions of Walter's Valuation Model

- 1) Retained earnings are the only source of finance
- 2) Business risk is constant
- 3) Return on investment is constant
- 4) The firm is a going-concern
- 5) All earnings are either distributed as dividends or invested internally immediately.

SELF-ASSESSMENT EXERCISE 5

The earnings per share of a company is N8 and the rate of capitalisation applicable is 10%. The company has before an option of adopting (i) 50% (ii) 75% and (iii) 100% dividend payout ratio. Compute the market price of the company's quoted shares if it can earn a return of (a) 15% (b) 10% and (c) 5% on its retained earnings.

Solution

$$M_r = \frac{D + r_a (E - D)}{r_c}$$

- i) When the Dividend payout ratio = 50%

a) where $r_a = 15\%$

$$Mr = \frac{4 + \frac{0.15}{0.10} (8 - 4)}{0.10} = \frac{N100}{0.10}$$

b) where $r_a = 10\%$

$$Mr = \frac{4 + \frac{0.10}{0.10} (8 - 4)}{0.10} = \frac{N80}{0.10}$$

c) where $r_a = 5\%$

$$Mr = \frac{4 + \frac{0.05}{0.10} (8 - 4)}{0.10} = \frac{N60}{0.10}$$

ii) when the Dividend payout ratio = 75%

a) where $r_a = 15\%$

$$Mr = \frac{4 + \frac{0.15}{0.10} (8 - 6)}{0.10} = \frac{N90}{0.10}$$

b) where $r_a = 10\%$

$$Mr = \frac{6 + \frac{0.15}{0.10} (8 - 6)}{0.10} = \frac{N80}{0.10}$$

c) where $r_a = 5\%$

$$Mr = \frac{6 + \frac{0.15}{0.10} (8 - 6)}{0.10} = \frac{N70}{0.10}$$

(iii) when the dividend payout ratio = 10%

a) where $r_a = 15\%$

$$Mr = \frac{8 + \frac{0.15}{0.10} (8 - 8)}{0.10} = \frac{N80}{0.10}$$

b) where $r_a = 10\%$

$$M_r = \frac{8 + \frac{0.10}{0.10} (8 - 8)}{0.10} = \frac{N80}{0.10}$$

c) where $r_a = 5\%$

$$M_r = \frac{8 + \frac{0.05}{0.10} (8 - 8)}{0.10} = \frac{N80}{0.10}$$

3.4 Dividend Payment Procedure

Dividends are generally paid twice in a year that is, interim dividend and final dividend.

- **Declaration Date:** It is the date in which the forthcoming dividend is announced.
- **Date of Record:** This designates when share transfer book are to be closed.
- **Ex-div date:** This is the date when the shareholders register is closed for the transfer of shares. Purchase of shares after this date confers collection of dividend on the old owner or seller.
- **Dividend Notice:** This shows the amount of dividend payable after deducting appropriate withholding taxes.
- **Payment date:** This is the day dividend cheques are mailed out.

4.0 CONCLUSION

In this unit, you have learnt the different models on dividend theories, dividend payment procedures and the impact of dividend policies on the value of a firm.

7.0 SUMMARY

Gordon Growth Valuation Model says that the value of a share reflects the value of future dividends accruing to that share and the market price of that share is equal to the sum of its discounted future dividend payments.

Walter's Model asserts that in the long-run the share prices reflect only the present value of expected dividends and the retentions influence share price only through their effect on future dividends. According to Walter, the optimum dividend policy of a firm is determined by the relationship of firm's IRR and its cost of capital.

8.0 TUTOR-MARKED ASSIGNMENT

1. Dividend Growth Valuation Model's proposition is that value of a share reflects the value of future dividends accruing to that share. *Explain.*
2. What are the essential of Walter's Dividend Model?

7.0 REFERENCES/FURTHER READING

Aborode, R. (2005). *Financial Management*.

ACCA Study Text Kit (1998). *Strategic Financial Management* (BPP Publishing).

Drury, C. (1987). *Management and Cost Accounting*.

Ravi, M.K. (2007). *Financial Management* (6th ed.). Taxmann Allied Services (P.) Ltd.

UNIT 3 PROJECTS

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Types of Projects
 - 3.2 Capital Investment Process
 - 3.3. New Concepts in Financing and Execution Of Projects
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

A firm's project is an investment which could involve assets acquired for purposes of capital appreciation or income generation without activities in the form of production, trade or provision of services. Projects are basically capital investments. Capital investment decisions border on capital expenditures which involve large sum of money, have long time spans and carry some degree of risk and uncertainty. The planning and control of capital expenditure is termed capital budgeting. Capital budgeting is the art of finding assets that are worth more than they cost to optimise the wealth of a business enterprise. For making a radical decision regarding the capital investment proposals at hand, the decision maker needs some techniques to convert the cash outflows and cash inflows of a project into meaningful yardsticks which can measure the economic worthiness of projects.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the meaning of projects
- determine the different kinds of projects
- describe capital investment process
- explain new concepts in financing and execution of projects.

3.0 MAIN CONTENT

3.1 Types of Projects

Classification of project has been done based on the following criteria.

- (i) Purpose
- (ii) Size
- (iii) Ownership

Depending on the purpose, the projects can be classified as follows:

(a) Balancing Project

Balancing equipment is installed when there is imbalanced capacity utilisation of the plant and machinery due to unutilised capacity in some units.

(b) Replacement Project

If any equipment is deteriorated due to obsolescence or is no longer economically useful, it is replaced with new equipment which may be equivalent to the old machine or it may also be more efficient than the old one. Replacement project is considered in respect of individual machine.

(c) Expansion Project

When the current production levels of existing plant could not meet the growing demand for the product in the market, and such growth is of permanent nature, the management would decide to increase the capacity of the plant by installing additional equipment and facilitator thereby increasing the total production.

(d) Diversification Project

When a firm invests in project which is not connected with the existing line of business but to entirely set up a new project, such a project is called a diversification project.

(e) Technological development

Due to technological development, wear and tear, the old plant and machinery that were installed several years back, would require modernisation.

3.2 Capital Investment Process

The strategic capital investment process is discussed below:

- a. **Search for investment opportunities:** the first thing to do is recognising the investment opportunities. This involves a continuous search for investment opportunities which are compatible with the firm's objectives. Although business may pursue many goods, survival and profitability are two most important objectives.
- b. **Screening the alternatives.** Each proposal is then subjected to the screening process. This is to assess whether it is technically feasible, or whether resources required are available and the expected returns are adequate to compensate for the risks involved. The alternatives will be screened and it is neither feasible nor desirable to conduct a full scale evaluation of opportunities.
- c. **Analysis of feasible alternatives.** If a proposal satisfies the screening process, it is then analysed by gathering technical, economic and other relevant data. Projects are also classified as new projects based on, expansions or improvements and ranked within each classification with respect to probability, risk and degree of urgency.
- d. **Evaluation of alternatives.** This stage will involve the determination of proposal and its investments, inflows and outflows. The technique selected should be the one which enables a manager to make the best decision in the light of prevailing circumstances.
- e. **Authorisation.** Once evaluation is completed then proposal will be forwarded to a higher level of management for authorisation to take up the project.
- f. **Implementation and control.** The project will be implemented and its progress is monitored with the aid of feedback reports. These reports will include critical path analysis, capital expenditure progress reports, performance reports, conquering actual performance against plans set.

3.3 New Concepts in Financing and Execution of Projects

- a. **Build, Own and Operate (B.O.O).** Here, the entrepreneur will build the project from his own resources and he will own the project subsequent to its commercial launching.
- b. **Build, Operate and Transfer (B.O.T).** When the government is unable to finance a project due to scarcity of funds, the private sector is invited by the government to undertake the project and

the government allows them to operate for certain period after which the project is transferred to the government.

- c. **Lease, Rehabilitate, Operate and Transfer (L.R.O.T).** Here, the government will give a running plant for rehabilitation to put the plant on profitability track or for increasing its production capacity.
- d. **Engineering, Procurement and Construct (E.P.C).** Here, the contractor takes the complete responsibility to construct, erect, commission and supply the plant and keeps it ready to operate by the owners. The contractor carries the responsibility of providing engineering designs, procurement of materials, erection and commissioning the project and handing over to the owner.
- e. **Turnkey Contract.** When a project is handled and completed by a single contractor so that the owner merely turns the key and operates the plant, it is called turnkey contract. Turnkey contract may help in cutting down the number of responsibility centres to the extent of one. It reduces the number of agencies the owner is required to coordinate.

4.0 CONCLUSION

In this unit, you learnt the meanings of project idea, project identification, white elephant project and the importance of project.

7.0 SUMMARY

Capital investment involves a cash outflow in the immediate future in anticipation of returns at future date. It involves huge amounts of money and having a long span of time for cash inflow and carries some degrees of risk and uncertainty with the cash flows. The capital investment process involves searching for investment opportunities, screening and evaluation of alternatives and the selection of the right alternative for implementation.

8.0 TUTOR-MARKED ASSIGNMENT

1. Describe the steps in capital investment decision making process.
2. What is a project?
3. Explain the types of project according to size and ownership
4. What are the new concepts in financing and execution of projects?

7.0 REFERENCES/FURTHER READING

Aborode, R. (2005). *Financial Management*.

ACCA Study Text Kit (1998). *Strategic Financial Management* (BPP Publishing).

Drury, C. (1987). *Management and Cost Accounting*.

Ravi, M.K. (2007). *Financial Management* (6th ed.). Taxmann Allied Services (P.) Ltd.

UNIT 4 FEASIBILITY AND VIABILITY

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Feasibility Study
 - 3.2 Techniques for Project Control
 - 3.3 Reasons for Project Failure
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

Before a project idea is considered for detailed study, the promoter must verify certain factors. Once the entrepreneur is convinced that the project can be taken up for detailed study, he starts by conducting a feasibility study.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain feasibility study report
- analyse techniques for project control
- differentiate micro and macro considerations of a project.

3.0 MAIN CONTENT

3.1 Feasibility Study

This report is not very elaborate but it contains substantial information that qualifies a project for selection. The format of the report normally contains the following details.

- a) Study of the configuration of the project idea in all aspects
- b) Identifying the type and size of the project with justification
- c) Study of location
- d) Study of demand of products/services
- e) Survey of material requirements
- f) Project schedule
- g) Project cost and sources of finance
- h) Profitability and cash flow analysis

- i) Cost benefit analysis
- j) Identifying and quantifying risk element
- k) Social cost benefits
- l) Study of economic, political and legal environments.

This report is called “Pre-investment report”. It is prepared for establishing due prima-facie project’s viability with sufficient back up for the purpose of evaluation of investment proposal by the entrepreneur.

3.2 Techniques for Project Control

These techniques include the following.

- 1) Watch and measure the achievement at short intervals
- 2) Ascertain current variances and predict future variances
- 3) Ascertain root causes of variances
- 4) Take actions to offset the ill-effects of past variances
- 5) Prevent future potential variances
- 6) Track and measure the quantitative output and cost inputs
- 7) Evaluate targets, output and input in financial term
- 8) Introduction of incentives for good performance
- 9) Doing away with red-tapism and bureaucratic procedures
- 10) Periodic review meetings and taking appropriate actions.

3.3 Reason for Project Failures

- 1) Substantial overrun of the projects which makes the project not feasible to implement further
- 2) Changes in technology during the implementation of the project
- 3) Wrongful estimation of the cost of project and its profitability
- 4) Lack of experienced management team
- 5) Lack of delegation of authority and responsibility
- 6) Lack of proper project monitoring systems
- 7) Failure to obtain government clearances and permission
- 8) Lack of sufficient knowledge of the project to promoter

4.0 CONCLUSION

In this unit, you have learnt the meaning of feasibility and viability study of project, feasibility study and techniques of project and ways of controlling projects.

5.0 SUMMARY

A prepared detailed project report should contain details about the plan of action. Details about technical, financial, marketing, management and social aspect of the project were also discussed

6.0 TUTOR-MARKED ASSIGNMENT

Describe feasibility and viability study.

7.0 REFERENCES/FURTHER READING

Ravi, M.K. (2007). *Financial Management* (6th Ed.) Taxmann Allied Services (P.) Ltd.

VanHorne, J.C. & Wachowicz, J.M. (1996). *Fundamentals of Financial Management*.

UNIT 5 PROJECT PLANNING

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Project Organisation Structure
 - 3.2 Benefits of Project Management
 - 3.3 Selection of Project Location
 - 3.4 Choice of Technology
 - 3.5 WOT Analysis
 - 3.6 Project Visibility
 - 3.7 Variance and Performance Analysis
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

In this unit, you will learn about project organisation structure, the essence of project management, project visibility, SWOT analysis, how variance and performance analysis is done and the selection of project location.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain project organisation structure
- analyse the benefits of project management
- identify the selection of project location
- analyse the choice of technologies
- explain SWOT analysis
- explain project visibility
- describe feasibility study report.

