

NATURE AND SCOPE OF STRATEGIC FINANCIAL MANAGEMENT

1.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ◆ Define and explain strategic financial management;
- ◆ State the two broad categories of strategic financial decisions that are normally made by financial managers of an organisation;
- ◆ Mention some of the alternative courses of action (strategies) that are available to the company and capable of achieving the organisation's financial objectives;
- ◆ State some other aspects of the overall strategic plan in which financial managers are involved; and
- ◆ List the steps involved in strategic financial decision-making.

1.1 INTRODUCTION

Strategic financial management can be described as the allocation of scarce resources to identified possible strategies among competing opportunities and taking necessary actions to monitor the progress of the chosen opportunity so as to achieve set objectives.

However, the Chartered Institute of Management Accountants of UK (CIMA) defines Strategic Financial Management as “the identification of the possible strategies capable of maximising an organisation's net present value, the allocation of scarce capital resources between competing opportunities and the implementation and monitoring of the chosen strategy so as to achieve stated objectives”.

In order to understand what Strategic Financial Management is about, it is necessary to know the meaning of the two words ‘strategy’ and ‘strategic’ as provided by Oxford Advanced Learner's Dictionary, 6th edition.

Strategy: This is the process of planning something or carrying out a plan in a skillful way.

Strategic: This is done as part of a plan that is meant to achieve a particular purpose.

If the above definitions are used as a guide, then strategic financial management can be defined, as those aspects of the overall strategic plan of an organisation that concern the financial managers. For example, there are many aspects of a business plan (to be discussed later under Corporate Strategy): marketing and sales plan, production plan, personnel plan, capital expenditure plan, etc. All these plans have far-reaching financial implications for the financial managers of an organisation as they will be expressed in financial terms for the purpose of evaluating the overall performance of the organisation; which, itself, is measured in financial terms.

1.2 THE SCOPE OF STRATEGIC FINANCIAL MANAGEMENT

There are two broad categories of strategic decisions that are normally made by financial managers of an organisation:

- (a) **Decisions regarding investments in the assets of the company:** The most appropriate level and mix of the assets.
- (b) **Decisions regarding how such investments should be financed:** The optimum level and mix of funding requirements for the assets.

The above main decisions will focus on providing answers to the following questions:

- (i) Should a new factory be built for the purpose of producing (and selling) a new product or should a company already involved in the production of such a product be acquired?
- (ii) Should an organisation make a particular component in-house or should it buy it from outside?
- (iii) In financing the investments, should the company rely solely on funds from owners or should it mix these funds with those from lenders?
- (iv) If a mix of funds is the option taken, what proportion of each source should be used?
- (v) How should the funds be made available and at what cost?
- (vi) Should dividends be paid now or should earnings be re-invested and dividends paid later?

- (vii) If the organisation decides to pay dividend, what proportion of the available earnings should be paid and what proportion should be retained for future expansion and growth?
- (viii) Should the organisation be paying a fixed Naira amount or a fixed percentage of earnings every year?
- (ix) What should be the appropriate level of stocks to hold at any point in time?
- (x) Should the company extend credit to customers and how much should be given to each customer?
- (xi) Should the company take advantage of cash discount if offered by suppliers?
- (xii) Which type of banks' facility arrangement should be put in place – term loan, overdraft or both?

1.3 IMPLICATION OF THE PREFIX '*STRATEGIC*' IN STRATEGIC FINANCIAL MANAGEMENT

The prefix “strategic”, to financial management, means that decisions to accept or reject proposals have to be based on strategic factors. Capital investment decisions are typical examples of these decisions. An investment proposal may add value to the business based on the application of the discounted cash flow techniques which takes into account only the quantifiable cash flows. However, the decision might be to reject the proposal if some highly uncertain but very beneficial inputs are not considered. On the other hand, a proposal might be accepted on strategic bases even if, based on quantifiable cash flows alone, it subtracts value from the business.

1.4 OTHER RELATED ACTIVITIES IN WHICH FINANCIAL MANAGERS ARE INVOLVED

The other related activities in which Financial Managers are involved include the following:

- (a) Financial managers work with other managers within the organisation in the preparation of the various plans with a view to producing the projected financial statements of the organisation.
- (b) Financial managers match each aspect of the business plan with the financial resources available and ensure that each plan, in financial terms, falls within the total funds available. A production plan, for

instance, must not only be in agreement with the overall strategic plan but must also be financially feasible.

- (c) Financial managers, along with other managers, are involved in monitoring and controlling the activities of the organisation. Actual resources used are compared with planned resources, deviations are highlighted and appropriate corrective action is taken in each case.
- (d) Financial managers work hand-in-hand with capital market operators, particularly the issuing houses and the stockbrokers. They are concerned with the effect of their decisions on the share price. For example they do not have to worry about threats of take-over if their organisation's share price is increasing.
- (e) Financial managers concern themselves with the events in the legal, political and socio-economic environment, since it may affect the organisation's cash flow. An example is the enactment of the law on environmental pollution by the National Assembly.

All the above questions and the related activities will be treated in detail in subsequent chapters.

1.5 STEPS IN STRATEGIC FINANCIAL DECISION-MAKING

- (a) Determine the objectives of the organisation.
- (b) Identify all possible courses of action.
- (c) Collect, collate and record data in respect of each alternative course of action.
- (d) Analyse, summarise and present data in a form suitable for decision making.
- (e) Arrive at a decision, taking into account quantitative, non-quantitative, social, cultural, normative, psychological factors etc.
- (f) Execute the decision, through pragmatic and co-ordinated action, to actualise the plan.
- (g) Highlight the differences between planned results and actual results.
- (h) Take necessary corrective action that will improve performance or lead to the adjustment of the original plan.

1.6 SUMMARY AND CONCLUSIONS

Strategic Financial Management is a planning and control process with focus on allocation of financial resources (funds) in such a way as to achieve the

specified objectives of organisations. The methods of financial analysis used by financial managers have now been extended to include consideration of strategic factors – those highly uncertain and unquantifiable factors which may bring substantial benefits to the organisation but are ignored by the conventional discounted cash flow (DCF) appraisal methods.

The two major activities in which financial managers are primarily involved are investments in assets of the organisation and the financing of those assets.

There are of course, many management decisions which fall within these two broad categories. There are also other activities of an organisation in which financial managers are involved. These are, among others, the co-ordinating activities that foster goal congruence, stock market activities and external environmental activities; particularly those external limitations which financial managers should recognise when they take decisions. Financial managers must appreciate how critical certain steps are, in the decision-making process. For example, objectives must be clearly defined before embarking on identification of strategies. There is also the need for feedback to enable corrective action to be taken.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

1.7 REVISION QUESTIONS

1.7.1 MULTIPLE CHOICE QUESTIONS

1. Strategy is concerned with _____
 - A Forecasting
 - B Implementation
 - C Feedback
 - D Monitoring
 - E Planning

2. Strategic decisions imply that decisions are based on _____
 - A Quantitative factors.
 - B Qualitative factors.
 - C Short- term.
 - D Quantitative and qualitative factors short and long term.
 - E Long term.

3. Decisions on working capital management are concerned with
 - A Profitability
 - B Growth
 - C Profitability and liquidity
 - D Liquidity
 - E Long - term stability

4. The first step in the strategic financial decision making process is

- A Collecting, Collating and recording data
- B Identifying all possible courses of action
- C Analysing, summarising and presenting data
- D Determining the objectives of the organisation
- E Arriving at a decision

5. The two broad phases of decision making are

- A Monitoring and control
- B Control and feed back
- C Planning and monitoring
- D Planning and implementation
- E Monitoring and feedback

1.7.2 SHORT ANSWER QUESTIONS

1. State two broad categories of strategic decisions with which financial managers are concerned.
2. State the key decision which financial managers make with respect to dividends.
3. Why is capital investment decision the most important decision of all the decisions made by financial managers?
4. When managers make decisions, what should be the common basis of their decisions?
5. State ONE activity of a business organisation in respect of which the financial manager is secondarily involved.

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

OBJECTIVES OF BUSINESS ORGANISATIONS

2.0 LEARNING OBJECTIVES

After studying this chapter readers, should be able to:

- ◆ Explain the objectives of an organisation;
- ◆ Identify some of the various financial objectives of a business organisation;
- ◆ Bring out the overall financial objective which financial managers should assume;
- ◆ State and briefly explain the non-financial objectives of a business organisation;
- ◆ State and briefly explain the social and ethical obligations of a business organisation;
- ◆ Explain the concept of value-for-money as an objective of managers in public sector organisations; and
- ◆ State the components of value-for-money and the problems in using this approach.

2.1 INTRODUCTION

The objective of an organisation is the end which the organisation intends to achieve and which investment and financing decisions encourage it to achieve. The decisions identified in **Chapter One** are therefore normally made with respect to the objective or goal of the organisation. The implication of this is that every financial decision will be adjusted on the basis of this objective.

If decisions were not matched with objectives, there would be:

- (a) absence of relevant information with which the decision maker will work; and
- (b) no bases for financial managers' decisions.

These may result in decisions being taken that may not be congruent with the organisation's objectives.

2.2 OBJECTIVES OF A BUSINESS ORGANISATION

There are many objectives which an organisation can pursue. It is generally accepted that there should be one overall objective with all other objectives giving support so that this overall objective can be achieved. What is, however uncertain is the objective that should serve as the real objective of the organisation. For a business organisation, a financial objective is generally taken as the overall objective.

2.2.1. Financial Objectives

The financial objectives of a business organisation include, among others, the following:

- (a) Profit maximisation;
- (b) Profitability maximisation;
- (c) Liquidity;
- (d) Long-term stability;
- (e) Growth;
- (f) Corporate wealth maximisation; and
- (g) Shareholders' wealth maximisation.

These financial objectives are further discussed as follows:

(a) Profit Maximisation

This objective refers to accounting profits and it means that financial managers should attempt to make as much profits as possible.

Financial managers tend to pursue this objective because of the fact that the ordinary shareholders are, in law, the owners of the organisation. They have ultimate control of the company and take residual profits.

However, profit maximisation is a good objective but it has its deficiencies.

- (i) A company, for the purpose of expanding its operations, may raise additional capital but the additional profits generated may not justify the additional capital

obtained. In this case, profits may be rising but earnings per share may be falling.

- (ii) A company may be earning short-term profits at the expense of long-term profitability. For example, management may be tempted to cut down say research and development expenditure in a particular year. This may increase the profits of that year but jeopardize future sales and profitability.
- (iii) Profit maximisation, as an objective, ignores risk. Risk, particularly business risk, is an unavoidable fact of business life as business organisations operate into the future.

(b) Profitability Maximisation

This is a better objective than profit maximisation as it takes into account both profits and the assets utilised in generating such profits. Measures of profitability include Return on Capital Employed (ROCE), or Return on Investment (ROI), Return on Equity (ROE) and Earnings Per Share (EPS) and so on. This objective also has some short-comings, namely:

- (i) Problem of definitions; that is, which profits and capital are to be used;
- (ii) The uncertainty that goes with the earning of the profits (risk) is ignored;
- (iii) Time value of money is also ignored; and
- (iv) It fails to provide an operational feasible measure for ranking alternative courses of action in terms of their economic efficiency.

(c) Liquidity

This is purely a short-term objective which should be pursued only in a period of temporary economic meltdown. During this period, it is the “survival instinct” that is critical. Shareholders are not likely to put their funds in a company whose management lacks the required aggressiveness for long-term profitability and growth.

(d) Long-Term Stability

Here, the company does not want to grow but to maintain its present size over a relatively long period of time. This is not good enough as it shows lack of aggressiveness on the part of the managers.

(e) Growth

This implies growth in profits and assets. This is a good objective as it shows that short-term profits will not be pursued at the expense of long-term financial stability. However, this objective is deficient in some way since growth can be achieved by merely raising funds in the capital markets.

(f) Corporate Wealth Maximisation

This is an alternative objective to shareholders wealth maximisation. The emphasis is on stakeholders.

All interest groups in a business organisation as against one interest group (the shareholders) are considered. The individual group's interests are treated at par as against maximising the shareholders' interests alone. Typical stakeholders, aside from ordinary shareholders, are management, employees, customers, suppliers, bank and loan creditors, local community and the government.

The intention of this objective is to maximise long-run earnings and to retain enough to increase the corporate wealth for the benefit of all stakeholders.

(g) Shareholders Wealth Maximisation

This objective seeks to maximise return to ordinary shareholders, as measured by the sum of dividends and capital appreciation. Wealth maximisation also implies maximising the value of the company or its share price. The share price is the result of a general consensus among market operators regarding the value of companies and mirrors its expectations concerning the current and anticipated future profits of the firm, reflects the time value of money to them and the risk attached to those profits.

Wealth maximisation takes into account both risk and return. Short-term and long-term benefits are also given equal prominence.

Financial managers should assume and follow this objective in their financial decision-making. They should, however, balance it with those of other stakeholders in the firms.

For the purpose of this study pack, shareholders' wealth maximisation will be adopted in view of its superiority over the other objectives and the fact that it is theoretically logical and operationally feasible normative goal for guiding financial decision-making.

2.2.2. Non-Financial Objectives

The following are some of the operational objectives of a business organisation which are essential for the achievement of its overall strategic objective:

- | | | |
|---------------------------------------|---|---|
| (a) Market Share | - | Control a larger portion of the market |
| (b) Sales Growth | - | Obtain a specified percentage of growth in sales volume at a pre-determined price level. |
| (c) Market Development | - | Sell existing products in new markets. |
| (d) Technological Improvements | - | Acquire the state-of-the-art technology in manufacturing equipment. |
| (e) Organisation | - | Create a structure that encourages appropriate delegation of authority, adequate motivation and good participation. |
| (f) Social and ethical Responsibility | - | Meet the social expectations of the society and the environment in which it operates. |

2.2.3. Social and Ethical Obligations

A company is an integral part of the society and cannot be separated from the environment (internal and external) in which it operates. It, therefore, owes stakeholders both within and outside the company certain social and ethical obligations, among which are:

- (a) *Employees:* provide a conducive work environment, job satisfaction and job security.
- (b) *Customers:* produce good quality product(s) at affordable price(s) and devoid of any health hazards.
- (c) *Suppliers:* pay as and when due and avoid exploitation.
- (d) *Local community:* protect the environment from pollution of the air or water through industrial wastage and oil spillages. Give financial aids to charities and support sports development programmes. Set up schools and colleges to enhance educational opportunities of the children in the community. Get involved in other community activities.
- (e) *Government:* co-operate with government by paying its tax when due and discourage tax evasion. Obey all laws enacted by the National Assembly which affect its operations for example health and safety of its workers, building construction and so on. Discourage imports and avoid smuggling.

2.3 OBJECTIVES OF NOT-FOR-PROFIT ORGANISATIONS

These are organisations which, according to Alan Walter Steiss, “are concerned with allocation of scarce national, state or local government resources – land, capital and personnel – which have alternative uses, to achieve the best, the maximum or the most socially effective production of goods and services.” The central theme is economic efficiency.

In Nigeria, not-for-profit organisations are the various government ministries at Federal, State and Local Government levels, the government parastatals like Power Holding Company of Nigeria (PHCN), Federal Airports Authority of Nigeria (FAAN) and Nigerian Ports Authority (NPA).

Their main common function is to provide value for money services.

2.3.1 Value for Money

Value for Money (VFM) replaces the term cost-effectiveness by bringing in element of quality in service. In the public sector, it can be taken as what profit is to the private sector. It is that objective which the public sector managers, who are not looking for profit, should try to achieve.

2.3.1.1. Components of Value for Money

Bernard M. Jones (1996) mentioned three components: economy, efficiency and effectiveness and defined them, in terms of input, output and outcome, as follows:

- (a) **Economy:** "Conversion of the primary input (cash) into the usable secondary inputs - staff, consumable and capital item.
- (b) **Efficiency:** "Conversion of the usable resource into output, for example, making the best use of buildings and equipment."
- (c) **Effectiveness:** "Ensuring that the efficiently produced outputs are directed to achieving the desired outcome."

In using VFM approach, the required outcomes must have been properly specified and an appropriate monitoring and control system put in place.

2.3.1.2. Problems of Value for Money Approach

The problems of value for money approach are:

- (a) **Measurement Problem:** Outcomes cannot be easily quantified. This makes monitoring difficult.
- (b) **Normative Problem:** Assessment of quality of outcome involves value judgement. Good or bad quality will depend on who is doing the evaluation.

2.4 SUMMARY AND CONCLUSIONS

The objectives of business organisations are many, and in practice, no company pursues one single objective. When the possible financial objectives

of an organisation are assessed, the general consensus among finance practitioners is that shareholders' wealth maximisation should be the dominant objective.

However, there is a strong contender which is regarded as alternative to shareholders' wealth maximisation; this objective emphasizes stakeholders' interests as against the interest of a group – the ordinary shareholders. This, notwithstanding, the operators in the capital market still believe that shareholders wealth maximisation should be pursued by financial managers. The point here is that providers of finance have alternative ways of investing their funds: risk-free securities (treasury bills), low-risk government bonds and high-risk equities. If they have to channel their funds into equities, they require a premium. The only attraction to them, in this case is the residue that will remain after all other interests have been satisfied. Aside from the above objectives, there are other objectives which are critical to the achievement of the shareholders' wealth maximisation and which should also be of concern to financial managers. These are the organisation's non-financial objectives.

A company, of course, does not stand alone, it is part of the society and the environment in which it operates. It therefore owes certain social and ethical obligations to the people in its environment.

A public sector organisation has value-for-money as its objective rather than profit motive.

*Refer to Comprehensive Questions and Suggested Solutions in Appendix II
Page 465*

2.5 REVISION QUESTIONS

2.5.1 MULTIPLE CHOICE QUESTIONS.

1. The ideal objective of managers in the management of business organisation should be to:
 - A Minimise Cost
 - B Maximise profits
 - C Maximise shareholders wealth and relegate the interest of other groups
 - D Maximise shareholders wealth but give due attention to other interest groups
 - E Maximise the interests of all groups

2. The objective of a not - for - profit organisation should be
 - A Cost effectiveness
 - B Profit maximisation
 - C Shareholders wealth maximisation
 - D Value for money
 - E Market position
3. In terms of global business activities what is that objective that is usually regarded as an alternative to shareholders wealth maximisation?
 - A Long-term stability
 - B Long-term growth
 - C Corporate wealth maximisation
 - D Share price maximisation
 - E Cost minimisation
4. In a business organisation, the overall corporate objective should be the company's;
 - A Marketing objective
 - B Technological objective
 - C Production objective
 - D Financial objective
 - E Personnel objective
5. Which of the following should NOT be the social objective of a business organisation vis-a-vis the government?
 - A Pay tax as at when due
 - B Obey laws enacted by the National Assembly
 - C Keep clean environment
 - D Encourage tax avoidance
 - E Encourage tax evasion

2.5.2 SHORT ANSWER QUESTIONS.

1. What should be the objective of a company with respect to the local community in which it operates?
2. State one reason why a business organisation should have an overall objective.
3. What is the term given to situations where managers make decisions which are not in line with the overall strategic objective of the business?
4. State one major problem of the objective of a not-for-profit organisation.
5. State one shortcoming of profit maximisation as an objective.

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

AGENCY THEORY

3.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ◆ Explain agency theory;
- ◆ Define agency relationship and give relevant examples of such relationships;
- ◆ Identify and explain areas of potential conflict of interests in agency relationships;
- ◆ Explain goal congruence; and
- ◆ Mention and explain actions necessary to achieve goal congruence.

3.1 INTRODUCTION

Agency theory provides the framework for discussing the relationships that exist between the various interest groups in an organisation. It views the firm as a “composite unit” consisting of separate interest groups. Each interest group pursues its own interest and ensures it stands at an advantageous position in relation to the firm. Each individual group however recognises the fact that its success is a function of the company vis-à-vis other companies in the same industry. The theory brings out a clear exposition of the actions of some managers which are not in consonance with the actions they were to take, assuming shareholders’ wealth maximisation objective is pursued.

3.2 AGENCY RELATIONSHIP

Agency relationship exists when one person (or a group of persons) called the Principal, appoints another person called the Agent, to perform some work on its behalf and gives the agent the appropriate decision-making authority. In the context of Strategic Financial Management, such relationships occur, among others, between:

- (a) Shareholders and managers; and
- (b) Creditors and shareholders.

It is natural that where such relationship exists, there is bound to be conflict of interest which creates a problem known as ‘agency problem.’ The reason

underlining the conflict in the case of shareholders-managers relationship, is the separation of ownership and control.

3.3 SHAREHOLDERS VS MANAGERS

The reason underlining the conflict is the separation of ownership and control. This may arise in the following situations:

(a) **Choice of Projects Appraisal Technique**

In pursuit of their self-interests, managers may prefer projects with short lives as against those with long lives. They may therefore, want to use Payback technique instead of the superior Net Present Value technique.

(b) **Appraisal of Risky Projects**

Financial managers may not want to undertake projects which bring substantial benefits to the owners, but are highly risky, because of the negative impact of this risk on their own financial position. However, this risk has presumably been well diversified away by the shareholders.

(c) **Gearing**

Financial managers may not want the company's debt to be unduly large in relation to equities so as to reduce the financial risk of the company. Financial managers may however, by doing this, not be taking advantage of tax-deductible interest cost, where interest is treated by the tax authorities as a charge against profits.

(d) **Diversification through acquisition**

This is where a company acquires the shares of another company for the reason that it wants to diversify its operations. However, since rational shareholders are expected to diversify their investments, financial managers will only be adding value if they can obtain greater return than what the shareholders themselves would have gotten.

(e) **Takeover bids**

When a company is compulsorily taking over another company, the target company's directors may be resisting such action in order to protect their own jobs; even though it will bring greater wealth to the existing shareholders.

(f) Leveraged Buy-Out

In a leveraged buy-out, the company's management borrows funds to purchase the outstanding shares of the company via a tender offer (an offer to buy the shares of a company directly from the shareholders). There is the possibility that managers might try to drive down the price of the company's share just before the tender offer, so that they can buy the shares at a bargain price.

(g) Dividend Policy

This is where financial managers are pursuing an unduly conservative dividend policy: that is, trying to keep dividends at a level which is much lower than the normal level, given the industry norms. The question, however, is: can the funds not distributed be utilised better by the shareholders themselves, if received as dividends?

(h) Disclosure of Information in the Financial Statements

This is where financial managers 'paint' the financial condition of the company, via its balance sheet, rosier than what it really is. This is known as 'window dressing' or, in a mild form, 'creative accounting'. It is made possible by the open-ended nature of the choice of accounting policies, when directors prepare financial statements. For example, directors might want to defer certain type of expenditure (e.g. advertising) and capitalise it or put value on intangibles such as patents.

(i) Ethics

Top management might display certain unethical practices when it makes some decisions on operations. Typical examples of such practices are the degradation of the environment through pollution and testing of products on human beings.

3.3.1. Possible Solutions

Shareholders need to ensure that there is "*Goal Congruence*". Goal congruence means convergence of the interests of different groups such that the overall goal of the company can be achieved. Here, it means the need for shareholders to ensure that managers take actions in accordance with their expectations and in their best interest.

The actions necessary to achieve goal congruence are as follows:

(a) Monitoring

The 'company' needs to monitor every action of management. However, some costs known as agency costs would be incurred. This is an expensive way of ensuring goal congruence. Agency costs would include expenditure that is necessary to physically monitor the manager and expenditure to re-structure the organisation so that bad elements within the system are removed. They also include opportunity costs arising from profits lost when managers take decisions as agents instead of as owner-managers; decision-making is slow in the former but fast in the latter.

(b) Compensation via allocation of shares in the company

In this case costs might not be too prohibitive as managers would gear their efforts toward profitability and capital appreciation via cutting down operational costs including salaries and fringe benefits and taking less time off duty.

In between the above two extreme positions are the following:

(i) Threat of Dismissal

This may not be effective as ownership in many big companies (where ownership and control are highly separated) is widely dispersed and shareholders often find it difficult to speak with one voice. Few shareholders attend the annual general meetings and, in any case, directors usually ensure they get enough proxies to support them at meetings. It should be noted, however, that the presence of institutional investors could weaken the directors' strength.

(ii) Exposure to Take-over Bid

This could deter managers from taking actions that will be at variance with share price maximisation. If the company's earnings potentials are being knowingly or unknowingly suppressed through bad policies and the share is consequently undervalued, in relation to its true value, it may be exposed to hostile-take-over bid. The result is that some top managers might lose their jobs

and the authorities of those remaining might be drastically reduced.

(iii) **Executive Share Option Scheme**

This is a performance-based scheme that allows top managers to buy the shares of the company in future, at a price determined now. The belief is that this will motivate the managers to continually take actions that will be pushing up the share price: the option only has value if the price of the share increases above the originally fixed option purchase price. It should be noted, however that this scheme may not be beneficial to managers in a period of market downturn.

(iv) **Performance Shares**

These are shares given to top managers and linked to the company's performance as mirrored by its fundamentals – earnings per share, return on capital employed, return on equity, dividend per share and so on. This scheme is valuable to the extent that it is not affected by vagaries of the stock market.

3.4 CREDITORS VERSUS SHAREHOLDERS

The agency problem of creditors and shareholders (with managers as agents) arises from two situations:

(a) **Capital Investments**

Creditors would not like a situation where the acceptance of a project will add greater business risk than is expected by them. If this happens, they will increase their required rate of return and the value of their outstanding debt will fall. The major concern of creditors here is that if risky project succeeds, creditors will only receive a fixed amount (interest income) and shareholders will take all the benefits' whereas, if the project fails, they will share the losses with the owners.

(b) **Gearing**

Where the company increases its gearing (debt/equity) ratio to a level that increases its financial risk to more than expected, the value of the existing debt will fall because the earnings and assets backing available for this debt will diminish as a result of the new issue of debt.

3.4.1 In-built Solution

Shareholders do try as much as possible not to exploit creditors as such action may attract punitive high interest rates, restrictive covenants, restricted access to capital market, all of which may result in a fall in the long-term value of the company's share. Shareholders would, therefore, want to continue to maintain good and cordial relationship with their creditors, as it is by doing so, that their wealth will be maximised.

3.5 SUMMARY AND CONCLUSIONS

Agency theory provides the necessary framework for the discussion of agency relationships that exist within the firm, the conflict of interest that might arise from such relationships and the possible actions and events that could mitigate such conflict. Two major relationships are relevant in the context of the discussion – shareholders and managers, creditors and shareholders.

In the shareholders and managers relationship, there is bound to be conflict of interests in the areas of capital investment, gearing, diversification by top management, take-over bids and so on. Shareholders can however design relevant schemes to reduce this conflict. Also, it is possible to have conflict of interest between creditors and shareholders in the areas of selection of risky projects and raising of additional debt finance. In this case, however, there are in-built controls on the actions of the shareholders which tend to make them to want to be creditors' friendly most of the time.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

3.6 REVISION QUESTIONS

3.6.1 MULTIPLE CHOICE QUESTIONS

1. Which of the following provides a good example of agency relationship in a typical business organisation?
 - A Employees and government.
 - B Employees and creditors
 - C Creditors and shareholders
 - D Creditors and governments
 - E Debtors and creditors

2. In all these specific areas of gearing there are conflicts of interest between shareholders, managers EXCEPT.
 - A Increase gearing and increase tax-deductible interest cost.
 - B Reduce gearing and reduce tax deductible interest cost.

- C Reduce gearing and reduce risk
 - D Do nothing
 - E Increase gearing and reduce tax - deductible interest cost.
3. Which of the following is NOT a way of ensuring goal congruence in connection with Agency Theory?
- A Unlimiting the activities of the board
 - B Threat of dismissal
 - C Liquidation of the company
 - D Threat of take-over bid
 - E Compensation through allocation of shares.
4. Which of the following is NOT included in agency costs?
- A Annual salaries of top executives
 - B Extra payments as perquisites
 - C Physical monitoring costs
 - D Organisation re-structuring costs
 - E Profits lost when managers act as agent instead of as owner-manager
5. In what way might exposure to take-over bid encourage managers to pursue goal congruence? Deterrence from,
- A making large borrowing
 - B paying their employees fat salaries.
 - C offering good welfare packages
 - D diversifying the company's operation
 - E suppressing the potentials of the company.

3.6.2 SHORT ANSWER QUESTIONS

1. In relation to appraisal of capital projects, state ONE area that could create a conflict of interest between shareholders and managers.
2. What is the term given to the action of managers when they try to give the impression of a rosy financial condition of the company (via the balance sheet) when it is in reality not the case?
3. State one factor that might not really make performance shares to be effective as an instrument of goal congruence.
4. Give one reason why threat of dismissal may not reduce conflict of interest between shareholders and managers?
5. State one way in which leveraged buy-out creates conflict of interest between shareholders and managers.

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

CORPORATE GOVERNANCE

4.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ◆ Understand the rudiments in organisational management;
- ◆ Appreciate the roles of the Board and management;
- ◆ Understand ethical issues in Corporate Governance; and
- ◆ Know the importance and general principles of Corporate Governance.

4.1 INTRODUCTION

In today's global economy, the success of the national economy depends on the crucial role of a company's competitiveness, transparency and governance structure which operate within her territory, since companies are the entities that create economic value.

Dayton (1984) defined Corporate Governance as the process, structures and relationships through which the board of directors oversees what the executives do to achieve the objective of the company.

Mueller (1981) opined that "governance is concerned with the intrinsic nature, purpose, integrity and identity of the institution, with a primary focus on the entity's relevance, continuity and fiduciary aspects. Governance involves monitoring and overseeing strategic direction, socio-economic and cultural context, externalities and constituencies of the institution".

The most apt source of international best practices illustrated here is drawn from the Commonwealth Association for Corporate Governance (CACG), Cadbury Report and Sarbanes-Oxley Report, Guidelines which were largely followed by King 2 (South Africa 2002) and the Code of Corporate Governance for Companies in Nigeria (2003). Similar guidelines, albeit more detailed, exist in the USA and countries in Europe which address:

- (a) **Board Accountability**
 - (i) Roles, responsibility, capacity, and performance; and
 - (ii) Effective Delegation.

- (b) Values and strategy**
 - (i) Aligning and embedding values and principles; and
 - (ii) Informing strategic planning and policy formulation.
- (c) Risk management**
 - (i) Assessment of risks and responsibilities.
- (d) Management systems**
 - (i) Design and implementation of management systems; and
 - (ii) Providing assurance over management systems.
- (e) Performance monitoring and reporting**
 - (i) Selection and monitoring of key performance indicators.
- (f) Stakeholders interaction**
 - (i) Understanding stakeholder needs and expectations; and
 - (ii) Establishing effective communication mechanisms.
- (g) Accountability**
 - (i) Accounting disclosures;
 - (ii) Controls;
 - (iii) Internal audit;
 - (iv) External audit;
 - (v) Financial or Accounting Standards; and
 - (vi) Financial Reporting.
- (h) Committees of the Board**
 - (i) Executive;
 - (ii) Audit;
 - (iii) Remuneration;
 - (iv) Nomination;
 - (v) Risk management; and
 - (vi) Special.

4.2 THE ESSENCE OF GOOD CORPORATE GOVERNANCE

- (a)** Corporate Governance aims to promote a culture in which Directors will give priority to the ethical pursuit in the shareholders' best interest;
- (b)** Corporate Governance allows a review of audit regulations, corporate disclosure framework and shareholder participation, to improve the

accountability and transparency of companies, compliance to statutory regulation, best ethical practices, consumer protection and so on;

- (c) It ensures that the audit committee assists the Board of Directors in managing the accuracy and integrity of the financial statements of the company, ensuring compliance with the legal and regulatory requirements, and the efficiency of the company's internal audit functions;
- (d) It ensures the credibility of companies, and the existence of a managerial system which promotes creative entrepreneurship;
- (e) Corporate Governance helps in maximising the corporate value by enhancing transparency and efficiency;
- (f) The role of Corporate Governance is to prevent the exploitation of investors by the managers;
- (e) Good Corporate Governance prevents fraudulent practices through the mechanisms designed by the Board and management; and
- (h) Corporate Governance ensures that the suppliers of finance to companies have their rewards.

4.3 PRINCIPLES OF CORPORATE GOVERNANCE

There is no one best principle of good Corporate Governance to be adopted by all companies. Companies should design and implement strategies in light of regulatory framework that will produce an efficient, qualitative and result-oriented outcome, for optimising corporate performance and accountability, in the interest of shareholders and the broader economy.

Good corporate governance should be designed in line with the circumstances surrounding each entity and continuously reviewed according to the changing circumstances of the time. However, for the guidance of companies, which intend to compete internationally and raise managerial efficiency, the following are recommended as basic principles of corporate governance to be adopted:

- (a) Lay solid foundations for management and oversight;
- (b) Structure the Board to add value;
- (c) Promote ethical and responsible decision making;
- (d) Safeguard the integrity of financial reporting;

- (e) Make continuous, timely and credible disclosures to the Stock Exchange;
- (f) Respect the rights of shareholders;
- (g) Recognise and manage risk;
- (h) Adhere to Nigeria's Corporate Governance Code of Conduct for company directors published in 2003 under the aegis of Securities and Exchange Commission;
- (i) Encourage enhanced performance evaluation;
- (j) Remunerate fairly and responsibly; and
- (k) Recognise the legitimate interest of stakeholders.

4.4 ROLE OF THE BOARD AND MANAGEMENT

The company's framework need to be designed in such a way as to formalise and disclose the functions reserved to the Board and those delegated to the management.

The clarification of respective roles and responsibilities between the Board members and senior members of the executives (or the management) include:

- (a) Ensuring that there is a balance of authority so that no single individual has unlimited powers;
- (b) Enabling the Board to provide strategic guidance for the company by overseeing corporate strategy and performance objectives, reviewing and ratifying risk management, monitoring senior management's performance, as well as major capital expenditure and financial reporting; and
- (c) Ensuring that processes are in place for maintaining the integrity of the financial statements, ensuring compliance with the prescribed law and ethics, and the cordial relationship with the customers, suppliers and the stakeholders.

However, the Board, holding comprehensive power over the corporate management, should perform the following decision making functions:

- (a) Setting business goals and strategies;
- (b) Approving business plans and budgets;
- (c) Supervising management and evaluating management performance;

- (d) Replacing the management as appropriate, and reviewing their remuneration;
- (e) Monitoring major capital expenditures and corporate takeovers;
- (f) Mediating in resolving conflicting interests among the directors, management and shareholders;
- (g) Ensuring integrity of the accounting and financial reporting systems;
- (h) Supervising the compliance with statutes and professional ethics;
- (i) Monitoring the effectiveness of governance practices;
- (j) Overseeing the process of information disclosure; and
- (k) Risk management.

4.5 INDEPENDENT DIRECTOR

In order to manage and direct companies in the interest of various stakeholders, the Directors and the Board shall perform their duties faithfully. These can be assured only through the 'independence' of opinion of each of the Directors. In addition, some of the said directors must be independent. An 'independent' director is described as one who acts independently of management and is free from any business relationship or other relationship that could materially interfere with or could reasonably be perceived to materially interfere with the exercise of his or her unfettered and unbiased judgement. An independent director need not have any shareholding in the company but brings into use his experience and integrity in the affairs of the company.

4.6 STRUCTURE OF THE BOARD

In structuring the composition of the Board, the roles of the Chairman and Chief Executive Officer should be clearly separated; otherwise, a presiding Director position should be established to checkmate the excesses of the Chairman and those of the Chief Executive.

The re-appointment of Directors, (executive and non executive), should not be automatic and this should be by rotation. Details of directorship positions, which involve significant time commitments, should be disclosed to the shareholders prior to election.

4.7 ETHICAL AND RESPONSIBLE DECISION MAKING

In promoting good ethical and responsible decision making, companies are encouraged to formulate a code of ethics or conduct, that will serve to guide the Directors, the Chief Executive Officer and other key executive members, as to the practices necessary to maintain confidence in the company's integrity.

The code should address ethical issues, establish compliance standards and procedures. It should avoid conflicts of interest. The code should assure confidentiality, fair dealing, provide mechanisms to report unethical behavior and ensure that disciplinary measures are in place for any violations.

In achieving better ethical and responsible decision making processes, the company should clarify the standard of ethical behaviour required of company Directors and key executive members who have the opportunity to materially influence the integrity, strategy and operation of the business and its financial performance. Also, the company should publish its position concerning the issue of Board and employee trading in company securities and associated products, which operate to limit the economic risk of those investments.

In ensuring that better decisions are made, Directors should have better access to information on products, customers' viewpoints, market conditions and critical strategic and organisational issues, well ahead of meetings. The Directors should be empowered to seek their own information from those in the company and obtain first-hand knowledge of the business.

4.8 INTEGRITY OF FINANCIAL REPORTING

In order to enhance the integrity of financial reporting, the company is required to put in place, a structure of review and authorisation procedures designed to ensure the truthful and factual presentation of the company's financial position. The structure should include a process which ensures the independence and competence of the company's external auditors and an audit committee that will review and consider the financial statements.

In achieving the best practice of corporate governance, the company's policies should require the Chief Executive Officer and the Chief Financial Officer to state in writing to the Board that the company's financial reports present a true and fair view, in all material respects and are in accordance with relevant accounting standards. In addition, an audit committee should be established to ascertain that processes are in place and procedure for monitoring them are well catered for.

The composition of the audit committee should include equal number of independent Directors and representatives of the shareholders to a maximum of six, according to S.359 (4) of CAMA (2003, as amended). For proper discharge of duties, all members of the audit committee should be literate in financial and business matters and have understanding of the industry in which the company operates. It is expected that at least one member should have financial expertise and educational qualification of a recognised professional accounting body. However, all members of the audit committee should be subjected to re-election, annually.

4.9 DISCLOSURE TO STOCK EXCHANGE

Companies are obliged to disclose material information in a timely and accurate manner to the shareholders and other stakeholders. As the company's obligation, appropriate disclosure of corporate information to shareholders and stakeholders will raise their confidence and will give equal opportunity to market participants. Proper and accurate disclosure will prevent unfair practices using undisclosed information. Only information that are classified by the law may lawfully be withheld.

A listed company must, without delay, notify the regulatory information department of the Stock Exchange of any major new development which may lead to substantial changes in the prices of listed securities, the company's financial position, the performance of its business or the company's expectations as to its performance so that an investor would not out-perform the market, thereby resulting in inefficient capital market.

4.10 PROTECTION OF SHAREHOLDERS' RIGHTS

The rights of the shareholders, according to the law of contract, should be protected. Shareholders, should know appropriate means of redress for the infringement of their rights.

Companies should empower their shareholders by communicating effectively with and giving them ready access to balanced and understandable information, free of technical jargons. Companies should give proper notices of meetings and request the external auditor to attend the annual general meeting and make himself available to answer questions about the conduct of the audit and the preparation and content of the auditor's report.

4.11 RISK MANAGEMENT

The company's system should be designed to identify, assess, monitor and manage risk and inform investors of material changes in the risk profile. The

system designed will enhance the environment for identifying and capitalising on opportunities that would create value.

However, the best practice of risk management is achieved by establishing policies on risk oversight. The Management (the Chief Executive Officer or Chief Financial Officer, for example) should write to the board a statement that the company's financial report present a true and fair view, and that the organisation is being run on sound system of risk management, internal compliance and control.

4.12 PERFORMANCE EVALUATION

In ensuring good Corporate Governance, the performance of the Board, its committees, individual Directors, and 'key' executive members should be reviewed regularly and the process for performance evaluation disclosed. This means that the Directors and management should have access to continuing education to update and enhance their skill and knowledge needed to discharge responsibilities effectively.

The management's activities should also be evaluated under objective standards, including business results, achievement of business strategy, goals and others. The evaluation results should be used as a basis for determining remuneration and re-appointment of management.

4.13 REMUNERATION: FAIRLY AND RESPONSIBLY

Company's corporate governance guidelines should contain remuneration policy and procedures that would maintain talented and motivated Directors and employees so as to encourage enhanced performance of the company. The policies should show clearly the relationship between performance and remuneration and should be disclosed to the shareholders in a formal and transparent method. However, the Board should establish a remuneration committee, consisting of the majority of independent Directors, with a formal charter to review, recommend on executive remuneration and incentive policies, senior management remuneration, the company's recruitment, retention and termination policies etc.

In remunerating the management, the limit should be within the amount approved by the shareholders and the company's financial condition.

4.14 LEGITIMATE INTEREST OF STAKEHOLDERS /SHAREHOLDERS

Since companies have a number of legal and other obligations to both shareholders and stakeholders, such as employees, clients / customers, debenture holders and the community as a whole, a code of conduct should

be established and disclosed to address issues such as 'fair trading' and 'dealing', conflicts of interest, responsibilities to the community and individuals, corporate opportunities, compliance with law and encourage the reporting on any illegal or unethical behaviour.

To create a well governed Corporation, companies should start a rethink on the impact of Directors' role. The Board should be proactive and effective in policy making processes and ensure that the following corporate governance reforms are established:

- (a) Board members should be experts. Directors must be knowledgeable in the complexities of the company and its industry, of finance, relevant laws and regulations to be able to participate effectively in decision-making;
- (b) Board meeting procedures should focus on debating new decisions, strategies and policies not just on reviewing past performance. This will enable the Board to participate in the long range planning process right from the outset;
- (c) Board committees: the Audit, Compensation and Nominations - should be strengthened; and
- (d) Formal and periodic evaluation of the Chief Executive Officer and the Directors should become an annual event. The process should involve dialogue with the Chief Executive about his or her strengths, weaknesses, objectives, personal plans and of course, performance.

4.15 SUMMARY AND CONCLUSIONS

The term '*Corporate Governance*' means the system by which companies are directed and managed in the best interest of the owners and investors. It refers to the roles and responsibilities to the Board of Directors, Executive and non-Executive members, and shareholders' rights.

Corporate Governance as a term covers all the general mechanisms by which the management team is led to act in the best interest of the entity's owners.

A perfect system of Corporate Governance would give management all the right incentives to make value maximising investments and financing decisions. This chapter discussed the principles of Corporate Governance. Specifically, the roles of the Board, structure of the Board, issues of ethics and integrity, disclosure requirements, protection of shareholders' rights, risk management approach, performance evaluation process and frequency, remuneration and legitimate interests of stakeholders were discussed.

In summary, it can be deduced that proper management of companies is very important to enable an organisation to build a virile business, elevate Board's competence and encourage teamwork in order to realise immense benefits to the shareholders.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

4.16 REVISION QUESTIONS

4.16.1 MULTIPLE CHOICE QUESTIONS

1. Which ONE of the following is NOT a principle of corporate governance?
 - A Promotion of ethical and responsible decision making process.
 - B Giving the board an over-riding power.
 - C Structuring the board to add value.
 - D Integrity of financial reporting.
 - E Display of sincerity of purpose in the management of risk.

2. The clarification of roles between the board of directors and team of management will ensure the following EXCEPT:
 - A A balance of authority so that no single individual has unfettered power.
 - B Helps the board to provide strategic guidance for the company.
 - C Put in place processes for maintaining integrity of the company.
 - D Gives the Board of director the power to deal with deterrent management.
 - E Overseeing corporate strategy and performance.

3. The functions of the Board of Directors include the following EXCEPT:
 - A Monitoring the effectiveness of governance practices.
 - B Approving business plans and budgets.
 - C Ensuring that their interests are protected.
 - D Replacing the management and reviewing remuneration.
 - E Overseeing the process of information disclosure.

4. Which ONE of the following is not an essence of corporate governance in a firm?
 - A Gives the majority shareholders the right to remove directors that fails to pay dividend.
 - B Promotes culture in which directors will give concern to the ethical pursuit of shareholders interest.
 - C Prevents exploitation of investors by managers.
 - D Helps in maximizing corporate value by enhancing transparency and efficiency of company for the future.
 - E Prevents fraudulent practices through the mechanisms designed by the Board.

5. In order to create a well governed Corporation, which ONE of the following is not required?
- A Board should consist of members having experience in the industry in which the company operates.
 - B Majority of the Board members must have the highest number of shares.
 - C There should be a formal and periodic evaluation in the company
 - D Board committee should be strengthened.
 - E Board meeting procedures should focus on debating new strategies and policies.

4.16.2 SHORT ANSWER QUESTIONS

1. The combination of processes, structures and relationships through which business corporations are directed and controlled is referred to as _____
2. State one social responsibility of a company from the viewpoint of the community in which it operates.
3. What is the name given to that alternative objective to shareholders wealth maximisation which treats all stakeholders at par?
4. Give one benefit of good corporate governance from the point of view of the capital markets
5. State ONE greatest threat to corporate governance in the Nigerian corporate industry.

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

NIGERIAN FINANCIAL MARKETS

5.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ♦ Understand financial markets in general;
- ♦ State the major types of financial markets;
- ♦ Mention the instruments in each of the markets;
- ♦ Explain the characteristics of money market instruments;
- ♦ Appreciate the advantages and disadvantages of money market instruments;
- ♦ Explain the characteristics of government quoted securities;
- ♦ Know the advantages and disadvantages of government quoted securities;
- ♦ Mention the participants of the financial markets and understand the functions of the participants of the financial markets; and
- ♦ Understand the implications of the financial market activities.

5.1 INTRODUCTION

Financial markets are markets where individuals and organisations raise capital through sale of securities and invest their surplus funds through purchase of securities. Financial markets also include the institutions through which these transactions are carried out.

The securities bought and sold are known as financial assets. There are two broad categories of financial markets:

- (a) The money market; and
- (b) The capital markets.

5.2 THE MONEY MARKET

The money market is a market for short-term securities, that is, securities with tenure of one year or less. Instruments traded in the money market are

characterised by low level of return, high degree of safety, that is, low level of risk, high degree of liquidity and good institutional structure. Examples of instruments traded in the Nigerian money market include, treasury bills, Central Bank of Nigeria (CBN) certificates, commercial bank deposits, certificate of deposit (negotiable and non-negotiable), bankers acceptances (BAs) and Commercial Papers (CPs).

The characteristics of each of these instruments are discussed as follows:

5.2.1 Money Market Instruments

The following are the major money market instruments:

(a) Treasury Bills

These are short-term securities issued by the Central Bank of Nigeria (CBN) on behalf of the Federal Government of Nigeria (FGN). Aside from cash investments, they are the most liquid and the safest of all investments as they are backed by the Federal Government. They are therefore regarded by financial managers as risk-free securities.

Treasury bills are issued in denominations of ₦1,000 and are sold on auction basis. They have 91 days, 182 days and 365 days maturity and are sold at a discount to their face or par value.

(b) CBN Certificates

These are issued also by the CBN on behalf of the Federal Government to bridge the financing gap between treasury bills and long-term Federal Government bonds. They are sold for maturities of 180 days and 364 days.

(c) Commercial Banks' Deposits

These are usually referred to as savings accounts. They are the simplest forms of investment. The minimum required amount varies from bank to bank. There is no maximum. Deposit accounts normally pay a stated rate of interest which also varies among banks. Withdrawals can take place without penalty even when there is no notice. However, a minimum balance which varies among banks must be maintained to keep the account alive.

(d) Certificates of Deposit (CDs)

These are also known as fixed deposits. A certificate of deposit is a receipt issued by a bank to a depositor who puts in an agreed sum of money for a fixed period of time ranging from one month to any period as agreed with the bank. Banks usually pay a fixed rate of interest that is higher than that on the regular savings account and that increases with the period of deposit.

By issuing the certificate, a bank undertakes to pay the amount of money deposited (with interest) to the holder of the receipt on the specified date.

There are negotiable and non-negotiable certificates of deposit. Negotiable certificates issued by CBN can be sold before maturity on the secondary market or discounted at CBN. Non-negotiable certificates are held to maturity. Termination of the deposit before maturity usually attracts penalty.

(e) Bankers Acceptances (BAs)

A banker's acceptance is a negotiable time draft belonging to a class of instruments known as bill of exchange. A bill is usually drawn on a bank and properly signed by the drawer. It is made payable to the drawer himself or to a named third party. If and when the drawee bank signs the bill across by writing "accepted", the bill becomes a "banker's acceptance". Bankers acceptances have three parties – drawer, drawee, and payee – and maturity periods ranging from 30 days to 180 days. There is considerable safety and liquidity but not as high as those on treasury bills. Their rates are however, higher than those of treasury bills. Banker's acceptance is a form of guarantee by the bank and can be used to finance domestic or international trade. Bankers acceptances are bought and sold on a discount basis.

(f) Commercial Papers

These are short-term negotiable unsecured promissory notes sold by big and reputable companies mostly finance companies to raise money in the money market. Commercial papers have two parties – promisor and the promisee. A bank only comes in as an agent of either party or both parties.

The rates on commercial papers are higher than those on bankers acceptances and their risk is also higher. Commercial papers are also traded on a discount basis.

5.2.2 Advantages and Disadvantages

Money market instruments have common advantages and disadvantages as they all belong to the same single market.

Advantages include:

- (a) **Liquidity:** There are restrictions on withdrawals and instruments traded can be discounted on the secondary market or at the discount 'window' of the CBN.
- (b) **Risk:** There is safety of income and capital as issuers of securities are government, banks and reputable big business organisations.
- (c) **Institutional structure:** the organisational arrangements, in terms of market and the participating institutions, are good,

Disadvantages include:

- (a) **Return:** return is low because the risk is also low.
- (b) **Inflation:** both income and capital values could be eroded by inflation. There is fixity of income and capital is only repaid at the end of the instrument tenor.
- (c) **Growth:** there is zero growth for both the capital invested and income stream over the investment period.

5.3 THE CAPITAL MARKETS

The capital markets are the markets for intermediate and long-term securities; that is, securities that have more than one year of maturity say three years, five years, ten years and twenty-five years. The capital markets comprise the bond market and stocks (shares) market. The bond market is the market where lending and borrowing of capital (exchange of securities and cash) take place while the stocks market are the market where shares are bought and sold. Regardless of whether it is a bond market or stocks market, there is also a division into primary market and secondary market. The primary market is a market for new issues while the secondary market is a market for existing securities.

The backbone of the secondary market is the stock exchange. In Nigeria, the activities of the stockbrokers (the key operators of the stock market) are being regulated by the Nigerian Stock Exchange (NSE) or simply “The Exchange”.

It should be noted that, unlike the money market (with its unifying interest rate), the capital markets comprising the primary and secondary markets has its own distinct and unique characteristics; hence the description ‘capital markets’ (and not capital market).

5.3.1 Capital Markets Instruments - Government Securities

These are securities issued by the government at any of the three levels- federal, state or local. They are generally long-term and they can be quoted or unquoted. Quotation here means listed and traded on the floor of The Nigerian Stock Exchange. At present there are the inactive Federal Government Development stocks, the Federal Government Bonds and State Revenue Bonds.

However, in view of the particular interest investors place on quoted government securities, subsequent discussions will be devoted to it.

5.3.1.1. Characteristics of Quoted Government Securities

The characteristics of government securities quoted on the Nigerian Stock Exchange are discussed under the following headings:

(a) Issuing Prices

These are usually in units of ₦1000 and at so much percent. The ₦1000 represents the nominal or par value of the security.

(b) Interest

Each government security usually has a rate of interest attached to it at the time of issuance. This is referred to as the nominal rate of interest (also called coupon rate). This coupon rate may be fixed or variable. If it is fixed, it means the issuer guarantees a fixed amount of interest every year payable usually, twice a year. If it is variable, it means the interest rate will be linked to movement in a particular market index such as the CBN monetary

policy rate (MPR) but with a floor rate and a ceiling rate. For example, if a state revenue bond is issued at a coupon rate of 4½% above the MPR of say 10% (with a maximum rate of 18%), the floor rate will be 14½% and the ceiling rate will be 18%. Investors in this bond are protected against interest rate risk although not against inflation risk if interest rates do not adjust fully for expected inflation.

(c) **Yield**

This is the market rate of interest and the driving force for the market price (real value) of all quoted fixed – interest government securities. The higher the yield or market interest rate the lower the value of a quoted fixed interest bond and vice versa. For example, if investors feel that a fair rate of interest for investing now in long-term government securities is 20%, a previously issued State Revenue Bond with a fixed coupon of 10% and par value of ₦1000, will now be worth ₦500. Thus, a prospective investor in this particular bond will now pay ₦500 per unit.

(d) **Return**

Return comprises both interest actually received during the period the security is held plus capital appreciation. It is mathematically expressed as:

$$R = \frac{I + (P_1 - P_0)}{P_0} \%$$

Where I represents interest payments received and P_1 represents value at the end of the holding period and P_0 represents value at the beginning.

$P_1 - P_0$ is the capital appreciation (or depreciation) either on disposal or on redemption.

This formula assumes one year holding period only.

(e) Redemption (Repayment)

Repayment of the nominal amount borrowed by the government will be made at a specified future date (say 2015) or within a specified future period (2015-2019). Where government bonds are undated, these bonds will probably never be repaid as the government has no obligation to repay by a specific date and repayment will depend on sharply falling interest rates when new issues could be made at a lower coupon on the same nominal value.

Repayment of a state bond is usually based on the issue of Irrevocable Standing Payment Order (ISPO) which serves as a first charge upon (and payable out of) the state's statutory allocation.

5.3.1.2 Advantages and Disadvantages

Government quoted securities have the following advantages and disadvantages.

Advantages**(a) Security of Capital**

Capital is usually secured as it is backed by the Federal or State government as the case may be. Also, as a bond approaches its repayment date, the market value will not fluctuate so much from its par value.

(b) Security of Income

Income is also secured as default in paying interest is not expected from government.

(c) Liquidity

Being a quoted security, there is a market where disposal can take place if there is need for cash.

Disadvantages include

(a) Risk

Being a quoted security which has a price that could fluctuate, there is some element of risk – the interest rate risk.

(b) Inflation

Both income streams and capital values may be eroded by inflation – inflation risk.

5.3.2 Quoted Companies' Securities

These are also securities of the capital market. The basic ones are debentures (loan stock), preference shares and ordinary (equity) shares. Their individual characteristics will be discussed later in another chapter covering "Sources of long-term capital".

5.4 PARTICIPANTS OF THE FINANCIAL MARKETS

The participants in the capital markets are those who are actively involved in the purchase and sale of stocks and shares and those institutions that are involved as regulatory authorities.

They include in the main:

- (a) Individuals and companies;**
- (b) Banks;**
- (c) Non-bank financial institutions;**
- (d) Issuing houses;**
- (e) Stockbrokers;**
- (f) The Nigerian Stock Exchange (NSE);**
- (g) Securities and Exchange Commission (SEC); and**
- (h) Central Bank of Nigeria (CBN).**

Individuals, companies, banks and non-bank financial institutions (insurance companies, unit trusts, finance houses) participate in the financial

markets either as buyers or as sellers of securities.

Issuing houses act as financial intermediaries in:

- (a) The pricing of new issues (along with the issuing company);
- (b) Underwriting of securities;
- (c) Bringing new issues to the market;
- (d) Determining the timing of new issues (subject to the approval of SEC).
- (e) Performing specialist activities; and
- (f) Providing financial advisory services.

Stockbrokers act as agents on behalf of buyers and sellers of securities on the stock market and collect commission called “brokerage”. Investors can only buy or sell through stockbrokers who are licensed to represent them and trade on the Stock Exchanges. Stockbrokers also provide professional advice on the selection and management of investments and assist project sponsors to raise money on the capital market.

The Nigerian Stock Exchange (NSE)

- (a) Provides the platform for buying and selling of existing securities;
- (b) Provides liquidity for investors;
- (c) Regulates the activities of the stock brokers;
- (d) Encourages transactions in the new issue market.; and
- (e) Helps to spread promoters risks.

Securities and Exchange Commission (SEC)

- (a) Registers all securities to be offered for sale to, or for subscription by, the public;
- (b) Approves timing of new issues;
- (c) Maintains surveillance over dealings in securities;
- (d) Registers all stock exchanges including their branches and capital market operators; and

- (e) Protects the securities market against any manipulations including insider trading.

Central Bank of Nigeria (CBN)

- (a) Operates mainly in the money market;
- (b) Manages the interest rate;
- (c) Safeguards the nation's economy against depreciation of the value of the naira; and
- (d) Puts inflation rate at a tolerable level.

5.5 FINANCIAL MANAGERS AND THE MARKETS

In carrying out his functions of allocation, and sourcing for funds, the financial manager is a net user of capital resources. He enters the money market to invest funds temporarily surplus to the company's requirements. He goes to the capital markets to raise funds. In doing this, he has to design strategies for choosing the best and cheapest source(s) of funds. The rate of return he pays affects the choice and acceptability of the company's projects. As earlier discussed, he should be interested in the price put on the company's share on the stock market as this may ultimately affect the security of top management (including himself) vis-à-vis their emoluments and their continued stay on the job.

5.6 SUMMARY AND CONCLUSIONS

Financial markets are markets where financial assets (securities) are traded. They comprise money market and capital markets. Money market is a market for short-term securities while capital markets are markets for intermediate and long-term securities. Money market instruments are the securities traded in this market and they include treasury bills, commercial banks' deposits, fixed deposits, bankers' acceptances and commercial papers.

Capital markets instruments comprise, among others, Federal Government bonds, state revenue bonds, debentures (corporate loan stocks) Preferences shares and ordinary shares.

Money market instruments have common characteristics which border on low risk, low return, high liquidity and good institutional structure. Capital markets instruments have different and unique characteristics.

Participation in the financial markets may be active (as buyers and sellers), intermediating (as agents) or regulatory. Participants are individuals, companies, banks, non-bank financial institutions, issuing houses, stock brokers, Bureaux de Changes, Nigerian Stock Exchange, Securities and Exchange Commission and Central Bank of Nigeria.

The activities in the financial markets have great implications for the financial managers of a company.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

5.7 REVISION QUESTIONS

5.7.1 MULTIPLE CHOICE QUESTIONS

1. Which of the following is NOT an instrument of the money market?
 - A Certificates of deposits
 - B Commercial banks deposits
 - C Bankers acceptances
 - D State revenue bonds
 - E Treasury bills

2. Which of the following is NOT a characteristic of money market instruments?
 - A High level of liquidity
 - B High level of safety
 - C Low maturity period
 - D High degree of return
 - E Good institutional organisation.

3. The price at which new issues are made in the primary market is determined by:
 - A Security and Exchange Commission (SEC)
 - B Registrars
 - C Nigerian Stock Exchange (NSE)
 - D Issuing House and Issuing Company
 - E Stockbrokers

4. State the relationship between yield and price of fixed - interest securities
 - A The higher the yield the higher the price.
 - B The higher the yield the lower the price.
 - C The yield is always equal to the price.
 - D The yield is unrelated to the price.
 - E The lower the yield the lower the price.

5. Which of the following is NOT an advantage of Federal Government fixed interest securities?
- A Risk
 - B Safety of capital
 - C Safety of income
 - D Liquidity
 - E Good institutional arrangement

5.7.2 SHORT ANSWER QUESTIONS

1. In terms of risk, state the main difference between money market and capital market.
2. In terms of number of parties, what is the difference between Bankers' acceptances (BAs) and commercial papers (CPs).
3. State the impact of inflation on money market instruments.
4. State the difference between 'par' value and 'market value' of a government fixed - interest security.
5. State the primary function of stockbrokers in the capital markets.

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

CORPORATE STRATEGY AND PLANNING

6.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ◆ Identify the main components of corporate plan;
- ◆ Understand strategic financial planning; and
- ◆ Appreciate various growth strategies.

6.1 INTRODUCTION

The success of an organisation depends on its strategic focus and its continuous search for ways to reach out in new directions, creating and transforming visions, to guide the company into the future.

The term '*Corporate Planning*' can be described as a process of policy formulation, establishment of goals and objectives as well as the development of strategies. It is the systematic articulation of long-term company objectives and the strategies required to achieve them.

Taylor and Sparkes (1977) describe Corporate Planning as a systematic exercise for determining the total resources of the organisation for the achievement of its quantified objectives within a specified time frame.

Strategic Planning, is defined by Peter Drucker (1974) as the continuous process of making present entrepreneurial decisions systematically and with the greatest knowledge of the futurity; organising systematically the effort needed to carry out these decisions; and measuring the results of these decisions against expectations through organised systematic feedback. It attempts to identify the lines of business in which the firm has the greatest long-run opportunities and develop plans for achieving success. Strategic planning takes an overall, 'top-bottom' view of the company, spotlighting the business area in which the company has a true competitive advantage, identifying business units to sell or liquidate and deciding business units that should be closed down.

For an organisation to achieve an effective corporate strategic planning, the Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis is very essential. This is by establishing its basic strengths, identifying its weaknesses, and examining the environment for available opportunities and those factors that can threaten its survival.

The following are the main components of a Corporate Plan:

- (a) Establishing company's objectives and targets to be achieved within a time horizon.
- (b) Examining the environment for possible opportunities.
- (c) Appraising the Strengths, Weaknesses, Opportunities and Threats (SWOT).
- (d) Formulating strategies, with alternatives.
- (e) Implementing strategies and action plans.
- (f) Performance Evaluation.

6.2 COMPANY'S OBJECTIVES AND TARGETS

The establishment of a company's objectives and targets to be achieved within a time horizon, is the first and probably the most important step in the planning process. In determining company's objective, management and every member of the organisation should know why the company is in existence, the purpose for which it is established and what it expects to achieve within a time period. If there is no time horizon, no one will be held responsible for the organisation's non-attainment of the set target(s).

Furthermore, an organisation must carry out its SWOT analysis critically through the appraisal of its present and potential resources and in relation to its competitors within and outside the organisation.

6.2.1 The Environment

In order to establish a feasible objective, an organisation must search its environment for opportunities that may be available for exploitation. In examining the environment for opportunities that could be exploited, the organisation must look at the future consequence of each opportunity.

However, environmental scanning must be a continuous process since the corporate world is dynamic and subject to frequent changes over time and as today's threats may become growth opportunities in the near future.

6.2.2 Appraising the Opportunities

After setting the company's objectives and examining the environment for opportunities that may be available, the organisation must evaluate its available resources, whether they are adequate to accomplish the objectives.

However, since an organisation can have more than one objective at a time and consequently may not be able to complete each one satisfactorily due to inadequate resources, business decision analysis technique such as Discounted Cash Flow (DCF) Techniques and Programmes Evaluation Review Techniques (PERT), could be used in determining the viability, time of completion, the cost and resources of rescheduling the alternative strategies.

6.2.3 Long-term Strategic Planning and Formulation

It is not good enough to have just one strategy. A list of possible strategies must be drawn up or developed through either brainstorming or a survey of informed opinion, both within and outside the company. The longer the term, and the wider its range, the better.

The developed strategies should be cost effective and be designed to suit the objectives as well as be within the resource capacity of the organisation. However, the strategic options that an organisation develops and chooses must be strictly within the framework of pre-established policy, flexible enough to accommodate changes occurring in the environment and not in conflict with the company's overall organisational purpose.

There are various strategies that an organisation might adopt in its desire to survive and grow. Growth strategies may be internally or externally generated and may be stable or dynamic.

An organisation can decide to grow internally by establishing a dividend policy that has a low pay-out ratio, thereby using the retained earnings to finance the growth. The growth could be through penetrating the market with low-priced, better quality and efficient

products, introducing new products or approaching a new market. However, in determining the strategies to adopt, Boston Consulting Group (BCG) came up with a model for putting the firm's strategic posture at corporate level in proper perspective. This model is known as BCG model.

In the model, businesses were grouped into a two- cell matrix according to their market growth rates and relative market shares.

MARKET SHARES

GROWTH RATE

	HIGH	LOW
HIGH	STARS	WILD CATS
LOW	CASH COWS	DOGS

Fig 6.1: BCG Model (Boston Consulting Group)

'Stars' are best performers representing super profit and growth opportunities in a rapidly growing market. They are products or services that have a high market share in a high growth market, thereby necessitating the commitment of substantial resources to maintain its position in the market. Stars offer the best opportunities for expansion.

'Cash cows' are declining stars and providers of cash to be utilized elsewhere in the firm. However, its high market share assures low operational costs, and high profit and cash flow generation.

'Wild cats', also known as "question marks", are opportunities that can be either developed into stars, if the firm can capture a larger share in the rapidly growing markets, or divest from it if they remain unprofitable on account of the firm's inability to increase its market share.

'Dogs' are on a weak competitive level and offer limited opportunities for improvement because they are hardly in a position to generate cash flows sufficient to sustain their existence. Therefore, they should be eliminated through liquidation, 'spin-off', divestment or discontinuance.

For growth opportunities outside the organisation, the firm might adopt mergers, acquisitions or diversification and other forms of business combination strategies in order to enjoy the benefits accruing from the pooling together of resources.

However, the following factors usually shape the strategies to be adopted:

- (a) Opportunities identified in the environment;
- (b) Organisational competence;
- (c) Resource capabilities;
- (d) Threats to opportunities in the environment;
- (e) Social obligations;
- (f) Societal ethical values; and
- (g) Organisational culture and value system.

6.2.4 Implementing Strategies

All the objectives, targets and strategies of an organisation need to be clearly defined for the operational managers to implement. These strategies must be translated into a detailed weekly, monthly, or yearly plan since this will necessitate easy monitoring in the execution of the strategies. The detailed operational plans should include what is to be done, how, by whom and when. Tactics and methodologies are chosen for efficiency in assisting the chosen strategy to achieve the required result.

6.2.5 Performance Evaluation

Having broken down objectives and strategies into detailed operational plans, performance must be evaluated periodically to find out if the organisation is in the course of achieving its corporate objectives. Performance evaluation is the periodic review of results against set objectives and strategies to reveal whether there is any deviation from the plans and if need be, any corrective action. The main contention is that an organisation should normally embark upon projects that yield a positive NPV.

6.3 CORPORATE PLAN AND BUDGETING

Forecasting is predicting, while planning is taking action on the forecast to make it an economic reality. Planning is concerned with setting objectives and the means for their attainment. It is essentially concerned with the future;

therefore it must be an adequate predictive model which must have objectives and lead to a higher level of performance. Planning is therefore, closely related to budgeting. In fact, a budget is a tool for planning.

6.4 SUMMARY AND CONCLUSIONS

The success of any organisation depends on its strategic focus and vision.

Corporate strategic planning involves seeking the right goals and objectives for the organisation within its competencies, resources and ability. Strategic planning helps the organisation in reducing the risk of straying away from its set goals by engaging in attractive and multiple projects.

However, having a strategy is not enough. Planning is essential to translate a strategic vision into reality. It takes corporate planning to forestall corporate failure. In this light, the main components of a corporate plan are identified, It is shown that planning is intricately linked with budgeting: budgeting is a tool for planning.

*Refer to Comprehensive Questions and Suggested Solutions in Appendix II
Page 465*

6.5 REVISION QUESTIONS

6.5.1 MULTIPLE CHOICE QUESTIONS

1. The following are the main components of corporate plan, EXCEPT:
 - A Appraisal of the opportunity
 - B Performance evaluation
 - C Predictions
 - D Implementing strategies
 - E Formulating policies.

2. The need for corporate planning does not include ONE of the following:
 - A Assessing the long-term future of a company
 - B Predicting the available opportunities which the company can exploit
 - C Threats which endanger the manager's jobs
 - D Ascertaining in which area of the business to invest the resources of the company
 - E Strategic planning.

3. In formulating strategies to be adopted the following factors should be put into consideration, EXCEPT
 - A Protection of top management's interests
 - B social obligations
 - C Organisational culture and value system
 - D Organisational competence and resources capabilities
 - E Market share and penetration.

4. Planning is concerned with the following, EXCEPT
 - A The future period
 - B Providing for uncertainty
 - C Predicting
 - D Budgeting
 - E Providing for risk.
5. Which ONE of the following does not explain why corporate planning is imperative?
 - A Future is unpredictable
 - B Predictions are susceptible to errors
 - C Decision relating to corporate planning rest on hunches
 - D The probability of future outcome of event is unknown
 - E Decision makers cannot be assertive on future events.

6.5.2 SHORT ANSWER QUESTIONS

1. The process of policy formulation, establishment of goals and objectives and the development of strategies is known as _____
2. The continuous process of making present entrepreneurial decisions systematically and with the greatest knowledge of the future consequences, organising systematically the effort needed to carry out these decisions; and measuring the results of these decisions against expectations through organised systematic feedback is known as _____
3. The main contention of corporate planning is that an organization should always embark upon a project that yields _____ having critically viewed the investment.
4. _____ are schemes, methods, manouvres which management hopes to deploy in order to move the organization from its present position to arrive at its target goal by the end of a specific period, recognising that during the intervening period, a host of changes may take place in the environment.
5. _____ is a very specific, concrete, time-bound, clear and quantifiable state of affairs which the organization is pursuing.

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) ON FINANCIAL MANAGEMENT PRACTICES

7.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ◆ Explain the nature of a decision support system;
- ◆ Understand the nature of decision support models and software;
- ◆ Explain application packages;
- ◆ Explain some of the applications relying on decision support system and relevance to financial management; and
- ◆ Define some relevant terminologies in information and communication technology environment.

7.1 INTRODUCTION

The primary reason why business enterprises take advantage of information technology is to receive support for their business decisions. This reason had been made more formidable with the emergence of e-Commerce revolution ignited by the internet and the worldwide web. Business managers now operate in a highly competitive and changing global business environment and therefore require information systems that provide speedy responses to complex business enquiries. All stakeholders in e-commerce (the organisations and employees and managers, suppliers, customers) require on line real time information to enable them make fast decisions. They should be able to get more customised and pro-active web-based decision support. The new information technologies ensured that these requirements were met. The Personal Computer (PC) with application software, the networked client-server relationship, and the networked PC version of the decision support systems and the executive information systems programmes made decisions support available to all stakeholders. This trend was accentuated by the shocking growth of intranets and extranets which networked e-business firms with their stakeholders.

In particular, web-based analytical techniques and models exist to give support to the various decisions of financial managers.

Please note that this study pack does not attempt to explain the technical aspects of information and communication technology as these are beyond the scope. Rather, emphasis is placed on how a computer based decision support system (DSS) assists financial managers in decision making.

7.2 DECISION SUPPORT SYSTEM (DSS) (End-User Computing Systems) AND THE FINANCIAL MANAGERS

Decision support systems, unlike the traditional management information system (MIS), are computer-based information systems which give business managers the necessary interactive information support that help their decision-making. DSS are normally used by financial managers in financial planning, financial modeling, analysing alternative courses of action and making financial decisions. Financial managers normally receive decision support by interacting with the computer system. DSS use analytical models, specialised databases, interactive computer-based modeling process plus the financial manager's own intuitive knowledge and judgment to lend support for the making of semi-structured financial decisions. The emphasis is on semi-structured problems where the financial manager's interaction with the computer system might improve his ability to solve some difficult problems involving complex relationships. The financial manager uses small, simple financial models as against complicated integrated systems which require the services of IT experts.

In summary, the following are the main characteristics of DSS:

- (a) Information and decision support methods are utilised for carrying out analysis of specific problems, opportunities and threats;
- (b) Problems containing data, which are semi-structured and also analytical process which is partly computerised and partly dependent on the financial manager's personal insight and judgement;
- (c) There are interactive enquiries and responses between the financial manager and the computer which enhance the problem solving process;
- (d) There are no predetermined solutions or reporting formats. Information products are ad-hoc, flexible and in adaptable formats; and
- (e) Information is produced by analytical modeling of financial data.

7.2.1 DSS Models and Software

As earlier mentioned, decision support systems (DSS), unlike the old management information systems utilise model bases and databases in their support provision. A DSS model base is a software component

comprising models used in calculations and analyses which mathematically display relationships among variables such as sales, expenses and net profit.

A typical example of DSS models is the spreadsheet. Other DSS model includes financial planning models, capital budgeting models (present value and internal rate of returns models) linear programming models and analytical models. These other models may be in the form of spreadsheet models or statistical and mathematical programmes.

7.3 APPLICATION PACKAGES

These are programs (software) that deal with particular commercial tasks and which can be obtained either directly from specialist software suppliers or written in-house. Most small and medium scale enterprises depend only on ready-made packages for tasks.

Application packages are usually customised to fit into the end users needs; based on the users data needs, report formats and frequency, nature of computations and so on. Most application packages are supplied in modules, the choice of which depends on the user.

7.4 SPREADSHEET

This is an electronic worksheet that can be used for a variety of tasks and applications. The most common spreadsheet package in the market now is Excel. The electronic worksheet is arranged in rows and columns called cells, the contents of which can be manipulated in many ways as required by the user. For example, cell contents can be added or subtracted or worked upon by more complicated formula in whatever form it is needed including any particular computations required by the user.

Some applications of spreadsheet packages which are particularly relevant to the financial manager are briefly explained below:

7.4.1 Financial Planning

An important method of constructing projected financial statements for periods longer than one year is through the use of DSS based financial planning models. These models are stored in the form of spread sheets and they can be programmed to provide support for the financial managers in the following circumstances:

- (a) Where there are many assumptions to be made and there is need to jointly determine the impact of these assumptions.

- (b) Where there is need to show the effects of different assumptions one at a time, say, of sales level, different sales prices, input costs, on the other projected variables in the financial statements.
- (c) Where there is need to evaluate different financing plans and their effects on significant variables like earnings per share, debt-equity ratio and so on.
- (d) Where it is necessary to modify the initial plan based on the outcome of previous projections. For example, planned sales might be reduced if it becomes difficult to raise funds; operating process might be adjusted in such a way that fixed capacity are maximally utilised and a company may even think of possible outsourcing of any of its manufacturing operations.