3.0 MAIN CONTENT

3.1 Project Organisation Structure

Matrix organisation structure. This is a formal way of hierarchy and sharing authority between the project manager and his team of functional managers, who are answerable to him as well as the functional heads. The matrix organisation seeks to achieve two objectives of official use of resources and effective realisation of project objectives.

Task force organisation structure

Structure. A task force is created by drawing personnel from various functional departments and putting them under the project manager.

3.2 Benefits of Project Management

Project management is essentially involved in executing the project and thereby accomplishes the goals of the organisation on time. The benefits of project management are as listed below.

- 1) Project management provides techniques for making trade-offs between conflicting goals and priorities, besides enabling better control and coordination.
- 2) It helps in minimising surprises and conflicts
- 3) It helps in reducing time, lowering costs and producing higher order results
- 4) It reduces the need for continuous reporting
- 5) It helps in expressing problems in advance

3.3 Selection of Project Location

The following are the factors to be considered before the selection of an appropriate location for setting up a project.

- 1) **Proximity of inputs.** In some industries, bulky raw materials are used as inputs in the processing of their products and such industries minimise cost by setting up their industries near their input source. Eg. The Savannah Sugar Company in Numan. The Sugar processing plant was located within the farm complex to ease the production of the product.
- 2) **Proximity of market.** Market may be a determining factor for a project's location because setting up such a project may be very important to the distribution of the company's product. Projects

which manufacture perishable products are located near the places of consumption For example, fruits processing plants.

- 3) **Availability of power.** It is important to verify the adequate and uninterrupted power supply before deciding the location of a project,. The cost of power will play a major role in the selection of a project location. For example, a manufacturing plant will need adequate power supply to be able to meet the market demands of its products.
- 4) **Availability of transport.** Adequate transport facilities are important and required for movement of input (raw materials) and output (finished goods) to the market. The project site should be well connected by rail, road, sea and air transport facilities. This is to ease easy movement of the goods from the factory to their distribution points.
- 5) **Communication facilities.** The project site must be located where all modern communication facilities like telephone, telex, fax, internet, etc are available.
- 6) **Manpower availability.** For any project to be effectively set up, the availability of manpower or personnel must be carefully considered. It is not enough to have the above selection criteria without first thinking of the people who will work and manage the project itself.

3.4 Choice of Technology

The following factors will influence the choice of technology:

- 1) **Plant capacity.** To meet a given capacity requirement, perhaps only a certain production technology may be viable.
- 2) **Principal Inputs.** The choice of technology depends on the principal inputs available for the project.
- 3) **Investment outlay and production costs.** The effect of alternative technologies on investment outlay and production cost over a period of time should be carefully assessed.
- 4) **Inlay by other units.** The technology adopted must be proven by successful use by other units.
- 5) **Production mix.** The technology chosen must be judged in terms of the total product-mix generated by it, including saleable by-products.
- 6) **Latest developments.** The technology adopted must be based on latest developments in order to ensure that the likelihood of technological obsolescence in the near future is minimised.
- 7) **Ease of absorption and appropriateness.** The ease with which a particular technology can be absorbed, can influence the choice of technology.

3.5 SWOT Analysis

‘SWOT’ stands for *Strengths, Weaknesses, Opportunities and Threats*. By conducting SWOT analysis, the strengths and weaknesses of the proposed project is highlighted. While strength and weaknesses constitute variables of factors which are internal to the proposed project, opportunities and threats constitute those external factors which are usually imposed by the environment with either direct or indirect influence on the project. Some of the aspects considered in SWOT analysis are as follows.

1. Internal financial resources
2. Availability of funds in the capital market
3. Extent of support from banks and financial institutions
4. Existing and proposed level of investments and its impact on ROI, EPS and market value of the firm.
5. The business and financial risk attached to the firm.
6. Technology developed internally or possibility to obtain reliable technical know-how at cheaper cost.
7. Brand loyalty of existing products
8. Source of raw material and other infrastructural facilities.
9. Market share and distribution network
10. Severity of completion
11. Cost of production and managerial competence
12. Cost of capital
13. Governmental clearances and permission
14. Macro and Micro-economic environment in which the business operates.

3.6 Project Visibility

The project activities start prior to the zero data. Zero data of a project means a date is fixed up from which the implementation of the projects begins. A project cannot be seen by the public most of its life time. A project can be seen by the public only at the end of its implementation stage. A project becomes visible slowly as it grows, bringing the idea into reality, by using men, machines, money and managerial skill.

3.7 Variance and Performance Analysis

- 1) **Variance analysis.** The traditional analysis involves comparison of actual costs with budgeted costs to determine the variance. This approach is inadequate for project control, because it tells only what happened in the past and does not answer what will happen in future and does not give indications about the rate of work.

- 2) **Performance analysis.** This is a modern approach where analysis is done for the project as a whole. It will enable the project manager to know whether or not the project is on schedule, behind or ahead of schedule. It also indicates whether the cost of a project as a whole is as per budget.

Illustration

The following information has been gathered on an on-going project

Budgeted Cost of Work Schedule (BCWS)	50
Budgeted Cost of Work Performed (BCWP)	40
Actual Cost of Work Performed (ACWP)	44
Budgeted Cost of Total Work (BCTW)	100
Additional Cost of Completion (ACC)	66

Determine:

- performance variance
- efficiency variance
- performance index
- efficiency index
- estimated cost performance index

Solution

- Performance variance

$$= BCWP - BCWS = 40 - 50 = -10$$
- Efficiency variance

$$= BCWP - ACWP = 40 - 44 = -4$$
- Performance index

$$= BCWP/BCWS = 40/50 = 0.80$$
- Efficiency Index

$$= BCWP/ACWP = 40/44 = 0.9091$$
- Estimated cost performance index

$$= BCTW/(ACWP + ACC) = 100/(44 + 66) = 0.9091$$

4.0 CONCLUSION

In this unit, you have learnt the definition of management, the three dimensions of management and the need for management as well as the levels of management.

5.0 SUMMARY

The capital investment process involves searching for investment opportunities, screening and evaluation of alternatives and selection of the right alternative for implementation.

6.0 TUTOR-MARKED ASSIGNMENT

1. Describe project organisation structure.
2. Explain the factors that determine the choice of technology in project planning

7.0 REFERENCES/FURTHER READING

RavI, M.K. (2007). *Financial Management* (6th Ed.) Taxmann Allied Services Ltd.

Van–Horne, J.C. & Wachowicz, J.M. (1996). *Fundamentals of Financial Management*.

MODULE 3

Unit 1	Project Appraisal
Unit 2	Risk and Return
Unit 3	Capital Asset Pricing Model
Unit 4	Portfolio Theory
Unit 5	Financing SMES
Unit 6	International Financial Management

UNIT 1 PROJECT APPRAISAL

CONTENTS

1.0	Introduction
2.0	Objectives
3.0	Main Content
3.1	Investment Appraisal Techniques
3.2	Traditional Techniques
3.3	Discounted Cash Flow Techniques
4.0	Conclusion
5.0	Summary
6.0	Tutor-Marked Assignment
7.0	References/Further Reading

1.0 INTRODUCTION

Our major concern here has to do with investment decision. This is called capital expenditure decision and this is under the umbrella of capital budgeting. Capital budgeting involves all investments in long-term projects. It is the process of selecting alternatives such as long-term investment opportunities. This decision entails scrutiny that tends to find out whether or not money should be invested in long-term projects. In capital investment decisions, a firm is faced with different alternatives out of which the firm must select those ones that optimise its shareholders' wealth. This is done by examining cash generation of the project which is called **investment appraisal**.

In appraising a project, various techniques have been developed ranging from the traditional to discounted cash flow techniques. Meanwhile, to permit realistic appraisal, the value of cash payment or receipt must be related to the time when the transfer takes place. The process of converting future sums into their present equivalent is known as discounting which is used to determine the present value of future cash flows.

2.0 OBJECTIVES

At the end this unit, you should be able to:

- identify the need for capital investment appraisal
- analyse cash flows associated with the project
- analyse payback period and its reciprocal
- explain accounting rate of return
- distinguish between NPV and IRR
- explain discounted payback period
- define terminal value method.

3.0 MAIN CONTENT

3.1 Investment Appraisal Techniques

There are two methods of appraisals.

- i) The traditional technique
- ii) Discounted cash flow technique

3.2 The Traditional Techniques

There are two methods under this technique.

- a) Payback Period Method
- b) Accounting Rate of Return

Payback Period Method

This refers to the length of time which it takes the cash inflows from a capital investment project to equate the cash outflows. It is usually expressed in years. It concentrates on how quickly a project repays its outlay. When deciding between two or more competing projects, the usual decision is to accept the one with the shortest payback. The basic element of payback period method is a calculation of recovery time by accumulation of the cash inflows year by year until the cash inflows equate the amount of the original investment.

Payback period can be calculated in two ways depending on whether the cash flows are constant or non - constant.

Illustration

Adamawa Plc is to undertake a project requiring N1, 000,000 outlays. What is the payback period if,

- a) the project generates N250,000 annually
- b) the project has the following cash flow profile

Yr	Cash flow	
	200,000	1
	220,000	2
	230,000	3
	220,000	4
	195,000	5

Solution:

$$\text{a) Payback} = \frac{\text{Outlay}}{\text{Annual cash flow}}$$

$$= \frac{\text{N1, 000,000}}{\text{N250, 000}} = 4 \text{ years}$$

b)	Yr	Outlay	CF	Balance
	0	(1,000,000)	-	(1,000,000)
	1	200,000	(800,000)	
	2	220,000	(580,000)	
	3	230,000	(350,000)	
	4	220,000	(130,000)	
	5	195,000	-	

$$\text{PBP} = 4\text{years} + \frac{130,000 \times 12}{195,000}$$

$$= 4 \text{ years, 8 months}$$

Decision rules:

When it is an independent project:

- 1) Accept the project if the project has a PBP that is equal to or less than that set by the management
- 2) Reject if the project has a PBP that is greater than that set by the management.

When there are mutually exclusive projects:

- 1) choose the project with the least PBP
- 2) the PBP should be equal to or less than that set by the management

Advantages of PBP

- 1) It is simple to calculate and understand
- 2) It does not involve assumptions about future interest rates
- 3) Unlike ARR, it uses cash profit instead of accounting profit
- 4) It is the most suitable when the future is very uncertain.

Disadvantages

- 1) It ignores the time value of money
- 2) There are no rules for setting the maximum accepted PBP by the management
- 3) It ignores the cash flows after the payback period
- 4) It makes no attempt to measure a percentage return on the capital invested and is often used in conjunction with other methods.

Payback Period Reciprocal

$$\text{Payback Period Reciprocal} = \frac{1}{\text{Payback Period}} \times 100$$

If a project has a payback period of 2.5 years

$$\text{i.e. Payback Period Reciprocal} = \frac{1}{2.5} \times 100 = 40\%$$

The higher the PBP reciprocal, the more worthwhile the project.

Bailout Payback Period

If necessary, a machine may have to be scrapped before its payback period. In this case, the cash flow and the salvage value of the machine are taken together in bailout decision.

SELF-ASSESSMENT EXERCISE 2

Project **A** costs N200, 000 and Project **B** costs N300, 000 and both have a ten year lifespan. Uniform cash receipts expected are **A**-N40,000 p.a. and **B**-N80,000 p.a. Salvage values expected are **A**-N140,000 declining at an annual rate of N20,000 and **B**-N160,000 declining at an annual rate of N40,000.

Solution

The bail-out payback period is reached when the cumulative cash receipts plus the salvage value at the end of a particular year is equal to the initial investment.

Project A initial investment = N200,000
Cumulative Cash flow + Salvage value

End of yr-1	40,000+140,000	=	180,000
2	80,000+120,000	=	200,000

Bailout Payback period for A is 2 years
Project B initial investment = N300,000
Cumulative Cash flow + Salvage value

End of yr	1	80,000 +160,000	=	240,000
	2	160,000 +120,000	=	280,000
	3	240,000+80,000	=	320,000

Bailout PBP for B is 3 years

∴ Therefore Project A is chosen.

Accounting Rate of Return

This technique is assessed by calculating the return on investment (ROI). It is based on return on capital employed. It makes use of the accounting concepts of accounting profits and capital employed. This can be calculated as follows:

$$ARR = \frac{\text{Average Annual Profit After Tax}}{\text{Average or Initial Investment}} \times 100$$

$$\text{Average Investment} = \frac{\text{Initial Investment} + \text{Salvage values}}{2}$$

Sometimes, initial investment is used in place of average investment.