7.4.2 Capital Budgeting

The capital budgeting models (discounted cash flows) are used to support the financial manager in the financial analysis and evaluation of different capital investments alternatives. The relevant data in the decision making process is semi-structured and the models help in making certain analysis such as 'what if' analysis, sensitivity analysis and so on.

Electronic spreadsheet packages such as EXCEL have in-built NPV and IRR functions in their application programs. The task entails input of cash inflows and outflows with their respective years separately into the individual cells of the spreadsheet and key in the discount rate also in a separate cell. Then, enter the NPV formula, for example NPV (F9, C10:C14)+C9. This means you are telling your PC to compute using the discount rate entered in cell F9, the present value of cash flows entered in cell C10 to cell C14 and then subtract the initial cost entered in cell C9. Note that C9 is added because it is already negative. In the case of IRR what is needed is just to input as above the cash flows along with their respective years and enter the IRR formula, for example IRR (C8:C12). Here, the PC is being directed to find the IRR of a project whose cash flows are in the cell C8 to C12. It should be noted that the cash flow entered in year 0 has a negative sign showing the initial amount put into the project.

7.4.3 Linear Programming

The formulation of and the proffered solutions to linear programming problems lend itself to the utilisation of the computer-based DSS. In such problems there may be many constraints and interacting

variables which might make solutions to such problems very labourious and probably impossible under manual approach.

7.4.4 DSS: Analytical Models

The use of DSS entails a typical interactive analytical process comprising analysis such as 'what if' analysis, sensitivity analysis and so on. Here, alternative 'what-if-changes' in input variables can be entered by the financial manager into the computer. The DSS software package might show series of outcomes in response to say what-if changes. In this case financial managers are not asking for pre-information. Instead they are examining all possible alternatives. They need not decide in advance what information they need. What they do is to utilise the DSS to get the information they require to assist them in arriving at a decision. This is the usefulness of a DSS.

The following analytical modeling tasks, among others, make up, the analytical aspects of a DSS:

7.4.4.1 "What-If" Analysis

In this kind of analysis, the financial manager changes some variables or their inter-relationships and observes the effects of these changes on other variables. For instance, in capital budgeting, the financial manager (using a spreadsheet) might want to change the initial amount to be invested due to capital constraint. The spreadsheet program will recompute all the variables in the spreadsheet that are affected by the change. The values of these variables would be observed particularly the NPV (the decision criterion) and evaluated accordingly. A repeat of this analysis will be carried out until the outcome of the various changes is satisfactory.

7.4.4.2 Sensitivity Analysis

This is a variant of the "what-if" analysis. Here the value of only one variable is altered many times and the effects on all other variables are observed by the financial manager. There are some DSS software packages that automatically make repeated minor alterations to a variable when commanded to carry out sensitivity analysis. Since the input variables are estimated and therefore subject to a change, there is need to perform sensitivity analysis to see how the bottom line figure set by the NPV react to a small change in a critical input factor such as the initial investment, the discount rate or the tax rate.

7.4.4.3 "How-Can" Analysis

This is a reverse of "what-if" analysis where the decision maker changes the ultimate result repeatedly and each time raises a fundamental question on how the company can achieve the new result. This is a very useful analytical method in financial planning when trying to achieve, for instance, a particular return on capital employed. Given the net assets employed, the net profit after tax might be subjected to repeated changes and the effect of such changes on other variables within the spreadsheet observed. A question that arises is how the new profit level is to be attained. It may be that materials control has to be tightened or labour types have to be properly examined or there may even be need to properly examine fixed costs to see if they can be avoided. Again, may be it is the company's marketing efforts that have to be intensified to raise volume where the increased volume can be absorbed by the market. This analysis is also known as goal-seeking analysis.

7.4.4.4 Optimum Level Analysis

This is a very useful analysis when financial managers are confronted with complex problems involving determination of the maximum level or minimum level a variable could attain in the face of specified limiting factors. Here, the objective is to look for an optimal value of a variable subject to a number of constraints. For example, the financial manager might want to maximise the net present value of the contributions from two or three product that use common resources where two or more of the resources; labour, machines hours, materials or facilities are constraints to the achievement of the specified maximisation objective. This is a typical multi-constraint linear programming problem which requires the support of a DSS to be able to solve the problem.

7.5 SOME RELEVANT e-BUSINESS TERMINOLOGIES IN ICT

There are some relevant terminologies in ICT which should be of interest to the financial manager. They are briefly described below.

7.5.1 Electronic Commerce (e-Commerce)

Electronic commerce is the process of doing business electronically. It involves the automation of a variety of business-to-business and business-to-consumer transactions through reliable and secure connections, especially the Internet.

Electronic Commerce is the application of various communications technologies to provide the automated exchange of business information with internal and external customers, suppliers and financial institutions. Examples of these technologies include Electronic Data Interchange (EDI), bar coding, scanning, E-mail and fax. Electronic Commerce, simply put, is the automation of the business process between buyers and sellers.

7.5.2 Electronic Data Interchange (EDI)

Is the exchange of business data using an understood data format. It predates today's Internet. EDI involves data exchange among parties that know each other well and make arrangements for one-to-one (or point-to-point) connection.

EDI is a standard format for exchanging business data. An EDI message contains a string of data elements, each of which represents a singular fact, such as a price, product model number, and so forth, separated by delimiter. The entire string is called a data segment. One or more data segments framed by a header and trailer form a transaction set, which is the EDI unit of transmission (equivalent to a message). A transaction set often consists of what would usually be contained in a typical business document or form. The parties who exchange EDI transmissions are referred to as trading partners. EDI messages can be encrypted to prevent unauthorized access.

7.5.2.1 Costs-Benefits of Electronic Data Interchange

The cost-benefit of any project should be evaluated before investing funds in that project. The following are the benefits and cost of EDI.

Benefits:

- (a) Fast movement of information and payments.
- (b) System is very reliable as there is relative transparency.
- (c) Improved cash management.
- (d) Savings in cost-reduction in mail, paper and document storage costs.
- (e) Goodwill arising from benefits accruable to customers.
- (f) Elimination of idle cash (float).

Costs:

- (a) Need for substantial investment in computer hardware and software, though these costs have been dropping sharply in recent times,

- (b) Need to train employees to operate the system
- (c) Efforts and time required to woo business partners (suppliers and customers) into doing business electronically with the company.

7.5.3 Electronic Funds Transfer (EFT)

This is an important part of EDI. Its salient feature is that what is being transferred is "value." Here deposit taking financial institutions (commercial banks) send and receive money in electronic form. EFT, when viewed locally would include "First Bank Western Union Money Transfer", "UBA. Money Gram, CSCS transactions within the trio of the CSCS, the NIBSS and the Stockbrokers, the automated clearing system transaction between the clearing houses (the designated commercial banks) and NIBSS.

From the global point of view, EFT may involve instructions and transfers by way of the Society for Worldwide Interbank Financial Telecommunication (SWIFT) and the Clearing House Interbank Payment System (CHIPS).

7.5.4 Financial Electronic Data Interchange (FEDI)

This is the second important part of EDI. It entails the exchange of electronic business information (non-value transfers) between a company and its bank or between one bank and the other. Examples include, information about customer's bank accounts balances, interbank lending and borrowing rates, spot and forward exchange rates and so on.

It should be noted that e-Business firms still carryout some paper transactions. In some instances, they might have to do this for legal reasons.

7.5.5 Internet

The Internet is a global network of computers and communication devices. It is also public network that connects several computers, communication devices and smaller networks into a global network. There are many different types of computers on the Internet - personal computers, mainframes and mini-computers, Macintoshes, and others - and many of these computers use different operating system platforms and devices, and are parts of smaller networks, which make up the Internet.

These computers are connected together in a continuously growing network. Most of the physical connections consist of optical cables or telephone lines that are either bought or leased from telephone

companies. In some cases signals are transmitted via satellite links. Many of the connections are also used for other purposes, like ordinary voice telephone calls. And many of the computers are only attached to the Internet occasionally. The easiest way to understand the Internet is to use it.

7.5.6 Intranets and Extranets

Intranet

A private network inside a company or organization that uses the same kinds of software that would be found on the public Internet, but only for internal use.

Extranet

An extended private network that uses Internet communication standards and the public telecommunication system to share part of a business's information or operations (such as a company's Intranet) securely with suppliers, vendors, partners, customers, or other businesses.

7.5.7 e-Banking

Electronic banking, also known as electronic fund transfer (EFT), uses computer and electronic technology as a substitute for cheques and other paper transactions. EFTs are initiated through devices like cards or codes that let customers or those authorised by him have access to his account. Many financial institutions use ATM or debit cards and Personal Identification Numbers (PINs) for this purpose. Some use other forms of debit cards such as those that require, at the most, customer's signature or a scan.

7.6 REPORTING IN AN ICT ENVIRONMENT

Whereas information under the traditional management information systems is provided via periodic, exceptional reports, information in a DSS is obtained through interactions with the computers, command of enquiries and instantaneous receipt of responses. Hence all those qualities of good reporting system under old MIS may not be really relevant in a DSS.

7.7 SUMMARY AND CONCLUSIONS

The implications of information and communication technology (ICT) for the financial managers in a business organisation are tremendous. Financial managers are decision makers in a typical business entity. The relevant information system in the ICT environment is the Decision support system (DSS). The main thrust of the system is to provide support to decision makers

(including the financial managers) to enable them make speedy, timely and accurate decisions regarding complex business problems. DSS, also known as End-User computing system, uses analytical models, specialized databases and interactive computer-based modeling to give support to the decision maker who, with his own intuitive knowledge and judgment, is expected to make his decisions quickly and accurately.

Examples of applications which receive support from a DSS, from the view point of financial management, include, but not limited to, financial planning, capital investment appraisal, complex optimization problems, and some analyses including sensitivity analysis. A major software used by DSS is the spreadsheet. However there are other programmes relating to the above applications which may be in the form of spreadsheets.

Application packages are available in the market and can be easily obtained at low costs. They are usually customised to meet end-users' requirements.

DSS analytical models are capable of carrying out four major types of analysis - the 'what-if' analysis, sensitivity analysis, target-seeking analysis and optimizing analysis. There are certain terminologies that are worth knowing by financial managers, particularly the treasury managers. These include e-business, e-communication.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

7.8 REVISION QUESTIONS

7.8.1 MULTIPLE CHOICE QUESTIONS

1. Which of the following is not really an advantage in the information produced by the Decision Support System?
 - A Accuracy
 - B Volume
 - C Complexity of relationship
 - D Automatic decision making
 - E Calculating capability
2. Which of the following does not provide speed advantage when a financial manager interacts with the computer?
 - A Printing
 - B Updating
 - C Data input via the key board
 - D Information retrieval
 - E File reading

3. Which of the following is not an application of decision support systems?
 - A Cash budgeting
 - B Capital investment appraisal
 - C Payroll analysis
 - D Sensitivity analysis
 - E Optimum level analysis
4. The international network of computers linking employees of a company with computers in the company is known as
 - A Extranets
 - B Internet
 - C Online in real time
 - D Intranets
 - E E-employees
5. The DSS analytical modelling makes use of the following models EXCEPT
 - A what if analytical model
 - B target seeking analytical model
 - C optimum level analytical model
 - D sensitivity analytical model
 - E inventory control model

7.8.2 SHORT ANSWER QUESTIONS

1. The exchange of business information in a non-paper format in an information technology (IT) environment is known as _____
2. The transfer of business information on such transactions as ordering, and dispatching, in a computer-readable format is called _____
3. In terms of decisions, state ONE difference between the traditional management information system and the Decision Support System.
4. In terms of structure how would you classify financial management problems in an information technology (IT) environment?
5. In the context of provision of support for managers of a business organisation by DSS, what is the level of management into which financial managers fall?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

MATHEMATICS OF FINANCE

8.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ◆ Explain the concept of time value of money;
- ◆ Understand and apply compound interest;
- ◆ Calculate the present value of a future lump sum;
- ◆ Define an annuity, differentiate between ordinary annuity and annuity due, calculate and apply the future values of an ordinary annuity and annuity due;
- ◆ Apply the formula used in the future value of an ordinary annuity to the operation of a sinking fund; and
- ◆ Calculate the present value of an ordinary annuity and annuity due, the present value of an ordinary annuity to a loan amortisation table and its application.

8.1 INTRODUCTION

Mathematics of finance consists of mathematical formulae that bring into focus the time value of money – a very important concept in financial decision-making. In financial decision-making, cash flows occur into the future and at different times. But, decisions have to be made now. Thus, financial managers must find a way of converting the future cash flows to their present worth, using the appropriate discounting tools.

8.2 TIME VALUE OF MONEY

Financial decisions recognise that money has value over time. This means that an amount of money now, has a greater value than the same amount at some time in the future. This idea is based on the fact that if you have “x” naira now, you can make it to work for you so that you obtain “x plus” naira in the future. Given this situation, lenders of money would also want to be compensated financially for parting with present consumption. The amount they receive is known as interest. It should be noted that this interest will be charged even if no inflation is anticipated and it is certain that the money will be received.

8.3 INTEREST

Interest, like commodity price in the commodity markets, is the price one pays for money in the financial markets. It is that vital factor that is used to quantify the time value of money. Interest rate makes possible the conversion of the values of cash flows having different timings to a desired point in time; for the purpose of financial decision-making. Thus, present values, with the aid of interest rate can be converted to future values and vice versa.

8.4 COMPOUND INTEREST

As against simple interest, where interest is charged on the principal only for the relevant period, compound interest is charged and added to the principal from period to period; both principal and interest forming the basis of the next period interest calculation. In effect, interest is being earned on interest.

8.5 FUTURE VALUE OF A LUMP SUM

One area in which the compound interest principle is applied is where a single lump sum is deposited, for example, in a savings or fixed deposit account at a specified rate of interest per period. This deposit is allowed to grow undisturbed while the interest is assumed to be re-invested.

ILLUSTRATION 8-1

Assume an amount of ₦1,000 is put in a fixed deposit account for 3 years at the rate of 12 per cent per annum. If the amount is left untouched, what will be the worth of the investment at the end of the third year?

SUGGESTED SOLUTION 8-1

(i) Step-by-step approach

Value at the;

End of year 1: $₦1,000 (1.12) = ₦1,120.00$

End of year 2: $₦1,000 (1.12)(1.12) = ₦1,000(1.12)^2 = ₦1,254.40$

End of year 3: $₦1,000 (1.12)(1.12)(1.12) = ₦1,000(1.12)^3 = ₦1,404.93$

(ii) Generalised formula

$FV_n = P_0(1+r)^n$. If the original investment were allowed to grow for ten years, its worth at the end of ten years would be:

$$\begin{aligned} FV_{10} &= \text{₦}1,000(1.12)^{10} \\ &= \text{₦}3,105.85 \end{aligned}$$

8.6 FREQUENCY OF COMPOUNDING

There are some investments where interest is compounded more than once during the year. This method is applicable to fixed-deposit accounts and other savings instruments. It increases the effective interest rate, assuming interest is compounded “ m ” times during the year.

The above formula is varied thus:

$$FV_n = P_0 \left(1 + \frac{r}{m}\right)^{mn}$$

ILLUSTRATION 8-2

If, interest on the above investment of ₦1,000 is to be compounded monthly (instead of once in the year), what will be the value at the end of one year:

SUGGESTED SOLUTION 8-2

At the end of one year, the value will be:

$$\begin{aligned} FV_n &= \text{₦}1000 \left(1 + \frac{0.12}{12}\right)^{12 \times 1} \\ &= \text{₦}1,000 [(1.01)^{12}] \\ &= \text{₦}1,126.83 \end{aligned}$$

Since ₦1,000 grows to ₦1,126.83 in one year, this is equivalent to an effective interest rate of 12.68 percent, as follows: $\frac{126.83}{1000.00} \times \frac{100}{1} = 12.68\%$.

8.7 CONTINUOUS COMPOUNDING

This is a situation where compounding periods are infinitely short, such that m , the number of times a year interest is compounded approaches infinity. In

this case the term $(1 + \frac{r}{m})^{mn}$ approaches e^r where “e” is a symbol for the irrational number 2.71828 and can be represented by the formula:

$$e^r : \lim_{m \rightarrow \infty} \left[1 + \frac{r}{m} \right]$$

ILLUSTRATION 8-3

What is the value at the end of three years of ₦1,000 deposited at 12 percent per annum with interest compounded continuously?

SUGGESTED SOLUTION 8-3

The value will be:

$$\begin{aligned} FV_3 &= P_0(e^{rn}) &= [e^{(0.12)(3)}] 1000 \\ & &= (2.71828^{0.36}) \text{ ₦1,000} \\ & &= \text{₦1,433.33} \end{aligned}$$

This is the maximum possible future value of ₦1,000 at the end of three years. Continuous compounding implies that where the return on investment is available immediately it is earned, it is instantly re-invested to earn more.

8.8 DOUBLE YOUR MONEY: RULES OF THUMB

Rule 72: This rule says 72 should be divided by the interest rate to find the number of years it will take to double an amount of money. Alternatively, the rule helps to obtain the rate of interest that an amount of money must earn if that money is to double during a given number of years. For example, if interest rate on savings account is 8 percent it will take 9 years to double the money saved. Conversely if the interest rate is 9%, the amount saved would double in 8 years.

Rule 7-10: This rule says that money will double in 10 years if interest rate is 7 per cent and in 7 years, if the rate is 10 per cent.

8.9 FUTURE VALUE WITH REGULAR ANNUAL INVESTMENT

Here, there is an initial deposit with an addition of a fixed amount at the end of each period. The future value will be arrived at by the use of the following generally accepted formula:

$$FV_n = \left(P_0 + \frac{p}{r} \right) (1 + r)^n - \frac{p}{r}$$

Where p is the regular addition which is assumed to be made at the end of each period.

ILLUSTRATION 8-4

An investor made an initial deposit of ₦50,000 at the beginning of 2007. While this amount remains invested, he plans to be adding ₦5,000 on January 1 each subsequent year starting from January 1 2008. Assuming interest is compounded each year at the rate of 12 per cent per annum, what will be the value of his investment on January 1, 2011?

SUGGESTED SOLUTION 8-4

Substituting values for the symbols p , r and n we have

$$\begin{aligned} FV_4 &= \left(50,000 + \frac{5,000}{0.12} \right) (1 + 0.12)^4 - \frac{5,000}{0.12} \\ &= (50,000 + 41,667) (1.12)^4 - 41,667 \\ &= (91,667 \times 1.5735) - 41,667 \\ &= 144,238 - 41,667 \\ &= \text{₦}102,571 \end{aligned}$$

Note: This formula can also be used to calculate the amount that is added yearly to the initial deposit.

8.10 REGULAR ANNUAL WITHDRAWALS

If p is allowed to be negative, the same formula can be used to calculate the amount that will be left from an initial investment given withdrawal of regular fixed amount at the end of each period.

ILLUSTRATION 8-5

A pensioner deposits N100,000 representing his gratuity in a bank account and withdraws N15,000 at the end of each year beginning from the end of the first year. What will be the balance of his bank account after five years if the deposit is invested at 12 percent per annum?

SUGGESTED SOLUTION 8-5

$P_0 = \text{N}100,000$, $r = 0.12$, $n = 5$ and $p = \text{N}15,000$

$$FV_n = \left(P_0 - \frac{p}{r} \right) (1 + r)^n + \frac{p}{r}$$

$$\begin{aligned} FV_n &= \text{N} \left(100,000 - \frac{15,000}{0.12} \right) (1 + 0.12)^5 + \frac{\text{N}15,000}{0.12} \\ &= (\text{N}100,000 - \text{N}125,000) (1.12)^5 + \text{N}125,000 \\ &= -\text{N}25,000 (1.7623) + \text{N}125,000. \\ &= \text{N}(-44,058 + 125,000) \\ &= \text{N}80,942. \end{aligned}$$

8.11 PURCHASE OF AN ANNUITY CONTRACT (REVERSE INSURANCE POLICY)

This formula can also be used by an annuitant to know the amount of regular income receivable from an insurance company in consideration of payment of a capital sum.

ILLUSTRATION 8-6

You won N7m from Eko Akete State Lottery Competition. Being unemployed and old, you wish to have a regular income over the next ten years. You have been approached by a life insurance company that sells annuity contracts and will pay you a fixed naira amount annually for ten years. Your opportunity cost of funds is 12 percent. How much annual income will you be receiving?

SUGGESTED SOLUTION 8-6

Using the withdrawal equation, future value will be put at zero as the fund will be fully utilised.

$P_0 = 7\text{m}$, r is 0.12 and n is 10. Given the formula, we have:

$$\text{N} \left(7\text{m} - \frac{p}{0.12} \right) (1.12)^{10} + \frac{p}{0.12} = 0$$

$$\text{N}(7\text{m} - 8.33p) (3.1058) + 8.33p = 0$$

$$\text{N}(21.7406\text{m} - 25.8713p + 8.33p) = 0$$

$$17.5413p = \text{N}21.7406\text{m}$$

$$p = \text{N} \frac{21.7406\text{m}}{17.5413}$$

$$= \text{N}1.2394\text{m}$$

$$= \text{N}1.24\text{m}$$

This formula can also be used to calculate how much initial investment is required (P_0) to produce a given expected regular and fixed annual income.

8.12 PRESENT VALUE OF A FUTURE LUMP SUM

If it is true that money has value over time, then ~~N~~1 today is worth more than ~~N~~1 in a year's time. This means that future cash flows occurring at different points in time do not possess the same values right now. In that case, there should be a way of converting those future cash flows to their present worth; this process is known as discounting, that is, reversing the procedure for compounding.

ILLUSTRATION 8-7

Assume a fixed deposit account will pay with certainty ~~N~~11,200 one year from today. If the depositor can receive 12 per cent per annum from the next best opportunity, how much is required now to have the ~~N~~11,200?

SUGGESTED SOLUTION 8-7

This can be obtained by reversing the generalised formula as follows:

$$P_0 = \frac{FV_n}{(1 + r)^n}$$

$$= \frac{11,200}{(1.12)}$$

$$= \text{₦}10,000.$$

NOTE: The interest rate (for this purpose) is known as discount rate.

When compounding we make **forward** steps over time. The difference between the initial amount and the compounded value is known as **compound interest** and is normally expressed as $(1 + r)^n - 1$. When discounting, we make **backward** steps overtime. The difference between the future value and the present value is known as **compound discount** and is normally expressed as $1 - (1 + r)^{-n}$.

8.13 ANNUITY

This is a series of **equal** amounts of money to be paid or received **each year** for a specified future period of time. If the payment or receipt is made at the **end** of each year, it is known as **ordinary annuity**. If the payment or receipt is made at the **beginning** of each year, it is called **annuity due**.

ILLUSTRATION 8-8

FUTURE VALUE OF AN ANNUITY (ORDINARY)

Assume you take up a savings programme asking for deposit of **₦10,000** at the end of each year for the next three years in an account paying 12 percent per annum compounded annually. How much will you have in the account at the end of the third year?

SUGGESTED SOLUTION 8-8

		₦
The first ₦ 10,000	$= 10,000(1.12)^2$	$= 12,544$
The second ₦ 10,000	$= 10,000(1.12)$	$= 11,200$
The third ₦ 10,000 (<i>No interest earned</i>)	$=$	<u>10,000</u>
Total at the end of year 3		<u>₦33,744</u>

The above is a step-by-step approach which although correct, can be cumbersome and unwieldy where calculations are for many years. In this case it is advisable to use formula.

The formula for the future value of an **ordinary annuity**, without minding its development, is stated as follows:

$$FVA_n = A \left[\frac{(1 + r)^n - 1}{r} \right]$$

Where FVA_n is the future value of the annual receipt or payment, for n years, A is the annual payment or receipt, n is the length of the annuity and r is the interest rate per annum compounded annually. You will notice that this formula is obtained by simply dividing the compound interest by the rate. Applying the formula to the above, we have

$$\begin{aligned} FVA_n &= \text{N}10,000 \left[\frac{(1.12)^3 - 1}{0.12} \right] \\ &= \text{N}10,000 \left(\frac{1.4049 - 1}{0.12} \right) \\ &= \text{N}10,000 \left(\frac{0.4049}{0.12} \right) \\ &= \text{N} 10,000 (3.3744) \\ &= \text{N}33,744 \end{aligned}$$

ILLUSTRATION 8-9

FUTURE VALUE OF AN ANNUITY DUE

Assuming the above annual cash flows occur at the beginning of each year. How much will you have in the account at the end of the third year?

SUGGESTED SOLUTION 8-9

Here, future value will be calculated by focusing on one year after the last cash flow. The formula will thus be slightly adjusted to read:

$$FVAD_n = A \left[\frac{(1 + r)^n - 1}{r} \right] (1 + r)$$

Using the information in the savings programme and assuming ₦10,000 is deposited at the beginning of each year, the account at the end of the third year will be $\text{₦}33,744(1.12) = \text{₦}37,793$. You will note that this is simply the future value of an equivalent three year-ordinary annuity compounded for additional one year.

8.14 APPLICATION OF FUTURE VALUE OF AN ORDINARY ANNUITY FORMULA TO BUSINESS DECISIONS: SINKING FUND

At times, it may be necessary to set up a sinking fund to provide either for the replacement of a plant at a future time or for the repayment of a loan where for example, interest is paid periodically but the principal will not be due until the maturity date. Since the amount set aside each year will be invested outside the business to earn interest, the total of the amounts so set aside can be less than the amount required for the asset replacement or loan repayment.

It should be noted also that this formula can be used to solve the twin problem of how much is required to be invested each year in order to give a specified total sum in a given number of years.

ILLUSTRATION 8-10

A firm plans to set aside (out of its profit and loss account) ₦500,000 at the end of each year and to invest the equivalent amount outside the business. This is to enable it replace one of its production machines in five years time. If the investment is to earn interest at the rate of 12 per cent per annum, how much will be available at the end of the fifth year for such replacement?

SUGGESTED SOLUTION 8-10

$A = \text{₦}500,000$, $r = 0.12$, $n = 5$

$$\begin{aligned}
 FVA_n &= A \left[\frac{(1+r)^n - 1}{r} \right] \\
 &= 500,000 \left[\frac{(1 + 0.12)^5 - 1}{0.12} \right] \\
 &= 500,000 \left[\frac{1.7623 - 1}{0.12} \right] \\
 &= \text{₦}500,000 \times 6.3525 \\
 &= \underline{\text{₦}3,176,250}
 \end{aligned}$$

ILLUSTRATION 8-11**PRESENT VALUE OF AN ORDINARY ANNUITY**

Let us assume you want to open a savings account that will give you a guaranteed sum of ₦10,000 per annum for the next three years. If the bank pays its customers 12 per cent per annum on savings accounts, how much do you have to put into the account immediately so that you would have nothing in the account at the end of the third year?

SUGGESTED SOLUTION 8-11

This is a present value of a fixed annual cash flow problem and can be solved by the following step by step approach:

PV of the first withdrawal =	$10,000 / 1.12$	=	₦8,928.57
PV of the second withdrawal =	$10,000 / (1.12)^2$	=	₦7,971.94
PV of the third withdrawal =	$10,000 / (1.12)^3$	=	₦7,117.94
Amount to be paid into the account			<u>₦24,018.45</u>

If the amount required were to produce the same cash flow each year for fifty years instead of three, the process would be the same but the calculations needed would be quite unwieldy. Therefore it may be necessary to, without going through its development, apply a generalised formula as follows:

$$PVA_n = A \left[\frac{1 - (1 + r)^{-n}}{r} \right]$$

Where PVA_n = present value of annual receipt or payment for n years
 A = annual receipt or payment.
 n = length of the annuity
 r = discount rate per annum compounded annually.

Using the formula to solve the above problem, we will have:

$$\begin{aligned} PVA_3 &= 10,000 \left[\frac{1 - (1.12)^{-3}}{0.12} \right] \\ &= 10,000 \left[\frac{1 - 0.7118}{0.12} \right] \end{aligned}$$

$$= 10,000 \left[\frac{0.2882}{0.12} \right]$$

$$= 10,000 (2.4017)$$

$$= \text{N}24,017 \text{ (difference due to rounding error).}$$

ILLUSTRATION 8-12

PRESENT VALUE OF AN ANNUITY DUE

The present value of an annuity due for 'n' years will be equal to the discounted (present) value of n-1 year ordinary annuity plus the first year cash flow which will not be discounted because it occurs at the beginning of the year that is end of year zero. This can be represented by the following formula:

$$\text{PVAD}_n = A + A \left[\frac{1 - (1+r)^{-(n-1)}}{r} \right]$$

SUGGESTED SOLUTION 8-12

Using the formula to solve the problem on page 13 we would have:

$$\begin{aligned} \text{PVAD}_n &= \text{N}10,000 + \text{N}10,000 \left[\frac{1 - (1.12)^{-2}}{0.12} \right] \\ &= \text{N}10,000 + \text{N}10,000 \left(\frac{0.2028}{0.12} \right) \\ &= \text{N}10,000 + \text{N}16,000 \\ &= \text{N}26,900 \end{aligned}$$

8.15 APPLICATION TO BUSINESS PROBLEM: LOAN AMORTIZATION

A good application of present values principle occurs when a loan is granted by a bank and repayment has to be in a series of equal periodic instalments with each instalment comprising both interest and principal elements.

ILLUSTRATION 8-13

Assume Mallam Jinan Kurawa bank lends you ₦1m for a period of five years at 15 percent interest per annum to be compounded annually. Repayment to be at the end of each year. To fully recover for the lender both principal and interest set up a loan amortisation table.

SUGGESTED SOLUTION 8-13

The first step is to determine the amount of each instalment using the formula of present value of an ordinary annuity:

$$PVA_n = A \left[\frac{1 - (1 + r)^{-n}}{r} \right]$$

$$PVA_n = A \left[\frac{1 - (1.15)^{-5}}{0.15} \right]$$

$$₦1,000,000 = A \left[\frac{0.5028}{0.15} \right]$$

$$₦1,000,000 = 3.352 A$$

$$₦298,329 = A$$

The second step is construction of the table.

AMORTISATION TABLE

Year	Beginning Loan bal. ₦	Annual install. ₦	Annual Interest ₦	Principal Repayment ₦	Ending loan bal. ₦
1	1,000,000	298,329	150,000	148,329	851,671
2	851,671	298,329	127,751	170,578	681,093
3	681,093	298,329	102,164	196,165	484,928
4	484,928	298,329	72,739	225,590	259,338
5	259,338	298,329	38,901	259,428	(90)
		<u>1,491,645</u>	<u>491,555</u>	<u>1,000,090</u>	

NOTE:

- (i) The annual interest for each year is based on the amount of principal outstanding at the beginning of each year; and
- (ii) Interest charged is reducing over time while the principal is increasing over time. This is to reflect the fact that interest is based on the reducing balance of the principal.

8.16 PERPETUAL ANNUITY

This is an ordinary annuity whose series of cash flows continue so long that an end is not in sight. In this case; 'n' is regarded to be tending to infinity. Looking at the present value of an ordinary annuity formula, the term $(1 + r)^{-n}$ is less than annuity and will, therefore, tend to zero as 'n' tends to infinity. We will, therefore, have in this situation the following formula:

$$\begin{aligned} PVA_{\infty} &= A \left[\frac{1-0}{r} \right] \\ &= \frac{A}{r} \end{aligned}$$

Therefore, the present value of a perpetual (eternal) annuity is simply the annual cash flow divided by the interest rate per annum.

ILLUSTRATION 8-14

If a man is promised the sum of ₦10,000 per annum indefinitely at an interest rate of 12 percent per annum, what will be the present value of this perpetual annuity?

SUGGESTED SOLUTION 8-14

Using the above formula, the present value will be:

$$\frac{A}{r} = \frac{10,000}{0.12} = \text{₦}83,333$$

8.17 STREAM OF UNEVEN CASH FLOWS

These are cash flows that do not occur either strictly as lump sums or strictly as annuities. Their patterns are irregular. The problems posed by their timings will be treated later under Techniques of investment appraisal.

8.18 UNKNOWN VARIABLES

8.18.1 Rate

At times, the rate of interest (discount) may be the only unknown variable in a typical investment problem and this rate needs to be found.

ILLUSTRATION 8-15

An investment of ~~₦~~20,000 (now) is expected to yield ~~₦~~80,000 in 5 years time. What is the imprinted compound interest rate?

SUGGESTED SOLUTION 8-15

Using the formula:

$$FVS_5 = P_0 (1 + r)$$

We have:

$$\cancel{₦}20,000 (1 + r)^5 = \cancel{₦}80,000$$

$$(1 + r)^5 = 4$$

$$1 + r = 4^{0.20} \quad \text{or} \quad \sqrt[5]{4}$$

$$1 + r = 1.3195$$

$$r = 1.3195 - 1$$

$$= 31.95\%$$

8.18.2 Number of Years ("n")

It may be necessary to know how long it will take an investment to grow given the initial amount, its future value and the compound rate of interest.

ILLUSTRATION 8-16

How long will it take a deposit of ₦10,000 to grow to ₦50,000 given an annual interest rate of 8 percent compounded annually?

SUGGESTED SOLUTION 8-16

This will be solved as follows:

$$₦10,000 (1 + r)^n = ₦50,000$$

$$(1 + 0.08)^n = \frac{₦50,000}{₦10,000} = 5$$

Using the natural logarithm approach, we have

$$n \log (1.08) = \log 5$$

$$n = \frac{\log 5}{\log 1.08}$$

$$= 20.9124$$

$$= \underline{21 \text{ years.}}$$

Note: Searching for imputed interest rate in annual cash flows (regular and irregular) situation involves trial and error process patterns with the exact rate being computed through linear interpolation. This will be dealt with later under Internal Rate of Return (IRR).

8.19 SUMMARY AND CONCLUSIONS

Compound interest and discount formulae are important mathematical tools for financial analysis. Their use enable future values of lump sums and annuities to be calculated. Also present values of future lump sums and annuities can be computed.

These calculations assist financial managers in capital investment decisions. Business firms invest now in capital projects whose cash flows occur into the future. One needs to know the present worth of these cash flows, compare with the initial amount that will be invested now, before taking a decision whether or not to invest.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

8.20 REVISION QUESTIONS**8.20.1 MULTIPLE CHOICE QUESTIONS**

1. What is the meaning of the term “time value of money”?
 - A Time has value over money
 - B An amount of money in future, has greater value than the same amount now
 - C An amount of money now, has greater value than an amount of money in future
 - D An amount of money in future, has less value than an amount of money now
 - E An amount of money now has greater value than the same amount in future.

2. Mr. D has just inherited ₦500,000 from his late father’s estate. How much money will he have at the end of ten years if he invests it at 8 percent per annum compounded annually?
 - A ₦231,500
 - B ₦1,079,462
 - C ₦540,000
 - D ₦62,500
 - E ₦4,000,000

3. Mrs. E. has a mortgage loan with a Savings and Loans financial institution. The unpaid mortgage on the house in ten years time will be ₦895,500. How much does she have to invest annually at 8 percent per annum to have just this amount on hand at the end of the tenth year?
 - A ₦61,814
 - B ₦111,938
 - C ₦89,550
 - D ₦72,460
 - E ₦58,815

4. John, a civil servant, has estimated that for the first ten years after he retires, he will need an annual income of ₦27,200. How much money must he invest at 8 percent per annum at age 65 (retirement age) to realise this annual income?
 - A ₦180,902
 - B ₦218,762
 - C ₦182,512
 - D ₦194,758
 - E ₦118,480

5. X wants to invest ₦1m now at 8 percent per annum compounded annually. He wants this amount to become ₦2m. Approximately, how long will the investment take for him to realise this amount?
 - A 7 years

- B 8 years
- C 10 years
- D 11 years
- E 9 years

8.20.2 SHORT ANSWER QUESTIONS

Use this information to answer questions 1 & 2.

A company intends to set aside (out of its profits) a sum of ₦5m at the end of each year and to invest the equivalent amount outside the business. This is to enable it replace one of its old machines with an automated state-of-the-art equipment in five years time. The investment is to earn interest at 8 percent per annum.

1. What is the name given to this financial programme?
2. How much will be available at the end of the fifth year for the replacement?

Use the following information to answer questions 3 & 4

Mr. Babalode plans to acquire a car under a hire purchase agreement. The cost of the car is ₦2m payable over 3 years in three equal annual instalments. The first instalment will start at the beginning of the year with subsequent instalments on the anniversary of this date, that is every January 1. Presently money can be invested at 8 percent per annum.

3. This series of payment is called _____
4. How much does Mr. Babalode need to pay every year as instalment?
5. State the significance of present value approach to financial decision making.