SELF-ASSESSMENT EXERCISE 3

Omotola Plc is to undertake a project requiring an investment of N100,000 on necessary plant and machinery. The project is to last for 5 years at the end of which the plant and machinery will have net book value (NBV) of N20,000. Profits before depreciation are as follows:

Yr	Profit (N)
1	40,000
2	44,000
3	48,000
4	52,000
5	58,000

1. You are required to calculate the ARR of the project

Solution:

- (i) Calculation of depreciation

Cost	N100,000
NBV	<u>20,000</u>
	80,000

$$\text{Average depreciation} = \frac{\text{N}80,000}{5 \text{ years}} = \text{N}16,000$$

- (ii) Calculation of Average Investment

Initial Investment	= N100,000
+ NBV	= <u>20,000</u>
	120,000

$$\text{Average investment} = \text{N}120,000/2 = \text{N}60,000$$

- (iii) Calculation of Average Profit

Yr	Profit (N)	Depreciation (N)	Net profit (N)
1	40,000	16,000	24,000
2	44,000	16,000	28,000
3	48,000	16,000	32,000
4	52,000	16,000	36,000
5	58,000	16,000	42,000
			162,000

$$\text{Average Profit} = \frac{\text{N}162,000}{5 \text{ years}} = \text{N}32,400$$

$$\text{ARR} = \frac{\text{Estimated Average Profits}}{\text{Estimated Average Investment}} \times 100$$

$$\frac{\text{N}32,400}{60,000} \times 100 = 54\%$$

Decision rules.

- a) When only one project is involved
 - 1. Accept if the project has an ARR that is equal to or greater than that set by the management
 - 2. Reject if the project has an ARR that is less than that set by the management
- b) When more than one project is involved
Select the project with the highest ARR

Advantages of ARR

- 1. It is simple to calculate and understand
- 2. It considers the profit over the entire life of the project
- 3. It uses readily available accounting data.
- 4. It could be used to compare performance for many companies

Disadvantages of ARR

- 1. It takes no account of the time value of money
- 2. It uses accounting profit rather than cash as the measure of benefit
- 3. There are no rules for setting the minimum acceptable ARR by the management
- 4. There is no clear definition in accounting of profit and capital employed.

3.3 Discounted Cash Flow Techniques

These are investment appraisal techniques which use discounted cash flows to evaluate projects.

These techniques involve the following.

- a) Net Present Value Method (NPV)
- b) Internal Rate of Return Method (IRR)
- c) Discounted Payback Period Method (DPP)
- d) Terminal Value Method (TV)

Net Present Value

The Net Present Value (NPV) technique recognises that different amounts arising at different time periods will not command the same value. It is obtained by discounting all cash outflows and inflows attributable to a capital investment project by a chosen percentage. By this method, the

net cash flows from the investment is discounted by the minimum required rate of return and the initial investment is deducted to arrive at the NPV. If the NPV is positive, the project is acceptable but unacceptable if the NPV is negative.

In the discounting process, discounting factor is used:

$$\text{Dcf} = \frac{1}{(1 + r)^n}$$

Where dcf = discounting factor

r = minimum rate of return

n = number of years over which we discount

SELF-ASSESSMENT EXERCISE 4

Semijeje is to undertake a project worth ₦10m having the following cash flow profile:

Yr	Cash flows
1	5,000,000
2	6,000,000
3	8,000,000

However, if the discount rate of 25% is applied in order to account for the time value of money, should the project be accepted?

i) Calculation of discounting factor

Yr	D.F
1	$\frac{1}{(1+0.25)} = 0.800$
2	$\frac{1}{(1+0.25)^2} = 0.640$
3	$\frac{1}{(1+0.25)^3} = 0.512$

ii) Calculate of NPV

Yr	CF	DCF@25%	PV
0	(10,000,000)	1	(10,000,000)
1	5,000,000	0.800	4,000,000
2	6,000,000	0.640	3,840,000
3	8,000,000	0.512	4,096,000
NPV			<u>1,936,000</u>

The project should be accepted.

Decision rules:

For only one project

- a) Accept if the project has a positive NPV
- b) Reject if the project has a negative NPV

For more than one project

- a) Select the project with the highest NPV

Advantages of NPV

1. It recognises the time value of money
2. It uses all the cash flows over a project's lifespan
3. It gives a clear accept/reject recommendation
4. It gives absolute measure of profitability

Disadvantages of NPV

1. It is relatively more difficult to calculate and understand
2. It may not give dependable results
3. The selection of discounting rate is subjective.

Internal Rate of Return Method (IRR)

IRR is the percentage discount rate used in capital investment appraisals which brings the cost of a project and its future cash inflows into equality. It is the rate of return which equates the present value of anticipated net cash flows with the initial outlay. It is also known as the cut-off rate, the hurdle rate, the target rate, the marginal efficiency cost of capital etc. It is the rate at which NPV is equal to zero.

IRR is calculated using a two-step approach.

Step 1: Trial and error

Here, two different rates that will produce two opposing NPVs (one positive and the other negative) are applied.

Step 2: Interpolation

From step 1, relevant figures relating to the formula below are applied to generate the IRR.

$$\text{IRR} = \frac{R_1 + N_1}{N_1 - (N_2)} \times (R_2 - R_1)$$

where R1 = Lower rate

R2 = Higher rate

N1 = the NPV of the lower rate

N2 = the NPV of the higher rate

SELF-ASSESSMENT EXERCISE 5

Calculate the IRR of a project having the following cash flows:

Yr	NCF
0	(3,610)
1	1,000
2	2,000
3	3,000

Solution

Trial and error

Yr	NCF	DCF@15%	PV	DCF@26%	PV
0	(3,610)	1	(3,610)	1	(3,610)
1	1000	0.87	870	0.79	790
2	2000	0.76	1520	0.63	1,260
3	3000	0.66	<u>1980</u>	0.50	<u>1,500</u>
			760		(60)

Interpolation

$$\text{IRR} = \frac{R_1 + N_1}{N_1 - (N_2)} \times (R_2 - R_1)$$

R1 = 15, R2 = 26, N1 = 760, (N2) = (60)

$$\begin{aligned}
 \therefore \text{Irr} &= \frac{15 + 760}{760 - (-60)} \times (26-15) \\
 &= \frac{15 + 760}{820} \times 11 \\
 &= 15 + 10.2 = 25.20\%
 \end{aligned}$$

Decision rules:

- a) In a case of only one project: to accept a project, if it has an IRR that is greater than the cut-off rate stipulated by the management or if its IRR is higher than the cost of borrowing.
- b) In a case of more than one project. Select the projects that have an IRR that is greater than the cut-off rate indicated.

Discounted Payback Period Method

In this method, the cash flows generated from a project are discounted back to present value term. The discounted cash inflows are then matched with the original investment in order to identify the period taken to payback the outlay. This method overcomes the shortcoming of not accounting for the time value of money but it still does not take into account those cash flows which occur subsequent to the payback period.

SELF-ASSESSMENT EXERCISE 6

Gateway Ltd. is implementing a project with an initial capital outlay of ₦7, 600. Its cash inflows are as follows

Yr	1	2	3	4
Cash flows (₦)	6,000	2,000	1,000	5,000

The expected rate of return on the capital invested is 12% p.a. Calculate the discounted payback period of the project

Yr	Cash inflow ₦	Discount factor	Present value ₦
1	6,000	0.893	5,358
2	2,000	0.797	1,594
3	1,000	0.712	712
4	5,000	0.636	3180
		<u>NPV</u>	10,844

The discounted PBP is 3 years i.e. $5358 + 1594 = 712$

Terminal Value Method

Under this method, it is assumed that each cash flow is re-invested in another project at a predetermined rate of interest. It is also assumed that each cash inflow is reinvested elsewhere immediately until the termination of the project. The present value of the sum total of the compounded reinvested cash flows is greater compared with the values of the original outlay.

SELF-ASSESSMENT EXERCISE 7

Original outlay	N8, 000
Life of the project	3 years
Cash inflows	N4000 p.a for 3 years
Cost of capital	10% p.a.

Expected interest rates at which the cash inflows will be re-invested are as follows:

Year end	1	2	3
Rate	8	8	8

Solution

i) Calculation of the compounded sum

Year	Cash inflow	Int. Rate	Yrs for invest.	Comp. factor	Comp. sum
1	4,000	8	2	1.166	4,664
2	4,000	8	1	1.080	4,320
3	4,000	8	0	1.000	4,000
					<u>12,984</u>

The present value of ₦12, 954

$$= \frac{\text{₦ } 12,954}{(1.10)^3} = \text{₦ } 9,755$$

Since the present value of reinvested cash flows of ₦ 9,755 is greater than the original cash outlay of ₦ 8,000, the project would be accepted.

4.0 CONCLUSION

In this unit you have learnt the meaning of investment appraisal, the two types of investment appraisal techniques and distinction between various techniques.

5.0 SUMMARY

In appraising a project, various techniques have been developed ranging from the traditional to the discounted cash flows techniques. The traditional techniques do not take into account the time value of money. However, under the discounted cash flow techniques, the future net cash flows generated by a capital project are discounted to ascertain their present values.

6.0 TUTOR-MARKED ASSIGNMENT

1. What is payback period?
2. Write short notes on an Average Rate of Return
3. Explain the concept of time value of money and its relevance
4. Distinguish between IRR and NPV
5. Under what situation are investment decisions mainly guided by Payback Period method?

7.0 REFERENCES/FURTHER READING

Aborode, R. (2005). *Financial Management*.

Drury, C. (1987). *Management and Cost Accounting*.

Ravi, M.K. (2007). *Financial Management* (6th Ed.) Taxmann Allied Services (P.) Ltd.

VanHorne, J.C. & Wachowicz, J.M. (1996). *Fundamentals of Financial Management*.

UNIT 2 RISK AND RETURN

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 5.0 Main Content
 - 3.1 Risk and Return of a Single Asset
 - 3.2 Risk and Return of Portfolio
 - 3.3 Portfolio Diversification and Risk
 - 3.4 Indifference Curves and Investors' Attitudes
 - 3.5 Risks-return Relationship
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

Risk is seen as the degree of probability of occurrence assigned to an investing or financing decision from the knowledge of the past or existing events. The term risk is used to describe an option where the outcome is not known with certainty in advance but the probability of its occurrence ranges between 0 and 1. It implies the possibility of receiving lower than expected return on investment or not receiving any return at all or even not getting the principal amount back.

The difference between risk and uncertainty has been that, uncertainty cannot be quantified while risk can be quantified in the likelihood of future outcomes. Risk denotes a positive probability of something bad happening while uncertainty does not necessarily imply a value judgment or ranking of the possible outcomes. Therefore, risk is present when future events occur with measurable probability.

On the other hand, uncertainty is present when the likelihood of future events is indefinite or incalculable.

2.0 OBJECTIVES

At the end this unit, you should be able to:

- explain the meaning of risk
- determine the risk and return of single asset
- determine the risk and return of a two-asset portfolio
- determine the risk and return of a three-asset portfolio
- ascertain the optimal portfolio of two assets

- minimise risk through diversification of portfolio
- distinguish the relationship between risk and return.

3.0 MAIN CONTENT

3.1 Risk and Return of a Single Asset

Return of an Asset

A firm's investment should earn reasonable and expected rate of return. Certain investments like bank deposits, debentures, bonds, etc. carry a fixed rate of return payable periodically. In case of investments in shares of companies, the periodical payments in form of dividends are not assured, though it may ensure higher returns than fixed income investments. The rate of return of a particular investment is calculated as follows:

$$\frac{R}{Po} = \frac{D}{Po} + \frac{P1 - P2}{Po}$$

Where R = Annual rate of return of a share

D = Dividend paid at the end of the year

Po = Market price of share at the beginning of the year

P1 = Market price of share at the end of the year

In the above formula,

D/Po represents dividend yield and

$\frac{(P1 - Po)}{Po}$ represents capital gain or loss

SELF-ASSESSMENT EXERCISE 1

Mr. Lagimori has purchased 100 shares of N10 each of Kinetic Ltd. in 2001 at N78 per share. The company has declared a dividend of 40% for the year 2008-2009. The market price of share as at 1-4-2008 was N104 and on 31-3-2009 was N128.

Calculate the annual return on the investment for the year 2008-2009.

Solution

Dividend received = N10 x 40/100 = N4

$$\frac{R}{Po} = \frac{D}{Po} + \frac{P1 - Po}{Po} = \frac{4}{104} + \frac{4(128-104)}{104} = 0.2692 \text{ or } 26.92\%$$

Risk of an Asset

Risk has been statistically expressed in terms of standard deviation of return. The mean of the probable returns gives the expected rate of return and the standard deviation or variance measures risk. Low standard deviation means low risk and a risk averse investor will look for return where the range is low. Risk is therefore equaled with volatility in expected returns.

Illustration

The rate of return of equity shares of Hill Top Ltd. For the past six years are given below.

Yr	2004	2005	2006	2007	2008	2009
Returns	12	8	-6	20	22	24

Solution

Calculation of the mean (Average Rate of Return)

$$R = \frac{\sum R}{N} = \frac{12 + 18 - 6 + 20 + 22 + 24}{6} = 15$$

Yr	Return	R	(R - R)	(R - R) ²
	2004	12	-3	9
	2005	18	3	9
	2006	-6	-21	44.1
	2007	20	5	25
	2008	22	7	49
	2009	24	9	81
			E(R-R) ²	= 614

$$\text{Variance} = \sigma^2 = \frac{614}{6} = 102.23$$

$$\text{Standard deviation} = \sigma = \sqrt{\sigma^2} = 10.12$$

In investment risk analysis, expected returns rather than actual or realised returns on investment are used. Expected return is the rate of return on investment attached with associated probabilities.

$$E(R) = \sum PR = \text{probability} \times \text{returns}$$

SELF-ASSESSMENT EXERCISE 2

The possible returns and associated probabilities of securities X and Y are given below:

Security X		Security Y	
Probability	Return (%)	Probability	Return (%)
0.10	5	0.05	6
0.15	10	0.20	8
0.40	15	0.30	12
0.25	18	0.25	15
0.10	20	0.10	18
0.05	24	0.05	20

Calculate the expected return and standard deviation of security X and Y.

Solution

Calculation of Expected Return and Standard deviation of X

Probability (P)	R	PR	(R-R)	P(R-R) ²
0.05	6	0.30	-9.5	4.5125
0.15	10	1.50	-5.5	4.5375
0.40	15	6.00	-0.5	0.1000
0.25	18	4.50	2.5	1.5625
0.10	20	2.00	4.5	2.0250
0.05	24	1.20	8.5	3.6125
	<u>R 15.5</u>		<u>16.35</u>	

Expected Return of security X (R) = 15.5

Standard deviation of security X

$$\sigma^2 = 16.35$$

$$\sigma_x = \sqrt{16.35} = 4.04$$

Calculation of Expected Return and Standard deviation of Y

Probability (P)	R	PR	(R-R)	P(R-R) ²
0.10	5	0.50	-7.25	5.2563
0.20	8	1.60	-4.25	3.6125
0.30	12	3.60	-0.25	0.0188
0.25	15	3.75	2.75	1.8906
0.10	18	1.80	5.75	3.3063
0.05	20	<u>1.00</u>	<u>7.75</u>	<u>3.0031</u>
		R 12.25		17.09

Expected Return of security Y (R) = 12.25

Standard deviation of security Y

$$\sigma^2 = 17.09$$

$$\sigma_y = \sqrt{17.09} = 4.134$$

\therefore Security X has higher expected return and lower level of risk as compared to security Y.

3.2 Risk and Return of a Portfolio

A portfolio is a collection of securities

1) Two-Asset Portfolio

Return

The expected return from a portfolio of two or more securities is equal to the sum of the weighted returns from the individual securities.

$$E(R_p) = W_A(R_A) + W_B(R_B)$$

where $E(R_p)$ = Expected return from a portfolio

W_A = Proportion of wealth/funds invested in security A

W_B = Proportion of funds invested in security B

R_A = Expected return of security A

R_B = Expected return of security B

$W_A + W_B = 1$ or 100%

SELF-ASSESSMENT EXERCISE 3

A company's share gives a return of 20% and B company's share gives 32% return. Mr. Otunba invested 25% in A's shares and 75% of B's shares. What would be the expected return of the portfolio?

Portfolio Return

$$\begin{aligned} H_p &= E(R_p) = W_A(R_A) + W_B(R_B) \\ &= 0.25(20) + 0.75(32) = 29\% \end{aligned}$$

Risk of Two-Asset Portfolio

The securities consisting in a portfolio are associated with each other. So, in determining the portfolio risk, the co-variance between the returns of the investments is considered. Co-variance of two securities is a measure of their co-movement. It is the degree to which the securities vary together.

The risk of two-asset portfolio is given them

$$\sigma_p = W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2 W_A W_B R_{AB} \sigma_A \sigma_B$$

where

σ_p = Standard deviation of the portfolio

W_A = Proportion of funds invested in security A

W_B = Proportion of funds invested in security B

σ_A = Standard deviation of security A

σ_B = Standard deviation of security B

r_{AB} = correlation coefficient between A and B

The correlation coefficient is given as

$$r_{AB} = \frac{\text{Cov}_{AB}}{R_A R_B}$$

where $\text{Cov}_{AB} = \text{NEAB} - (E_A)(E_B) = P(A-A)(B-B)$

where N = number of observation

E = summation

The degree of correlation between securities is very important in portfolio selection because it dictates how possible it is to diversify risk (unsystematic).

SELF-ASSESSMENT EXERCISE 4

The table below is related to a portfolio comprising 40% of securities A and 60% of security B.

Prob.	Expected return Security A (%)	Expected return Security B (%)
0.2	12	15
0.6	15	20
0.2	18	25

Calculate the portfolio expected return and risk.

For Security A

R	P	PR	(R-R)	(R-R) ²	P(R-R) ²
12	0.2	2.4	-3	9	1.8
15	0.6	9.0	0	0	0
18	0.2	3.6	3	9	1.8
	R =	15		<u>3.6</u>	

$$\sigma_A^2 = \text{variance of A} = 3.6$$

$$\sigma_A = 3.6 = 1.8974$$

For Security B

R	P	PR	(R-R)	(R-R) ²	P(R-B) ²
15	0.2	3	-5	25	5
20	0.6	12	0	0	0
25	0.2	5	5	25	5
		$R = \frac{20}{10}$			10

$$\sigma_B^2 = \text{variance of B} = 10$$

$$\sigma_B = 10 = 3.1623$$

$$\text{Coefficient of correlation} = \frac{\text{Co-variance AB}}{\sigma_A \sigma_B}$$

Covariance AB =

P	A-A	B-B	P(A-A) (B-B)
0.2	-3	-5	3
0.6	0	0	0
0.2	3	5	3

$$\therefore r_{AB} = \frac{6}{\sigma_A \sigma_B}$$

$$r_{AB} = \frac{6}{1.8974 \times 3.1623}$$

i) Expected Return of the Portfolio

$$\begin{aligned} N_p &= R_p = W_A(R_A) + W_B(R_B) \\ &= 0.4(15) + 0.6(20) \\ &= 6 + 12 = 18 \end{aligned}$$

Risk (standard deviation)

$$\begin{aligned} \sigma_p &= W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2 W_A W_B R_{AB} \sigma_A \sigma_B \\ &= (0.4)^2 (1.8974)^2 + (0.6)^2 (3.1623)^2 + 2(0.4)(0.6) \\ &\quad (1.8974)(3.1623)(1) \\ &= (0.16)(3.6) + (0.36)(10) + 2.8801 \\ &= 0.576 + 3.6 + 2.8801 \\ &= 7.0561 \\ \sigma_p &= 7.0561 = 2.6563 \end{aligned}$$

Return of a Three-Asset Portfolio

For the portfolio consisting three securities A, B and C

$$N_p = W_A R_A + W_B R_B + W_C R_C$$

Risk of A Three-Asset Portfolio

For a portfolio consisting three securities A, B and C:

$$\sigma_p = \sqrt{W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + W_C^2 \sigma_C^2 + 2W_A W_B \sigma_A \sigma_B r_{AB} + 2W_A W_C \sigma_A \sigma_C r_{AC} + 2W_B W_C \sigma_B \sigma_C r_{BC}}$$

Optima Portfolio

The investor can minimise his risk on the portfolio. Minimisation of portfolio risk is attainable by selecting negatively correlated securities. The diversification of unsystematic risk using two security portfolios depends upon the correlation that exists between the returns of those two securities. Optimal portfolio can be achieved where:

$$W_A = \frac{\sigma_B^2 - \text{Cov}_{AB}}{\sigma_A^2 + \sigma_B^2 - 2 \text{Cov}_{AB}}$$

Note that where W_A is the proportion of funds invested in security A, then the proportion invested in B is $1 - W_A = W_B$

3.3 Portfolio Diversification and Risk

Diversification can be regarded as a strategy adopted by rational investors by spreading and committing their funds in several investments in such a way that if a given line goes bad with such an investor, a portfolio is held by an investor in order to diversify risk. And in order to diversify risk for the creation of an efficient portfolio (*one that allows the firm to achieve the maximum return for a given level of risk or to minimise risk for a given level of return*) the concept of correlation must be understood.

In a portfolio consisting of two securities, if the two securities move together, they are positively correlated. If they move in opposite directions, they are negatively correlated. The existence of perfectly correlated (where $r = 1$ or -1) is rare. In order to diversify risk and thereby reduce the firm's overall risk, the projects that are best combined or added to the existing portfolio of projects are those that have negative correlation of A and B.

If $R_{AB} = 1$ No unsystematic risk can be diversified

$R_{AB} = -1$ All systematic risk can be diversified

$R_{AB} = 0$ No correlation between the returns of A and B.

Note that $-1 \leq r_{AB} \leq 1$

Also, combining projects with correlations falling between perfect positive correlation ($r_{AB} = 1$) and perfect negative correlation ($r_{AB} = -1$) can reduce the overall risk of a portfolio.

3.4 Indifference Curves and Investor's Attitude

The indifference curve is the curve which shows the combination of expected return and risk that the individual investor will find to be of equal benefit. It shows the different combinations of risk and return which will leave individual equally satisfied. All the points lying on a given indifference curve offer the same level of satisfaction.

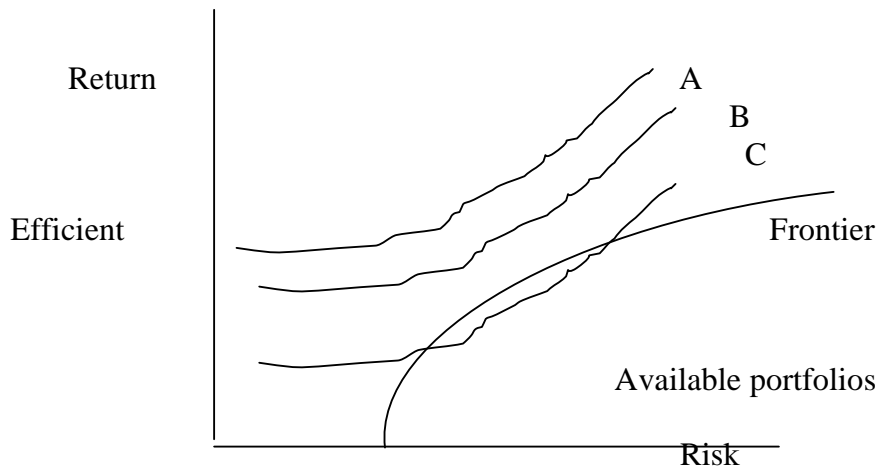


Fig A.

Indifference Curve Compared

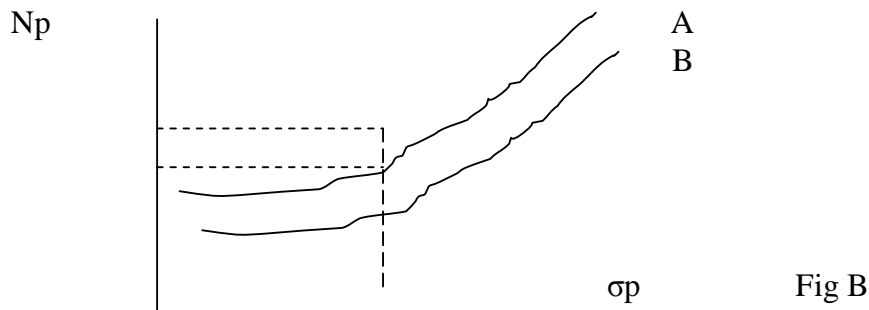


Fig B

The indifference curves shown here are typical in that every point on each curve has a higher expected return or a lower risk than other points on the curve. Also, an investor would choose combination of risk and expected return on one curve with equal indifference, but he would prefer combination of return and risk on indifference curve A than on B because curve A offers higher returns for the same degree or risk and less risk for the same amount of expected returns).

In Fig A, an investor would prefer a portfolio of investments on indifference curve A to a portfolio on curve B, which in turn is preferable to a portfolio on curve C.

3.5 Risks-Return Relationship

The risk and return constitute the framework for taking investment decision. Dealing with the return to be achieved requires estimate of the return on investment over the time period. Risk denotes deviation of actual return from the estimated return. This deviation of actual return from expected return may be on either side. However, investors are concerned with the downside risk. The risk under consideration is made up of two parts.

1. Unsystematic risk
2. Systematic risk

1. Unsystematic risk is also known as diversifiable, unique, specific, residual and non-market risk. It is caused by events such as:

- i. quality of management
- ii. location
- iii. nature of products

This part of risk is internal and is related to the firm and industry.

2. Systematic risk is also known as non-diversifiable, non-specific, general and market risk. It is caused by events such as:

- i. inflation
- ii. economic problems
- iii. political problems
- iv. war
- v. death of the president

This is also known as unavoidable risk and it is external to the firm and industry.