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

CAPITAL EXPENDITURE PLANNING AND CONTROL

9.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ♦ Know the importance of capital expenditure to the company;
- ♦ State and explain the stages involved in capital expenditure planning and control;
- ♦ Know the benefits of capital expenditure planning;
- ♦ Identify the capital investment appraisal techniques available to a company;
- ♦ Appraise a typical project using appropriate technique; and
- ♦ Advise on the selection of a suitable project based on agreed decision criterion.

9.1 INTRODUCTION

Decisions regarding acquisition of fixed assets and other long-term projects of the company are critical to the future profitability and success of the company. Such investment includes purchase of equipment, acquisition of land and buildings, introduction of new products and so on.

There are cases when the equipment makes the business, for example, the aircraft and the ship are the backbone of an airline and shipping company, respectively. The import of the above is that expenditure on them have to be properly planned and evaluated before a company commits funds into them.

The importance of capital investments also lie in the fact that large sums of money are normally sunk into these investments and once decisions on them are made, they are nearly always irretrievable. Whereas the returns on these investments go into the future and may be highly uncertain in some cases, the expenditure on them is now.

The future cash flows have to be properly estimated and this is the most difficult aspect of the planning and evaluation process. The company, having estimated the future cash flows of each capital investment available, will evaluate each investment proposal using the appropriate appraisal technique(s). Each investment proposal should be assessed on the basis of its ability to achieve the minimum expected return by the providers of the funds that will be channeled to that proposal.

This minimum return will be assumed to remain unchanged and be the same for all investment opportunities. In other words, the acceptance of a project will not change the business profile of the company as perceived by investors. Risk is therefore held constant.

9.2 CAPITAL EXPENDITURE PLANNING AND CONTROL

Pandey (1989) defined capital expenditure planning and control as “a process of facilitating decisions covering expenditure on long-term assets”.

Another school of thought highlights that Capital expenditure includes all expenditure, on tangible and in some cases intangible assets, which are expected to produce benefits to the firm over a period of time (not less than one year).

Capital expenditure planning and control is an integral part of the corporate plan of an organisation.

The capital budgeting process includes:

- (a) identification,
- (b) development,
- (c) evaluation,
- (d) authorisation, and
- (e) control.

(a) Identification of investment opportunities

Identification of investment proposals is the most critical aspect of the investment process and should be guided by the overall strategic considerations of a firm. Once the investment proposal has been identified, each potential idea should be developed into a project and submitted for appraisal to determine its viability and worthiness. A sound appraisal technique which should maximise the shareholders wealth should be used to measure the economic worth of the projects.

In this respect, there would be a need to consider all cash flows, to determine the true profitability of the project. This will involve the development of cash flow estimates.

(b) Developing cash flow estimation

Estimation of cash flows is a difficult task because the future is uncertain. Therefore, the risk associated with cash flows should be handled properly and taken into account in the decision process as

the estimation of cash flows requires collection and analysis of all quantitative and qualitative data. The next process is the evaluation of the net benefits.

(c) Evaluation of the net benefits

In selecting a method or methods of investment evaluation, a company should take adequate care to ensure that the criteria selected would lead, to the net increase in the company's wealth, that is, its benefit exceeds its cost adjusted for time value and risk. The evaluation criteria should also not discriminate between the investment proposals. Whatever criterion that is applied, it should be capable of ranking projects correctly in terms of profitability.

In this particular case, the net present value method is theoretically recommended, among others by experts as it has a true measure of profitability. It ranks projects correctly and is consistent with the wealth maximisation criterion. However, other methods in use apart from the NPV are the payback period, the internal rate of return (IRR), accounting rate of return (ARR) and profitability index (PI).

In the implementation of a sophisticated evaluation system, the use of a minimum required rate of return is necessary. This should be based on the riskiness of cash flows of the investment proposal which are considered to be normally influenced by the following factors, amongst others:

- (i) Price of raw materials and other inputs;
- (ii) Price of products (selling price);
- (iii) Product demand;
- (iv) Government policies;
- (v) Technological changes;
- (vi) Project life; and
- (vii) Inflation.

In theory, a number of techniques are suggested to handle risk. Some of these include: simulation techniques, sensitivity analysis, conservative forecasts, standard deviation, co-efficient of variation and decision trees.

(d) Authorisation to spend

There is no specific standard administration procedure for approving investment proposal as it differs from one company to another. However, when large sums of capital expenditure is involved, the authority for the final approval may rest with the Board or the top management which may be the Chief Executive of the company. The approval authority may be delegated to the junior management for certain types of investment project involving small amounts. Funds are usually appropriated for capital expenditure from the capital budget after the final selection of investment proposals. Meanwhile top management are to ensure that funds are spent in accordance with appropriations made in the capital budget.

Funds for the purpose of project implementation should be spent only after approval has been granted by the finance manager or any other authorised person.

(e) Control and monitoring of capital projects

A capital project reporting system is required to review and monitor the performance of investment projects during and after completion. This will mean comparing the actual performance with original estimates. It will require regular reporting either monthly, quarterly or half-yearly.

The evaluation reports may among others include information on expenditure to date, stage of physical completion and approved and revised total cost. The reappraisal may also include consideration of the comparison between actual and forecast capital cost savings and rate of return. The perceived advantages of reappraisal are:

- (i) Improvement in profitability by positioning the project as per the original plan;
- (ii) Ascertainment of errors in investment planning which can be avoided in future;
- (iii) Guidance for future evaluation of projects; and
- (iv) Generation of cost consciousness among the project team.

9.3 INVESTMENT APPRAISAL TECHNIQUES

Investment decisions affect the value of the firm and this will increase, if investments are profitable and add to shareholders' wealth. It is, therefore, important to ensure that investments are evaluated on the basis of criteria

which are compatible with the objective of the shareholders' wealth maximisation.

In this respect, it is necessary to examine the different methods of selecting investment in long-term assets, that is, capital expenditure, to be able to determine the most valid technique of evaluating an investment project.

A number of capital budgeting techniques are used in practice. They are grouped into two major categories:

1. Discounted Cash Flow (DCF) Techniques

These include:

- (a) Net present value (NPV);
- (b) Internal rate of return (IRR);
- (c) Profitability index (PI); and
- (d) Discounted payback period.

2. Non-Discounted Cash Flow Techniques

These include:

- (a) Payback period (PB); and
- (b) Accounting rate of return (ARR)

In evaluating an investment, three steps are involved, these are:

- (a) Estimation of cash flows;
- (b) Estimation of the required rate of return (opportunity cost of capital); and
- (c) Application of a decision rule for making the choice

It is important to emphasise that expenditure on and benefits of an investment should be measured in cash. In this respect, it is the cash flow that is important and not the accounting profit.

However, it is assumed that the capital projects' opportunity cost of capital (rate of return) is known. It is also assumed that the expenditure and benefits of the investment are known with certainty.

9.3.1 Non-Discounted Cash Flow Techniques

(a) Payback period technique

This technique shows the number of years over which the investment would be recovered in current naira value. CIMA defines payback as “the period usually expressed in years, in which the cash outflows will equate the cash inflows from a project. This technique measures projects on the basis of the period over which the investment pays back itself or the period of recovery of the initial investment.” This means that the full recovery of the projects cash outflow would be measured through the cash inflows.

This method pays attention to the shortness of the project, that is, the shorter the period of recovery of initial investment or capital outlay, the more acceptable the project becomes.

Where there is constant or uniform annual net cash flows from a project, the payback period is calculated thus:-

$$\text{Payback Period} = \frac{\text{Initial Investment (Capital Outlay)}}{\text{Annual Net Cash flow}}$$

Decision rule

If the payback period calculated for a project is less than the maximum or standard payback period set by management, it would be accepted, if not, it would be rejected.

If the firm has to choose among two mutually exclusive projects the project with shorter payback period will be selected.

Advantages of Payback Method

- (i) It is simple to calculate and better understood of all the methods of capital budgeting.
- (ii) It least exposes the firm to the problem of uncertainty since it focuses on shortness of project to pay back the initial outlay.

- (iii) It is a fast screening technique especially for the firms that have liquidity problems.

Disadvantages of Payback Method

- (i) It does not take account of the cash inflows earned after the payback period.
- (ii) It does not take into account the time value of money.
- (iii) It does not take into account the risks associated with each project and the attitude of the company to risk.

ILLUSTRATION 9-1

DAAP Ltd, a manufacturing company, is faced with the problem of choosing between two mutually exclusive projects.

Project A requires a cash outlay of ₦250,000 and generates a net cash flow of ₦100,000 per year for 4 years.

Project B costs ₦150,000 and is expected to generate net cash flow of ₦65,000, ₦55,000, ₦40,000 and ₦50,000 over its life of 4 years. If the management of the company had set the maximum acceptable period of 2½ years, which of the projects should be embarked upon?

SUGGESTED SOLUTION 9-1

Project A

$$\begin{aligned}\text{Payback Period} &= \frac{\text{Initial Capital Outlay}}{\text{Annual Net Cashflow}} \\ &= \frac{\text{₦}250,000}{\text{₦}100,000} = 2\frac{1}{2} \text{ Years}\end{aligned}$$

Project B

Yr	Net cash flow	Cumulative net cash flow
	₦	₦
0	(150,000)	(150,000)
1	65,000	(85,000)

2	55,000	(30,000)
3	40,000	10,000
4	50,000	60,000

$$\text{Payback period} = 2\text{yrs} + \frac{30,000}{40,000} \times 12 \text{ in months}$$

$$= 2\text{yrs } 9 \text{ months}$$

Decision: Since the maximum acceptable period set by the management is 2½ years, only project A meets the acceptance criteria and should be accepted while project B should be rejected.

(b) Accounting Rate of Return (ARR)

The accounting rate of return (ARR) technique is derived from the concept of return on capital employed (ROCE) which is also known as return on investment (ROI). It uses accounting information provided by the financial statements to measure the profitability of an investment. It is calculated by dividing the average after-tax profit by the average book value of the investment during its life. The formulae is:

$$\text{ARR} = \frac{\text{Average Income}}{\text{Average Investment}} \times \frac{100}{1} \%$$

Decision Rule

The rule is to invest in all projects whose accounting rate of return (ARR) are higher than the company's pre-determined minimum acceptable rate.

Where mutually exclusive projects are concerned, the rule is to accept the project with the highest ARR.

Advantages of Accounting Rate of Return

- (i) It is easy to calculate.
- (ii) It is simple to understand and use.
- (iii) It incorporates the entire stream of income in calculating the project's profitability.

Disadvantages of Accounting Rate of Return

- (i) It uses accounting profits in appraising the projects.
- (ii) The averaging of income ignores the time value of money.
- (iii) It uses an arbitrary cut off yardstick.
- (iv) It is an average concept and as such will hide the sizes and timing of the individual cash flows.
- (v) It does not take into consideration the risk associated with each project as well as the attitude of the management to risk.
- (vi) There is no unique definition for ARR. For instance "average profit" may be profits after depreciation, interest and before tax or profits after depreciation, interest and tax which is adopted in the illustration 9-2. Initial investment could be initial investment plus scrap value or just initial investment which is adopted in the illustration 9-2.

ILLUSTRATION 9-2

Alhaji Umore invested the sum of ₦800,000 in a poultry project. He estimates that the project will yield the following after tax returns annually for the next five years, viz ₦20,000, ₦40,000, ₦60,000, ₦80,000 and ₦120,000 respectively. The poultry house is expected to be depreciated on a straight line basis.

Required:

Provide the accounting rate of return of this project.

SUGGESTED SOLUTION 9-2

Alhaji Umore

Year	1	2	3	4	5	Average
Earnings	₦	₦	₦	₦	₦	₦
After tax	20,000	40,000	60,000	80,000	120,000	64,000
Book Value of investment						

Beginning (a)	800,000	640,000	480,000	320,000	160,000	
Depreciation	(160,000)	(160,000)	(160,000)	(160,000)	(160,000)	
End (b)	<u>640,000</u>	<u>480,000</u>	<u>320,000</u>	<u>160,000</u>	<u>----</u>	
Average $\left(\frac{a+b}{2}\right)$	720,000	560,000	400,000	240,000	80,000	400,000

$$\text{Accounting Rate of Return} = \frac{\text{₦}64,000}{\text{₦}400,000} \times \frac{100\%}{1}$$

$$= 16\%$$

9.3.2 Discounted Cash Flow (DCF) Techniques

(a) Net Present Value (NPV) Method

Net present value (NPV) is one of the discounted cash flow (DCF) techniques that recognises the time value of money. It is the net contribution of a project to its owners wealth, that is, the present value of future cash flows minus the present value of initial capital investment. With the present value method, all cash flows are discounted to their present values using the required rate of return. The formula for calculating NPV can be written as follows:

$$\text{NPV} = \left[\frac{C_1}{(1+r)} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \dots + \frac{C_n}{(1+r)^n} \right] - C_0$$

OR

$$\text{NPV} = \sum_{t=1}^n \frac{C_t}{(1+r)^t} - C_0$$

where:

$C_1, C_2 \dots$ represent cash inflows in year 1, 2 n

“r” represents the opportunity cost of capital

C_0 is the initial cost of the investment

n is the expected life of the investment and

t=1 up to and include t=n

ILLUSTRATION 9-3

A machine costing ₦200,000 will provide an annual net cash inflow of ₦60,000 for six years at a cost of capital of 10 percent.

- i. Calculate the net present value (NPV) of the machine.
- ii. Should the machine be purchased?

SUGGESTED SOLUTION 9-3

(i)	Year	Cash flows ₦	DCF @ 10%	PV ₦
	0	(200,000)	1.000	(200,000)
	1	60,000	0.909	54,540
	2	60,000	0.826	49,560
	3	60,000	0.751	45,060
	4	60,000	0.683	40,980
	5	60,000	0.621	37,260
	6	60,000	0.564	33,840
			NPV	61,240

- (ii) Decision: The machine should be purchased since the NPV is positive, that is $NPV > 0$.

Decision Rule:

Accept all projects that produce positive net present value (NPV)

- Accept if $NPV > 0$
- Reject if $NPV < 0$
- May accept or reject if $NPV = 0$

If mutually exclusive projects are involved, the rule is to accept the project that produces the highest positive net present value.

Advantages of NPV

- (i) It recognises the time value of money;
- (ii) It uses all cash flows occurring over the entire life of the project;
- (iii) It measures in absolute terms (Naira value) the increase in the wealth of the shareholders; and

- (iv) It facilitates measuring of cash flows in terms of present values. This implies that if the values of separate assets are known, the firms value can simply be found by adding their values. This is called the value-additivity principle.

Disadvantages of NPV

- (i) It is more difficult to calculate than the payback and the accounting rate of return (ARR); and
- (ii) It relies heavily on the correct estimation of the cost of capital, that is, where errors occur in the cost of capital used for discounting, the decision would be misleading.

(b) Internal Rate of Return (IRR)

The internal rate of return (IRR) method is another discounted cash flow technique which takes account of the time value of money. It is also known as yield of a project, marginal efficiency of capital, rate of return over cost, time adjusted rate of internal return and so on. It is defined as the cost of capital for which the NPV of a project would be zero.

It is a break-even point cost of capital. It is also the cost of capital or discount rate that will equate the cash inflows of a project with the cash outflows of that project.

The formula for calculating the IRR is given as:

$$IRR = \sum_{t=1}^n \frac{C_t}{(1+r)^t} - C_0 = 0$$

The above formula shows that it is the same as that for calculating NPV. The only difference is that in NPV method, the required rate of return is assumed to be known while in IRR method the required rate of return has to be determined, hence, the result is equated to zero.

An alternative method to the above formula is the trial-and-error. This is also known as interpolation method. In this method, the discounting factor yielding a positive NPV is improved to move towards negative and a midway is discovered to arrive at zero. The formulae:

$$IRR = DF_p + \left(\frac{NPV_p}{NPV_p + NPV_N} (DF_N - DF_p) \right)$$

Where:

DF_p = Discount factor yielding positive NPV

DF_N = Discount factor yielding negative NPV

NPV_p = Positive NPV

NPV_N = Negative NPV

ILLUSTRATION 9-4

Using the details in illustration 9.3, calculate the IRR of the machine.

SUGGESTED SOLUTION 9-4

Yr	Cash flows ₦	DF@10% ₦	PV ₦	DF@20% ₦	PV ₦
0.	(200,000)	1.000	(200,000)	1.000	(200,000)
1.	60,000	0.909	54,540	0.833	49,980
2.	60,000	0.826	49,560	0.694	41,640
3.	60,000	0.751	45,060	0.579	34,740
4.	60,000	0.683	40,980	0.482	28,920
5.	60,000	0.621	37,260	0.402	24,120
6.	60,000	0.564	33,840	0.335	20,100
		NPV	<u>61,240</u>		<u>(500)</u>

$$IRR = 10\% + \frac{₦ 61,240}{₦ 61,240 - (-500)} \times \frac{(20\% - 10\%)}{1}$$

$$= 10\% + \frac{₦ 61,240}{₦ 61,740} \times 10\%$$

$$= 10\% + 9.92\%$$

$$= 19.92\%$$

Decision Rule:

Accept all projects whose IRR are greater than the company's cost of capital

i.e Accept if $r > k$

Reject if $r < k$

May accept or reject if $r = k$

Where r = internal rate of return and k = cost of capital

If mutually exclusive projects are being considered the rule is to accept the project that produces the highest IRR.

Advantages of IRR

- (i) It recognises the time value of money
- (ii) It considers all cash flows occurring over the entire life of the project
- (iii) It gives the same acceptance rule as the NPV method.
- (iv) It is consistent with the shareholders wealth maximisation objective.

Disadvantages of IRR

- (i) It is more difficult to calculate than the other methods.
- (ii) It can give misleading and inconsistent results when the NPV of a project does not decline with discount rates.
- (iii) In some cases, it fails to indicate a correct choice between mutually exclusive projects.
- (iv) Unlike in the case of NPV, the additivity principle does not hold when IRR method is used - IRR projects do not add.
- (v) Sometimes, it yields multiple rates.

(c) Profitability Index (PI) Technique

The profitability index (PI) method is another cash flow technique. It is the ratio of the present value of cash inflows, at the required rate of the investment. It may be gross or net that is, gross minus one.

The formula is given as follows:

$$PI = \frac{PV \text{ of cash inflows (NPV) + Initial Cash Outlay}}{\text{Initial Cash Outlay}}$$

OR

$$PI = \frac{NPV \text{ of Project}}{\text{Initial Cash Outlay}}$$

ILLUSTRATION 9-5

Using the details in illustration 9-3, calculate the PI of the machine.

SUGGESTED SOLUTION 9-5

$$PI = \frac{NPV \text{ of project}}{\text{Initial cash outlay}} = \frac{\text{N}61,240}{\text{N}200,000} = 0.31$$

OR

$$\begin{aligned} PI &= \frac{PV \text{ of cash inflows (NPV) + Initial Cash Outlay}}{\text{Initial Cash Outlay}} \\ &= \frac{\text{N}61,240 + \text{N}200,000}{\text{N}200,000} \\ &= \frac{\text{N}261,240}{\text{N}200,000} = 1.31 \end{aligned}$$

Decision rule

Accept all projects whose PI is positive or greater than 1 (one)

i.e. Accept if $PI > 0$ or positive

Reject if $PI < 0$ or negative

May accept or reject if $PI = 0$

Advantages of PI

- (i) It recognises the time value of money
- (ii) It is a variation of the NPV method and requires the same computation as in the NPV method
- (iii) It is a relative measure of a project's profitability since the present value of cash inflows is divided by the initial cash outflow.
- (iv) It is generally consistent with the wealth maximisation principle

Disadvantages of PI

- (i) It can only be used to choose projects under simple, one period, capital constraint situations.
- (ii) It does not work when mutually exclusive projects or dependent projects are being considered.

(d) Discounted Payback Period Technique (DPPT)

This technique is an improvement over the payback method. It is aimed at overcoming the problem of the time value of money disadvantage of the normal payback method, by incorporating into its calculation, the discount factor. In the discounted payback period method, the cash flows are discounted and used in the calculation of the payback period.

ILLUSTRATION 9-6

A machine will cost ₦300,000 and will provide an annual net cash inflow of ₦100,000 for five (5) years. The opportunity cost of capital is 10 percent.

Calculate the discounted payback period of the machine

SUGGESTED SOLUTION 9-6

Cash Year	Cash Flows	DF @10%	PV of Cash Flows
	₦		₦
0	(300,000)	1.000	(300,000)
1	100,000	0.909	90,900
2	100,000	0.826	82,600

3	100,000	0.751	75,100
4	100,000	0.683	68,300
5	100,000	0.621	<u>62,100</u>
		NPV	<u>79,000</u>

Using the simple payback period method, the time required to recover the investment is 3 yrs; calculated as follows:

$$\frac{\text{₦}300,000}{\text{₦}100,000} = 3 \text{ Years}$$

However using the discounted payback period method, the time required to recover the investment is calculated as follows:

Year	PV of cash flows	Cumulative PV of cash flows
	₦	₦
0	(300,000)	(300,000)
1	90,900	(209,100)
2	82,600	(126,500)
3	75,100	(51,400)
4	<u>68,300</u>	<u>16,900</u>
5	<u>62,100</u>	<u>79,000</u>

$$\text{Discounted payback is } 3\text{yrs} + \left(\frac{51,400}{68,300} \times 12 \right) \text{ months}$$

$$= 3\text{yrs} + 9.031 \text{ months} = 3\text{yrs } 9 \text{ months.}$$

Advantages of Discounted Payback Period Technique

- (i) It recognizes the time value of money.
- (ii) It focuses on shortness of project to payback the initial outlay
- (iii) In addition to the fact that it recognises the time value of money it has all the advantages of the payback method.

Disadvantages of Discounted Payback Period Technique

- (i) It does not take into account the cash inflows earned after the payback period.

- (ii) It does not take into account the risks associated with each project and the attitude of the company to risk.
- (iii) Except that it uses discounted cash flows, it has all the disadvantages of payback method.

9.4 SUMMARY AND CONCLUSIONS

Capital expenditure represents expenditure in long-term assets of the company, both tangible and intangible. This chapter, however dealt with tangible quantifiable fixed assets. Whereas, the expenditure on these assets is now, returns are in the future. There is, therefore, need for proper planning and control. The planning and control process involves identification, development, evaluation, authorisation and control.

A very important aspect of the financial manager's function is the evaluation of capital projects. Here decisions have to be taken on whether or not a particular project is acceptable, based on the use of an appropriate appraisal technique and on the laid down decision criterion, such technique includes the non-discounted cash flow techniques, namely: the ARR and payback period and the discounted cash flow technique such as NPV, IRR and PI. It is fundamental that a company uses the right technique to avoid wrong decisions, bearing in mind the financial implication such decisions can bring to the company. It should be noted that a project must firstly be properly evaluated before selection. It is the acceptable project that is included in the capital expenditure programme of the company for the year.

*Refer to Comprehensive Questions and Suggested Solutions in Appendix II
Page 465*

9.5 REVISION QUESTIONS

9.5.1 MULTIPLE CHOICE QUESTIONS

1. The essence of discounting is to take care of
 - A Inflation
 - B Uncertainty
 - C Timing of cash flows
 - D Amount of cash flows
 - E Taxation of cash flows
2. Which of the following is regarded, in theory as an incorrect technique of investment appraisal?
 - A Accounting rate of return (ARR)
 - B Internal rate of return (IRR)
 - C Discounted payback

- D Net Present value (NPV)
E Profitability Index (PI)

3. A machine costs ₦3.4m. The machine is expected to produce an average annual cash flows of ₦850,000 with a nil salvage value. What is the expected payback period of the machine if the economic useful life of the machine is 6 years?

- A 6 years
B 4 years
C 5 years
D 3 years
E 2 years

4. Which ONE of the following is not an advantage of accounting rate of return?

- A Easy to calculate
B Simple to understand and use
C Inexpensive as it uses existing accounting information
D Incorporates entire stream of income
E It takes into account the time value of money

5. A company intends to undertake an investment programme which has initial amount of ₦2.5m. The program is expected to generate annual net cash inflows of ₦270,000 for an indefinite future period. The company's opportunity cost of fund is 12 percent per annum.

What is the Net present value of the project?

- A ₦2,550,000
B ₦2,000,000
C ₦2,450,000
D ₦2,250,000
E ₦2,350,000

9.5.2 SHORT ANSWER QUESTIONS

1. State one key reason for proper planning of capital expenditure.
2. State one major reason for the popularity of payback method of investment appraisal despite its incorrectness.
3. What is the implication of using a wrong discount rate when using a NPV approach.
4. What is the relationship between Net present value and shareholder wealth?
5. What is the decision rule when internal rate of return method is used to evaluate a project?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

EVALUATION OF CAPITAL PROJECTS: COMPLEX INVESTMENT DECISIONS

10.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ♦ Evaluate capital projects with different lives;
- ♦ Evaluate capital projects involving replacement and abandonment decisions;
- ♦ Evaluate capital projects under conditions of capital rationing; and
- ♦ Provide a mathematical programming formulation for a typical multi-period constraint problem.

10.1 INTRODUCTION

In practice, a company faces complicated investment decisions. The most common situations include choosing among investments with different lives, deciding about the replacement of an existing asset or timing of an investment and evaluating investments under inflation or capital rationing. The NPV rule can be extended to handle such situations.

10.2 PROJECTS WITH DIFFERENT LIVES

In order to choose between mutually exclusive projects with the same lives, the NPVs are compared and the project with a higher NPV is chosen. However where two mutually exclusive projects being compared have different lives, the use of the NPV rule, without accounting for the difference in the projects' lives, may fail to indicate the correct choice. In this case, there is need to evaluate the project for an equal period of time to be able to arrive at a reasonable decision.

ILLUSTRATION 10-1

Suppose a company has to choose between two grinding machines L and M which are of different designs but perform the same function. Machine L would involve an initial cash outlay of ₦12,000 and operating cash expenses of ₦4,000 per year for 6 years. On the other hand, machine M would involve an initial cash outlay of ₦10,000 and operating cash expenses of ₦5,000 per

year for 3 years. If the opportunity cost of capital is 14 percent, the present value of costs would be as follows:

Machine L				Machine M		
Year	Cash Flows N'000	DF@ 14%	PV N'000	Cash Flows N'000	DF@ 14%	PV N'000
0	12	1.000	12.000	10	1.000	10.000
1	4	0.877	3.508	5	0.877	4.385
2	4	0.769	3.076	5	0.769	3.845
3	4	0.675	2.700	5	0.675	3.375
4	4	0.592	2.368	-	-	-
5	4	0.519	2.076	-	-	-
6	4	0.456	1.824	-	-	-
		<u>3.888</u>	<u>NPV 27.552</u>		<u>2.321</u>	<u>21.605</u>

If the difference in the projects lives is disregarded, machine M will be chosen since it has a lower present value of costs. But this need not necessarily be the best decision for the company taking into consideration the fact that machine L will last for 6 years while machine M will last for 3 years and will need to be replaced at the end of the 3rd year.

ILLUSTRATION 10-2

Using illustration 10-1 and assuming that machine M is replaced at the end of the 3rd year at the same initial outlay and same operating expenses and life expectancy, the new position would be as follows:

Machine L				Machine M		
Year	Cash Flows N'000	DF@ 14%	PV N'000	Cash Flows N'000	DF@ 14%	PV N'000
0	12	1.000	12.000	10	1.000	10.000
1	4	0.877	3.508	5	0.877	4.385
2	4	0.769	3.076	5	0.769	3.845
3	4	0.675	2.700	15	0.675	10.125
4	4	0.592	2.368	5	0.592	2.960
5	4	0.519	2.076	5	0.519	2.595
6	4	0.456	1.874	5	0.456	2.280
		<u>3.888</u>	<u>NPV 27.552</u>		<u>3.888</u>	<u>NPV 36.190</u>

By the end of year 6, machine L would need to be replaced while machine M would need to be replaced the second time. When the PVs to the two machines are compared at the end of year 6, machine L will be chosen. Thus, the use of simple NPV rule would give incorrect results when two projects with different lives are considered.

In order to overcome this problem, it is advisable to use the Annual Equivalent Value (AEV) or Annual Equivalent Cost (AEC) of the assets as against the NPVs.

Annual Equivalent Value (AEV) is the NPV of an investment divided by the annuity factor given its life and discount rates.

$$AEV = \frac{NPV}{\text{Annuity Factor}}$$

This method is recommended especially where there is no inflation as it is quicker and less cumbersome than any other method.

ILLUSTRATION 10-3

Using illustration 10.1 the position will be as follows:

Machine L					Machine M			
Year	Cash Flows	DF@ 14%	PV	AEV	Cash Flows	DF@ 14%	PV	AEV
	₦'000		₦000		₦'000		₦000	
0	12	1.000	12.000		10.00	1.000	10.000	
1	4	0.877	3.508	7.09	5.00	0.877	4.385	9.31
2	4	0.769	3.076	7.09	5.00	0.769	3.845	9.31
3	4	0.675	2.700	7.09	5.00	0.675	3.375	9.31
4	4	0.592	2.368	7.09	-	-		
5	4	0.519	2.076	7.09	-	-		
6	4	0.456	1.824	7.09	-	-		
		<u>3.888</u>	<u>27.552</u>				<u>21.605</u>	

AEV for machines L and M are calculated as follows:

$$AEV = \frac{NPV}{\text{Annuity factor}}$$

Where annuity factor represents present value of ₦ 1 per year for y Years @ X percent i.e. 3.888 and 2.321 for L & M respectively as shown in illustration 10-1

$$AEV \text{ for Machine L} = \frac{₦27,522}{3.888} = ₦7,090$$

$$AEV \text{ for Machine M} = \frac{₦21,605}{2.321} = ₦9,310$$

The calculations show that a chain of machine L's cash flow is exactly equal to annual cash flows of ₦7,090 while a chain of machine M's cash flows is exactly equal to ₦9,310. Since a series of ₦9,310 a year is worth more than that of ₦7,090 a year, a chain of machine M's cash flows (costs) should be

higher than that of a chain of machine L's. In this respect machine L will be chosen and this is in agreement with illustration 10.2 above.

10.3 REPLACEMENT AND ABANDONMENT DECISIONS

In the previous section, the method of constant replication or replacement chains to choose between assets with different lives was discussed. In the illustrations, it was assumed that assets are replaced at the end of their physical lives but this is not usually the case in practice. In most cases replacement decisions are governed by the economic and necessity considerations. An equipment should be replaced whenever a more economic alternative is available.

Some companies follow the practice of approving a new machine only when the existing one can no longer function. They do not decide when to replace, the machine decides for them. This is one of the most expensive policies which a company could follow. A company that follows this practice is likely to go into liquidation sooner or later if care is not taken as it will be unable to compete favourably with companies that adopt cost-reduction policies by following a systematic replacement policy and are able to reduce prices in the future.

Therefore, for a firm to remain in business it should follow a replacement policy based on economic considerations and decide when to replace.

An economic analysis may indicate replacement of a machine when it is say, 4 years old with an improved alternative. However if the machine is retained till when it is beyond repairs, say 15 years, the company must have been incurring extra costs on maintenance and losing extra profit for 11 years.

ILLUSTRATION 10-4

Suppose a company is operating a machine which is expected to produce net cash inflows of ₦5 million, ₦4million, ₦3million and ₦2million respectively for the next 4years. A new machine, which is more efficient to operate and cost effective has just been introduced into the market. It is expected that the new machine will cost ₦15million and will provide a net cash inflow of ₦7million a year for six years. What should the company do?

SUGGESTED SOLUTION 10-4

Alternative 1

One approach is not to consider replacement since the machine can still do the job. In that case the machine may be considered for replacement after 4years.

Alternative 2

Buy the new machine without any consideration for its economic advantage over the old machine.

The analysis are made as follows:

Old Machine					New Machine			
Year	Cash Flows	DF@ 14%	PV	AEV	Cash Flows	DF@ 14%	PV	AEV
	₦'000		₦'000	₦'000	₦'000		₦'000	₦'000
0	-	1.000	-	-	(15,000)	1.000	(15,000)	-
1	5,000	0.877	4,385	3,660	7,000	0.877	6,139	3,140
2	4,000	0.769	3,076	3,660	7,000	0.769	5,383	3,140
3	3,000	0.675	2,025	3,660	7,000	0.675	4,725	3,140
4	2,000	0.592	1,184	3,660	7,000	0.592	4,144	3,140
5	-	0.519	-	-	7,000	0.519	3,633	3,140
6	-	0.456	-	-	7,000	0.456	3,192	3,140
		<u>3.888</u>	<u>10,670</u>				<u>12,216</u>	

The above table shows that a chain of the cash flows for the new machine is equivalent to an annuity of $(\text{₦}12,216 \div 3.888)$ million = $\text{₦}3.14$ million per year for the life of the machine. The old machine provides an annuity of $(\text{₦}10,670 \div 2.913)$ million = $\text{₦}3.66$ million where 3.888 and 2.913 represent present value of an annuity for 6 years and 4 years respectively at 14%.

Since the old machine generates a cash inflow of more than $\text{₦}3.14$ million which the new machine generates, there does not seem to be an economic justification for a replacement.

This example can be extended to incorporate salvage value. But this would not change the procedure for the analysis.

10.4 OTHER OPTIMAL DECISION MAKING METHODS

Other methods that can be adopted for the purpose of making optimal decisions apart from the AEV or AEC methods are:

- ♦ Least Common Multiple
- ♦ Finite Horizon method

However, the most popular technique is the AEV or AEC illustrated above.

10.4.1 Least Common Multiple (LCM) method

This method examines the cash flows of all possible cycles, of the machine over an equal number of years. This period is usually the least common multiple (LCM) of all cycle, for example, for a machine that has a life span of four years, a firm may choose to replace it every year, every two years every three years or every four years.

The LCM approach requires the examination of the relevant cash flows of these cycle over a period of twelve years for a machine that has a life span of 4 years. The cycle with the least present value of cost, or highest value of revenue would be chosen.

A major drawback of this method is that an asset with a long life span will require computation over a very long period.

10.4.2 The Finite Horizon Method

This method examines cash flows of all cycles over a foreseeable period. This period is normally the length of time within which the company's financial management team can generate reliable estimates.

A major drawback of this method is that the choice of the foreseeable future or the finite horizon is subjective and varies among decision makers.

10.5 INFLATION IN CAPITAL INVESTMENT DECISIONS

Inflation is an important factor of economics and must be considered in capital budgeting. Since the cash flows of an investment project may occur over a long period of time, the impact of inflation should be correctly included for the investment analysis to be free of bias.

The impact of inflation in capital budgeting could be adjusted for, either in the cash flow or the discounting rate. The discount rate is usually market determined and stated in nominal terms.

However where either cash flows or discount rates are expressed in real terms, they can be reverted to their normal value through the following formula which in economic theory is known as "Fisher's effect".

$$\text{Nominal Rate} = (1 + \text{Real Rate}) (1 + \text{Inflation Rate}) - 1$$

This equation can also be used to derive the real rate of return thus:

$$\text{Real Rate} = \frac{1 + \text{Nominal Rate}}{1 + \text{Inflation Rate}} - 1$$

If the discount rate is stated in nominal terms, then consistency requires that cash flows be estimated in nominal terms, thus taking account of inflation rates.

Costs are usually sensitive to inflation; some costs increase at a faster rate than others. Certain items are not affected by inflation, for instance the tax shield on depreciation (for tax purposes, depreciation is not allowed on the book value). In evaluating the economic worth of a project, the real cash flows could be discounted at real discount rate, (although not common) or the nominal cash flows discounted at the nominal rate.

Both methods will usually give the same answer subject to approximation error.

ILLUSTRATION 10-5

Suppose a firm forecasts the following project cash flows in real terms and discount at a 15% nominal rate. Should the firm invest in it if 10% rate of inflation is assumed?

	Y0	Y1	Y2	Y3
	₦	₦	₦	₦
Project Cash flows	(100,000)	35,000	50,000	30,000

SUGGESTED SOLUTION 10-5

It would be inconsistent to discount the real cash flows at 15% nominal rate. The question can be solved by converting real cash flows to nominal cash flows and discounting at 15% nominal rate, to obtain the real rate of return.

Alternative 1: Converting real cash flows to nominal terms.