The risk and return tend to be positively related. Risk assures exogenous position in risk-return function while return depends on risk level for its determination. It is generally believed that there is consistently risk-return trade-off i.e. the greater the risk accepted, the greater must be the potential return as reward for committing ones funds to an uncertain outcome.

4.0 CONCLUSION

In this unit, you have learnt the definition of risk, various forms of risks and relationship with single asset portfolio, portfolios diversification etc

9.0 SUMMARY

Uncertainty means inability of one to know exactly what will happen in future and this cannot be quantified; while risk means future happening that can be assumed under probability and the likelihood of future outcomes can be quantified. The risk of an asset is expressed in terms of standard deviation. The mean of the probable return gives the expected rate of return and the standard deviation measures the risk. The expected return from a portfolio of two or more securities is equal to the weighted average of the expected returns from the individual securities.

10.0 TUTOR-MARKED ASSIGNMENT

1. How do you ascertain the risk and return of a portfolio?
2. Write short notes on co-variance.
3. How do you ascertain the optimal portfolio?
4. What is the necessity for portfolio diversification?
5. Write short notes on indifference curves.

7.0 REFERENCES/FURTHER READING

Aborode, R. (2005). *Financial Management*.

ACCA Study Text Kit (1998). *Strategic Financial Management* (BPP Publishing).

Drury, C. (1987). *Management and Cost Accounting*.

Ravi, M.K. (2007). *Financial Management* (6th ed.). Taxmann Allied Services (P.) Ltd.

UNIT 3 CAPITAL ASSET PRICING MODEL

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Classification of Risks
 - 3.2 Assumptions of CAPM
 - 3.3 Beta Factor
 - 3.4 Security Market Line
 - 3.5 Capital Market Line
 - 3.6 Efficient Frontier
 - 3.7 Limitations of CAPM
 - 3.8 Arbitrage Pricing Model
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

The Capital Asset Pricing Model was developed by three economists; W.F. Sharpe, J.N. Linter and Jack Treynor between 1965 and 1966 in an attempt to simplify the assumption of portfolio theory as they relate to investment in securities. The model is based on the portfolio theory developed by Harry Markowitz. It emphasises that the risk factor in portfolio theory is a combination of two risks, i.e. systematic risk and unsystematic risk. The combination of both types of risk provides total risk.

: Total risk = systematic risk + unsystematic risk

This model also suggests that a security's return is directly related to its systematic risk which cannot be neutralised through diversification. So, the total variance (risk) is equal to market related variance plus company's specific variance. The model employs Beta co-efficient (B).

A risk-free security has a B of 0; while the risk premium is also 0. the market portfolio has a B of 1 and a risk premium of $(R_m - R_f)$. A problem arises as regards the risk premium if a security does not have a B of 0 or 1. This is what the Capital Asset Pricing Model (CAPM) attempts to solve.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the meaning of Capital Asset Pricing Model (CAPM)
- explain the classification of risks into systematic and unsystematic risks
- distinguish between Security Market Line and Characteristics Line
- determine the beta co-efficient
- analyse Risk-return Trade - off using CAPM
- analyse the use of Arbitrage Pricing Model in ascertaining expected return.

3.0 MAIN CONTENT

3.1 Classification of Risks

According to the CAPM's theorists, the risk associated with portfolio rate of return can be divided into two.

- i) Systematic risk
- ii) Unsystematic risk

i) Systematic risk

Systematic risk arises out of external and uncontrollable factors. It is the portion of total variation in return caused by factors that affect the price of all securities. The movement or variation is generally due to the response of economic, social and political changes. This risk cannot be avoided because it relates to economic trend which affects the whole market. During economic boom, prices of all stocks indicate rising trend and in recession, the prices of all stocks will be falling. This type of risk is associated with the following factors.

- a) Market risk. This is in connection with changes in demand and supply, expectations of the investors, information flow, and investor's risk perception. Variation in price caused by social, political and economic events is referred to as *market risk*.
- b) Interest rate risk. Generally, price of securities tends to move universally with changes in the rate of interest. The return on investment depends on the market rate of interest. Also, the cost of corporate debt depends on the interest rates prevailing, maturing periods, etc. The uncertainty of future market value caused by fluctuations in the general level of interest is known as *interest rate risk*.

- c) **Purchasing power risk.** This is a risk due to inflation. The risk in prices due to inflation will cause increase in cost of production and reduction in profit due to lower margins. The investor's expectations will also change with the changes in the levels of purchasing power. This risk is inherent in all securities and it is uncontrollable by the individual investors.

ii) **Unsystematic risk.**

This is that portion of total risk which results from known and controllable factors. All the factors responsible for this risk are related to the firm or industry. Unsystematic risk is specific to individual stocks and can be diversified as the investor increases the number of stocks in his or her portfolio. Investors are not compensated for unsystematic risk because they are expected to be rational in holding diversified portfolio to diversify away risk. While systematic risk is attributable to broad macro factors affecting securities, unsystematic risk is attributable to factors unique to a security.

The following factors are possible for unsystematic risk.

- a) **Business Risk.** Business risk is associated with volatility of revenue and profits of a particular company due to its market conditions, product mix, labour supply etc. It has to do with the efficiency with which a firm conducts its operations within the broader environment.
- b) **Financial Risk.** This risk is associated with the financing activities of the firm. It is associated with the Capital Structure of the firm. An ungeared company has no financial risk. Financial risk will also arise due to short – term liquidity problems, shortage of working capital, bad debt, etc.
- c) **Default Risk.** The default risk arises due to default in meeting the financial obligations as and when due for payment.

3.2 **Assumption of CAPM**

- a. Investors are rational and risk averse.
- b. Investors seek to maximise utility which is a function of risk and expected return.
- c. Risk is measured by the standard deviation of returns.
- d. There is a linear relationship between the return obtained from an individual security and the average rate of return from all securities in market.
- e. The stock market is efficient (i.e. security values reflect all known information, which is available to all investors at no cost). No individual investor dominates the market.

- f. All investors can borrow and lend infinitely large sum of money at the same risk-free rate.
- g. There is no taxation.
- h. There are no transaction costs.
- i. All investors view securities in the same way with respect to return, risk and correlation with other securities. Investor's expectations are homogeneous.
- j. The CAPM is a one-period model, though it is not useless in multi-period situation.

3.3 Beta Factor

CAPM states that an investor shall:

- not be rewarded if he accepts alpha (unsystematic) risk because it is avoidable
- be rewarded if he undertakes beta (systematic) risk because it is unavoidable.

Beta is a measure of the systematic risk of a security that cannot be avoided through diversification. It is a measure of risk of an individual stock relative to the market portfolio of all stocks.

- The formula for beta (β) is made of two parts;
- The risk-free rate
- The risk premium

$$\text{So, } E(R_i) = R_f + B_i (E(R_m) - R_f)$$

Where,

- $E(R_i)$ = the expected return on security i
- R_f = the risk-free rate
- $E(R_m)$ = the expected return on the market portfolio
- B_i = the beta of security i
- $E(R_m) - R_f$ = the market risk premium

Formulae for beta

i) where β is made the subject of the above formulae

$$\beta_i = \frac{E(R_i) - R_f}{E(R_m) - R_f}$$

ii) where regression analysis is used

$$\beta_i = \frac{n \sum xy - \sum x \sum y}{n \sum x^2 - (\sum x)^2}$$

where $x = \Sigma(R_m) - R_f$

$y = \Sigma(R_i) - R_f$

n = the number of period's data in the question

iii) where expected returns are known with probability (p)

$$B_i = \frac{\Sigma p (R_i - R_m) (R_m - R_m)}{\Sigma p (R_m - R_m)^2}$$

where,

R_i = Forecast return from security i

R_i = Expected return from security i

R_m = Forecast return from the market

R_m = Expected return from the market

P = Probability distribution

iv) where from formulae (iii)

$$P_o = \frac{\text{Cov}(r_i, r_p)}{\text{Var}(r_p)}$$

where r_i = the rate of return of security i

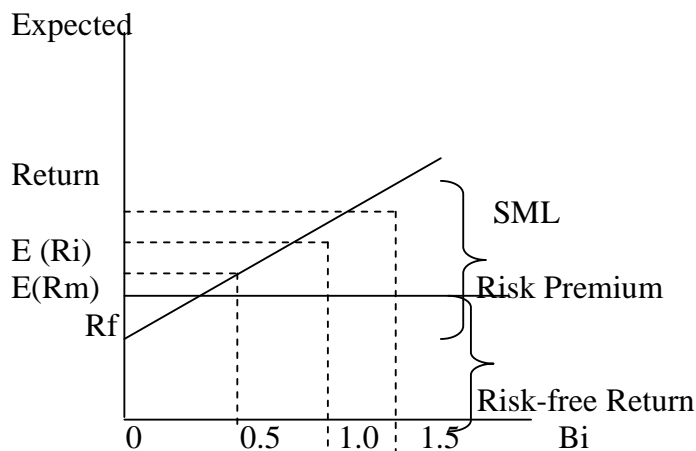
r_p = the rate of return of the portfolio

$\text{Cov}(r_i, r_p)$ = the covariance between the rates of return

3.4 Security Market Line

The SML is the line representing the relationship between expected return of a security and market risk (B). The expected return of a security increases linearly with the market risk. The SML is an upward sloping straight line with an intercept at the risk-free return securities and passes through the market portfolio.

Graphically it is explained thus:



This linear relationship is derived from the formulae:

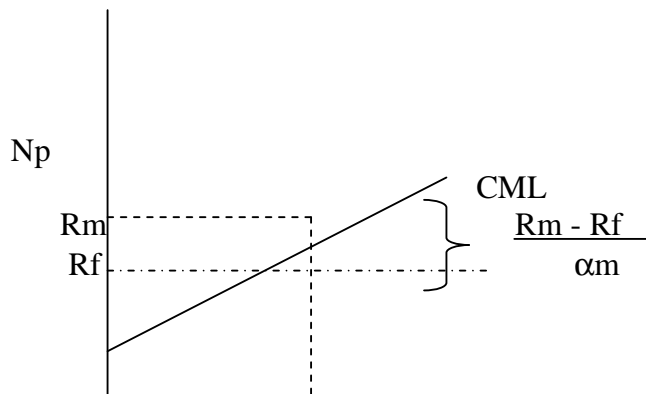
$$E(R_i) = R_f + B_i (R_m - R_f)$$

The market itself has an underlying beta (B) of 1.0, and individual stocks are ranked according to how much they deviate from the macro market. A stock that swings more than the market (more volatile) overtime has a beta whose absolute value is above 1.0. If a stock moves less than the market, the absolute value of the stock's beta is less than 1.0.

More specifically, a stock that has a beta of 1.5 follows the market in an overall decline or growth but does so by a factor of 1.5; meaning when the market has an overall decline of 3%, a stock with a beta of 1.5 will fall by 4.5%. Betas can also be negative, meaning the stock moves in the opposite direction of the market. A stock with a beta of -3 would decline by 9% when the market goes up by 3% and vice versa.

3.5 Capital Market Line

The CML represents the tradeoff between risk and return available in the capital market. It defines the linear relationship that exists between expected return on a portfolio and that portfolio risk. The slope of the CML is the rate of exchange between expected return and risk and it is given by:



3.6 Efficient Frontier

In selection of a portfolio, comparisons between combinations of portfolios are essential. As a rule, a portfolio is not efficient if there is another portfolio with:

- a) a higher expected value of return and a lower standard deviation (risk)
- b) a higher expected value on return and the same standard deviation (risk)
- c) the same expected value of return but a lower standard deviation (risk)

If an investor's portfolio is not efficient, he may through diversification:

- a) increase the expected value of return without increasing risk
- b) decrease the risk without decreasing the expected value of return
- c) obtain some combination of increase of expected return and decrease risk.

This is possible by switching to a portfolio on the efficient frontier.

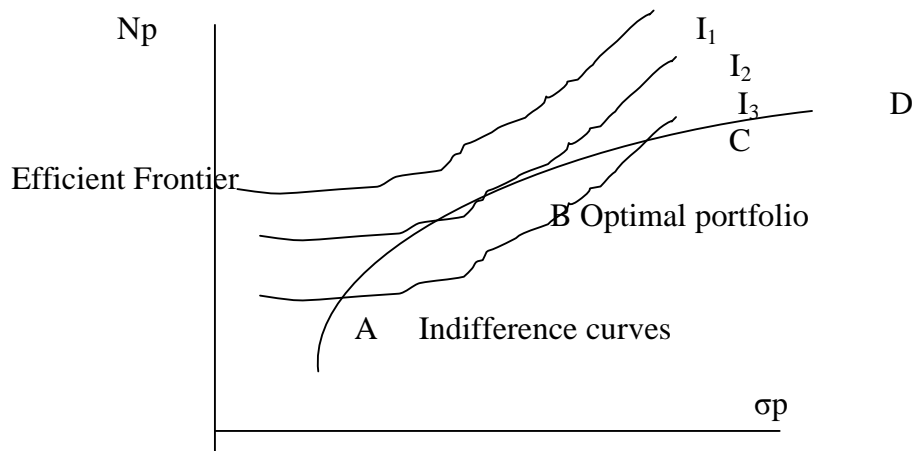


Fig A.

The above graph depicts efficient frontier and the different levels of indifference curves for an investor. The individual investor will want to hold that portfolio of securities that places him on the highest indifference curves, choosing from the set of available portfolios.

A, B, C, and D define the boundary of all possible investments which are the efficient proposals lying on the efficient frontier. The optimal portfolio is achieved at a point where the indifference curve is at tangent to the efficient frontier.

3.7 Limitations of CAPM

- 1 Beta is difficult to measure accurately for an individual company.
- 2 Beta values may be unstable overtime.

- 3 CAPM is a theoretically one period model. As one period model, it should be used with caution for the appraisal of multi-period projects.
- 4 There might be problems in determining the appropriate risk-free rate of return.
- 5 In the real world, a perfect market does not exist and thus, calculating expected return on market portfolio will not be visible.
- 6 The model only considers systematic risk. It assumes that investors always hold a balanced portfolio which eliminates unsystematic risk.
- 7 There are possibilities of conflicts in the decision reached with WACC.
- 8 In practice, the cost of insolvency cannot be ignored. Also, the possibility of insolvency is related to a firm's total risk rather than its systematic risk.

3.8 Arbitrage Pricing Model

The arbitrage Pricing Model (APM) is similar to the CAPM with their origins being significantly different. While CAPM is a single-factor model, the APM is a multi-factor model with a whole set of beta values, one for each factor unlike CAPM that uses a single beta value.

Arbitrage Pricing Theory (APT) out of which the APM arises, states that the expected return on an investment is dependent upon how that investment reacts to a set of individual macro – economic factors and the risk premium associated with each of those macro – economic factors.

In the case of APM, the expected return on a particular investment is given by:

- $$E(R_i) = R_f + B_{fi} (R_{fi} - R_f) + B_{FL} (R_{F2} - R_F) + \dots B_{FN} (R_{FN} - R_F)$$

Where f_1 and f_2 , etc. individual macro – economic factor

n = the number of identified factors.

A major problem with the use of APM is that the identity of those macro – economic factors is unclear.

4.0 CONCLUSION

In this unit, you have learnt the definition of Capital Asset Pricing Model(CAPM), the different classification of risks and the use of Arbitrage Pricing Model.

9.0 SUMMARY

Markowitz's Mean Variance Model suggests that investors are basically concerned with risk and return relating to the investment. In company diversification of portfolio, the tradeoff is possible between risk and return.

The optimal investment is achieved at a point where the indifference curve of an investor is at tangent to the efficient factor.

6.0 TUTOR-MARKED ASSIGNMENT

1. Distinguish between market risk and issuer risk.
2. Write short note on market portfolio.
3. Write short note on capital market line.
4. Distinguish between capital market line and security market line.

7.0 REFERENCES/FURTHER READING

Aborode, R. (2005). *Financial Management*.

ACCA Study Text Kit (1998). *Strategic Financial Management* (BPP Publishing).

Drury, C. (1987). *Management and Cost Accounting*.

Ravi, M.K. (2007). *Financial Management*. (6th ed). Taxmann Allied Services (P.) Ltd.

UNIT 4 PORTFOLIO THEORY

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Markowitz Mean - Variance Frontier
 - 3.2 Concept of Efficient Frontier
 - 3.3 Separation Theorem
 - 3.4 CAPM and APM: the Application
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

In 1952, Harry Markowitz, in an article drew attention to a general and common practice of portfolio diversification. Modern Portfolio Theory (MPT) concentrates on portfolio management which is concerned with efficient management of investment in the securities.

A portfolio is the collection of several securities on behalf of an investor. Portfolio management deals with the process of selecting securities from the number of opportunities available with different expected returns carrying different levels of risk and the selection of securities is made with a view to provide the investors the maximum yield for a given level of risk or ensure minimised risk for a given level of returns.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- describe the mean variance analysis
- explain the concept of efficient frontier
- describe the separation theorem
- explain the usage of CAPM and APM.

3.0 MAIN CONTENT

3.1 Markowitz Mean - Variance Frontier

According to Harry Markowitz, investors are mainly concerned with two properties of an asset; that is, risk and return. Though, it is possible to trade off between risk and return through diversification. By this theory, the risk of individual asset is not really important; what is very important is the contribution of each individual asset to the investor's total risk. For selecting the right portfolio from different assets, he developed mean variance analysis.

The portfolio selection problem can be divided into two stages.

- a. Calculate the mean–variance of the efficient portfolios.
- b. Select one such portfolio.

The idea behind the mean–variance analysis is to ascertain the expected return and risk of portfolios for comparison. The mean of the forecast value of returns is the expected returns while the variance or standard deviation represents the risk.

As we know:

$$N_p = W_A(R_A) + W_B(R_B)$$

$$\text{Variance} = \sigma_p^2 = W_A^2 \sigma_A^2 + W_B^2 \sigma_B^2 + 2 W_A W_B R_{AB} \sigma_A \sigma_B$$

where, W_A = Proportion of funds invested in A

W_B = Proportion of funds invested in B

σ_A = Standard deviation of A

σ_B = Standard deviation of B

R_A = Forecast returns of A

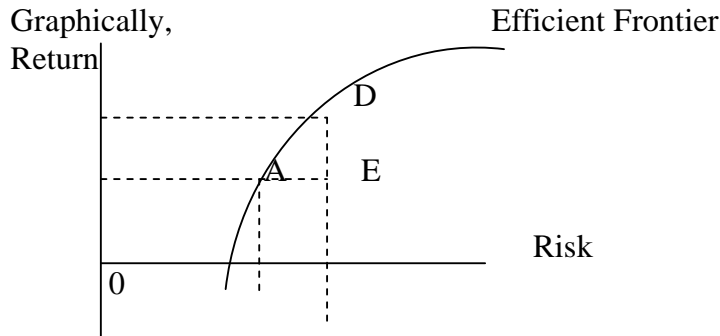
R_B = Forecast returns of B

r_{AB} = Correlation co-efficient

N_p = Expected returns on the portfolio

3.2 Concept of Efficient Frontier

In practice, a rational investor will seek to minimise risk and maximise return. He will therefore prefer the project having the higher return at the same level of risk with another; and where two securities have the same return; he will select the one with the lower risk.



Investment A will be preferred to investment E because it has the lower level of risk at the same level of return with investment E. Security D will be preferred to security E because it has the same level of risk with E but higher return. Both securities A and D dominate security E and where all shareholders or investors prefer a particular security based on the same criterion or criteria, the preferred security is said to have a stochastic dominance over the less preferred security.

The choice between security A and security D depends on the attitude of the investors in the fact that there is no clear choice not only between A and D but also all securities that fall along the curve that is known as the efficient frontier. So, a risk - taker will prefer security D which has the higher return and higher risk. A risk averse investor will select A which has both lower risk return to security D.

3.3 Separation Theorem

The attitude of individual investors towards bearing risk affects only the amount that is loaned or borrowed. It does not affect the optimal portfolio of risky assets. Investors would select portfolio of risky assets no matter what the nature of their indifference curves is. The reason is that when a risk - free security exists, and borrowing and lending are possible at the same rate, the market portfolio dominates all others. As long as they can freely borrow and lend at the risk - free rate, two investors with very different preferences will both choose portfolio of risky assets. Thus, the individual utility preferences are independent of or separate from the optimal portfolio of risky assets. This condition is known as the separation theorem. It states that the determination of an optimal portfolio of risky assets is independent of the individual's risk preferences. Such a determination depends only on the expected returns and standard deviations for the various possible portfolios of risky assets.

In essence, the individual's approach to investing is in two phase:

- determination of an optimal portfolio of risky assets.
- determination of the most desirable combinations of the risk-free security and the portfolio.

3.4 Application of CAPM & APM

Recalling the Capital Asset Pricing Model

$$E(R_i) = R_f + B_i (R_m - R_f)$$

SELF-ASSESSMENT EXERCISE 1

Oreoluwa Ltd., an investment company has invested in equity shares of a Bluechip company.

Its Risk-free return (R_f) = 10%

Expected total return (R_m) = 16%

Market sensitivity index (B_i) = 1.5

Calculate the expected rate of return on the investment made in the security.

$$\begin{aligned} E(R_i) &= R_f + B_i (R_m - R_f) \\ &= 10 + 1.5 (16 - 10) \\ &= 10 + 1.5 (6) = 19\% \end{aligned}$$

Implications of Beta Values

- A portfolio with beta greater than one is more volatile than the market and will have a higher return than the market.
- A portfolio with beta less than one is not as risky as the market and will have a lower return than the market.
- A portfolio with beta equal to one has the same risk with the market and will have the same return with the market.
- A portfolio with beta equal to zero is risk-free.

Asset Beta

An asset beta reflects a company's business risk. It is the weighted average beta of equity and beta of debt including any relevant tax effects. The difference between a company's asset beta and equity beta reflects the financial risk. Only systematic risk that cannot be diversified away is considered in an asset beta.

Thus:

$$\beta_a = \frac{\beta_e (MVe)}{MVe + MVd (1-t)} + \frac{\beta_d [MVd (1+t)]}{MVe + MVd (1-t)}$$

$$\therefore \beta_a = \beta_a + (\beta_a - \beta_d) \frac{MVd (1-t)}{MVe}$$

where β_E = Beta of Equity
 β_a = Asset of beta
 β_d = Beta of debt
 MVe = Market value of debt (ex-int)
 MVe = Market value of equity (ex-div)
 t = Corporation tax rate

SELF-ASSESSMENT EXERCISE 2

The most recent balance sheet of Olekoko Plc. shows the following:

	N
Net Assets	67,500
Represented by:	
Ordinary shares of 50k	52,500
10% debentures	15,000
	67,500

The beta of the company's asset is 0.85 while that of the debt is 0.20. Return on government bond is currently 12% while the return on the market securities is 17%. The ordinary shares are currently quoted at N2.10 per share while the market value of the debentures is 89%. Using the capital asset pricing model, determine the company's appropriate cost of capital assuming the rate of company tax is 30%.

Solutions

- i. Calculation of Number of shares

$$\text{Number of shares} = \frac{N52,500}{50k} = 105,000 \text{ shares}$$
- ii. Total market value of equity

$$100,000 \times N2.10 = N220,500$$
- iii. Total market value of debt

$$\frac{N15,000 \times 89}{100} = N13,350$$

- iv. Calculation of the beta of equity

$$\beta_e = \beta_a + (\beta_a - \beta_d) \frac{MV_d (1 - t)}{MV_e}$$

$$\beta_e = 0.85 + (0.85 - 0.20) \frac{13,350 (1 - 0.30)}{220,500}$$

$$= \frac{0.85 (0.65) 13,350 (0.70)}{220,500} = 0.8775$$

- v. Calculation of the cost of equity

$$\begin{aligned} E(R_i) &= R_f + \beta_i (R_m - R_f) \\ &= 12 + 0.8775 (17 - 12) \\ &= 12 + 0.8775 (5) \\ &= 12 + 4.39 = 16.39\% \end{aligned}$$

- vi. Calculation of cost of debt

$$K_d = \frac{I (1 - t)}{MV_d} = \frac{10 (1 - 0.3)}{89}$$

$$= \frac{10(0.7)}{89} = 7.87\%$$

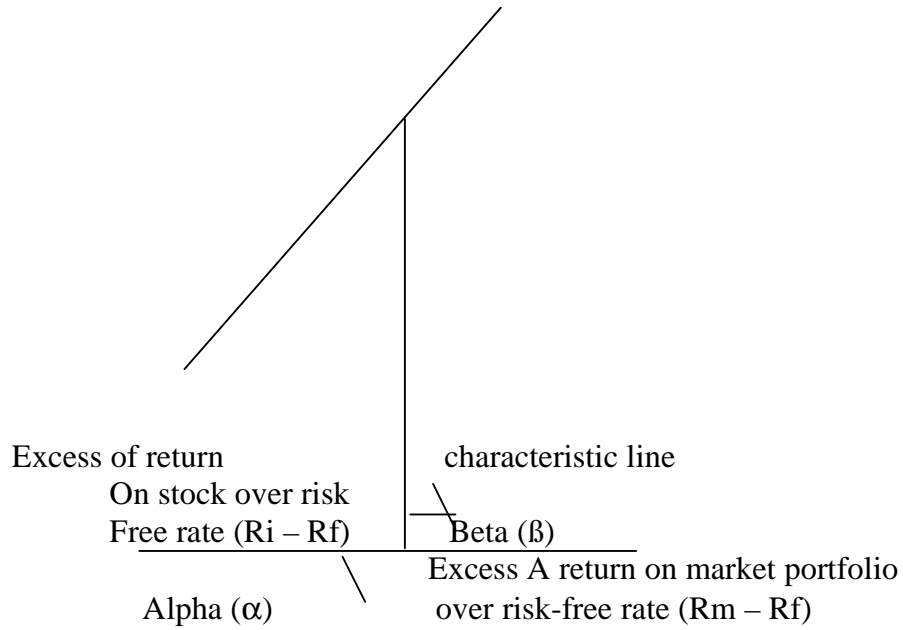
- vii. Calculation of the company's cost of capital (WACC)

	MIV	COST	HASH	TOTAL
EQUITY	220,500		16.39	36,140
DEBT	13,350		7.87	1,051
	<u>233,850</u>			<u>37,191</u>

$$K_w = \frac{37,191}{233,850} \times 100 = 15.90\% = 16\%$$

Characteristic line

A line that best fits the points representing the returns on the assets and the market is called characteristic line. The slope of the line is the beta of the asset which measures the risk of a security relative to the market. The greater the beta co-efficient value, the greater the slope of the characteristic line and the greater the systematic risk for an individual security.