Yrs	Real Cash Flows		Nominal Cash Flows
	₦	₦	₦
0	(100,000)	100,000 (1.00)	= (100,000)
1	35,000	35,000 (1+0.1)	= 38,500
2	50,000	50,000 (1+0.1) ²	= 60,500
3	30,000	30,000 (1+0.1) ³	= 39,930

$$\begin{aligned}
 \text{NPV} &= \frac{(100,000)}{1} + \frac{38,500}{1.15} + \frac{60,500}{(1.15)^2} + \frac{39,930}{(1.15)^3} \\
 &= (\text{₦}100,000) + \text{₦}33,478 + \text{₦}45,747 + \text{₦}26,255 \\
 &= \text{₦}5,480
 \end{aligned}$$

Alternative II: Converting nominal rate to real rate.

$$\text{Real Rate} = \frac{1 + \text{Nominal Rate}}{1 + \text{Inflation Rate}} - 1$$

$$\text{Real Rate} = \frac{1 + 0.15}{1 + 0.10} - 1$$

$$= \frac{1.15}{1.10} - 1$$

$$= 0.0455$$

$$= 4.55\%$$

$$\text{NPV} = (100,000) + \frac{35,000}{(1.0455)^1} + \frac{50,000}{(1.0455)^2} + \frac{30,000}{(1.0455)^3}$$

$$= (\text{N}100,000) + \text{N}33,477 + \text{N}45,746 + \text{N}26,251$$

$$= \text{N}5,474$$

Conclusively, projects' cash flows should be adjusted for inflation so that the profitable ones would not be rejected.

NOTE: Always discount nominal cash flows at nominal discount rate or discount real cash flows at real discount rate.

10.6 CAPITAL RATIONING

Capital rationing arises when there are insufficient funds to execute all viable and profitable projects. The inadequacy of resources to finance projects may arise due to external factors or internal constraints imposed by the management. These constraints may relate to the imperfections in the capital markets and self imposed restrictions by the management. Under capital rationing, the objective is to select the combination of investment proposals which yield the highest net present value (NPV) subject to availability of funds.

However, selections should not be done solely on the basis of individual NPVs if the firm aims to maximise NPV subject to the funds constraint. In a simple single or one period constraint situation, a firm aims to get the largest benefit for the limited funds, that is, to select those projects that give the highest ratio of net present value per unit of the capital invested. This ratio is known as: profitability index (PI) and it is calculated as follows:

Profitability Index (PI)

$$= \frac{\text{Present value of cash inflows}}{\text{Initial Outlay}} \text{ OR } \frac{\text{NPV} + \text{Initial Outlay}}{\text{Initial Outlay}}$$

However, projects under a capital rationing situation might involve mutually exclusive or mutually dependent or divisible projects. Care must be taken to treat each case thoroughly.

(a) Divisible Projects

In this case there is an implicit linearity assumption between the initial outlays and the NPVs of projects. It is assumed that fractions of a project can be undertaken.

(b) Indivisible Projects

The assumption in this case is that projects are not divisible fractions and cannot therefore be undertaken in parts. It is only in this case that there may be surplus funds which represents the available funds after allocation.

(c) Mutually Dependent Projects

In this case, acceptance of one of the mutually dependent projects automatically implies an acceptance of the remaining mutually dependent projects. For example, if projects A and B are mutually dependent, it means that one can only accept or reject both projects and not undertake only one of them.

(d) Mutually Exclusive Projects

In this situation, an acceptance of one project group implies the rejection of all the other project group.

ILLUSTRATION 10-6

Suppose a company is faced with a problem of investing ₦1 million in three projects which are all attractive and profitable @ 12 percent opportunity cost of capital. Which of the projects should be undertaken given the following evaluation results?

Projects	Initial Outlay	NPV
-	₦'000	@ 12%
1	1,000	210
2	500	160
3	500	120

SUGGESTED SOLUTION 10-6

Calculation of profitability index.

Note All figures are in ₦'000

$$PI = \frac{\text{Total of PV of Cash inflows}}{\text{Initial Outlay}}$$

OR

$$\frac{NPV + \text{Initial Outlay}}{\text{Initial Outlay}}$$

$$PI - \text{Project 1} = \frac{210 + 1000}{1000} = \frac{1,210}{1000} = 1.21$$

$$PI - \text{Project 2} = \frac{160 + 500}{500} = \frac{660}{500} = 1.32$$

$$PI - \text{Project 3} = \frac{120 + 500}{500} = \frac{620}{500} = 1.24$$

Project	Initial Outlay ₦'000	NPV ₦'000	PI	Ranking Using NPV	Ranking Using PI
1	1,000	210	1.21	1 ST	3 RD
2	500	160	1.32	2 ND	1 ST
3	500	120	1.24	3 RD	2 ND

The table above shows that the three projects are viable and should be undertaken if there is no capital constraint but the question states that the company has only ₦1 million to invest.

Using the NPV rule, the firm will accept project with NPV of ₦210,000 that will exhaust the available fund but the PI suggest otherwise. The PI suggests the selection of projects 2 and 3 which together have higher NPV of ₦280,000 (₦160,000+₦120,000) as against ₦210,000 of project 1 and with their outlays within the budget ceilings.

The company should therefore undertake projects 2 and 3 in preference to project 1 to obtain the highest possible NPV.

ILLUSTRATION 10-7

XY Plc is faced with a problem of investing ₦30million in 5 profitable projects @ 15 per cent opportunity costs of capital. The following are the available projects with the cash flows of each project being generated at a constant amount throughout the economic life of the project which is 5 years in each case.

Projects	Initial Outlays	Annual flows
	₦'000	₦'000
A	10,000	4,000
B	12,000	5,000
C	6,000	3,000
D	3,000	1,000
E	11,000	4,500

Required:

Which of the projects should be undertaken if they were:

- (i) Divisible?
- (ii) Indivisible?

SUGGESTED SOLUTION 10-7

Project	Initial Outlay	Annual Cashflows	Annuity Factor	PV	NPV	PI	Ranking
	₦'000	₦'000		₦'000	₦'000		
A	10,000	4,000	3.352	13408	3408	0.34	4th
B	12,000	5,000	3.352	16760	4760	0.40	2nd
C	6,000	3,000	3.352	10056	4056	0.68	1st
D	3,000	1,000	3.352	3352	352	0.12	5th
E	11,000	4,500	3.352	15084	4084	0.37	3rd

(i) **Divisible Projects**

Allocations	₦'000's
Available Fund	30,000
Select Project C	<u>6,000</u>
	24,000
Select Project B	<u>12,000</u>
	12,000
Select Project E	<u>11,000</u>
	1,000
Select 10% of Project A	<u>1,000</u>
	<u>NIL</u>

Decision

Accept projects C, B and E and 10% of project A

(ii) Indivisible Projects

Allocations	₦'000's
Available Fund	30,000
Select Project C	<u>6,000</u>
	24,000
Select Project B	<u>12,000</u>
	12,000
Select Project E	<u>11,000</u>
Surplus Fund	<u>1,000</u>

Decision

Accept projects C, B, E and invest balance, that is, the surplus fund.

ILLUSTRATION 10-8

ABC Plc has a capital budget of ₦12million for investment. The company has presented the following investment proposal to you for advice in your capacity as the Financial Adviser to the company.

Projects	A	B	C	D	E	F	G	H	I	J
Profitability Index	1.17	1.20	1.19	1.22	1.15	1.15	1.22	1.20	1.16	1.10
Outlay (₦'million)	2.00	3.00	1.50	4.00	4.00	2.00	1.00	1.50	1.00	3.00

The company's expected cost of capital is 15% Projects A and D are mutually dependent while projects B and C are mutually exclusive.

Required:

As the financial adviser to the company, which projects will you recommend? Assume that fractions of a project can be undertaken

SUGGESTED SOLUTION 10-8**GROUP A**

Projects	Profitability Index	Ranking	Initial Outlay ₦'000	NPV ₦'000
A and D	1.20	4th	6,000	1220
B	1.20	3rd	3,000	600
E	1.15	7th	4,000	600
F	1.15	6th	2,000	300
G	1.22	1st	1,000	220
H	1.20	2nd	1,500	300
I	1.16	5th	1,000	160
J	1.10	8th	3,000	300

<u>Allocation</u>	<u>N'000</u>	<u>NPV</u> <u>N'000</u>
Available Fund	12,000	
Select Project G	<u>1,000</u>	220
	11,000	
Select Project H	<u>1,500</u>	300
	9,500	
Select Project B	<u>3,000</u>	600
	6,500	
Select Project A&D	<u>6,000</u>	1220
	500	
Select 50% Project I	<u>500</u>	<u>80</u>
	<u>NIL</u>	<u>2420</u>

TOTAL NPV = 2.420 million

NB: This group includes "B" and excludes project "C" because the two are mutually exclusive while projects 'A' and 'D' are mutually dependent.

GROUP B

Projects	Profitability Index	Ranking	Initial Outlay N'000	NPV N'000
A and D	1.20	3rd	6,000	1220
C	1.19	4th	1,500	285
E	1.15	7th	4,000	600
F	1.15	6th	2,000	300
G	1.22	1st	1,000	220
H	1.20	2nd	1,500	300
I	1.16	5th	1,000	160
J	1.10	8th	3,000	300

<u>Allocation</u>	<u>N'000</u>	<u>NPV</u> <u>N'000</u>
Available Fund	12,000	
Select Project G	<u>1,000</u>	220
	11,000	
Select Project H	<u>1,500</u>	300
	9,500	
Select Project A&D	<u>6,000</u>	1220
	3,500	
Select Project C	<u>1,500</u>	285
	2,000	
Select Project I	<u>1,000</u>	160
	1,000	
Select 50% of Project F	<u>1,000</u>	<u>150</u>
	<u>NIL</u>	<u>2335</u>

TOTAL NPV = ~~N~~2.335million

NB: This group includes project 'C' and excludes project 'B' because both are mutually exclusive while projects 'A' and 'D' are mutually dependent.

Decision

The company is advised to choose projects G, H, B, A&D and 50% of project 'I' (GROUP A) because they produced the higher NPV of ₦2.420million compared to that of group "B" of ₦2.335million

Note: The PI for projects 'A&D' is calculated as follows:

$$\begin{aligned}
 PI &= \frac{(1.17 \times \text{₦2million})}{\text{₦2million}} + \frac{(1.22 \times \text{₦4million})}{\text{₦4million}} \\
 &= \frac{\text{₦2.340million}}{\text{₦2million}} + \frac{\text{₦4.880million}}{\text{₦4million}} = \frac{\text{₦7.220million}}{\text{₦6million}} \\
 &= \underline{\underline{1.20}}
 \end{aligned}$$

Readers should note that, in a single constraint problem, a firm should not select projects solely on the basis of individual NPVs when funds are limited, rather, the NPV rule should be modified to incorporate the PI ratio with top ranked projects undertaken until funds are exhausted.

However, the PI rule has its own limitation as it does not always work in situations where there are two or more constraints or when mutually exclusive projects or dependent projects are to be considered. In these cases, a more sophisticated approach, linear programming or integer programming can be used.

10.7 MULTI-PERIOD FUNDS CONSTRAINT PROBLEM

Capital investment decisions under multi-period funds constraint situations have the objective of choosing a combination of projects which gives the firm maximum total net present value, subject to the company's resource availability. To achieve this, it is necessary to maximise the net present value (NPV) of the project using the technique of linear programming or integer programming where it is not possible to undertake the project in parts.

ILLUSTRATION 10-9

AB consult has identified the following projects.

Projects	Year 0	Year 1	Year 2
	₦	₦	₦
A	(100,000)	(100,000)	302410
B	(50,000)	(100,000)	218070
C	(200,000)	150,000	107,230

Provide a mathematical programming formulation to assist the company in choosing the most viable project if capital available for year 0 and Year 1 is limited to N170,000 and N80,000 respectively. Assume 5 percent cost of capital and that the projects are divisible.

SUGGESTED SOLUTION 10-9

Project A

Years	Cash Flow ₦	DF @ 5%	PV ₦
0	(100,000)	1.00	(100,000)
1	(100,000)	0.952	(95,200)
2	302,410	0.907	274,286
		NPV	<u>79,086</u>

Project B

Years	Cash Flow ₦	DF @ 5%	PV ₦
0	(50,000)	1.000	(50,000)
1	(100,000)	0.952	(95,200)
2	218,070	0.907	197,789
		NPV	<u>52,589</u>

Project C

Years	Cash Flow ₦	DF @ 5%	PV ₦
0	(200,000)	1.000	(200,000)
1	150,000	0.952	(142,800)
2	107,230	0.907	97,258
		NPV	<u>40,058</u>

$$\text{Max: NPV} = \text{₦}79,086A + \text{₦}52,589B + \text{₦}40,058C$$

Subject to:

$$\text{₦}100,000 A + \text{₦}50,000 B + \text{₦}200,000C \leq \text{₦}170,000$$

$$\text{₦}100,000 A + \text{₦}100,000 B \leq \text{₦}80,000 + \text{₦}150,000C$$

$$A, B, C \leq 1$$

$$A, B, C \geq 0$$

Note: The above equation can be solved using the computer.

10.7.1 Limitations of linear/integer programming

- (a) Very technical.
- (b) Can only be solved with the help of the computer.
- (c) Very costly to use when large indivisible projects are involved.
- (d) It assumes that future investment opportunities are known.

10.7.2 Limitations of Capital Rationing

The following constitute the limitations of capital rationing:

- (a) The assumption of divisibility of projects may not be possible in practice, for all projects
- (b) The assumption of linearity between outlays and NPV of projects may not hold because of economies and diseconomies of scale.
- (c) On many occasions capital rationing treats projects in isolation. It does not recognise the inter dependence of projects, for example, an investment in a project may result in substantial savings only if another project is undertaken, which capital rationing ignores.
- (d) Where more than two projects are involved and capital is restricted in more than one period, the profitability index approach will no longer be sufficient for resolving project acceptance under capital rationing. In such cases, linear programming technique may be applied.

10.8 SUMMARY AND CONCLUSIONS

Financial managers are often confronted with complex investment decisions. Examples of such decisions relate to decisions on projects with different lives, replacement of an existing asset and evaluation of investments in an inflationary environment.

Such decisions involve putting into consideration particular factors that affect the evaluation of the project. For example, the future cash flows of a project might have to be adjusted for inflation. Also in a replacement problem, some non-quantitative factors might need to be assessed separately before a final decision on whether or not to replace is taken.

In a multi-period funds constraint problem, it is sufficient to formulate the problem. The operational researchers would proffer solution.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

10.9 REVISION QUESTIONS**10.9.1 MULTIPLE CHOICE QUESTIONS**

1. In a typical replacement problem, the method to use in the evaluation process is:
 - A The basic net present value method
 - B The internal rate of return method
 - C The profitability index method
 - D The payback period method
 - E The annual equivalent value method

2. In bringing in inflation into the capital investment evaluation process which of the following is NOT affected by inflation and therefore ignored?
 - A General increase in selling prices
 - B General increase in wage rates
 - C General increase in materials unit prices
 - D Tax shield on depreciation
 - E General increase in the unit costs of other inputs.

3. In a multi-period capital rationing, which of these methods is the correct method to use?
 - A NPV of each project
 - B NPV per £1 investment in each project
 - C Linear programming technique
 - D IRR of each project
 - E Payback of each project.

4. The correct approach to use in reflecting inflation in the future cash flow of a project is _____
 - (i) Discount money cash flows at real discount rate
 - (ii) Discount real cash flows at normal discount rate
 - (iii) Discount money cash flows at normal discount rates
 - (iv) Discount real cash flows at real discount rates
 - A (i) and (ii)
 - B (ii) and (iii)
 - C (i) and (iv)
 - D (iii) and (iv)
 - E (ii) and (iv)

5. Which of the following is NOT a limitation in capital rationing problems?
 - A Assumption of divisibility of projects
 - B Assumption of linearity
 - C The treatment of capital projects in a stand alone basis
 - D The limitation of profitability index as a method for ranking projects
 - E Determination of the amount of capital under consideration

10.9.2 SHORT ANSWER QUESTIONS

1. What is the main method to use when evaluating projects with different lives?
2. In using the finite horizon method of making capital equipment replacement decisions, what is the major difficulty?
3. When incorporating inflation into the capital investment process it is often necessary to calculate the real rate. Give the formula for this variable.
4. The capital investment decision in which new equipment is required because of new technology is a _____ decision.
5. State the main difference between hard and soft capital rationing.

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

ADVANCED MANUFACTURING TECHNOLOGY (AMT) AND PROJECT APPRAISAL TECHNIQUES

11.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ◆ State the characteristics of AMT investments;
- ◆ Explain the bias being levelled against the conventional appraisal techniques and advance points to show that this bias is misplaced;
- ◆ Illustrate the use of incorrect technique and incorrect use of a correct technique with payback period and net present value techniques;
- ◆ Highlight and explain other possible shortcomings in the application of appraisal techniques;
- ◆ State the steps in the appraisal process; and
- ◆ Mention the management actions that may mitigate the bias being raised against methods of appraising AMT projects.

11.1 INTRODUCTION

The conventional appraisal techniques have been widely criticised for being unfavourably disposed towards AMT projects. It had been claimed that because of their peculiar characteristics, the projects were being excluded from the capital expenditure plans of companies in their strategic decision-making.

However, it is not the appraisal techniques, *per se*, that are to blame for this bias, but the practitioners who use the techniques. This bias must have arisen either because:

- (a) The practitioners use an incorrect technique; or
- (b) They incorrectly use the right techniques.

11.2 CHARACTERISTICS OF ADVANCED MANUFACTURING TECHNOLOGY PROJECTS

The following are the characteristics of AMT projects:

- (a) Initial costs are very high and may be spread for example over two years;
- (b) Returns are generated for a very long period of time; and
- (c) Returns grow over the estimated life of the project.

11.3 USE OF INCORRECT TECHNIQUE

The argument here, is that the use of an incorrect technique particularly payback period, tends to exclude totally some benefits, and de-emphasise others, from the appraisal process such that a project would be rejected when probably it should have been accepted. This, it is believed, would operate to the detriment of the overall strategic objective of the company.

ILLUSTRATION 11-1

Payback Period Versus Net Present Value.

Consider the following two projects X and Y with their relevant cash flows:

End of year	Cash Flows	
	Project X (£'m)	Project Y (£'m)
0	(50)	(20)
1	(40)	5
2	0	5
3	15	5
4	20	5
5	25	
6	30	
7	35	
8	40	
9	45	
10	50	

Project X is an AMT project while Project Y is a capacity expansion project. Which project should be selected using:

- (i) Payback method; and
- (ii) Net Present Value (NPV) method?

Assume discount rate of 15%.

SUGGESTED SOLUTION 11-1

Using payback as a method of appraisal, project Y will pay itself back in four years while project X will pay itself back in six years. As project Y will pay back itself faster than project X, project Y will be selected. However, if NPV method were used, project X will have net present value of ₦13.27million while project Y will have negative net present value of ₦5.72 million. If the discount rate of 15% represents the shareholders opportunity cost of capital, project X will be selected as it will add ₦13.27million to the value of the business. In the context of shareholders' wealth maximisation objective, project X would be superior to project Y. Payback period had, therefore, been wrongly used in this case.

Workings**(i) Payback Method**

Calculating the payback periods

$$\text{Project Y} \quad \frac{\text{₦} \quad 20\text{m}}{\text{₦} \quad 5\text{m}} = 4 \text{ years}$$

Project X		
Year	Net Cash Flow	Cumulative Net Cash
	₦'m	₦'m
0	(50)	(50)
1	(40)	(90)
2	0	(90)
3	15	(75)
4	20	(55)
5	25	(30)
6	30	0
7	35	35
8	40	75
9	45	120
10	50	170

NOTE:

The payback period for project X is 6 years that is the year in which the cash outflows equate the cash inflows.

(ii) **Net Present Value Method**
Calculation
Project X

Year	Cash flow N'm	D F 15%	PV N'm
0	(50)	1.000	(50.00)
1	(40)	0.870	(34.80)
2	0	0.756	0.00
3	15	0.658	9.87
4	20	0.572	11.44
5	25	0.497	12.43
6	30	0.432	12.96
7	35	0.376	13.16
8	40	0.327	13.08
9	45	0.284	12.78
10	50	0.247	12.35
	NPV		<u>13.27</u>

Project Y

Year	Cash flow N'm	D F 15%	PV N'm
0	(20)	1.000	(20.00)
1	5	0.870	4.35
2	5	0.756	3.78
3	5	0.658	3.29
4	5	0.572	2.86
	NPV		<u>5.72</u>

11.4 INCORRECT USE OF THE RIGHT TECHNIQUE

The claimed bias being levelled against the discounted cash flow techniques (DCF) is a case more of financial management practice and less of principle. In this respect, the use of unduly high discount rate or predetermined internal rate of return are worthy of note.

One incorrect way of using DCF techniques is to adopt an unduly high discount rate, for example 25%, and inappropriate time period. A very high rate creates highly unfavourable dispositions toward projects with long economic lives as against those with short useful lives. Also, unnecessarily high rates almost always result in negative results, for projects of growing cash flows, into the far distant future as against projects with constant cash flows over a short time span.

For example, the present value of ₦100 obtainable in fifteen years time at 12% is ₦18.27 while at 25% is just ₦3.52. Similarly a sum of ₦100,000

received every year for the next fifty years at 12% will be worth ₦399,990. This situation normally deters managers from selecting AMT-like projects and instead, they go for projects with conventional cashflow patterns (initial outlay at the beginning of the year followed by constant cash flows over a short period of time).

ILLUSTRATION 11-2

Impact of different levels of discount rates on net present value.

An AMT-type project has the following cash flow patterns.

End of Year	Cash Flow ₦'m
0	(45)
1	(15)
2	15
3	30
4	45
5	60

Prepare a table showing the NPV of the project assuming 6%, 12% and 30% discount rates, and comment as appropriate.

SUGGESTED SOLUTION 11-2

Workings @6%

End of year	₦'000
0 PV of ₦45m = ₦45 x 1.0	(45,000)
1 PV of ₦15m = ₦15m x 0.9434	(14,151)
PV of costs	<u>(59,151)</u>
2 PV of ₦15m = ₦15m x 0.8900	13,350
3 PV of ₦30m = ₦30m x 0.8396	25,188
4 PV of ₦45m = ₦45m x 0.7921	5,645
5 PV of ₦60m = ₦60m x 0.7473	44,838
PV of benefits	<u>119,021</u>

@12%

End of year	₦'000
0 PV of ₦45m = ₦45m x 1.0	(45,000)
1 PV of ₦15m = ₦15m x 0.8929	(13,394)
PV of costs	<u>(58,394)</u>
2 PV of ₦15m = ₦15m x 0.7972	11,958
3 PV of ₦30m = ₦30m x 0.7118	21,354
4 PV of ₦45m = ₦45m x 0.6355	28,598
5 PV of ₦60m = ₦60m x 0.5674	34,044
PV of benefit	<u>95,954</u>

@ 30%

End of year		₦'000
0	PV of ₦45m = ₦45m x 1.0	45,000
1	PV of ₦15m = ₦15m x 0.7690	<u>11,535</u>
	PV of costs	<u>56,535</u>
2	PV of ₦15m = ₦15m x 0.5920	8,880
3	PV of ₦30m = ₦30m x 0.4550	13,650
4	PV of ₦45m = ₦45m x 0.3500	15,750
5	PV of ₦60m = ₦60m x 0.2690	<u>16,140</u>
	PV of benefits	<u><u>54,420</u></u>

Table 12.1

Discount Rate	Present Value of Benefit	Present Value of Costs	Net Present Value
%	₦'000	₦'000	₦'000
6	119,021	59,151	59,870
12	95,954	58,394	37,560
30	54,420	56,535	(2,115)

Comments

From the table, it will be observed that the impacts of using higher discount rates create a relative disadvantage on benefits when compared with costs. An increase in discounted rate from 6% to 12%, for example, decreases the PV of benefits by 19.38% and the PV of costs by only 1.28%.

In the same vein, an increase from 12% to 30% reduces benefits by about 43.29% but cut down costs by just 3.18%. It should be noted that at a discount rate level of 30% the project in its entirety looks unprofitable in terms of net present value.

Other Possible Shortcomings in the Application of DCF Techniques:

These are:

(a) Risk and calculation of risk premium

The risk premium, that is calculated and added to the discount rate to take account of risk, reflects the total risk of the project. This, however, contradicts the submission of the capital asset pricing model (CAPM) which recognises only the systematic risk of a project and assumes that rational investor would have diversified away the unsystematic component of the total risk of the projects. Thus the procedure for calculating the risk premium by managers may unduly increase the discount rate.

(b) Inadequate and inaccurate data

Many long-term and valuable benefits of AMT projects might not be captured and there might be failure to separate relevant from irrelevant data. Relevant data such as incremental cash flows and lost income from an alternative might not be focused upon while irrelevant data such as depreciation (a non-cash item), book value of equipment, committed future costs might be included in the financial analysis.

(c) Measurement Problem

The benefits accruing to AMT projects have both tangible and the equally, but not visible, intangible elements. While the tangible benefits are usually correctly evaluated, there are no objective bases for measuring the intangible benefits.

Tangible Benefits

These include:

- (a) Possible savings in interest costs, rent of warehouse space, insurance costs, and so on, as a result of keeping much lower inventory levels.
- (b) Savings in inspection costs arising from substantially improved production methods (now highly automated).
- (c) Reduction in set-up costs arising from AMT equipment's adaptability to smaller production runs.

The Intangible benefits

These include:

- (a) The unseen and unfelt positive effects on sales revenue as a result of speedy response to customers requirement.
- (b) Those unquantifiable improvements in quality that would attract customers to the product and enhance the product's competitiveness in the market.
- (c) Sharp improvements in employees' skills arising from substantial planning and education.

11.5 STEPS IN THE APPRAISAL OF AMT PROJECTS

The following are the steps involved in the appraisal of typical AMT projects:

- (a) Ensuring that the proposed AMT investment fits in with the company's strategic plan;
- (b) Constructing a simple DCF, for example NPV model of the decision problem on hand. If there is going to be capital rationing this constraint, (including the appropriate programming method) can be built in;
- (c) Predicting the relevant quantifiable cash flows;
- (d) Choosing the most appropriate discount rate and time scale bearing in mind the need to consider strategic factors; and
- (e) Calculating the NPV of the project, using only the estimated tangible benefits.

Decision

If NPV is positive, go ahead with the project

If NPV is negative, identify and carry out a critical analysis of the intangible benefits using an agreed scoring system.

Weighing the intangible benefits by comparing them with the short-fall in NPV. If the benefits more than justify the short-fall, then the AMT can be accepted on strategic grounds despite its negative numerical value.

It should be noted that this step requires top management value judgement as the decision here involves strategic thinking. An alternative, although less acceptable, is to lower the discount rate where it is strongly believed that the intangible benefits weigh more than the short-fall in NPV.

11.6 MANAGEMENT ACTIONS REQUIRED TO REDUCE BIAS AGAINST AMT PROJECTS

As the claimed bias against AMT projects is more of management practice, the following actions may be necessary to reduce incidences of bias.

- (a) Top management should ensure that individual manager's objectives are aligned as much as possible, with the overall strategic goal of the company. This is particularly relevant in those activities that encourage short-termism.
- (b) Where the organisation operates on the basis of divisional centres, the issue of what value to put on divisional transfers of goods and services must be properly examined.

- (c) Data should be carefully gathered, analysed and reported in such a way that decisions made on the basis of this data do not create bias against AMT projects and are in line with the long-term competitiveness and profitability of the company. Accounting information should be decision oriented.
- (d) There should be careful delineation of quantifiable data from those requiring high value judgement.
- (e) Ability to segregate relevant data, leaving the irrelevant, is an important anti-bias element in AMT investment appraisal.
- (f) The right appraisal technique should be selected.
- (g) The selected technique should not be incorrectly used.
- (h) The method for determining the risk premium should not be such as to create bias against AMT projects; capital asset pricing model-based risk assessment should be used.
- (i) Performance measures that are used should be in line with the strategic objectives of the company. For example, the bonus system that is operated should, as much as possible, be linked to the NPV of investments undertaken.
- (j) High level in-house training and education must be a continual activity in the company.
- (k) Staff at all levels should be encouraged to give maximum commitment to the project. Participatory management will be needed in order to generate acceptance by middle management and other staff.
- (l) Management psyche should not be negative. Maintaining the status or just having the belief that new methods cannot work should be totally removed from the psyche of management at all levels.

11.7 SUMMARY AND CONCLUSIONS

The AMT projects are such that they can be discriminated against, unless top management takes decisions that are based on strategic grounds.

Firstly, they are very costly in terms of establishment and implementation. Secondly, they have long economic lives. Thirdly, they have growing patterns of cash flows. Therefore, if care is not taken by top management, decisions might be taken towards the rejection of some projects when the correct decision would be to accept them. Principal areas of possible errors by management are, in the use of a wrong appraisal technique like the payback period or the

wrong use of a right technique such as NPV. Other areas of possible management errors would be:

- (a) Calculating the risk premium (which is normally added to discount rate);
- (b) Inability to capture all relevant data;
- (c) Utilisation of inaccurate data;
- (d) Difficulty in measuring tangible quantifiable data;
- (e) Exclusion of intangible benefits or making these intangible benefits not really valuable even if they exist; and
- (f) Critically determine the long-run competitiveness and survival of the company.

The steps involved in AMT investments appraisal are:

- (a) Alignment of the AMT project with the strategic goal of the company;
- (b) Model construction of the decision problem;
- (c) Data gathering and analysis; and
- (d) Computation of the NPV of the project.

Where the NPV is negative, the project should only be accepted if intangible benefits exist that more than compensate for the fall. It should be noted that these benefits, although cannot be converted into cash values, exist and must for strategic reasons, be brought into the appraisal process.

As the problem of bias leveled against appraisal technique of AMT investments is more of practice than principle, it is management, through their actions, that should mitigate this bias. Those actions include, ensuring goal congruence, having the right organisational structure, careful and astute data gathering and analysis, selection of the right technique, correct use of the right method, correct calculation of risk premium, determination of the correct performance methods, high level of in-house training and education and so on. As AMT projects must be made to work, top management support and commitment of middle management and other staff are very important.

*Refer to Comprehensive Questions and Suggested Solutions in Appendix II
Page 465*

11.8 REVISION QUESTIONS

11.8.1 MULTIPLE CHOICE QUESTIONS

1. Who is to blame for the so-called bias against AMT projects - the DCF appraisal techniques or financial managers who use these techniques?
 - (i) DCF appraisal techniques
 - (ii) Financial managers
 - (iii) DCF and financial managers
 - A (i) only
 - B (i) and (ii)
 - C (i) and (iii)
 - D (ii) only
 - E (ii) and (iii)
2. Which appraisal technique could create bias against AMT projects?
 - (i) NPV
 - (ii) Payback period
 - (iii) IRR
 - A (ii) only
 - B (iii) only
 - C (i) only
 - D (i) and (ii)
 - E (ii) and (iii)
3. Which of the following is not a deficiency in the application of DCF techniques to AMT projects?
 - A Method employed in the calculation of risk frequencies
 - B Inadequate and inaccurate tangible data
 - C Incorrect measurement of tangible data
 - D Exclusion of certain intangible benefits
 - E Use of discount rate
4. What is the first step in the evaluation of AMT projects?
 - A Calculate the NPV of the benefits
 - B Weigh the intangible benefits
 - C Ensure AMT project fits in with the overall strategic plan of the company
 - D Predict the relevant quantifiable cash flows
 - E Construct a simple DCF, present value model

5. Which inventory control model fits in with the AMT projects?

- (i) Basic EOQ model under certainty
- (ii) EOQ model under uncertainty
- (iii) Just-in-time model

- A (i) only
- B (i) and (ii)
- C (ii) only
- D (iii) only
- E (i) and (iii)

11.8.2 SHORT ANSWER QUESTIONS

1. State one characteristics of advanced manufacturing technology (AMT) projects with respect to initial investment.
2. State one incorrect way of using DCF appraisal technique
3. Give example of how wrong use of a correct appraisal technique could create a bias against AMT projects.
4. In terms of support for financial managers, state one Decision Support System (DSS) analytical model that could be used for AMT projects.
5. In terms of objectives what should top management do to reduce bias against AMT projects?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

CAPITAL BUDGETING UNDER RISK AND UNCERTAINTY

12.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ◆ Evaluate investment projects using "Certainty Equivalent" method;
- ◆ Carry out sensitivity analysis of a project's outcomes;
- ◆ Calculate the Expected Net Present Value (ENPV) of projects;
- ◆ Draw decision trees with a view to solving future alternative sequential problem; and
- ◆ Discuss and state the qualitative factors affecting capital investment decisions.

12.1 INTRODUCTION

Uncertainty and risk analysis in capital investment decisions play a vital role because the real economic worth of a project cannot be properly determined if they are not considered. Risk is a situation in which various outcomes to a decision are possible and the probabilities to those alternative outcomes are known. Uncertainty, on the other hand, describes a situation where there is no such knowledge of probabilities about the outcomes. Risk and uncertainty in investment decisions arise because of the inability of the financial manager to forecast the possible future events of the project with certainty.

In resolving the issue of risk and uncertainty, various techniques are applied to analyse their effect on capital investment decisions. Some of the techniques are:

- (a) Payback period
- (b) Finite Horizon
- (c) Certainty Equivalent
- (d) Risk Adjusted Discount Rate
- (e) Sensitivity Analysis & Simulation
- (f) Expected NPV
- (g) Standard Deviation and Variance
- (h) Co-efficient of Variation
- (i) Decision Tree.

12.2 PAYBACK PERIOD

In the payback period method, the shorter the time required to return the project's initial outlay, the better. In its simplest form, the payback method completely ignores returns after the payback, the distribution of returns within the payback period, and discount rates. The payback period method is based on the rationalisation of "the sooner, the surer" and focuses attention on the near future, thereby emphasising the liquidity of the firm through the early recovery of capital.

12.3 FINITE HORIZON

In the finite horizon method, returns beyond a particular date are ignored, while returns within a certain period are subjected to analysis. The longer the horizon the less this will matter and the nearer the method becomes a straight forward discounting cash flow method.

The assumptions for using this method are as follows:

- (a) Cash flows of future years for conventional projects would normally be the net cash inflows.
- (b) The inability to forecast cash flows of distant future years is unavoidable
- (c) The present values of distant future cash flows will be insignificant and immaterial since they will tend to zero. For example, a project with a ten year life span may be evaluated with cash flows of only the first five years.

12.4 CERTAINTY EQUIVALENT

Under the certainty equivalent method, a risk adjusted factor known as certainty equivalent co-efficient is used to adjust for the risk effect in the project's cash flow. Multiplying a period's cash flow with the co-efficient produces the certainty equivalent cash flow which is discounted to appraise the project.

ILLUSTRATION 12-1

A project costs ₦70,000 and it has cash flows of ₦40,000 ₦50,000 and ₦35,000 in years 1 to 3. Assume the certainty equivalent co-efficient are estimated to be 1.00, 0.85, 0.75 and 0.6 for years 0-3, respectively, and the risk-free discount rate is 10%. Calculate the net present value.

SUGGESTED SOLUTION 12-1

Yrs	Cash flow	Certainty Equivalent Co-efficient	Certainty Equivalent Cash flow	DCF@10%	PV
	₦		₦		₦
0	(70,000)	1.00	(70,000)	1.000	(70,000)
1	40,000	0.85	34,000	0.909	30,906
2	50,000	0.75	37,500	0.826	30,975
3	35,000	0.60	21,000	0.751	15,771
				NPV =	<u>7,652</u>

12.5 RISK ADJUSTED DISCOUNT RATE

Unlike the certainty equivalent method where adjustment for the riskiness of a project is done on the cash flow, in the risk adjusted discount rate method, the project risk effect is adjusted for in the discounting rate. For the riskiness of a project, a risk premium is determined and added to the risk-free discount rate. If, for instance, a firm evaluates its risk-free projects at 10% and defines extra 5% for risk premium, risky projects will be evaluated at 15%.

This means that:

Risk-Adjusted Discount Rate = Risk Free Rate + Risk Premium.

12.6 SENSITIVITY ANALYSIS AND SIMULATION

This method is valuable, practical and is widely used. Sensitivity analysis is a particular kind of simulation in which limiting and crucial values of a project's parameters are ascertained. The parameters will usually be the values which will render NPV to zero.

Sensitivity analysis is a measure of the impact of a change in the value of one of the project's variables such as discount rate, lifespan, sales volume, sales price and annual fixed cost. The more the changes that occur in the NPV, the more crucial the parameter of sensitivity analysis to the firm.

ILLUSTRATION 12-2

For an investment project, the following initial estimates have been made:

Initial outlay on equipment	₦100,000
Sales price	₦30
Unit cost	₦20
Discount rate	10% per annum
Life of project	3 years
Sales volume	(units)
Year 1	4,000
Year 2	6,000
Year 3	3,000

The equipment will manufacture a product at the above-stated unit cost and selling price in the volumes indicated. Calculate the maximum tolerable unfavourable changes as a percentage of the original estimated value in:

- (a) Sales price
- (b) Unit cost
- (c) Sales volume
- (d) Initial outlay.