The characteristic line equation for the individual security is given below:

$$(R_i - R_f) = \alpha + \beta_i (R_m - R_f)$$

SELF-ASSESSMENT EXERCISE 3

The ratios of return on the security of company X and market portfolio for 10 periods are given below:

Period	Return of X (%)	Return on Market Portfolio
1	20	22
2	22	20
3	25	18
4	21	16
5	18	20
6	-5	8
7	17	-6
8	19	5
9	-7	6
10	20	11

- What is the beta of security X?
- What is the characteristic line for security X?

Solution

R _X	R _M	(R _X - R _X)	(R _M - R _M)	(R _X - R _X) (R _M - R _M)
		(R _M - R _M) ²		
20	22	5	10	50
22	20	7	8	56
25	18	10	6	60
21	16	6	4	24
18	20	3	8	24
-5	8	-20	-4	80
17	-6	2	-18	-36
19	5	4	-7	-28
-7	6	-22	-6	132
20	11			357
ΣR _X	ΣR _M			706
β _x	Σ(R _X -R _X)(R _M -R _M)			Σ(R _M -R _M) ²
=	COV _x m			
	σ ² _m			

$$\text{Cov}_{xm} = \frac{\sum (R_X - R_X)(R_M - R_M)}{n - 1} = \frac{357}{9} = 39.67$$

$$\sigma_m^2 = \frac{\sum (R_M - R_M)^2}{n - 1} = \frac{706}{9} = 78.44$$

$$\beta_x = \frac{39.67}{78.44} = 0.506$$

ii. From the linear equation

$$Y = \alpha + \beta_x$$

$$15 = \alpha + 0.506(12)$$

$$\alpha = 8.928\%$$

$$\therefore \text{Characteristics line of X} = \alpha + \beta(R_M)$$

$$= 8.928 + 0.506R_M$$

Arbitrage Pricing Model (APM)

Recalling the Arbitrage Pricing Model

$$E(R_i) = R_f + B_{fi}(R_{fi} - R_f) + B_{FL}(R_{F2} - R_F) + \dots B_{FN}(R_{FN} - R_F)$$

Where f_1 , f_2 and f_n represent the individual macro – economic factors which may include:

- changes in the level of industrial production in the economy
- changes in the shape of the yield curve
- changes in the default risk premium
- changes in the inflation rate
- changes in the real interest rate
- level of personal consumption
- level of money supply in the economy

SELF-ASSESSMENT EXERCISE 4

As an investment manager, you are given the following information:

Factors	Expected Risk Premium		
Market	6.40%		
Interest rate	-0.60%		
Yield spread	5.10%		

Stock	Market (B1)	Interest rate (B2)	Yield spread (B3)
A	1.0	-2.0	-0.2
B	1.2	0	0.3
C	0.3	0.5	1.0

Required:

- a) calculate the expected return for each of the three stocks.
- b) consider a portfolio with equal investment in stocks A, B and C.
 - i) what are the factor risk exposures for the portfolio?
 - ii) what is the portfolio's expected return?

Solution

- a)

$$R_A = 12 + 1(6.4) - 2(-0.6) - 0.2(5.10) = 18.58\%$$

$$R_B = 12 + 1.2(6.4) + 0(0.6) + 0.3(5.10) = 21.21\%$$

$$R_C = 12 + 0.3(6.4) + 0.5(-0.6) + 1(5.10) = 18.72\%$$
- bi.

$$\beta_1 = 1/3 (1 + 1.2 + 0.3) = 0.83$$

$$\beta_2 = 1/3 (-2.0 + 0 + 0.5) = -0.50$$

$$\beta_3 = 1/3 (-2.0 + 0.3 + 1.0) = -0.37$$
- ii.

$$R_p = 12 + 0.83(6.4) - 0.50(-0.6) - 0.37(5.10) = 19.50\%$$

4.0 CONCLUSION

In this unit, you have learnt the mean variance analysis, the concept of efficient frontier, the application of CAPM and the separation theorem.

5.0 SUMMARY

Markowitz Mean Variance Model suggests that investors are basically concerned with risk and return relating to the investment and by diversification of portfolio, the trade-off is possible between the risk and return.

Investors prefer portfolios on the efficient frontier with the least possible risk to earn expected rate of return.

10.0 TUTOR-MARKED ASSIGNMENT

1. What factors necessitates arbitrage pricing model?
2. Write short note on characteristic line.
3. Write short note on separation theorem
4. Distinguish between security risk and market risk.

7.0 REFERENCES/FURTHER READING

Aborode, R. (2005). *Financial Management*.

Akinsulire, O. (2002). *Financial Management* (2nd Ed.).

Ravi, M.K. (2007). *Financial Management* (6th Ed.) Taxmann Allied Services (P.) Ltd.

VanHorne, J.C. & Wachowicz, J.M. (1996). *Fundamentals of Financial Management*.

UNIT 5 FINANCING SME_s

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Features of Small Scale Industries
 - 3.2 Problems of Small Scale Industries
 - 3.3 Sources of Finance for SMEs
 - 3.4 Government Measures to Enhance the Status of SMEs
 - 3.5 Small and Medium Industries Equity Investment Scheme
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

Small and Medium Scale Enterprises (SMEs) can be defined as having three characteristics.

Firms are likely to be unquoted
Ownership of the business is restricted to a few individual

They are not micro business that are normally regarded as those very small business that act as a medium for self – employment of the owners.

The economy of any country depends on the contributions of all sectors of the economy particularly the small and medium scale enterprises.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- explain the meaning of small and medium scale enterprises
- identify the features of small scale enterprises
- discuss the problems of small scale industries
- identify the sources and finance of SMEs
- understand government measures to enhance the status of SMIs.

3.0 MAIN CONTENT

3.1 Features of Small Scale Industries

1. They usually have low set up cost.
2. They rely on local raw materials.
3. Employment operation.
4. They accelerate rural development and contribution to stemming urban migration and problems of congestion in large cities.
5. They provide links between agriculture and industries.
6. They mobilise private savings and harness them for productive purposes.
7. They supply parts and components for large-scale industries.
8. They contribute to domestic capital formation.

3.2 Problems of Small Scale Industries

The small scale industries are faced with many problems as follows.

1. Management problems: all important entrepreneurial and operational decisions are taken by one person and there is lack of formal training in management and production skills.
2. Financing problems: these constitute the major problem. Their low business credibility, poor management, inefficiencies, limited collateral security, high risk of failure make it difficult for them to raise capital from usual sources and often force them to secure loans at higher interest rates from their lenders.
3. Most of them tend to imitate rather than innovative.
4. They engage in production of non – standardised products.
5. Most of them are concentrated in urban centres and could therefore not tap the local advantages e.g. cheap labour, access to primary products, etc.
6. They have little access to or inability to apply new technologies.

3.3 Sources of Finance for SMEs

At one time or another in the life of any enterprise, the owners of SMEs would also need money either as starting capital or capital to augment the business. Generation of funds for the successful operation of these enterprises involves the following.

- a. Owner/self/personal financing
- b. Loans from cooperatives, banks, associates
- c. Trade credit
- d. Equity financing
- e. Venture capital

- f. Leasing
- g. Factoring

Owner Financing. This comes in the form of owner's contribution in the case of a sole proprietor. This money is needed as pointed out to provide working capital to acquire fixed assets and to pay for promotional expenses. This is the same as equity financing.

3.4 Government Measures to Enhance the Status of SMIs

The government has introduced schemes and policies to encourage more lending to small firms and special sectors of the economy and these are as follows.

- Central Bank of Nigeria guidelines on sectoral allocation of loans and advances.
- The loan scheme of National Directorate of Employment.
- The granting of credits by Agricultural Credit Guarantee Schemes.
- The establishment of Development Banks such as BOI and NACRDB.
- Establishment of SMEDAN.
- Establishment of small and medium scale equity investment scheme.
- Establishment of ADB Export stimulation fund scheme, IDA and IFC.

3.5 Small and Medium Scale Industries Equity

Investment Scheme

The Bankers Committee on December 21, 1999, at its 264th meeting resolved that all banks in Nigeria should set aside 10% of their profit before tax for equity investments in small and medium industries.

Consequently, the scheme Small and Medium Scale Industries Equity Investment Scheme (SMIEIS) was launched and on August 2001, the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) was established to address the problems associated with the SMEs.

The objectives

The objectives of the SMIEIS scheme are to:

- facilitate the flow of funds for the establishment of new Small and Medium Scale Industries (SMI) projects.
- reactivate, expand and modernise or restructure on-going projects.
- stimulate economic growth, develop local technology and generate employment
- eliminate the burden of interest and other financial charges for the entrepreneurs as imposed by most lenders
- provide financial, technical and managerial support to the entrepreneurs.

4.0 CONCLUSION

In this unit, you have learnt the definition of Small and Medium Scale Enterprise, the features of SMEs, the problems of SMEs and the sources and finance of SME's.

5.0 SUMMARY

In this unit, you have learnt the definition of SME's with respect to their major characteristics. You have also learnt the features of the SME's, some of their major problems and the different ways that they generate their funds which include loans, trade credit, venture capital and leasing among others. Finally, you are now conversant with some of their major objectives.

6.0 TUTOR-MARKED ASSIGNMENT

1. State some of the objectives of SME's.
2. Discuss some of the features of small scale industries and their problems.

7.0 REFERENCES/FURTHER READING

Adelaja, B.O. (2003). *Financing Small and Medium Enterprises under SMIEIS: Operators' Perspective*. (CBN Publication, Lagos).

Ravi, M.K. (2007). *Financial Management* (6th Ed.) Taxmann Allied Services Ltd.

Van-Horne, J.C. & Wachowicz, J.M. (1996). *Fundamentals of Financial Management*.

UNIT 6 INTERNATIONAL FINANCIAL MANAGEMENT

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Foreign Exchange Management
 - 3.2 Factors Affecting Fluctuations in Exchange Rates
 - 3.3 Methods of Hedging Against Foreign Currency Risk
 - 3.4 Foreign Exchange Market Participants
 - 3.5 Exchange Rate
 - 3.6 Theories of Foreign Exchange Determination
 - 3.7 Currency Forecasting
 - 3.8 Exchange Risk
 - 3.9 Foreign Exchange Management Techniques
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

Due to the fact that all countries are not equally endowed with the different natural resources, no country is self-sufficient in its demand and supply of goods and services and that is why factors of production such as labour and capital are seen moving freely across the national frontiers. All the countries trade in goods and services, borrow and lend, invest and accept investments from other countries with nominal or full control to govern the currency flow and trade. Since different countries have their own currencies, with different purchasing power, the settlement of payments cannot be made with the currency of any one country. It is from this that the concept of foreign exchange rate emerges.

2.0 OBJECTIVES

At the end of this unit, you should be able to:

- describe foreign exchange management
- explain the determinants of exchange rates
- explain hedging the foreign exchange risk
- determine theories of foreign exchange determination
- calculate exchange rates.

3.0 MAIN CONTENT

3.1 Foreign Exchange Management

It is clear that no country can produce all that she needs. Countries individually, produce such goods in which such a country has comparative advantage and sells those goods to other countries while also buying the goods the other countries have comparative advantage in.

Although, exchange rate fluctuation may result in a gain (positive) or a loss (adverse), it is often considered undesirable because it introduces an element of uncertainty. However because of the risk involved, it can be said that foreign exchange management can impose an extra burden on a company's finance manager.

Meanwhile, the following shall be considered.

- a) Balance of Trade
- b) Invisible Balance
- c) Balance of Payment on current account.

Balance of trade

Visible goods are goods that have physical existence such as cars, machinery which are traded and exchanged in international trade. When a country produces such goods and sells them abroad they are referred to as visible export. When she buys such goods abroad for home consumption it is known as visible imports. The difference in the value of visible exports and visible imports is known as the balance of trade and it may be favourable or unfavourable depending on the time of the operation.-

Invisible balance

Countries also buy and sell services such as banking services, shipping services etc. When a country sells or renders such services to another country such transactions is called invisible exports, when the opposite is the case, i.e. services are provided for the country by other countries, they are called invisible imports and this is the difference between invisible imports and invisible items which may either be favourable or unfavourable for any particular year.

The balance of payment on current account

This is the record of all transactions between one country and the rest of the world, for all visible goods and invisible services in the course of the year. When the total payments made for both visible goods and invisible services in the course of one year exceed the total receipt from visible and invisible services. The balance of payments on current account is said to be unfavourable. A country in this position is said to experience a deficit on the account. In a reversed case, the balance of payment is favourable.

3.2 Factors Affecting Fluctuations in Exchange Rates

- 1) The supply and demand for the foreign currency
- 2) The supply and demand for the local currency
- 3) Global inflation rates and its effect on the domestic rate of inflation
- 4) Local economic conditions including local production of goods for export and local interest rates
- 5) The political environment in Nigeria and in the foreign country
- 6) Volume of trade
- 7) Speculation: speculators influence movements in exchange rates by buying and selling in the expectation of making positive returns.
- 8) Interest rate
- 9) International confidence in the naira reflecting international confidence in the domestic economic management policies.

3.3 Methods of Hedging against Foreign Currency Risk

- 1) **Forward countries.** This is a contract to buy or sell a specified quantity of foreign currency at an agreed future date or within a specified future time period. The contract could be fixed if the future date is fixed. It could be floating, if the future date falls within a range.
- 2) **Foreign currency invoicing.** One way of avoiding exchange risk is for an exporter to invoice a foreign customer in domestic currency. In this way, only the exporter will be able to avoid exchange risk, the burden of the risk will now be passed on to the importer.
- 3) **Matching.** If a Nigerian company expects to receive some earnings in foreign currency and at the same time expects to incur certain expenses in the same foreign currency, it may plan to offset its payments against receipts in the currency. In this way, movements in exchange rates between the naira and the currency in question would be irrelevant to the extent that matching can

take place as there will be no need to purchase or sell foreign currency.

- 4) **Borrowing in a foreign currency.** An exporter who invoices foreign customers in a foreign currency can hedge against the exchange risk by:
 - i) borrowing an amount in the foreign currency now
 - ii) converting the foreign currency into domestic currency at the spot rate
 - iii) repaying the loan with interest out of the eventual foreign currency receipts
- 5) **Protection clauses.** An export or import contract might be given a protection clause, whereby sales prices in the foreign currency or the adjusted exchange rate moves outside a defined range.
- 6) **Netting.** This is a technique which involves the head office and its foreign subsidiary netting off the intra-organisational debts due at the end of each period. Only the balance exposed to currency risk needs to be hedged.
- 7) **Pricing Policy.** A company can anticipate adverse exchange rate movements by building an extra profit margin into the selling price to act as a cushion in the event that exchange rates do move adversely. Protection clause is another aspect of pricing policy.
- 8) **Leading and lagging.** Accelerating (leading) and delaying (lagging) international payments by modifying credit terms normally on credit.

3.4 Foreign Exchange Market Participants

1) Arbitrageurs

There is the need to earn risks-free profits by taking advantage of differences in exchange rates in other countries. They buy currencies that are underpriced at one centre and simultaneously sell the same set of currencies at the centres where they are overpriced, thereby making a risk-free arbitrage profit.

2) Speculators

The reason for their action is profit making. They trade in foreign currencies by profiting from the exchange rate fluctuations. They take risks in the hope of making profits by buying a particular currency when the price is low and selling the same currency when the price is high.

3) Hedgers

These are mainly multinational companies. They operate in several countries and their assets and liabilities are designated in foreign currencies. The foreign exchange rate fluctuation can cause diminution in the home currency value of their assets and liabilities.

4) **Exchange rate**

Exchange rate is the equivalent of the foreign currency that is obtainable from a unit of home currency. It is the rate at which one currency exchanges for another currency.

3.5 **Exchange Rates**

Direct and Indirect Quotes

Direct Quote

- a. Since the advent of SAP in 1986, Nigeria adopted direct quote of exchange.
- b. Exchange is quoted directly when the number of units of home currency to deal in one unit of foreign currency is given. For example, \$1 = ₦128.

Indirect Quote

- a. It is indirect when the number of units of foreign currency to deal in one unit of home currency is given. E.g. ₦1 = \$0.0078.
- b. Indirect quote is the reciprocal of direct quote and vice versa.

Types of Exchange Rate:

- 1) **Fixed exchange rate.** With a fixed exchange rate, the government of a country maintains its currency at a particular exchange rate against a specified foreign currency. When the level can no longer be maintained due to market pressure, devaluation takes place.
- 2) **Floating exchange rate.** With this system, the market determines the exchange rate of that currency with other currencies and these rates will constantly fluctuate (ie. Exchange rates may fall rise).
- 3) **Spot rate.** This is the rate at which foreign exchange can be bought or sold with payment set for the same day. This is the rate of exchange ruling at the conversion date.
- 4) **Forward rate.** It is the currency rate quoted now for delivery at some future specified date.

3.6 **Theories of Foreign Exchange Determination**

1) Purchasing power parity theorem

This theorem predicts that the exchange value of foreign currency depends on the relative purchasing power of each currency in its own country and that spot exchange rates will vary over time according to relative price changes.

It follows therefore that if the rate of inflation of country “A” is greater than the rate of inflation in country “B”, the rate of exchange of currency of country “A” will fall against the currency of Country “B”.

The exact relative purchasing power parity relationship is expressed as follows:

$$\frac{S_1 - S_0}{S_0} = \frac{P_n - P_f}{1 + P_f}$$

where S_0 = Current (direct quote) spot rate
 S_1 = Expected future (direct quote) spot rate at time 1
 P_n = Inflation rate of home country
 P_f = Inflation rate of foreign country

The above formula can be simplified

$$\frac{S_1}{S_0} = \frac{1 + P_n}{1 + P_f}$$

SELF-ASSESSMENT EXERCISE 1

It is expected that the inflation rates in Nigeria and US are 6% and 3% respectively. The present spot rate of 1 US\$ is ₦45.36. What will be the expected spot rate in twelve months time?

$$\frac{S_1}{S_0} = \frac{1 + P_n}{1 + P_f}$$

$$\frac{S_1}{45.36} = \frac{1 + 0.06}{1 + 0.03}$$

$$\begin{aligned} S_1 \times 1.03 &= 45.36 \times 1.06 \\ S_1 &= \frac{48.0816}{1.03} = \text{₦}46.68 \end{aligned}$$

Fisher Effect

The term fisher effect is used in looking at the relationship between interest rates and expected rates of inflation. The rate of interest can be seen as made up of two parts. The real required rate of return plus a premium for inflation. The real and nominal interest rates are connected by Fisher Effect as follows:

$$(1 + R) (1 + I) = (1 + M)$$

when R = Real interest rate

I = Expected rate of inflation

M = Market (nominal) interest rate

Then,

$$(1 + R) = \frac{(1 + M)}{(1 + I)}$$

The difference in interest rates between two countries is equal in equilibrium, to the expected difference in inflation rate between these countries. This hypothesis is called fisher effect. If real interest rates are equal in all countries, then

$$\frac{1 + i_n}{1 + i_f} = \frac{1 + P_n}{1 + P_f}$$

where i_n = Nominal interest rate of home country

i_f = Nominal interest rate of foreign country

P_n = Rate of inflation of home country

P_f = Rate of inflation of foreign country

International Fisher Effect

This is also called “Open Fisher Theory”. It asserts that countries with higher rates of inflation will have higher nominal interest rates to provide adequate return to investors to combat inflation. The international fisher effect relationship is expressed as:

$$\frac{S_1 - S_0}{S_0} = \frac{i_n - i_f}{1 + i_f}$$

where, S_1 = Expected future spot rate at time period 1

S_0 = Current spot rate

i_n = Nominal interest rate of home country

i_f = Nominal interest rate of foreign country

The formula can be simplified as follows:

$$\frac{S1}{S0} = \frac{i_n - i_f}{1 + i_f}$$

$$\begin{aligned}\frac{S1}{45.36} &= \frac{1 + 0.08}{1 + 0.05} \\ S1 &= 48.99/1.05 = 46.66 \\ S1 &= \text{N}46.6\end{aligned}$$

2) Interest rate parity theorem

This theorem states that the differential between the forward exchange rate and the spot exchange rate is equal to the differential between the foreign and domestic interest rates. Its condition is that the forward premium or discount for a currency quoted in terms of another currency is approximately equal to the difference in interest rates prevailing between the two countries.

$$\text{So, } \frac{F - S0}{S0} = \frac{i_n - i_f}{1 + i_f}$$

where, F = Direct quote for forward rate

S0 = Direct quote for spot rate

i_n = Interest rate of home country

i_f = Interest rate of foreign country

Simply,

$$\frac{F}{S0} = \frac{i_n - i_f}{1 + i_f}$$

SELF-ASSESSMENT EXERCISE 2

The current bank interest rate of U.S. and Nigeria are 4.5% and 8.5% respectively. The present spot market rate of exchange in 1 US \$ is ~~N~~45.36.

What would be the twelve months forward rate?

$$\frac{F}{S0} = \frac{i_n - i_f}{1 + i_f}$$

$$\begin{aligned}\frac{F}{45.36} &= \frac{1 + 0.085}{1 + 0.045} \\ F(1.045) &= 45.36 \times 1.085 \\ F &= 49.2156/1.045 = \text{N}47.096\end{aligned}$$

3.7 Currency Forecasting

- a) **Market based forecast.** The currency forecast is obtained by extracting the prediction embodied in interest and forward rate.
- b) **Model Based Forecast:**
 - i. **Fundamental analysis.** It relies painstakingly on the examination of macro-economic variables and policies that are likely to influence a currency prospect. The variables examined include relative inflation, interest rates, national income growth and changes in money supply.
 - ii. **Technical analysis.** It focuses exclusively on past price and volume movements while totally ignoring economic and political factors.

3.8 Exchange Risk

This is the variability of a firm's value that is due to uncertain exchange rate.

Currency Exposure to Risk

- 1) **Accounting or translation exposure.** This is Risk of adverse effects on a firm's financial statements that may arise from changes in exchange rates.
It is the change in the value of a firm's foreign currency denominated account due to a change in the exchange rate.
- 2) **Economic exposure.** This is the Risk that arises from changes in real exchange rate. It is the extent to which the value of a firm will change due to exchange rate movement.
- 3) **Transaction exposure.** This is the Risk to a firm with known future cashflows in a foreign currency that arises from possible changes in the exchange rate. It is the extent to which a given exchange rate will change the value of foreign currency dominated transactions already entered into.

3.9 Foreign Exchanges Management Techniques

- 1. **Currency options.** This gives the holder the right but not the obligation to sell (put) or buy (call) the contract currency at a set price and at a given date.
- 2. **Currency future.** This is a contract for future delivery of a specific quantity of a given currency with the exchange rate fixed at the time the contract is entered into.

3. **Currency forward contract.** This is similar to future contracts except that they are not traded on organised market. They are non-standardised private deals.
4. **Interest rate swaps.** This is an agreement between two parties to exchange interest rate payments for a specific maturity on an agreed principal. The most common interest rate swap involves exchanging fixed interest payments for floating interest payments.
5. **Currency swap.** This is a simultaneous borrowing and lending operation whereby two parties exchange specific amount of two currencies at the beginning at the spot rate. The parties undertake to reverse the exchange rate after a fixed term at a fixed exchange rate.
6. **Debt swap.** This is a set of transactions (also called debt-equity swap) in which a firm buys a country's dollar debt and swap this debt with Central Bank for local currency that can be used to acquire a local enterprise.

4.0 CONCLUSION

In this unit, you have learnt the definition of foreign exchange, exchange rate and the factors that influence it, theories of foreign exchange determination, currency forecasting and foreign exchange management techniques.

5.0 SUMMARY

In this unit, you have learnt about foreign exchange management as a consideration in case of exchange rate fluctuation. You are now aware of the various methods of hedging against foreign currency risk, foreign currency, invoicing, matching, borrowing in foreign currency, protection clauses, netting, pricing policy, leading and lagging. You are also conversant with the foreign exchange participants, direct and indirect quotes, and various theories of foreign exchange determination and different techniques of foreign exchange management.

6.0 TUTOR-MARKED ASSIGNMENT

1. List and explain briefly the techniques of foreign exchange management.
2. Discuss briefly the various participants in the foreign exchange market.
3. What do you understand by direct and indirect quotes?

7.0 REFERENCES/FURTHER READING

Aborode, R. (2005). *Financial Management*.

Akinsulire, O. (2002). *Financial Management* (2nd Ed.)

RavI, M.K. (2007). *Financial Management* (6th Ed.) Taxmann Allied Services Ltd.

Van–Horne, J.C. & Wachowicz, J.M. (1996). *Fundamentals of Financial Management*.