SUGGESTED SOLUTION 12-2

Yrs	Sales Volume (Units)	Unit Selling Price ₦	Total Sales ₦	Unit Cost ₦	Total Variable Cost ₦	Contribution ₦
1	4,000	30	120,000	20	80,000	40,000
2	6,000	30	180,000	20	120,000	60,000
3	3,000	30	90,000	20	60,000	30,000

Calculation of NPV

Yrs	NCF (Contribution) ₦	DCF@10%	PV ₦
0	(100,000)	1.000	(100,000)
1	40,000	0.909	36,360
2	60,000	0.826	49,560
3	30,000	0.751	22,530
	NPV		<u>8,450</u>

Thus, the project is worthwhile.

Maximum tolerable changes in:

- (a) Sales Price

$$= \frac{\text{NPV of NCF}}{\text{PV of Total Sales}} \times 100\%$$

NCF = Net Cash flow (Contribution)

Yrs	Total Sales ₦	DCF @10%	PV ₦
1	120,000	0.909	109,080
2	180,000	0.826	148,680
3	90,000	0.751	67,590
			<u>325,350</u>

$$= \frac{\text{₦8,450}}{\text{₦325,350}} \times 100\%$$

$$= 2.6\%$$

The sales price should not fall by more than 2.6% of ₦30 (which is 78K). It should at least be sustained at ₦29.22K, otherwise the project will not be viable.

(b) Unit Cost

$$= \frac{\text{NPV of NCF}}{\text{PV of Variable Cost}} \times 100\%$$

PV of variable cost

Yrs	Variable Cost ₦	DCF@10%	PV of Variable Cost ₦
1	80,000	0.909	72,720
2	120,000	0.826	99,120
3	60,000	0.751	45,060
			<u>216,900</u>

$$= \frac{\text{₦8,450}}{\text{₦216,000}} \times 100\%$$

$$= 3.9\%$$

For the project to remain viable, the unit cost of the product should not fall by more than 3.9%. The variable cost should not be less than ₦19.22 (₦20 less 78k) per unit.

(c) Sales Volume

$$= \frac{\text{NPV of NCF}}{(\text{PV of Contribution})} \times 100\%$$

PV of Contribution

Yrs	Contribution ₦	DCF@10%	PV of contribution ₦
1	40,000	0,909	36,360
2	60,000	0,826	49,560
3	30,000	0,751	22,530
			<u>108,450</u>

$$= \frac{\text{₦8,450}}{\text{₦108,450}} \times 100\%$$

$$= 7.79\%$$

The sales volume of the product should not be reduced by more than 7.79% every year for the project to be worthwhile.

(d) Initial outlay:

$$= \frac{\text{NPV}}{(\text{Initial outlay})} \times 100\%$$

$$= \frac{\text{N}8,450}{\text{N}100,000} \times 100\%$$

$$= 8.45\%$$

For the project to be viable, the initial outlay of the project should not increase by more than 8.45%.

12.7 EXPECTED NPV

This is based on the principle of expected value. Once probabilities are assigned to future outcomes of net cash flow for a period, the expected value would be calculated and discounted. The expected NPV arithmetically takes account of the expected variability of two or more possible outcomes by averaging possible outcomes weighted by their respective probabilities.

ILLUSTRATION 12-3

For example, a project runs for three years with the following distribution of returns in each year, viz:

Year 1		Year 2		Year 3	
Return	Probability	Return	Probability	Return	Probability
N'000		N'000		N'000	
10,000	0.1	20,000	0.4	10,000	0.3
12,000	0.6	30,000	0.6	16,000	0.5
16,000	0.3			20,000	0.2

The project will cost the company N42 million to establish. Calculate the expected NPV if the discount rate is 10%.

SUGGESTED SOLUTION 12-3**Calculation of Expected value**

Year 1			Year 2		
Returns	Probability	Expected Value	Return	Probability	Expected Value
₦'000		₦'000	₦'000		₦'000
10,000	0.1	1,000	20,000	0.4	8,000
12,000	0.6	7,200	30,000	0.6	18,000
16,000	0.3	4,800			
		<u>13,000</u>			<u>26,000</u>

Year 3		
Returns	Probability	Expected Value
₦'000		₦'000
10,000	0.3	3,000
16,000	0.5	8,000
20,000	0.2	4,000
		<u>15,000</u>

Calculation of Expected NPV

Yrs	ENCF	DCF@10%	PV
	₦'000		₦'000
0	(42,000)	1.000	(42,000)
1	13,000	0.909	11,817
2	26,000	0.826	21,476
3	15,000	0.751	11,265
			<u>2,558</u>

Decision: The project cash flow gives a positive NPV of ₦2.558 million, therefore it is accepted.

12.8 STANDARD DEVIATION AND VARIANCE

Standard deviation is an absolute measure of risk. It measures the dispersion of cash flow or the spread about the mean value. The standard deviation of NPV (SD_{NPV}) is given by the formula:

$$SD_{NPV} = \sum \sqrt{(NPV - ENPV)^2 \rho}$$

Standard deviation is a proxy measure of total risk for the investment and takes no account of possible offsetting variations in other projects that may be undertaken by the same investor.

Variance is the square of standard deviation. It is the average squared departure of NPV from its mean value.

ILLUSTRATION 12-4

Suppose a firm has to choose between two mutually exclusive projects that cost ₦3 million each. The following are the possible net cash flows of the project and their associated probabilities; viz:

Project X		Project Y	
Probability	NCF	Probability	NCF
	₦'000		₦'000
0.10	3,000	0.10	2,000
0.20	3,500	0.25	3,000
0.40	4,000	0.30	4,000
0.20	4,500	0.25	5,000
0.10	5,000	0.10	6,000

Determine the standard deviation and variance of each project and advise which of them is preferable.

SUGGESTED SOLUTION 12-4

Project 'X'		Expected			
Probability	NCF(x)	Value	$(x - \bar{x})$	$(x - \bar{x})^2$	$P(x - \bar{x})^2$
	₦'000	₦'000	₦'000	₦'000	₦'000
0.1	3,000	300	(1,000)	1,000,000	100,000
0.2	3,500	700	(500)	250,000	50,000
0.4	4,000	1,600	0	0	0
0.2	4,500	900	500	250,000	50,000
0.1	5,000	500	1,000	1,000,000	100,000
Expected Value (EV) \bar{x}		<u>4,000</u>			<u>300,000</u>

$$\text{Project } x_{\delta} (\text{SD}) x = \sqrt{\text{₦}300,000,000} = \text{₦}547,720$$

Project 'Y'		Expected			
Probability	NCF(x)	Value	$(x - \bar{x})$	$(x - \bar{x})^2$	$P(x - \bar{x})^2$
	₦'000	₦'000	₦'000	₦'000	₦'000
0.10	2,000	200	(2,000)	4,000,000	400,000
0.25	3,000	750	(1,000)	1,000,000	250,000
0.30	4,000	1,200	0	0	0
0.25	5,000	1,250	1,000	1,000,000	250,000
0.10	6,000	600	2,000	4,000,000	400,000
Expected value (EV) \bar{x}		<u>4,000</u>			<u>1,300,000</u>

$$\text{Project } Y_{\delta} (\text{SD}) Y = \sqrt{\text{₦}1,300,000,000} = \text{₦}1,140,180$$

Since both projects will yield the same net present value, the firm should choose the project which is less risky. This is project X.

12.9 CO-EFFICIENT OF VARIATION

Co-efficient of variation is a relative measure of risk. It is simply the ratio of standard deviation of possible outcome divided by its expected value, depicted by the following formula:

$$\text{Co-efficient of variation} = \frac{\text{Standard Deviation}}{\text{Expected Value}}$$

ILLUSTRATION 12-5

Using illustration 12-4, compute the co-efficient of variation for the two projects.

SUGGESTED SOLUTION 12-5

$$\begin{aligned} &\text{Project X} \\ &= \frac{547.72}{4,000} = 0.13693 \end{aligned}$$

$$\begin{aligned} &\text{Project Y} \\ &= \frac{1140.18}{4,000} = 0.2850 \end{aligned}$$

Using this concept, the lower risk of project 'X' has been confirmed.

12.10 DECISION TREE

This is a method of representing alternative sequential decisions and the possible outcomes from the former, in a graphical form. Since present investment decisions may have implications for the future and the outcomes of those chance events are not known, then a probability distribution can be assigned. Decision tree shows the relationship on a future event and their consequences.

ILLUSTRATION 12-6

A project has an initial outlay of ₦15 million. Return in Year 1 is ₦13.5 million with probability of 0.4 or ₦9 million with probability of 0.6. If in Year 1 ₦9 million return is generated then in Year 2 there can be ₦12 million ($P=0.2$) or ₦10.5 million ($P=0.8$). If the first year return had been ₦13.5 million, then in the second year, there is a seven-tenths chance of ₦6 million and a three-tenths chance of ₦1.5 million. Find the co-efficient of variation if the discount rate is 10%.

SUGGESTED SOLUTION 12-6

		Probability			
(₦15,000)	0.4	₦6,000	0.7	0.28 (0.7 x 0.4)	i
	₦13,500	₦1,500	0.3	0.12 (0.3 x 0.4)	ii
	0.6	₦12,000	0.2	0.12 (0.2 x 0.6)	iii
	₦9,000	₦10,500	0.8	0.48 (0.8 x 0.6)	iv

All figures are in ₦'000

Calculation of NPV**Alternative**

$$I = (15,000) + \frac{13,500}{1.1} + \frac{6,000}{(1.1)^2} = \text{₦}2,231.40$$

$$II = (15,000) + \frac{13,500}{1.1} + \frac{1,500}{(1.1)^2} = (\text{₦}1,487.60)$$

$$III = (15,000) + \frac{9,000}{1.1} + \frac{12,000}{(1.1)^2} = \text{₦}3,099.18$$

$$IV = (15,000) + \frac{9,000}{1.1} + \frac{10,500}{(1.1)^2} = 1,859.50$$

All figures are in ₦'000

Probability		NCF x ₦'000	Expected Value ₦'000	$(x - \bar{x})$ ₦'000	$(x - \bar{x})^2$ ₦'000
I	0.28	2,231.40	624.79	520.66	271,086.84
II	0.12	(1,487.60)	(178.51)	(3,198.34)	10,229,378.76
III	0.12	3,099.18	371.90	1,388.44	1,927,765.63
IV	0.48	1,859.50	892.56	148.76	22,129.54
$\bar{x} = 1,710.74$					
Probability		$(x-x)^2$		$P(x-x)^2$	
0.28		271,086.84		75,904.32	
0.12		10,229,378.76		1,227,525.45	
0.12		1,927,765.63		231,331.88	
0.48		22,129.54		10,622.18	
<u>1.00</u>				<u>1,545,383.83</u>	
Variance = $G^2 NPV = 1,545,383.830$					
$\delta_{NPV} \text{ (SD)} = \sqrt{1,545,383,830}$					
$= \text{₦}1,243.130 \text{ approximately}$					
Coefficient of variation $\frac{\text{₦ } 1,243,130}{\text{₦ } 1,710,740} = 0.7267 \text{ approximately}$					

12.11 QUALITATIVE FACTORS IN CAPITAL INVESTMENT DECISION

It is not simply the use of the most referred DCF techniques (quantitative factors) that is important in capital investment decision, other practical considerations are as equally important. These are the qualitative factors and judgment.

In theory, the use of sophisticated techniques (DCF, IRR and so on) is emphasised since they maximise shareholders wealth. However in practice, companies give considerable importance to qualitative factors.

Reliability of figures could not be achieved without due consideration given to qualitative factors and in this respect judgment plays a significant role. For example, vision of judgment of the future plays an important role in factors like market potential, possibility of changes in technology, trend of government policies and so on, which are judgmental. Therefore, qualitative factors and judgement go together.

Qualitative factors

The qualitative factors to be considered in capital investment decisions include:

- (a) adaptation to the changing market environment - market potential.
- (b) technological development/change or obsolescence. This plays a significant role in guiding investment decisions
- (c) employees morale and safety.
- (d) projects' critical utility in the production of a main product.
- (e) strategic importance of capturing a new product first.
- (f) investors and customers image.
- (g) legal matters.
- (h) competitors.
- (i) risk involved in the project to be undertaken.
- (j) capabilities of management to cope with the implementation of the project.
- (k) consumer preference.
- (l) inflation.
- (m) the environment in which the project is to be undertaken.

Finally, DCF and other evaluation methods are guides. There is little value in using an analysis that does not consider the most appropriate alternative and sound assumptions. Resource allocation is not simply a matter of choosing the most profitable new projects; there are other factors that are equally important and may affect the final decision. It is therefore important for management to also spend time improving the quality of assumptions and assuring that all the strategic questions have been asked before taking final decision on capital investments.

Once strategic questions have been answered, investment proposals may be subjected to DCF and other investment techniques.

12.12 SUMMARY AND CONCLUSIONS

Capital Investment Appraisal under uncertainty involves the special appraisal technique such as payback period, finite horizon, certainty equivalent sensitivity analysis and others. All these techniques are methods of incorporating risk into the appraisal process.

Under uncertainty the appropriate decision variable to use in projects appraisal, is the expected net present value (ENPV), the standard deviation and variance of the project.

In evaluating projects with sequential outcomes, it might be more informative to use decision trees.

In addition to quantitative factors, finance managers should also try to assess any qualitative benefits that accrue to a project before taking final decision.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

12.13 REVISION QUESTIONS

12.13.1 MULTIPLE CHOICE QUESTIONS

1. One way of factoring risk into the capital budgeting process through adjustment to the cash flow is
 - i. determining the beta of the project
 - ii. using a risk adjusted discount rate
 - iii. using certainty equivalent co-efficient
 - A (i) alone
 - B (iii) alone
 - C (i) and (ii)
 - D (i) and (iii)
 - E (ii) and (iii)
2. In carrying out sensitivity analysis of a project, what is being tested is _____
 - (i) The impact of a change in output on input
 - (ii) the impact of a change in more than one input variable at a time on output
 - (iii) The impact of a change in only one single variable at a time on output.
 - A (i) only
 - B (iii) only
 - C (i) and (iii)
 - D (i) and (ii)
 - E (ii) and (iii)

Use the following information to answer questions 3 and 4

A project's cash flows are as follows:

Year 0: outflow ₦1m, Year 1: inflow of ₦700,000 and Year 2: inflow of ₦600,000. Their certainty equivalent are 1.0, 0.80 and 0.70 respectively. The project's opportunity cost of funds is 12%.

3. Calculate their certainty equivalent cash flows

	₦	₦	₦
(i)	1,000,000	(560,000)	(420,000)
(ii)	(1,000,000)	560,000	420,000
(iii)	1,000,000	560,000	420,000

- A (i) only
 - B (i) and (ii)
 - C (ii) only
 - D (ii) and (iii)
 - E (i) and (iii)
4. What is the project's net present value?
- A Positive NPV of ₦175,179
 - B Negative NPV of ₦175,179
 - C Positive NPV of ₦165,179
 - D Positive NPV of ₦185,479
 - E Negative NPV of ₦165,179
5. Which is the relevant analytical technique to use when the best possible value is being searched for an output given certain constraints?
- (i) Target-seeking analysis
 - (ii) What-if analysis
 - (iii) Optimisation analysis
- A (ii) and (iii)
 - B (iii) only
 - C (i) only
 - D (i) and (iii)
 - E (i) and (ii)

12.13.2 SHORT ANSWER QUESTIONS

1. In relationship to capital budgeting, what is the difference between risk and uncertainty?
2. In the context of projects investments evaluation what is "certainty equivalent"?
3. State one way of calculating the expected net present value of a project.
4. What is decision tree?
5. What is the process involved in simulation?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

SOURCES OF FINANCE

13.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ♦ Identify, and discuss, the main sources of long-term finance;
- ♦ State, and explain, the key factors which a company should consider when raising finance through issue of loan stocks;
- ♦ State, and explain, the key factors which a company should consider when raising finance through the issue of preference shares;
- ♦ State, and explain, the major factors which a company should consider when raising equity funds; and
- ♦ Explain the special nature of such issues as convertibles and warrants and state their advantages to the company issuing them.

13.1 INTRODUCTION

Strategic financing is a major function of financial managers in business organisations. While they require short-term finance to support their companies' working capital needs, they strategically search for the appropriate long-term finance(s) to enable them carry out their strategic investment functions of allocating capital resources towards fixed assets. The finance managers, in order to function effectively and efficiently, need to know all the major sources of funds available, their characteristics, their advantages and disadvantages both on a stand alone basis and in relation to one another. The knowledge of all the above will enable a finance manager to locate the right source, choose the cheapest source, balance risk and return, and select that source of finance that will fit in with the strategic goals of the firm.

13.2 SOURCES OF SHORT-TERM FINANCE

The major sources of short-term funds for companies are trade credit, bank overdraft, bankers' acceptances (BAs) and commercial papers. All these sources have certain common characteristics: they provide liquidity for companies, possess little or no risk for the lenders and thus provide relatively cheap sources of finance for the borrowing companies.

13.2.1 Bank Overdrafts

These are commercial banks' facilities which, by arrangement, allow companies to draw cheques in excess of what they have in their current accounts. A company, based on its risk profile, may be asked to pay a specified percentage for example 3% to 5% over the prime lending rate of the lending bank. There are, also, fixed establishment charges such as management fees payable on the facility.

The cost of funds is usually low as interest is only paid on funds used for the period the funds are actually utilised and the rates are relatively low vis-à-vis rates payable on loans.

Overdraft facilities help companies to cover temporarily net cash outflow situations. However, in principle, they are repayable on demand. This is, no doubt, a disadvantage to those companies that use overdraft facilities more or less as a permanent source of finance.

13.2.2 Trade Credit

This is a credit which a company takes when it is allowed to defer payment for goods supplied to it. As the credit is an inherent part of all credit transactions, there is, unlike interest on overdraft, no explicit cost to the firm. If a cash discount is offered to the company to encourage the company to pay earlier than agreed and the company takes advantage of this discount, there is still no cost. However if the company does not take advantage of the discount, there is a cost that is real.

ILLUSTRATION 13.1

Assume that a 3% cash discount is offered for a period of 45 days.

that is "3/15 net 60"

Calculate the real cost of fund?

This process can be likened to taking a loan of ₦97 for 45 days at an interest cost of ₦3.

The company can compare this rate with interest rate on overdraft and decide whether or not to take advantage of the cash discount. If, for example, the company currently pays 21% p.a., it will be advisable to take advantage of the discount. The assumption here is that the company would borrow at 21% p.a., use the funds thereby raised, to pay the creditor early enough to enjoy interest savings of 25.06% p.a.

It should be noted, from the above, that trade credit is not per se, a free source of funds.

Where the credit term is expressed as say "3/15 net 60", it means that the payment for goods supplied can be delayed for 60 days. If, however, cash is paid within 15 days a discount of 3% will be given. The following formula can then be used:

$$\frac{\% \text{Discount}}{100\% - \% \text{Discount}} \times \frac{365}{\text{payment date} - \text{discount period}}$$

The real cost of funds can be calculated as follows:

$$\frac{3\%}{100\% - 3\%} = \frac{3}{97} = 3.09\% \text{ for 45 days}$$

If this is expressed on an annual basis, that is, annualised it becomes.

$$3.09 \times \frac{365}{45} \% = 25.06\% \text{ p. a.}$$

Advantages

From the point of view of the company, the advantages of trade credit include:

- (a) It provides interest free funds where there is no cash discount or an advantage is taken of cash discount when offered.
- (b) The arrangement pays the company in a period of inflation.

Disadvantages

The disadvantages include:

- (a) Possible higher price
- (b) The company might have the opportunity of paying cheaper if immediate settlement of a transaction is made.
- (c) Lower credit rating. If trade credit is abused, the company's credit rating might be lowered. Suppliers might subsequently be demanding cash or stop supplies.
- (d) Administrative Costs. Credit taking usually involves some paper work with its attendant administrative and account costs.

- (e) **Restrictive Covenants.** Restriction may be embodied in the trade credit agreement, which call for minimum order size, continued patronage and so on.

13.2.3 Revolving credit facility

This is a type of bank finance and it entails the following steps:

- (a) The bank enters into a legal commitment, with the company, to lend up to a specified amount of money for an agreed period of time.
- (b) Based on the above commitment the company issues successive promissory notes covering the whole amount of the facility and bearing an interest rate already agreed and perhaps linked to the Central Bank of Nigeria (CBN) monetary policy rate (MPR).
- (c) The bank undertakes to sell these notes (commercial paper) in the money market and where unsuccessful agrees to underwrite the issue by buying the notes up in the market.
- (d) The company agrees to pay a commitment fee of say 1% per annum on the unutilised part of the specified amount for the bank's promise to make funds available. This is besides the interest on the amount of the credit actually given.

The flexible nature of this form of facility is the major advantage to the company. The bank may also benefit as it gives its customer a support that is unlikely to hinder its liquidity.

13.2.4 Bankers' Acceptance (BA)

This instrument has been discussed earlier in this pack under money market instruments. Companies use BAs to finance both domestic and global trade.

13.2.5 Commercial Papers (CP)

Similarly, this short-term promissory note had been discussed under money market instruments. It should be noted however, that it is a more expensive way of financing when compared with banker's acceptance.

13.3 SOURCES OF LONG-TERM FINANCE

In law, long-term finance, is financing that is made available for more than one year. However, in practice, finance under this heading would include medium-term and long-term. The classification into time periods say 3 years, 5 years, 7 years, 10 years and 25 years will depend on the company.

The main sources of medium to long-term finance are loan (debt) capital preference share capital, ordinary (equity) share capital, convertibles and medium-term bank credits such as equipment finance, project finance and finance lease. Each of these sources has its own unique characteristics which are discussed except medium-term bank credit which will be discussed in the subsequent chapter.

13.3.1 Loan (Debt) Capital

This comprises fixed-interest, secured loan stocks (also known as debentures) issued by companies. The loan stocks are said to be secured by a fixed charge on the company's specific identifiable property and a floating charge on all the assets of the company, both movable and immovable.

A floating charge means that the company can continue to deal with the assets charged (that is buy or sell), collateralise them for further loan until it does something (for example, defaults on interest payment or principal repayment) which makes the charge to crystallise. When this happens, the company can no longer deal with those assets. Debenture holders can then sell as many assets they require to redeem their loan.

A Trust Deed is normally prepared to protect the interests of the debenture holders. The Trust Deed defines the rights of the debenture holders in case of default, put certain restrictions on the company (for example a limit on the further amount of debt that can be raised) and provides for the appointment of a receiver. If, for example, the company defaults, a receiver will be appointed to sell its assets and re-imburse the creditors to the extent of the amount owing.

Unsecured lenders are less protected; on default, they will only share with other unsecured creditors.

13.3.1.1 Factors To Consider When Raising Finance Through Issue of Loan Stocks

The following factors should be considered by the company when issuing loan stocks:

(a) Issue (or floatation) costs

These are low compared with costs of issuing preference or ordinary shares.

(b) Servicing costs

The expected return, in terms of interest income and capital growth, is low because anticipated risk by lenders is also low. This implies that the cost of funds to the company is relatively low vis-à-vis other major forms of finance.

(c) Interest Payment

Interest must be paid whether or not the company makes a profit. This may impact negatively on earnings per share (EPS) which is an important measure of company's performance from the stand point of equity shareholders. Also, default on interest payment may attract sanction from creditors.

(d) Capital Repayment

Where it is a redeemable loan stocks issue, the company has a contractual obligation to pay back the principal amount.

(e) Tax Deductibility

Interests, unlike preference or ordinary share dividends, are tax deductible. They are allowed to be charged against profit before taxing such profit. This makes it to be relatively cheaper as preference and ordinary shares dividends are appropriations of profit.

(f) Control

The managers' ability to run the affairs of the company is limited by the restrictive covenants entrenched in the Trust Deed.

13.3.2 Preference Share Capital

This is capital raised through issue of preference shares. Holders are regarded as part-owners of the company and are entitled to a fixed income in form of dividend and receive this

income before equity shareholders get anything. However, unlike interest payment, the holders need not be paid. Notwithstanding, where the shares are expressed to be cumulative, all previously unpaid dividends must be paid before the ordinary shareholders.

On liquidation of the company, preference shareholders, subject to the provisions of the Articles, are entitled to a return of capital before ordinary shareholders.

13.3.2.1 Factors to Consider When Raising Finance Through Preference Shares

The following factors should be considered by the company when issuing preference shares:

(a) Issue (or floatation) cost

These are likely to be more than costs of issuing loan stocks but almost the same as those incurred when raising equity finance.

(b) Servicing Costs

These are likely to be more than those of lenders but less than those of the ordinary shareholders. This is because, in terms of risk, preference shares are regarded by the market as more risky than loan stock but less risky than ordinary shares.

(c) Dividend Payment

The company needs not pay dividend as the law does not compel the company to pay preference dividend.

(d) Repayment of Capital

Where the issue is redeemable, capital must be returned at maturity. Where it is irredeemable, the holders of preference shares are in a similar position with ordinary shareholders.

(e) Tax Deductibility

Preference dividends are not tax deductible. They are an appropriation of profit.

(a) Control

Preference shareholders have no right to vote. They may vote only when their dividends are in arrears.

13.3.3 Ordinary Share Capital

This is capital raised through the issue of ordinary shares. Holders are the owners of the firm and exercise the ultimate control over it. They bear the greatest risk as they may or may not receive dividends and their capital may be partially or totally lost.

While the firm is a 'going concern' they are the last to receive income and while on liquidation they occupy the bottom of the list in terms of capital replacement.

However, if the company is successful, ordinary shareholders gain substantially as they take the residual income after all other interests have been satisfied and also take the balance of capital on liquidation.

Ordinary shareholders have voting rights which they use at annual general meetings to exercise control over the company. Lenders have no such voting rights and preference shareholders have limited voting rights as they are only allowed to vote when their dividends are in arrears.

13.3.3.1 Factors To Consider When Raising Finance Through Issues Of Ordinary Shares

The following factors should be considered when issuing ordinary shares:

(a) Floatation (issue) costs

Those costs fluctuate, depending on the issue method used and the amount raised in the market. The costs of raising equity finance are very high when they are compared with rights issue cost and zero explicit cost of retention.

(b) Servicing Costs

The returns required (or expected) by the equity shareholders are very high in terms of dividends

and capital growth (capital appreciation). This is, because they presumably bear the greatest risk.

(c) Dividend Payment

There is no commitment by the company to pay dividends, since there is no legal obligation to do so. Dividends can only be declared at the instance of the directors, although approval will come from the ordinary shareholders. It is only on liquidation that a company is obliged to pay dividend where the final position of the liquidated company permits it.

(d) Repayment of capital

The company has no obligation to repay capital except when the company is in liquidation.

(e) Tax Deductibility of Dividends

Ordinary share dividends, like preference dividends, are not tax deductible. This makes dividends more expensive, as cost of funds, than interest, even without considering risk.

(f) Control

New issue of ordinary shares to the general public may shift voting power from its present share and possibly dilute control over the company.

(g) Pricing of Issues

Pricing is a critical factor when raising new capital from the general public. Over-pricing of securities may not attract enough buyers while under-pricing may not bring enough funds for the company to execute its programme.

(h) Success of Issue

Raising of capital via the general public can be less successful than through rights issue.

13.3.4 Convertible Securities

These are fixed-income securities (loan stocks or preference shares) of a company which can be converted during a specified future period of time into the ordinary shares of that company at a pre-determined price at the option of the holder. As the principle involved in each of the above categories of instruments is the same, subsequent discussion will centre on convertible loan stocks, which is more common than convertible preference shares.

13.3.4.1 Convertible Loan Stocks

These are normal loan stocks with all their characteristics but carrying the additional feature of the right to convert into ordinary shares. This right, known as conversion right, is normally expressed in terms of conversion price or conversion ratio.

(a) Conversion Price

This is the par (nominal) value of each unit of loan stock that will convert into one ordinary share. The conversion price can be set such that it increases over time to match expectations regarding increase in future share price. Thus ₦1000 par value loan stock might have, for each ordinary share, a conversion price of ₦100 of stock in first two years, ₦110 in the next two years and ₦120 in the third two-year period. This means that as the company moves into the future, fewer shares will be exchanged for one unit of loan stock. Conversion price can also be set such that adjustment could be made for share split or dividend that is declared after the convertible is sold.

(b) Conversion Ratio

This is the quantity of ordinary shares that will be exchanged for each unit of loan stock. The conversion ratio may be specifically stated or can be worked out from the conversion price which can be set at a percentage over and above the current market price.

ILLUSTRATION 13-2

L & K Plc has just issued at par ₦50 million, 15% convertible loan stocks in units of ₦1,000 each. The conversion terms allow ₦5000 of stock to be converted into 100 ₦1 ordinary shares.

Calculate the conversion price and the conversion ratio.

SUGGESTED SOLUTION 13-2

100 ordinary shares will exchange for = ₦5,000

$$1 \text{ ordinary share} = \frac{₦5000}{100}$$

$$= ₦50$$

$$₦5,000 \text{ loan stock} = 100 \text{ ordinary shares}$$

$$₦1 \text{ Loan Stock} = \frac{100}{₦5,000} \text{ ordinary shares}$$

$$₦1000 \text{ loan stock} = \frac{100}{₦5000} \times \frac{₦1000}{1} \text{ ordinary shares}$$

That is, 20 shares will be received = 20 shares from the conversion of each ₦1,000 of loan stock

(c) Conversion Value

This is the market value of the quantity of shares into which a unit of loan stock will be converted. It can be expressed as conversion ratio times market price of share at the time of issue. Thus assuming the current market price is ₦40, the conversion value using the above illustration will be ₦40 x 20 = ₦800.

The conversion value will be below the value of the convertible stock at the date of issue but will be expected to increase over time because the market price of the share is expected to increase as the date for conversion approaches.

(d) Conversion Premium

This is the difference between the issue value of the convertible stock and its conversion value at the date of

issue. If each unit of ₦1000 convertible is issued at par then the issue value will be ₦1000. The conversion premium will be ₦1000 - ₦800, which is equal to ₦200 or as it is done more frequently

$$\frac{\text{₦1000} - \text{₦800}}{\text{₦800}} \times 100\% \text{ which is equal to } 25\%$$

This can also be expressed as:

$$\left(\text{Conversion price} - \text{Market price of share at the date of issue} \right) \times (\text{Conversion ratio})$$

Using the above figures, this will be (₦50 - ₦40) x 20 = ₦200.

A company will endeavour to issue a convertible loan stock with as much premium as possible by setting a high conversion price or a low conversion ratio. The company, by doing this, will be able to issue low number of new shares for a given amount of capital raised.

13.3.4.2 Advantages of convertible loan stocks to the company

The following are the advantages that accrue to a company which finances its operations through the issue of convertible loan stocks.

(a) Avoidance of excessive interest payments

In a period of high interest rates, the company may be able to avoid unduly high interest payments. It can issue convertible stock at lower rate than issuing the straight loan stock at the high current interest rate because of the conversion right. The greater the value of this right to investors, the lower the servicing cost the company has to pay in order to sell the issue.

(b) Risk

A company whose rating by lenders is very poor might not be able to raise the straight long term debt. If, however, it has good growth potentials, it can still

successfully raise finance via the issue of convertibles. The market views the issue from the stand point of its quality as ordinary shares rather than its quality as a "straight".

(c) Access to funds

In a period of tight monetary conditions, the prospect of sharing in the future profits of the company may encourage investors to put their money in it.

(d) Financial Market Meltdown

Where there is a market meltdown and prices are depressed, convertibles offer an alternative source of capital to ordinary shares. The company might not want to issue shares at very low prices as enough funds will not be received for its programmes.

(e) Reduction in Earnings Per Share (Dilution)

Raising capital through convertible stock rather than through ordinary shares creates less dilution in earnings per share. While the conversion price is usually set higher than the current market price of the share, the price of the new issue of ordinary shares is usually lower in order for the issue to be successful in the market. Few numbers of shares are consequently made in the case of convertibles while more shares are issued in the case of new issue of ordinary shares.

(f) Financing Strategy

Convertibles, as against new shares, can be used as a financing strategy. Management may, due to asymmetry of information be able to assess the future potential of the company better than the market. They therefore issue convertibles now, so that if their expectations materialise, the share price would rise. It should be noted that this benefit hinges on the ability of management to assess the future more correctly than the market.

13.3.5 Warrants

A warrant, also known as subscription right, is a right to buy new shares of a company, during a specified period in future, at a price determined now. This price is known as exercise price.

Warrants are normally issued by the company as part of the issue of unsecured loan stocks to act as 'sweeteners' for such stocks; that is, to make them more marketable.

The following are the salient features of a warrant:

(a) Exchange Ratio

This is the number of shares which the holder of the warrant is entitled to buy for each warrant. This is normally stated in the warrant itself at for example 1 for 1.

(b) Price

This is the exercise price which is pre-determined and fixed. However, it may be stepped up over time during the exercise period (the period during which the right can be exercised). It may be stated, for example, as ₦10 per share until a particular date and ₦11.25 per share until the expiry date. The exercise price is normally set at the time of the issuance of the warrant, over and above the market price of ordinary share of the company. This premium may be, 15% percent above the share price. If the exercise price is set, for instance at ₦15, it means the holder must pay ₦15 per share in order to exchange one warrant for one share.

(c) Independence

Once issued, warrants are traded on the stock market, independently of the loan stock underlying their issue.

(d) Other Rights

Holders are not entitled to any cash dividends paid on ordinary shares and they have no voting power. However, the exercise price is usually adjusted to take care of any share split or declared dividend.

13.3.5.1 Advantages of warrants to a company

(a) Lower cost of funds

The company is able to pay a lower interest rate because of the opportunity to share in the future prospects of the company by investors.

(b) Restrictive Covenants

Restrictions placed on the company are less severe for the same reason above.

(c) Access to new loans

The company will be able to raise new loans with less difficulty.

(d) Additional Equity base

Warrants, when exercised, will add to the equity base of the company. This will increase the company's ability to raise new loan stock even when the original loan is still to be repaid.

(e) Cash Flow

Cash outflow of dividends can be delayed until a future time when the company is, presumably, in a financially comfortable position.

13.4 SUMMARY AND CONCLUSIONS

The various sources of short-term and long-term finance have been discussed. The common characteristics of short-term funds are low return to the investors (and therefore low cost to the company), low risk, high liquidity but zero growth. The long-term sources of finance which were discussed are the long-term securities quoted on the stock market.

These include the basic ones which are loan stocks (debenture), preference shares and equity shares. Others are convertible loan stock and warrants. Each of these securities has its own unique characteristics in terms of issue or floatation costs, servicing costs, income payment, capital repayment, tax effect and dilution of control. Financial managers, in raising capital, must consider the unique characteristics of each of the instruments, both in absolute and relative terms, before making a decision on which source(s) is the best vis-à-vis the long-term strategic objective(s) of the firm.

*Refer to Comprehensive Questions and Suggested Solutions in Appendix II
Page 465*

13.5 REVISION QUESTIONS

13.5.1 MULTIPLE CHOICE QUESTIONS

1. Which of the following is NOT a source of short term finance?
 - A Trade credit
 - B Debentures
 - C Bankers Acceptance
 - D Commercial Papers
 - E Bank overdrafts

2. Trade credit has a real cost in ONE of the following situations.
 - (i) Where no cash discount is offered
 - (ii) Where cash discount is offered but no advantage is taken thereof.
 - (iii) Where cash discount is offered and advantage is taken of the discount
 - A (i) only
 - B (i) and (ii)
 - C (ii) only
 - D (i) and (iii)
 - E (iii) only

3. Which of the following is not a relevant factor when taking a decision to raise money through loan stocks?
 - A Issue Costs
 - B Servicing Costs
 - C Control
 - D Capital repayment
 - E Interest payment

4. Which of the following is not an advantage of convertible loan stock?
 - A Avoidance of excessive interest payments
 - B Access to funds in a period of tight credit
 - C Alternative to ordinary shares where there is a market meltdown
 - D Need to pay interest immediately.
 - E Avoidance of immediate earnings per share dilution

5. A warrant is a right
 - (i) To buy new shares in the future
 - (ii) To sell new shares in the future
 - (iii) To buy and sell new shares in the future

- A (ii) only
- B (i) only
- C (i) and (ii)
- D (i) and (iii)
- E (ii) and (iii)

13.5.2 SHORT ANSWER QUESTIONS

Use the following information to answer questions 1 and 2

The supplier of your company has given (and you have accepted) the following terms "2/10 net 30"

1. What is the effective cost of credit per annum?
2. Assuming interest rate in the economy hovers around 40% per annum, will you advise your company to take advantage of the discount? Show your calculation.
3. In a convertible loan stock agreement, how is the conversion right expressed?
4. In the issuance of a convertible security what is the conversion value?
5. In the issuance of warrants, what is exchange ratio?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

VALUATION OF SECURITIES

14.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ◆ Define different concepts of value as used in finance literature;
- ◆ Understand how debenture holders value their securities;
- ◆ Explain how preference shareholders value their shares;
- ◆ Understand how ordinary shareholders value their shares;
- ◆ Know the process of determining the value of a convertible loan stock; and
- ◆ Understand how warrants are valued by the markets.

14.1 INTRODUCTION

Financial managers of a company should be interested in how investors value in units, the shares and debentures of their company. There is a strong relationship between many financial decisions of the company and the value of that company's share. Financial decisions are taken against the backdrop of the need to, at least in principle, maximise this value. Also, an investor's expectations regarding future cash receipts from the share or debenture determines how much will be paid for the share or debenture; it is these same expectations that financial managers are attempting to satisfy.

The principles that were learnt in time value of money will be applied in determining respectively the value of the following major securities: debenture, preference share, ordinary share, convertible loan stock and warrant.

14.2 CONCEPTS OF VALUE

There are various concepts of value, depending on what value is being discussed. They are: the book value, the market value, the intrinsic value, the going-concern value and the break-up value.

(a) Book Value of an Asset

The book value of an asset is the value of an asset as stated in the books of account. It is the cost less depreciation to date. The book value of the firm is the aggregate book value of all the company's assets less

the total book value of its liabilities and the total book value of preference shares (if any).

(b) Market Value

The market value of an asset is just the price at which the asset will be bought and sold in the open market. The market value of a security is the market price of the security. The market value of a firm is usually taken to be the higher of its break-up value or going-concern value.

(c) Intrinsic (true) value

The intrinsic value of a security is what the value should be if appropriately valued based on the company's fundamentals, that is, - its turnover, earnings, assets, future prospects, management and so on. This value is its economic value. If the stock market is price efficient (that is, all new information about a share is immediately incorporated into its price) the market price of the share should hover around its intrinsic value.

(d) Going-concern value

This value is based on the assumption that the firm will continue to operate into an indefinite future period and generate positive future cash flows for its investors. This is the value that will be assumed in this chapter.

(e) Break-up (Gone Concern)

This is the value of the firm where the assets (class of assets) are individually sold at their realisable values. This often happens when the firm is being liquidated and assets have to be realised in order to pay off the liabilities of the firm and distribute the balance (if any) to the owners.

The value which this chapter will be discussing is the intrinsic or true value of a security. This is the discounted value of future cash receipts from the security; using the investor's required rate of return as the discount rate.

14.3 VALUE OF DEBENTURES

The perpetual debenture will, first be discussed.

14.3.1 Perpetual Debentures

This is a debenture where a fixed amount of interest is paid for an indefinite time (infinity).

The present value of a debenture is obtained simply by capitalising the interest payments at the lender's required rate of return. This required rate of return may be represented by 'k' and it is the risk-free rate plus a premium for risk. It should be noted that there are different interest rates in the long-term corporate bond (debentures) market because of different degrees of risk.

The value of a perpetual debenture can be mathematically expressed as $\frac{I}{K_d}$ where I is the fixed periodic interest paid

K_d is the lender's required rate of return.

ILLUSTRATION 14-1

Assume an investor intends to purchase a ₦1000 debenture issued at par. The coupon rate is 15%; with promise of a fixed interest payment for an indefinite period. If the required rate of return of the investor is 20% determine the value of the debenture.

SUGGESTED SOLUTION 14-1

$$\begin{aligned} V &= \frac{I}{K_d} \\ &= \frac{150}{0.20} \\ &= \text{₦}750 \end{aligned}$$

The investor will buy this debenture for ₦750 as this is its true value. If the actual market price is greater than this amount, it does not pay him buying the debenture.

14.3.2 Debentures with specified maturity dates

If a debenture has a specified maturity date, its value will be determined not only by the interest payment; the capital repayment at maturity will also be considered. The formula for valuing such a debenture is given as follows:

$$V = \frac{I}{(1 + K_d)} + \frac{I}{(1 + K_d)^2} + \dots + \frac{I}{(1 + K_d)^n} - \frac{C}{(1 + K_d)^n}$$

Where V is the market value of the debenture, I is the annual interest, C is the capital to be repaid at final maturity date, K_d is the yield to redemption on the debenture and the number of years to redemption

known as 'pull to maturity'. It should be noted that this yield to redemption is also the required rate of return. It can also be referred to as market rate of interest as opposed to the coupon rate.

ILLUSTRATION 14-2

An investor intends to purchase a ₦1000 debenture in KNJ Plc. The debenture originally issued at par in 2009 is due for redemption in 2017. If the coupon rate is 16% and lenders, in general consider 20% as required rate of return, given the risk of the debenture, determine the value of the debenture.

SUGGESTED SOLUTION 14-2

$$V = \frac{160}{(1.20)} + \frac{160}{(1.20)^2} + \dots + \frac{160}{(1.20)^8} + \frac{1000}{(1.20)^8}$$

$$= \text{₦}160 (PV_{A\ 20\ \%.8}) + \text{₦}1,000 (PV_{S\ 20\ \%.8})$$

Using the present value of annuity table and present value of a sum table respectively, it will be observed that the $PV_{A\ 20\ \%.8}$ is 3.8372 and $PV_{S\ 20\ \%.8}$ is 0.2328. Given this situation

$$V = \text{₦}160 (3.8372) + \text{₦}1000(0.2328)$$

$$= \text{₦}613.95 + \text{₦}232.8$$

$$= \text{₦}846.75$$

14.3.3 Behaviour of Debenture Values

Debenture values fluctuate in response to changes in market interest rates relative to coupon rates. The lower the market interest rate (yield to maturity) compared with the coupon rate, the higher the value of the debenture. In the above example, assuming lenders are, in general, now demanding 14% as their appropriate rate of returns. The value will be:

$$V = \text{₦}160 (4.6385) + \text{₦}1000 (0.3506)$$

$$= \text{₦}742.16 + \text{₦}350.60$$

$$= \text{₦}1,092.96.$$

The required rate of return on a security is a reflection of the risk of the security as perceived by investors. In the above example, when the required rate of return falls to 14%, it means the market's perception

of the risk of the security has dropped. Investors are therefore prepared to pay a premium in purchasing the debenture by paying ₦1,092.82 now to receive ₦1,000 at maturity. In the earlier case, the debenture had to be sold at a discount to its face or par value before investors could purchase such a debenture. It is by buying at the price of ₦846.75 that they would be able to enjoy the same financial benefits that are available from the next best alternative investment in the same risk class, yielding 20% return.

For a given change in required return, the value of a debenture will fluctuate by a greater amount, when there is a long pull to maturity (the remaining life of the security). Also, the value of a debenture will be nearer its redemption value, the nearer it is to its redemption date. When there is a short pull to maturity, interest payment and changes in required return play a less significant role in determining the value of a debenture in the bond market. However, when there is a long pull to maturity, the debenture has a great risk of price change when changes occur in the general level of interest rates.

14.3.4 Non-Interest Bearing Debentures (zero - coupon debentures)

These are debentures that pay no interest. Instead, the debentures are sold at high discount to the par value with the return solely in steady capital appreciation over its original low price value toward the redemption date when the debenture will be redeemed at its nominal value.

The formula for zero-coupon debenture is:

$$V = \frac{C}{(1 + K_d)^n}$$

ILLUSTRATION 14-3

Assume Kaylat Plc issues a zero-coupon debenture having a 12- year pull to maturity and par value of ₦1000. If an investor's required rate of return is 15%, find the value of the debenture.

SUGGESTED SOLUTION 14-3

Using the above formula

$$V = \frac{C}{(1 + K_d)^n}$$

The value will be: $\frac{1,000}{(1.15)^{12}}$

Using the present value of a sum table, the discount factor (at 15% for 12 years) is 0.1869. Then,

$$\begin{aligned} V &= \text{₦}1,000 \times 0.1869 \\ &= \text{₦}186.90 \end{aligned}$$

If the debenture is purchased for ₦186.90 and is held to maturity for redemption for ₦1000, the original investment would have given a 15% yield on investment

14.3.5 Interest Paid twice a year (Semi-annually)

Where compounding takes place twice a year (as against once a year), there is need to modify the 'value formula' as follows:

$$V = \frac{\frac{I}{2}}{\left(1 + \frac{K_d}{2}\right)} + \frac{\frac{I}{2}}{\left(1 + \frac{K_d}{2}\right)^2} + \dots + \frac{\frac{I}{2}}{\left(1 + \frac{K_d}{2}\right)^{2n}} + \frac{V}{\left(1 + \frac{K_d}{2}\right)^{2n}}$$

Where K_d is the required rate of return, $\frac{I}{2}$ is the amount of interest paid semi-annually and $2n$ is the number of semi-annual periods till maturity.

ILLUSTRATION 14-4

Birlet Plc 18% Debenture Stock has 7 years to maturity. Interest is paid semi-annually. If the nominal required rate of return is 20% p.a., Calculate the value of a ₦1000 - face value debenture.

SUGGESTED SOLUTION 14-4

The value of this debenture is calculated as follows:

$$\begin{aligned} V &= \overset{PV_A}{90} + \overset{PV_S}{1000} \\ &= \text{₦}90 (7.3667) + \text{₦}1,000 (0.2633) \\ &= \text{₦}663 + \text{₦}263.30 \\ &= \text{₦}926.30 \end{aligned}$$

It should be noted that the above calculations involve four variables- the coupon rate, the yield, maturity and market price (value). Once any three of the four variables are known, the fourth can be calculated.

14.4 VALUE OF PREFERENCE SHARES

As mentioned earlier in this pack, preference shares have no stated maturity dates and holders are entitled to fixed income. This fixed income, which is in form of dividend, goes into an indefinite future period.

In view of the above, the same valuation approach, as used in perpetual debentures, will be used.

The value of a preference share is, represented by $V = \frac{D_p}{K_p}$

Where V is the present value, D_p is the stated dividend per annum per share and K_p is the required rate of return.

ILLUSTRATION 14-5

Sirkay Plc has in issue 15% ~~£~~5m preference shares of ~~£~~1 each. If the required rate of return is 20%, determine the value of each preference share.

SUGGESTED SOLUTION 14-5

Using the above formula:

$$V = \frac{D_p}{K_p}$$

$$V = \frac{0.15}{0.20}$$

$$= \text{£}0.75 \text{ per share.}$$

14.5 VALUE OF ORDINARY SHARES

There is no one generally acceptable method of valuing an ordinary share. However, there is one method that is so commonly used. This method looks at the value of an ordinary share as the discounted value of all expected cash dividends to be paid by the company for an indefinite future period. The formula for this expression can be written as follows:

$$V = \sum_{t=1}^{\infty} \frac{D_t}{(1 + K_e)^t}$$

Where D_t is the cash dividend to be received at the end of time period t , and K_e is the required return for the investor.

The above formula is appropriate for a trustee of a perpetual trust fund who intends to hold the shares indefinitely. If an investor intends to sell his shares, say after three years, the formula can be adjusted as follows:

$$V = \sum_{t=1}^3 \frac{D_t}{(1 + K_e)^t} + \frac{P_3}{(1 + K_e)^3}$$

Where P_3 is the expected selling price of the share at the end of the third year assuming that buyers are prepared to acquire the shares at the end of the three years. These buyers would in turn base their decision to buy at a particular price on expectation of future dividends and future selling price at the time of disposal. This process and thinking go on and on successively for an indefinite period of time. It is clear from the above process that what the shareholder receives from the company is cash dividends. There is, therefore, justification for the use of dividends as the basis for the valuation of ordinary shares.

14.5.1 Dividend Valuation Models

The use of dividend valuation models for computing the intrinsic value of a share involves making some specific assumptions about dividend growth patterns and required rates of return. The first of these models is the one of constant growth in rate of dividends.

(a) Constant Growth Dividend Model (Perpetual Growth Model)

In this valuation model, dividends per share are assumed to grow indefinitely at a compound growth rate, 'g'. This translates into the following formula:

$$V = \frac{D_1}{K_e - g}$$

Where D_1 is the dividend expected to be received at the end of year 1, (K_e) is the required rate of return for the share and (g) is the assumed constant growth rate.

ILLUSTRATION 14-6

JMJ Plc plans to pay a dividend of ₦2 per share at the end of year 1. This dividend is expected to grow indefinitely at the rate of 10 percent. The required rate of return on this share is 15 percent. What is the value of MJM Plc's share?

SUGGESTED SOLUTION 14-6

Applying the above formula:

$$V = \frac{2}{0.15 - 0.10}$$

$$= \text{₦40}$$

It should be noted that where the dividend is the dividend that has just been paid (as against expected to be paid), this is dividend at the beginning of the year D_0 . This should be converted to D_1 by multiplying D_0 by $(1+g)$, that is $D_0 (1+g)$.

(b) Constant Growth Dividend Model Price-earnings (P/E) Multiple Approach

At times the value of an ordinary share can be computed using the P/E multiple approach. This approach enables a prospective investor to know how much he will pay for every Naira of future expected earnings. In using this approach, the dividend constant growth model will be expressed in terms of earnings, as shown in the following illustrations.

ILLUSTRATION 14-7

JMJ Plc retains a constant percentage of its earning each year. This can be represented by X . The dividend payment ratio will also be constant at say $(1-x)$

SUGGESTED SOLUTION 14-7

$$\text{Thus } \frac{D_1}{E_1} = 1 - x$$

$$D_1 = E_1 (1 - x)$$

Substituting for D_1 in the dividend constant growth model

$$V = \frac{E_1 (1 - x)}{K_e - g}$$

That is: $V(K_e - g) = E_1 (1 - x)$

$$V/E_1 = \frac{(1 - x)}{K_e - g}$$

Assuming JMJ Plc intends to retain every year 30% of its future expected earnings then

$$\begin{aligned} \frac{V}{E_1} &= \frac{1 - 0.30}{0.15 - 0.10} \\ &= \frac{0.70}{0.05} \\ &= 14 \text{ Times} \end{aligned}$$

This is the P/E multiple (or ratio).

Based on ~~₦~~2 per share dividend and 0.70 pay-out ratio, the earnings per share (EPS) will be ~~₦~~2/0.70 and this will be approximately ~~₦~~2.80. The value of the share can then be obtained by multiplying the EPS by the P/E ratio; that is (~~₦~~2.80 X 14) which will be equal to approximately ~~₦~~40.

Although, this is an alternative valuation model, it is still based on the dividend constant growth model.

(c) Zero Growth

This assumes that the present level of dividend will be maintained indefinitely. The constant growth model can be modified for no growth situation as follows:

$$\begin{aligned} V &= \frac{D_1}{K_e - 0} \\ &= \frac{D_1}{K_e} \end{aligned}$$

ILLUSTRATION 14-8

ABC Plc plans to pay a constant dividend of ₦2 per share indefinitely. The required rate of return on the share is 20 percent. Calculate the value of the share.

SUGGESTED SOLUTION 14-8

Using the above formula:

$$V = \frac{D_1}{K_e}$$

$$V = \frac{2}{0.20} = ₦10.00$$

Irregular Growth Rate

The growth patterns of dividends for some companies, particularly the young growing ones, may not follow the normal patterns shown by mature companies. Initially their dividend payments, because of their above-average earnings performance, may be following above-average patterns.

After sometime, competition and other factors may force them to revert to the normal growth patterns within the industry. The valuation of the shares of such companies will be done in three stages:

Stage 1: Calculation of the present value of each of the dividends paid during the above-average growth pattern, taking into account the compound growth rate, and addition of the PVs.

Stage 2: Calculation of the present value of dividend (with a constant growth 'g') paid for an indefinite future period.

Stage 3: Addition of the PVs obtained in stages 1 and 2.

ILLUSTRATION 14-9

YSG Plc is expected to achieve an above-average performance in the next six years of its operations, with dividends growing at say 12% per annum. After this period, it is envisaged that competition from both existing companies and new entrants will set in. The growth in dividends might consequently revert to industry average of say 8%

The current dividend is ₦1 per share. What should be the value of the share now, if the required return on capital is 10%?

SUGGESTED SOLUTION 14-9**Stage 1**

End of year	Dividend	Discount Factor @ 10%	PV
1	₦1 (1.12) : ₦1.12	0.909	1.02
2	₦1 (1.12) ² : ₦1.25	0.826	1.03
3	₦1 (1.12) ³ : ₦1.41	0.751	1.06
4	₦1 (1.12) ⁴ : ₦1.57	0.683	1.07
5	₦1 (1.12) ⁵ : ₦1.76	0.621	1.09
6	₦1 (1.12) ⁶ : ₦1.97	0.564	<u>1.11</u>
			<u>6.38</u>

Stage 2

Value of share at the end of year 6 (that is beginning of year 7)

$$\begin{aligned}
 &= \frac{D_7}{K_e - g} \\
 &= \frac{\cancel{₦1.97} \times 1.12}{0.10 - 0.08} \\
 &= \frac{\cancel{₦2.21}}{0.02}
 \end{aligned}$$

Value now of year 6 price: ~~₦110.50~~ (0.564)

$$= \cancel{₦62.32}$$

Stage 3

Value of share now = ~~₦6.38~~ + ~~₦62.32~~

$$= \cancel{₦68.70}$$

The above iterative process can also be expressed in terms of the following formula:

$$V = \sum_{t=1}^6 \frac{D_0 (1 + g^*)^t}{(1 + K_e)^t} + \left(\frac{D_7}{K_e - g} \right) (1 + K_e)^{-6}$$

Where g^* is the above-average growth rate while g is the normal growth rate.

It should be noted that the growth of dividends in the second stage uses the expected dividends in year 6 as its base.

14.6 VALUATION OF A CONVERTIBLE LOAN STOCK

A convertible loan stock (or debenture) is a 'hybrid' security it is a loan stock but with the right to convert to ordinary shares in future.

The value of a typical convertible will therefore be discussed from two points of view:

- (a) Its value as a straight loan stock; and
- (b) Its value as its conversion value.

Whatever value a convertible takes on, will be largely influenced by movement in the price of the share of the issuing company. If the price of the share in the market moves up; the value of the convertible will be determined mainly by its conversion value. If the price falls, the value of the convertible will be determined by the value of a straight debenture issued by the same company. In this case, the value of the convertible will not fall below the value of the 'straight'; the convertible is said to have a downside protection against risk.

14.6.1 Value as a Straight Loan Stock

A straight loan stock is convertible without its conversion features, issued by the same company. The value of the convertible will be the price at which the stock will sell in the open market.

Assuming compounding takes place semi-annually, this value can be determined via the following formula:

$$VS_d = \sum_{t=1}^{2n} \frac{I/2}{\left(1 + r/2\right)^t} + \frac{RV}{\left(1 + r/2\right)^{2n}}$$

Where VS_d is the straight debenture value of the convertible.

$I/2$ is the interest payment as determined by the coupon rate and compounded semi-annually.

RV is the redemption value of the debenture.

$2n$ is the number of compounding periods to redemption.

$\frac{r}{2}$ is yield to maturity of a straight loan stock of the same company assuming semi-annual compounding.

ILLUSTRATION 14-10

Fidelis Plc has in issue 12% ~~₦~~1000 Convertible debenture due to mature in 10 years time. The interest is paid semi-annually. A straight debenture similar in all respects to the convertible except that it has no conversion features, can be sold in the market to yield 16% per annum. Calculate the straight debenture value of the convertible.

SUGGESTED SOLUTION 14-10

$$VSD = 60 \left(PV_{A \ 8\%, \ 20} \right) + \cancel{\text{₦}}1000 \left(PV_{S \ 8\%, \ 20} \right)$$

$$VSD = 60(9.818) + \cancel{\text{₦}}1000(0.215)$$

$$= \cancel{\text{₦}}589.08 + \cancel{\text{₦}}215.00$$

$$= \cancel{\text{₦}}804.08$$

$$= \cancel{\text{₦}}804 \text{ Approx.}$$

14.6.2 Value as its Conversion Value

As earlier said, the conversion value of a convertible is simply the product of the current market price of its company's share and the conversion ratio. This value is a function of the attractiveness of the conversion feature which, in turn, depends on the upward movement of the share price. However a convertible because of its downside protection will normally sell over and above its conversion value. Volatility of share price increments add some value to this downside protection. The more volatile the share price movement is, the greater the value added; and the greater the likelihood of the convertible selling at a price over its conversion value.

14.6.3 Premiums

When a convertible debenture sells at a price over the straight bond value, the difference is known as a premium over straight bond value. When the convertible sells at a price above its conversion value, the difference is called a premium over conversion value.

In the illustration above, the straight debenture floor value of Fidelis Plc convertible debenture is ~~₦~~804. This means that if the price of the share has dropped so much that the conversion attractiveness is nil or

negligible, the market price of the convertible cannot fall below this floor price of ₦804. The straight debenture value of a convertible does fluctuate over time depending on fluctuations in interest rate and changes in the risk profile of the company. Both variables will affect the expected yield to maturity of the straight debenture and hence its value.

In the market, a convertible will normally sell at a value over and above a straight debenture, that is, at a premium. As long as the market price of the company's share is rising relative to the conversion price, the conversion right has some value and it pays to convert. To the extent that the conversion right has some value, the convertible will be selling at a value over and above the straight debenture value. The higher the market price, the greater the difference between these two values (the premium).

The major reason for the existence of premiums in both cases is the uncommon attractiveness of a convertible due to its dual characteristics of a debenture and a built-in option. The security simultaneously gives the holder a protection against downside risk and an opportunity to share in the future fortunes of the company if and when its share price goes up.

14.7 VALUE OF A WARRANT

The theoretical value of a warrant can be calculated by the following formula:

$N(P_o - E)$ where P_o is the current market price of the ordinary share of the company, E is the exercise price and N is the number of shares the holder of the warrant can buy with one warrant.

Assume, for example, that a holder of one warrant is entitled to purchase one share at ₦1. He is also allowed to exercise this warrant anytime within the next four years. The present market price of the share is ₦4. The theoretical value of the warrant should be $1(₦4 - ₦1) = ₦3$. The actual price of the warrant in the market should not drop below ₦3. If it falls below this figure, speculators will move in, buy up the warrants, exercise them and sell the shares. The arbitrage activity will push back the price of the warrant to ₦3.

Where the actual market price of the share is less than the exercise price, the theoretical value of warrant is nil. The actual market price of the warrant should normally be higher than its theoretical value. The reason is the gearing benefits which accrue to buyers of warrants.

Suppose the exercise price of a warrant is ₦4 when the price of the underlying share is ₦6; this gives the warrant's theoretical value of ₦2. Suppose further

that there is a 50% upward change in share price to ₦9, then the theoretical value will be ₦5 or 150%.

It will be seen from the above that a greater benefit will accrue from holding the warrant rather than holding the share. Gearing, of course, also operates to the disadvantage of the warrant holder, as against the shareholder. Where there is a drop in the price of the share, there will be more than proportionate loss to the warrant holder. For example a 10% downward change in price

would create a 30% drop in the theoretical value of the warrant $\left(\text{₦}2 - \frac{\text{₦}1.40}{2} \right)$.

However, the warrant cannot fall to a price below zero. For the warrant price to fall to zero, the thinking in the market must be that the share price cannot rise over the exercise price during the exercise period; this is not so.

Market prices are, in general, usually over their theoretical values. This is because when prices of the underlying shares are going up, warrants do have potentials for upward movements in their values; however when prices of the shares are falling there is a downward protection, in that the value of a warrant cannot fall below zero.

14.7.1 Value of a Warrant using the DCF Approach

In terms of the discounted cash flows, the current value of warrant should be the difference between the future price of the share and the exercise price of the warrant. This relationship can be stated in terms of the following formula.

$$V_w = \frac{P_o(1+g)^n - E}{(1+K_w)^n}$$

Where V_w is the current value of the warrant

P_o is the current market price of the share

g is the expected growth rate in share price.

K_w is the cost of capital relevant to the warrant.

n is the number of time periods expiring before the warrant is exercised.

14.8 SUMMARY AND CONCLUSIONS

The processes of determining the intrinsic values of various financial assets have been highlighted. The value in each case, is what it should be, given the fundamentals of the issuing company. The intrinsic or true value of any financial asset is of particular interest to the investor. This value is normally compared with actual market price before a decision to buy or sell is taken. The Discounted Cash Flow (DCF) method has been used in the valuation process of the securities discussed. The full cash receipts from each asset should be discounted to their present worth, using the cost of capital appropriate to that security.

*Refer to Comprehensive Questions and Suggested Solutions in Appendix II
Page 465*

14.9 REVISION QUESTIONS

14.9.1 MULTIPLE CHOICE QUESTIONS

1. The discounted value of future cash receipts from a security is that security's
 - A Market value per unit
 - B Net asset value per share
 - C Intrinsic value
 - D Going-concern value
 - E Break-up value

2. A debenture where a fixed annual amount of interests is paid for ever is called:
 - A Redeemable debenture
 - B Irredeemable debenture
 - C Long-term debenture
 - D Medium-term debenture
 - E Convertible debenture

3. The market rate of a fixed interest security is its
 - (i) Coupon rate
 - (ii) Nominal rate
 - (iii) Yield
 - A (i) only
 - B (iii) only
 - C (ii) only
 - D (i) and (ii)
 - E (ii) and (iii)

Use the following information to answer questions 4 and 5

JIB Plc issued 12 per cent ₦1,000 debenture stock five years ago. It is due for redemption in the next five years. Currently, investors in general are asking for 15% per annum as the appropriate rate of return

4. Considering the current characteristics of this debenture, will its value increase or decrease?
 - (i) increase
 - (ii) decrease
 - (iii) remain unchanged

- A (i) only
- B (ii) only
- C (i) and (ii)
- D (ii) and (iii)
- E (iii) only

5. Calculate the expected value of the security.

- A ₦1,250
- B ₦1,000
- C ₦1,120
- D ₦1,150
- E ₦800

14.9.2 SHORT ANSWER QUESTIONS

1. A bond which does not make any periodic interest payments but instead is traded at a price much below its per value is called _____
2. What is a perpetual debenture?
3. What is the difference between interest yield and yield to maturity?
4. (i) What is the similarity between preference shares and debentures?
(ii) In terms of valuation, what is the relationship between preference shares and irredeemable debentures?
5. Where growth rate, (in using the Gordon's growth formulae) is not given, how will this rate be estimated?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

MEDIUM-TERM SOURCES OF FINANCE

15.0. LEARNING OBJECTIVES

After reading this chapter, readers should be able to.

- ◆ Discuss the main medium-term sources of finance available to a company;
- ◆ Highlight the two main categories of lease and state the major differences between them;
- ◆ Describe the main types of finance lease;
- ◆ State the steps involved in evaluating a lease or buy decision;
- ◆ Appraise a lease or buy investment proposal and take an appropriate decision; and
- ◆ State the advantages and disadvantages of a lease arrangement to the lessee.

15.1 INTRODUCTION

Medium-term sources of finance provide funds on fairly more permanent basis than short-term sources. The periods of loan usually lie between one year and seven years, although, what constitutes medium term is not exactly specified. Financial managers normally utilise funds obtained from these sources to finance fixed assets and investments in stocks and debtors. Repayments of loans from these sources are usually from cash flows generated in future years and are made in regular periodic instalments. The major sources that will be discussed in this chapter include medium term bank loans, equipment financing, project financing and financial lease financing.

15.2 MEDIUM-TERM BANK LOANS

These are loans given out by commercial banks for periods ranging from one year to five or seven and even ten years. They are usually given to companies to finance their medium-term working capital requirements or to finance on a longer time basis their fixed assets needs. There is usually a legal contractual loan agreement which specifies the terms of the loan and right of the parties to the loan transaction. Interest is usually charged on the amount borrowed to cover the period of the loan. The amount charged varies between banks and it is usually a specified percentage say, between 2% and 5% over a bank's prime lending rate depending on the bank's opportunity cost of funds and the risk perception of the company by the bank. In addition there is a fixed percentage up to 2 percent of the amount borrowed as a flat charge called

“management fees” or “administrative charges”, by the banks. Repayments are normally geared toward the cash flow generating patterns of the company but generally they are made either in periodic equal annual instalments or in lump sum at the end of the period of the loan. The former is more common.

The loan agreement usually provides for a period during which only interest will be paid and after which capital repayment starts. This period is called 'rest' period or moratorium period and it gives the company enough time to operate, before generating cash inflows that will be used to start liquidating the loan.

The loan agreements normally provide for the loan to be secured by a fixed charge on the company's specific property or a floating charge on all the assets of the company, valuable and invaluable.

15.3 EQUIPMENT FINANCING

This is the type of loan finance, obtained by a company, whereby the company uses its equipment as collateral for the loan. The equipment might have been already owned by the company or might be about to be purchased. The terms of the loan normally spread into future years, hence, it is treated as a medium-term finance.

The bank normally advances only a percentage of the market value of the equipment to create some margin of safety. What percentage will be advanced will depend on the marketability of the equipment (if it were to be sold); it may be 80%, 60% or 40%. The repayment schedule for the loan will be prepared to match the economic loss of value of the equipment such that at any point in time, the market value of the equipment will be more than the balance of the loan.

15.4 PROJECT FINANCING

This is the finance provided by the bank whereby the project itself serves as security for the loan. The bank looks at the project cash flows as the main source of repayment. The company's fundamentals - profitability, asset base - are of secondary importance.

The project should have identifiable cash flows and its risks should be assessable. Banks usually ask for higher returns on finance because of its attendant high risks. In addition they normally ask for domiciliation of the cash proceeds of the project.

15.5 LEASE FINANCING

A lease is a contract whereby the owner (the lessor) of an asset gives an exclusive right to another person (the lessee) to use the asset for a specified period of time in consideration for services of payments known as “lease payments (or rent)”.

There are two main types of lease:

- (a) Operating lease; and
- (b) Financial lease

The discussion in this study pack will focus on the financial lease, although, it is necessary to know the difference between the two types.

15.5.1 Operating Lease

This is a cancellable short-term lease contract usually shorter than the useful life of the asset. The contract can be determined at the instance of the lessee provided adequate notice had been given to the lessor. Examples of operating lease are, leases of photocopy machines, computer hardware, cars and so on.

15.5.2 Financial Lease

This is a non-cancellable long-term contract in which the period of the contract and the useful life of the asset are the same. Lease payments are made throughout this period. If and when the lease period expires, the lessee may return the asset or renew the lease contract or purchase the asset.

15.5.3 Differences Between Operating Lease And Financial Lease

- (a) Operating lease is a cancellable lease while financial lease is non-cancellable lease.
- (b) Operating lease is a short-term lease while financial lease is a long-term contract.
- (c) In operating lease the lessor is responsible for repairs, maintenance, insurance while in financial lease the lessee is responsible for carrying out these activities.

15.5.4 Types of Financial Lease

The main types of financial lease are direct lease, sale and lease back and leveraged lease.

(a) Direct Lease

This is the normal type of lease in which the manufacturer or the lessor (which may be a bank, a finance company or a leasing company) gives the lessee the right to use an asset.

The flow of transaction here is that a person (other than the manufacturer) acquires ownership of the asset, sells it to a lessor who in turn leases the asset to the lessee in return for periodic lease payments.

(b) Sale and lease back

In this form of lease, the lessee-company is the original owner of the asset. The company needs cash and at the same time wants a continued usage of the asset. It then sells the asset to the lessor company and leases it back from the lessor-company under the usual terms of a lease. By this arrangement the lessee will be able to get both cash and continued access to the asset.

(c) Leveraged Lease

In a leveraged lease there are three parties involved - the lessee, the lessor and a long-term lender. The lessor of the asset puts down only a certain percentage of the cost of the asset say 20% and borrows the balance from the lender.

The asset and assignment of the lease payments are used as collateral for the borrowing. The lessee's position is, however, not affected by this special arrangement.

Leveraged leasing is used in financing very expensive assets such as aircraft, ships, rigs, railway equipment and advance manufacturing technology (AMT) projects.

15.5.5 Lease or Buy Decision

There are times when financial managers have to make a decision on whether to lease an asset or to outrightly buy the asset.

There are two separate but inter-related decisions involved:

(a) Financing Decision

This involves identifying the cheaper method of financing the asset assuming a decision has been taken to lease the asset or to purchase it outright presumably through borrowing.

(b) Investment Decision

This involves evaluating the economic viability of the asset using the appropriate discounted cash flow method (the net present value) with the right discount rate.

The steps entailed in a lease or buy decision are as follows:

15.5.5.1 Financing Decision

- (a) Determine the patterns of cash flows for each financing method in terms of their magnitude and timing.
- (b) Determine the opportunity cost of funds (the discount rate) for the debt finance. If the company is in a taxable position, the relevant cost is the after-tax cost of debt capital.
- (c) In the case of outright purchase, calculate the appropriate capital allowances for the asset and the tax shield on each of the allowances noting that tax payments are normally in arrears.
- (d) Determine the net cash flow for each year.
- (e) Using the relevant after-tax cost of capital, calculate the discount factor for each year.
- (f) Apply the discount factor for each year to its net cash flow to obtain the present worth of each year's cash flow.
- (g) Add up each years PV to get the aggregate after-tax cost of debt finance.
- (h) In the case of leasing, determine the lease payment for each year noting that lease payments are usually made in advance.

- (i) Using the company's tax rate, calculate the tax shield on each lease payment noting that tax payments are normally in arrears.
- (j) Determine for each year the net cash flow, the discount factor and the PVs of each cash flow.
- (k) Add up each of the PVs to arrive at the aggregate after-tax cost of lease finance.
- (l) Compare the after-tax cost of debt finance with the after-tax cost of lease finance to get the cheaper method of finance.

15.5.5.2 Investment Decision

The steps are:

- (a) Determine the pre-tax operating cash flow for each year.
- (b) Determine the after-tax cost of capital for the asset in the same risk class (assuming the company is in a taxable position).
- (c) Calculate the tax payable on each year's cash flow noting that tax is actually paid in arrears.
- (d) Calculate the after-tax cash flow for each year.
- (e) Using the after-tax cost of capital, calculate the discount factor for each year.
- (f) Multiply the net operating cash flow of each year by its related discount factor to its PV.
- (g) Add up the PVs with the cost obtained through the cheaper method of financing.
- (h) If the above step results in positive NPV, accept the project, if not reject it.

ILLUSTRATION 15-1

DAAP Plc plans to acquire a new machine on January 1. The cost of the machine is expected to be ₦2.5 million. When the machine is put into use, the company plans to inject another ₦300,000 as working capital for the whole life of the machine. Once the machine starts operation, the company expects that it (the machine) will generate additional pre-tax operating net cash flows as follows:

Year	1	₦1,025,000
	2	₦1,143,000
	3	₦1,210,500
	4	₦1,170,500

The company is considering whether to lease or buy the machine. If the machine is to be leased the company (lessee) would make an annual lease payment of ₦750,000 per annum for 4 years; with each payment at the beginning of the respective year. If the machine is to be bought, the company would arrange for a term loan at a fixed rate of interest of 20% per annum. The machine is not expected to have any salvage value. The company believes that the appropriate after-tax cost of capital for a machine in the same risk class as the one to be bought is 22 percent. Company tax is 30%, payable one year in arrears.

Capital allowances are available as follows:

50% initial allowance and 25% annual allowance on a reducing balance basis. These allowances have been calculated as follows:

Year	Initial Allowance 50%	Annual Allowance 25%
	₦	₦
1	1,250,000	312,500
2	-	234,375
3	-	175,781
4	-	<u>131,836</u>
		<u>395,508 *</u>

* Balancing Allowance

Advise whether the machine should be bought or leased.

SUGGESTED SOLUTION 15-1**DAAP LIMITED****Financing decision****Buy**

End of yr	Cost	Capital Allowance	Tax Shield (30%)	Net Cash Flow	PV Factor @14%	PV of cash flow
	₦	₦	₦	₦		₦
0	(2,500,000)			(2,500,000)	1.000	(2,500,000)
1	-	1,562,500		-	0.877	-
2	-	234,375	468,750	468,750	0.769	360,469
3	-	175,781	70,313	70,313	0.675	47,461
4	-	131,836	52,734	52,734	0.592	31,219
		395,508				
5	-		158,203	158,203	0.519	82,107
						<u>(1,978,744)</u>

Lease

End of year	Lease Payment	Tax Shield (30%)	Net Cash Flow	PV Factor @14%	PV of cash flow
	₦		₦	₦	₦
0	(750,000)		(750,000)	1.000	(750,000)
1	(750,000)	225,000	(525,000)	0.877	(460,425)
2	(750,000)	225,000	(525,000)	0.769	(403,725)
3	(750,000)	225,000	(525,000)	0.675	(354,375)
4	-	225,000	225,000	0.592	<u>(133,200)</u>
					<u><u>(2,101,725)</u></u>

Based on the above calculations, it will be cheaper to buy. Buying has a lower cash outflow in present value terms.

Investment Decision

End of Year	Operating Cash Flow	Tax Payable @30%	After Tax Net Cash flow	PV Factor @ 22%	PV of Cash flow
	₦	₦	₦	₦	₦
0	(1,978,744) (300,000)	-	(2,278,744)	1.000	(2,278,744)
1	1,025,000	-	1,025,000	0.820	840,500
2	1,143,000	307,500	835,500	0.672	561,456
3	1,210,500	342,900	867,600	0.551	478,048
4	1,170,500 } 300,000	363,150	1,107,350	0.451	499,415
5		351,150	(351,150)	0.370	<u>(129,926)</u>
				NPV	<u><u>(29,251)</u></u>

The company should not go ahead to obtain the use of the machine since its use will decrease the value of the company by ₦29,251.

Notes:

- (1) It is assumed that investors see the lease and the term loan as perfect substitutes for each other from the stand point of capital structure and the riskiness of the cash flows. The same discount rate is, therefore, used for both leasing and buying through borrowing.
- (2) Since the company is in a taxable position, the correct cost of debt capital to use should be the after-tax cost, that is $20\% (1 - 0.30) = 14\%$.
- (3) The discount rate that should be used to obtain the PV of the machine's cash flows is the after-tax cost of capital relating to these cash flows. A different discount rate of 22% is used because the cash flows of the lease and loan payments have a different level of risk from the cash flow of the machine. The cash flows of the former are deemed more certain.
- (4) The working capital is usually treated as cash outflow at the beginning of the economic life of the machine and cash inflow at the end.

15.5.6 Advantages of leasing to the Lessee

- (a) The lessee needs not tie down a large amount of money.
- (b) The lessee company has access to the use of an asset when either it can afford to buy it or its borrowing capacity has been stretched to the limit.
- (c) Lease payments are allowed for tax purposes and this makes leasing tax efficient.
- (d) The lessee may be paying lower lease rentals as a result of part of capital allowance passed on to it by the lessor.
- (e) In a sale and lease back arrangement the lessee may be able to simultaneously raise cash and still continue to use the asset.
- (f) The lessee is able to avoid the risk of obsolescence that is typical of outright ownership of some assets.

15.5.7 Disadvantages of leasing to the Lessee

Leases are usually very expensive as lease payments contain both interest and profits to the lessor.

15.6 SUMMARY AND CONCLUSIONS

Companies need medium-term finance to be able to finance assets that are fairly permanent in nature. The main medium-term sources of finance are equipment finance, project finance and, most importantly, lease finance. Each of these sources has its own unique characteristics. In particular, lease finance has been treated as a medium term source of finance because it is viewed as an alternative to term loan. There are two major types of lease - the operating lease and the finance lease.

The main focus of financial managers is the finance lease. This is the lease whose usage period coincides with the economic life of the asset leased and is therefore not likely to have any salvage value at the end of its life. The main decision confronting financial managers, here, is whether to lease or buy the asset that is needed for operations. It is not a one-off decision. There are two decisions involved - whether to lease or borrow (financing) and whether to acquire the asset or not (investing). The after-tax cost of leasing will be compared with the after-tax cost of borrowing to ascertain the cheaper method of financing. Then the investment itself will be evaluated to see whether it gives positive NPV and therefore should be accepted. There are advantages and disadvantages accruing to a lessee and these were highlighted.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

15.7 REVISION QUESTIONS

15.7.1 MULTIPLE CHOICE QUESTIONS

1. Medium-term bank loan could be said to be a loan for
 - (i) less than one year
 - (ii) more than one year
 - (iii) period over one year but not fixed
 - A (ii) only
 - B (i) and (ii)
 - C (i) only
 - D (ii) and (iii)
 - E (iii) only
2. What is the name given to the financing of a particular fixed asset where that fixed asset is used as collateral.
 - (i) Fixed asset financing
 - (ii) Long-term financing
 - (iii) Equipment financing

- A (i) only
- B (iii) only
- C (i) and (ii)
- D (i) and (iii)
- E (ii) only

3. A non-cancellable long-term lease is called:

- A Operating lease
- B Long-term lease
- C Fixed asset lease
- D Operating asset lease
- E Finance lease

4. When evaluating a lease or buy capital project and borrowing is treated as alternative to leasing, what is the discount rate to use in the discounting of the lease cash flows?

- (i) company's cost of capital
- (ii) cost of borrowing
- (iii) cost of borrowing or cost of capital

- A (iii) only
- B (i) and (iii)
- C (ii) only
- D (i) and (ii)
- E (i) only

5. Where a company-lessee is in a permanent non-taxable position, what should be the correct cost of debt capital to use?

- (i) before tax cost of debt
- (ii) after tax cost of debt
- (iii) overall after tax company's cost of capital

- A (i) only
- B (ii) only
- C (iii) only
- D (ii) and (iii)
- E (i) and (iii)

15.7.2 MULTIPLE CHOICE QUESTIONS

1. In a lease or buy capital project appraisal, state the two principal steps involved in the evaluation process.
2. In terms of parties to a typical lease agreement, what is the difference between direct leasing and leveraged leasing?
3. State one practical disadvantage of leasing.
4. In project financing, what is the main security for the funds provided and how could this security be perfected?
5. In the borrowing option (of a lease or buy decision) involving fixed equal annual instalments, give the components of the tax shield benefits.

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

COST OF CAPITAL

16.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ♦ Explain the meaning and nature of cost of capital;
- ♦ Describe how risk is incorporated into the cost of capital;
- ♦ Estimate the costs of the major individual sources of capital- debt, preference shares and ordinary shares etc;
- ♦ Estimate the weighted average cost of capital (WACC); and
- ♦ Explain the justification for the use of WACC.

16.1 INTRODUCTION

In capital investment appraisal, a discount rate was used for discounting the future cash flows of a project with a view to determining its NPV. Under the IRR method a "cut-off rate" was assumed or given for comparison with the IRR of the project. Both approaches were aimed at determining the acceptability or otherwise of the project and its eventual effect on the firm's value and, therefore, on the wealth of its shareholders.

This discount rate or cut-off rate as the case may be is the company's cost of capital. In investment appraisal it is given or assumed but in this chapter, what this concept means and how it can be estimated will be discussed.

There is a link between the investment opportunities undertaken by a company and the funds that support those opportunities. The funds are obtained via financial assets issued to individual groups of investors that purchase these assets. These investors require certain minimum rates of returns on their investments. The project's return must achieve these minimum rates if they have to be acceptable. This desired minimum rate (for a particular group) is the firm's cost of capital provided by that group. The symbol normally used for cost of capital is 'K'.

The key question financial managers attempt to answer is: what is 'K' and how should it be measured.

16.2 MEANING AND NATURE OF COST OF CAPITAL

Cost of capital is known as the minimum desired (required) rate of return. Van Horne (2003) defines it as "the rate of return on the project that will leave unchanged the market price of the firm's stock". There are, however, differences of opinion on how cost of capital should be measured.

Cost of capital is an opportunity cost concept. It is viewed as the return which the providers of the capital could earn on their next best alternative investments. Thus, cost of capital is the opportunity cost of funds to be invested in a project and a composite, but an 'average cost. It is an average cost of the individual sources of capital, weighted by the amount of each source within the overall capital structure of the firm. Thus, the cost of each specific source of capital will be computed first before calculating the weighted average cost of capital (WACC).

16.3 COST OF CAPITAL AND UNCERTAINTY

A major problem in measuring cost of capital is how to incorporate uncertainty (risk). There are three components on this cost:

- (a) **The risk-free rate:** the rate desired from a security which is totally free of risk.
- (b) **A premium for business risk:** an increase in the rate of return arising from uncertainty about the future earnings of the firm. Things may not happen as expected, hence there is need for additional return to compensate the investor for the type of risk.
- (c) **A premium for financial risk:** a further increase in the rate of return where the firm borrows and therefore is exposed to the danger of being liquidated. This means, for ordinary shareholders, variability in the earnings available for them after deducting the fixed-interest obligations of the firm. The higher the level of a firm's financial leverage, the greater will be the financial risk to the ordinary shareholders. The risk premium that is required will be higher and the cost of capital will consequently rise. Each company will have its own cost of capital, depending on the type of business it does and the level of its gearing; even if all investors have the same marginal rate of time preference. Providers of debt capital would normally demand for a lower risk premium than that required by ordinary shareholders. In incorporating risk, it is usual to first calculate the weighted average cost of capital which includes: risk to investor and then add a further premium for risk to allow for the variability of the cash flows. If for instance, the firm's WACC is 10 per cent, the directors may increase this by 5% and appraise the project by discounting at 15 percent.

16.4 MEASUREMENT OF THE COST OF CAPITAL

The approach to measuring the overall cost of capital of a firm is to first calculate the cost of specific sources of funds that make up the capital structure of that firm.

Each cost will be calculated in terms of required (or expected) return or yield of the security involved. This study pack looks at three main sources-long-term debt, preference shares and ordinary shares (including retained earnings). It should be noted that it is the incremental cost of additional debt or preference capital or equity, that is, marginal cost, as against historical cost of existing debt or share capital, that is relevant when calculating these costs.

16.4.1 Cost of Debt Capital - Redeemable Debt

This is the discount rate (K_d) that equates the present value of future interest payment plus principal repayment with the current market value (price) of the debt. K_d is also known as market rate of interest or yield-to-maturity (YMT) and is solved, using the following formula:

$$P_0 = \frac{I_1}{(1 + K_d)} + \frac{I_2}{(1 + K_d)^2} + \frac{I_3}{(1 + K_d)^3} + \dots + \frac{I_n}{(1 + K_d)^n} + \frac{P_n}{(1 + K_d)^n}$$

Where P_0 is the current market price of the debts

I is the interest payment.

n is the year of redemption of the debt

P_n is the principal amount of the debt to be redeemed in year 'n'.

Note

This formula is for a redeemable debt. It is a complex equation. K_d can only be calculated manually by using trial-and-error approach as in IRR. Even then, it will be an approximate figure.

The approach involves (assuming the debt is irredeemable) calculating its cost and then adding an annualised capital gain that will be made from present time to maturity. In this case, the following formula can be used for YMT.

$$\text{Interest yield} \pm \frac{\text{Capital Gain (Loss) to Redemption}}{\text{Years to Redemption}}$$

This is the starting point towards using the trial and error approach,

16.4.2 Irredeemable Debt

Here, K_d is simply the interest or current or flat yield of the debt and the formula is as follows:

$$K_d = \frac{I}{P_0}$$

ILLUSTRATION 16-1

Alen plc has in issue 15% debentures with a par value of ~~£~~1000.00. The current market price is ~~£~~900.00 ex interest. Estimate the cost of this capital assuming.

- It is irredeemable
- It is redeemable at par in 2019. Ignore tax

SUGGESTED SOLUTION 16-1

- Cost of debt capital

$$K_d = \frac{I}{P_0} = \frac{150}{900} \times 100\% \\ = 16.67\%$$

- Cost of debt capital is 16.67% if irredeemable. The average gain to be made from now to redemption date

$$= \frac{\text{£}1,000 - \text{£}900}{10} \\ = 10$$

The best estimate to start with is 26.67%

At say 26% the NPV of interest of ~~£~~150 per annum for 10 years plus the principal repayment of ~~£~~1,000 at the end of the tenth year is: ~~£~~150 (3.465) + ~~£~~1,000 (0.099) = ~~£~~619,

That is, less than ~~£~~900.00. At say 16% the NPV of interest of ~~£~~150 per annum for 10 years plus the principal repayment of ~~£~~1000 at the end of the tenth year is ~~£~~150 (4.833) + ~~£~~1,000 (0.227)

= ~~£~~952, that is, greater than ~~£~~900

By interpolation, the estimated cost of this debt

$$= 16\% + \left(\frac{952}{1571} \times 100 \right)\% \\ = 16\% + 6.06\% \\ = 22.06\%$$

Note

- a) The cost of capital estimated above assumes:
- i. That the firm will continue to use the debt finance and not redeem the securities at their current market price.
 - ii. That the cost of raising additional capital would be equal to the cost of the one in existence.
- b) The cost of debt capital as calculated is the required rate of return of lenders to the company and it is a before-tax cost of debt. This is the relevant cost for a company with no taxable income, that is, in a permanent non-taxable position.

16.4.3 Debt capital and tax

Since interest on debt capital is a tax deductible expense, the cost of debt capital to be properly compared with the cost of equity capital, must be adjusted for tax so that, an after-tax cost of debt is calculated. Assuming an irredeemable debt, the formula will be:

$$k_i = \frac{I(1 - t)}{P_0}$$

Where k_i is the after-tax cost of debt

I is the annual interest payment

P_0 is current market price of the debt capital (after payment of the current interest)

t is the company's tax rate.

ILLUSTRATION 16-2

A company has in issue 12% irredeemable debenture stock with a face value of ₦1m and a market price of ₦0.8 m. If the company's tax rate is 30%, what is the cost of the debenture capital?

SUGGESTED SOLUTION 16-2

Interest payment per annum is $\frac{12}{100} \times \text{₦1,000,000}$

$$= \text{₦120,000}$$

$$k_i = \frac{\text{₦120,000}(1 - 0.30)}{\text{₦800,000}}$$

$$= \text{₦} \frac{84,000}{800,000}$$

$$= 0.105 \text{ or } 10.5\%$$

Where the debenture is redeemable involving equal period repayments that comprise both capital and interest, the capital element is not allowed for tax purpose. Only the interest will attract tax benefit. In this case, it might be necessary to calculate the internal rate of return (IRR) that reflects the tax shield benefits of interest.

16.4.4 Cost of Preference Share capital

This is the market - determined return or simply yield, of this element of capital. It depends on the stated dividend (an after-tax variable) and the capital to which it relates, has no redemption date. It is therefore represented as follows:

$$K_p = \frac{D_p}{P_0}$$

Where D_p is the stated annual dividend and P_0 is the current market price of preference share.

ILLUSTRATION 16-3

A company has in issue 15% preference share of ₦1 each at a book value of ₦1m. If new preference shares have to be sold, each share will sell at 90k per share. What is the cost of a preference share?

SUGGESTED SOLUTION 16-3

Using the formula $K_p = \frac{D_p}{P_0}$, the cost will be equal to

$$= \frac{0.15}{0.90} \times 100\%$$

$$= 16.67\%$$

Note that this cost is not adjusted for tax because preference dividend is an appropriation of profit, rather than a charge against profit.

16.4.5 Cost of Ordinary Share Capital: Dividend Valuation Model

This model assumes a future constant dividend per share per year perpetually. It values a share using the following formula:

$$P_0 = \frac{D_1}{(1 + K_e)} + \frac{D_2}{(1 + K_e)^2} + \frac{D_3}{(1 + K_e)^3} + \dots + \frac{D_n}{(1 + K_e)^n}$$

$$\sum_{t=1}^{\infty} \frac{D_t}{(1 + K_e)^t}$$

Where:

P_0 is the current market price of the share ex-div.

K_e is the shareholders' marginal rate of time preference or cost of equity capital

D_t is the dividend per share which is expected to be paid at the end of year t and

\sum represents the sum of the discounted future dividends

∞ is the symbol for perpetuity

This formula when simplified becomes

$$P_0 = \frac{d}{K_e}$$

$$K_e = \frac{d}{P_0}$$

Cost of equity capital can be, in line with this formula, defined as the minimum rate of return (including a risk premium) which must be earned on a project to ensure the maintenance of the market value of existing shares.

ILLUSTRATION 16-4

KS Plc is expected to pay a constant annual net dividend of 50k per ordinary share into an indefinite future time. The current market price per share is ~~45~~ 50 ex-div. What is the cost of equity?

SUGGESTED SOLUTION 16-4

$$\text{Cost of equity} = \frac{50}{500} = 0.10 \text{ or } 10\%$$

16.4.6 Cost of Ordinary Share Capital: Dividend Growth Model

Shareholders usually expect their dividends to increase over time instead of remaining the same indefinitely. Since the market price of a share is taken to be the discounted future cash receipts from the share, then, the market value of a share given an expected growth in dividends would be:

$$P_0 = \frac{d_1}{(1+k_e)} + \frac{d_1(1+g)}{(1+k_e)^2} + \frac{d_1(1+g)^2}{(1+k_e)^3} + \sum \frac{d_1(1+g)^{n-1}}{(1+k_e)^n}$$

$$\text{which reduces to: } P_0 = \frac{d_1}{k_e - g}$$

Re-arranging this, the ordinary shareholders' cost of capital, where constant rate of growth in dividends is expected, can be obtained as follows:

$$K_e = \frac{d_1}{P_0} + g$$

Where:

d_1 is the dividend expected to be paid at the end of year 1,
 K_e is the cost of equity capital
 g is the constant growth.

This formula is known as Gordon's Growth Model.

Notes

- (a) Where the dividend has just been paid or is a recent or current dividend, this is d_0 and must be adjusted for growth rate during year 1 to become $D_0 (1+g)$ or d_1 ,
- (b) P_0 is market price ex div. if the price includes the next dividend to be paid that is cum-div price, this price has to be cleaned by removing this dividend.

ILLUSTRATION 16-5

A company's ordinary shares are currently being sold at ~~N~~4 per share on the stock market. The company is expected to pay a dividend of ~~N~~0.60 per share at the end of the year. Future dividends are expected to grow at an annual rate of 6 percent of the prior year's dividend. Estimate the cost of ordinary shares of the company.

SUGGESTED SOLUTION 16-5

$$\begin{aligned} K_e &= \frac{d_1}{P_0} + g \\ &= \frac{0.60}{4.00} + 0.06 \\ &= 0.15 + 0.06 \\ &= 0.21 \text{ or } 21\% \end{aligned}$$

Note: The simplistic assumptions of perpetual constant dividend and constant growth models are not real, as dividends are usually increased overtime by the company and are allowed to remain unchanged for sometime before a new increase.

16.4.7 ESTIMATING THE GROWTH RATE

When using the Gordon's growth model, it may at times be necessary to estimate the future growth rate from data in dividends growth in the last few years.

ILLUSTRATION 16-6

The earnings and dividends of Abbey Plc in the last five years have been as follows:

Year	Earnings N'000	Dividends N'000
2004	2,000	750
2005	2,550	960
2006	2,750	1,030
2007	3,250	1,225
2008	3,500	1,312

The company is an all-equity company with 5m shares in issue, each with a market price of N3.50 ex-div. Estimate the cost of ordinary share.

SUGGESTED SOLUTION 16-6

Dividends have gone up from N750,000 in 2004 to N1,312,000 in 2008. This is 4 years growth. The average growth rate 'g' may be calculated as follows.

$$\text{Dividend in 2004} \times (1+g)^4 = \text{Dividend in 2008}$$

Re-arranging

$$\begin{aligned}
 (1+g)^4 &= \frac{\text{Dividend in 2008}}{\text{Dividend in 2004}} \\
 &= \frac{\text{N}1,312,000}{\text{N}750,000} \\
 &= 1.75 \\
 1+g &= \sqrt[4]{1.75} \\
 g &= \sqrt[4]{1.75} - 1
 \end{aligned}$$

$$\begin{aligned}
 &= 1.150 - 1 \\
 &= 0.15 \\
 &= 15\%
 \end{aligned}$$

$$D_0 = \frac{\text{Dividend(2008)}}{\text{No. of Shares}} = \frac{\text{₦1,312,000}}{\text{₦5,000,000}} = 0.2624$$

The previous years' average growth rate is expected by shareholders to continue into an indefinite future time. The cost of equity K_e will therefore

$$\text{be } \frac{D_1}{P_0} + g$$

$$\begin{aligned}
 \text{Where } D_1 &= D_0 (1+g) \\
 &= 0.2624 \times 1.15 = 0.3018 \\
 &= \frac{0.3018}{3.50} + 0.15 \\
 &= 0.08623 + 0.15 \\
 &= 0.23623 \\
 &= 0.24 = 24\%
 \end{aligned}$$

16.4.8 Share issue costs

Where there is issue cost, adjustment has to be made to the investment appraisal process. There are two approaches:

- Add the issue cost to the initial capital outlay of the project. Cost of capital is not affected.
- Calculate the cost of new equity with the formula,

$$K_e = \frac{d_1}{P_0 - x}$$

Where x represents the issue cost.

ILLUSTRATION 16-7

The issue price of a share is ₦3.00. Issue costs are 15 kobo per share. If the new shareholders expect a constant annual dividend of 50kobo per annum, what is the cost of the new equity?

SUGGESTED SOLUTION 16-7

$$\frac{50}{300 - 15} = 17.54\%$$

16.4.9 Cost of Ordinary Share Capital: Capital-Asset Pricing Model (CAPM)

The cost of equity could be estimated directly using the CAPM approach. CAPM calculates the required rate of return R_j on a share, using the following formula.

$$R_j = R_f + \beta(R_m - R_f)$$

Where R_j is the required return of security j

R_f is the risk-free rate,

R_m is the expected return of the market portfolio

β_j is the beta co-efficient of the security

As discussed earlier in this study pack, beta is a measure of the systematic risk of a security's return and because investors are risk averse, the greater the beta of a share the greater its required return. This risk-return relationship as shown in the above equation is known as the security market line (SML)

ILLUSTRATION 16-8

JSK Plc share had been found to be 1.25 reflecting the fact that its excess return (return in excess of the risk free return) varies more than proportionately in relation to the excess return for the market. The directors believe that this relationship will continue into the future. If the market index return is 15% and the return of treasury bills is 12%, calculate the cost of equity of JSK Plc.

SUGGESTED SOLUTION 16-8

Using the above CAPM formula

$$\begin{aligned} R_j &= 0.12 + 1.25 (0.15 - 0.12) \\ &= 0.12 + 1.25 (0.03) \\ &= 0.12 + 0.0375 \\ &= 0.1575 \text{ or } 15.75\% \end{aligned}$$

16.4.10 Cost of Ordinary Share Capital: Before-Tax Cost of Debt

Plus Risk Premium

This is a simple speedy but incorrect way of estimating the cost of equity. A risk premium is added to the risk-free rate to reflect the systematic risk of the firm to lenders. The greater this premium, the greater the interest that has to be paid by the firm. A further premium added to take care of the relative higher systematic risk of ordinary shares.

Assume, for example, that the normal risk premium expected for shares over debentures is about 6% and assume further that this appears okay for JSK Plc. If the company's before-tax cost of its debenture stock is say 10%, then its cost of equity will be estimated as $10\% + 6\% = 16\%$.

16.4.11 Cost of Retained Earnings

The cost of equity is normally used because retained earnings are also part of equity.

16.4.12 Computation of Weighted Average Cost of Capital (WACC)

The costs of individual company's source of capital have so far, been considered. The approach to calculating the WACC is explained in the illustration 16-9 below.

ILLUSTRATION 16-9

The management of Elumade Plc is planning an investment programme and it needs to decide on the appropriate cost of capital for evaluating investment projects. The company has in issue 1 million ordinary shares of 50k each with a current market price of 90 kobo per share cum div. It has also, in issue, ₦500,000 15% irredeemable debentures with a current market value of ₦105 (par value ₦100) and ₦300,000 11% preference shares currently priced at 80kobo per share. The preference dividend (net) has just been paid but the ordinary dividend and debenture interest are due to be paid in a not too distant future. The ordinary share dividend will be ₦120,000 this year and management has made its views known that earnings and dividends will grow by 6% per annum into perpetuity.

The extract from the company's balance sheet is as follows:

	N
Ordinary share of ₦50 each	500,000
16% Preference Shares	300,000
Debentures	500,000
Reserves	<u>200,000</u>
	<u>1,500,000</u>

Advise the management of Elumade Plc on the cost of capital to use stating any assumptions deemed necessary. Assume company tax of 30%.

SUGGESTED SOLUTION 16-9

The cost of capital of a financial asset (security) is the internal rate of return which equates the PVs of the expected future cash flows of the asset with its market price. The balance sheet (book) values of the securities and reserves should be ignored.

(i) Cost of debenture (irredeemable)

$$\begin{aligned}
 &= \frac{15}{105 - 15}(1 - 0.30) \\
 &= \left(\frac{15}{90}\right)(0.70) \\
 &= (0.1667)(0.70) = 0.1167 \text{ or } 11.67\%
 \end{aligned}$$

(ii) Cost of preference share

$$\begin{aligned}
 &= \frac{11 \text{ kobo}}{80 \text{ kobo}} \times 100\% \\
 &= 13.75\%
 \end{aligned}$$

(iii) Cost of ordinary share

Given a 6% per annum indefinite constant growth rate, this cost may be estimated as follows.

$$= \frac{N120,000(1.06)}{900,000 - 120,000} + 0.06$$

$$= \frac{127,200}{780,000} + 0.06$$

$$= 0.1631 + 0.06$$

$$= 0.223$$

$$= 22.30\%$$

(iv) **WACC**

Item	Market Value ₦	Cost of Capital	Hash Total ₦
Debentures	525,000	11.67%	61,268
Pref. shares	240,000	13.75%	33,000
Ordinary share	780,000	22.30%	173,940
	<u>1,545,000</u>		<u>268,208</u>

$$* \text{ ex div WACC} = \frac{\text{₦ } 268,208}{\text{₦ } 1,545,000}$$

$$= 0.1736 \text{ OR } 17.36\%$$

- (v) The management of Elumade Plc may decide to add a risk premium of say 6% to take care of risk of the project itself and then use approximately 23% to evaluate projects.

Important assumptions underlying the use of WACC

- (i) The capital structure (financing proportion) of the company is known and the company will continue to finance new projects in this proportion.
- (ii) The costs of the individual sources, as computed, will not change in future.
- (iii) The risk of the project under consideration is not different from the average risk of all other projects undertaken by the company.

- (iv) New projects are financed by new funds to be obtained for the projects.
- (v) The cost of capital used reflects the marginal cost of new funds to finance the project.

16.4.13 Justification for the use of WACC

The reason that had been advanced for the use of WACC is that a company will be able to enhance the market value of the company (and therefore the shareholders' wealth) by financing new investments in the proportions specified and accepting only those projects that yield more than WACC

ILLUSTRATION 16-10

Success Plc is financed by a mix of equity and debt. The capital structure has always been equity (3/5) and debt (2/5). The cost of equity is 15% and that of debt is 10%. A new investment opportunity has just emerged. The project will cost ~~£~~1m and provide a return before interest of ~~£~~150,280 for an indefinite future period. Should the company accept the project? Ignore tax

SUGGESTED SOLUTION 16-10

WACC is calculated as follows:

$$\begin{aligned}
 &= \frac{3}{5} \times 15\% + \frac{2}{5} \times 10\% \\
 &= 9\% + 4\% \\
 &= 13\%
 \end{aligned}$$

Return before interest = ~~£~~150,280

PV future cash flows is $\frac{150,280}{0.13}$

$$\begin{aligned}
 \text{NPV} &= \text{£}1,156,000 - \text{£}1,000,000 \\
 &= \text{£}156,000
 \end{aligned}$$

Funds deemed to be provided by lender = $\frac{2}{5} \times \text{£}1 \text{ m}$

= ~~£~~400,000. Interest on this amount is ~~£~~40,000

Amount available to the ordinary shareholders is

$$\text{£}156,000 - \text{£}40,000 = \text{£}116,000$$

$$\text{Share of Equity finance} = \frac{3}{5} \times \text{£}1 \text{ m} = \text{£}600,000$$

Return to the ordinary shareholders

$$\begin{aligned}\text{Will be} &= \frac{116,000}{600,000} \\ &= 19.33\%\end{aligned}$$

This return exceeds the cost of equity of 15%

16.5 SUMMARY AND CONCLUSIONS

The cost of capital of a company is an average cost concept where, as it is in most cases, a company is financed by a mix of debt, equity and other sources of finance. It is a weighted average, putting into consideration the importance of each source of finance. The cost of capital is normally required for the evaluation of investment projects of the company. The company's cost of capital must be lower than the yield on a new project if that project is to be acceptable. Alternatively, the projects future cash flows, discounted to their present values using the firm's cost of capital must be greater than the present cost of the project.

The WACC can only be computed after calculating the costs of individual sources of funds. A company finances its new project from a pool of funds. A project cannot be specifically identified with a particular source of funds, hence the use of WACC. It should be noted however, that the use of WACC can only be justified under specified assumptions, including the one involving the continuing maintenance of the existing capital structure when raising new funds for new projects.

In computing the cost of equity, an alternative approach to using the Dividend valuation model is the use of CAPM. The CAPM derives the cost of equity capital from capital market information. It deals explicitly with the risk of a security by calculating a risk premium that is based on the expected excess return determined by the beta of that security. WACC, although also market based, incorporates risk into the cost of capital less formally than CAPM,

Finally the justification for using WACC hinges on the fact that WACC is the most dependable guide to the additional cost of extra capital made available for the financing of new projects of the firm, provided the above assumptions hold.

*Refer to Comprehensive Questions and Suggested Solutions in Appendix II
Page 465*

16.6 REVISION QUESTIONS

16.6.1 MULTIPLE CHOICE QUESTIONS

1. In calculating the weighted Average cost of capital (WACC) what value should be used for the components of the capital structure?

A Book value
 B Going - concern value
 C Gone-concern value
 D Market value
 E Intrinsic value

Use the following information to answer questions 2 and 3.

A company's equity shares are currently trading at ₦4 each on the stock market. Dividend expected to be paid next year is 28 kobo per share and a constant growth rate of 10 percent into an indefinite future, is expected. The company is financed wholly by equity.

2. What is the cost of equity capital?

A 10%
 B 17%
 C 17.7%
 D 28%
 E 4%

3. What is the weighted average cost of capital (WACC) of the company?

A 10%
 B 28%
 C 4%
 D 17.7%
 E 17%

4. A company pays ₦40,000 per annum interest on irredeemable debenture stock with a nominal value of ₦500,000 and a market value of ₦400,000, the company's tax rate is 30%. What is the cost of debenture?

A 5.6%
 B 10%
 C 8%
 D 7%
 E 3%

5. In estimating the cost of equity capital where dividend is current dividend as against expected dividend, what should be the D_1 of the component of the formula where the dividend is expected to grow at a constant rate?

- A D_1
- B $D_1 + g$
- C $D_0(1 + g)$
- D $D_0 + g$
- E g

16.6.2 SHORT ANSWER QUESTIONS

1. State the relationship between the required rate of return of shareholders and the cost of equity capital of a company?
2. State ONE condition underlying the use of weighted average cost of capital (WACC) for a company's incoming project.
3. Where a debenture stock is redeemable say at the end of the fifth year, what approach should be used in calculating the cost of the debenture?
4. Where a company's policy is to reflect the issue cost of equity in the cost of equity capital, how should this cost be treated?
5. What is the cost of short-term funds such as overdrafts?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

CAPITAL STRUCTURE AND VALUE OF THE FIRM

17.0 LEARNING OBJECTIVES

After studying this chapter, the reader should be able to:

- ◆ Define and understand capital structure of a firm;
- ◆ Discuss the views of the traditional approach to the impact of gearing on the value of the company;
- ◆ Discuss the views of the net operating income approach;
- ◆ Discuss the views of Modigliani and Miller - the pretax position; and
- ◆ Discuss their post-tax views.

17.1 INTRODUCTION

Capital structure decisions are critical financing decisions of a company, because of their implications for the value of the company. Should a company borrow at all? If it decides to borrow, how much? The effects of these decisions are, up to now, not settled. This chapter will provide the necessary inputs that will guide financial managers in their decision-making process. The fundamental issue is whether a company can influence its total value through its cost of capital by varying its capital structure. The following assumptions will be made:

- (a) All earnings are distributed in form of dividends, thus ignoring the effect of dividend policy;
- (b) These earnings are assumed to have zero growth into perpetuity;
- (c) There is no change in the investment decisions of the company;
- (d) Although the total capitalisation will not change, the gearing of the company can be changed by issuing long-term debt to repurchase shares or issuing shares to redeem long-term debt; and
- (e) Tax is, for now, ignored.

The ensuing theoretical discussion will thus centre on the relationship between capital structure (only debt-equity financing assumed for simplicity) and the company's weighted average cost of capital and the impact of the variation of this relationship on the value of the company.

17.2 CAPITAL STRUCTURE: ALTERNATIVE VIEWS ON VALUE OF THE COMPANY

Capital structure, also called financial leverage or gearing, is the proportion of a company's long-term debt (and preference shares if any) to ordinary share capital. A company may, for example, have 30% debt and 70% equity or 40% debt and 60% equity making up its capital structure.

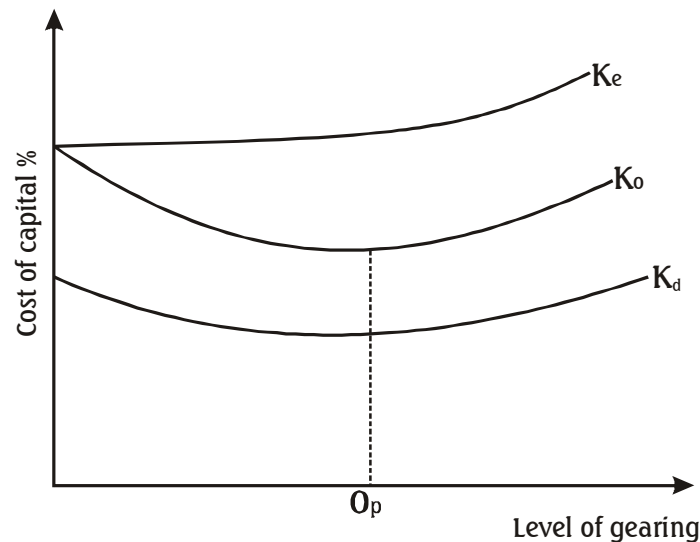
In relation to the effect of capital structure on the value of the company, there are two views - the 'traditional' view and the net operating income approach.

17.2.1 The Traditional View

The view of the traditionalist is that there is an optimal capital structure and that the management debt-equity decisions can be made to achieve this optimal position, thereby increasing the total value of the company. The optimal capital structure is that which minimizes the company's cost of capital (symbolised as K_e) and maximises the total value of the company.

The following points are advanced by this theory of capital structure:

- (1) As the company increases its gearing level, the cost of debt (symbolised as K_d) remains unchanged. After a certain level, (significant level), however, the financial risk to the lenders increases. They then ask for higher return.
- (2) The equity holders for the above reason, also increase the cost of equity (their required return). Although the cost of equity (symbolised as K_e) goes up, the interest rate benefits are not completely offset by this increase. Consequently, WACC will still be following.
- (3) However, as borrowing increases, the equity holders will (because of the much increased risk perception of the company) be asking for more returns. There will be a level when the required equity returns will more than offset the interest-tax benefits of borrowing. At this level, WACC will start rising. This level is the optimal capital structure level.
- (4) At the optimal level, the value of the company will be maximised. The reason is that at this level the lowest capitalisation rate K_0 is applied to the net operating cash flows; the result is highest present value of such cash flows. The traditionalist thus concludes that K_0 depends on gearing of the company and there is an optimal capital structure. The above view is demonstrated graphically as follows:



K_e is the cost of equity

K_d is the cost of debt

K_o is the weighted average cost of capital

O_p is the optimal gearing level

ILLUSTRATION 17-1

AB Plc has ₦500,000 of debt with coupon rate of 10% and a market value which is at par with the minimal value of the debt. There are 250,000 shares in issue. The cost of equity is 15% while the company earns ₦500,000 per annum before interest. Assume the company issues ₦480,000 of debt capital (also at par) at 10% to buy back 40,000 shares leaving 210,000 shares in issue. Assume further that because of increased gearing level and the attendant increased financial risk, the cost of equity increased to 17%. Calculate the WACC and market value of ordinary share both before and after change in capital structure and explain the effect of a change in capital structure.

SUGGESTED SOLUTION 17-1

	₦
(a) Before change in gearing	
Earnings per annum	500,000
Less: Interest (10% of ₦500,000)	(50,000)
Earnings available to the Ordinary Shareholder	<u>450,000</u>
Cost of equity	15%
Market Value of Equity	$\text{₦}450,000 \div 0.15$
	$= \text{₦}3,000,000$
Add market Value of debt	<u>500,000</u>
Market Value of the company	<u>₦3,500,000</u>

$$\begin{aligned} \text{The WACC is} & \quad \frac{\text{₦ } 500,000}{\text{₦ } 3,500,000} \times 100\% \\ & = 14.29\% \end{aligned}$$

$$\begin{aligned} \text{Market Value of} & \\ \text{each ordinary share} & \quad = \frac{\text{₦ } 3,000,000}{250,000} \\ & = \text{₦ } 12.00 \end{aligned}$$

(b)	After Change in gearing	₦
	Earnings per annum	500,000
	Less interest (10% of ₦980,000)	(98,000)
	Earnings available to the Ordinary Shareholder	<u>402,000</u>
	Cost of equity	0.17
	Market Value of Equity	<u>₦2,364,706</u>
	Add market Value of debt	980,000
	Market Value of the company	<u>₦3,344,706</u>

$$\begin{aligned} \text{The WACC is} & \quad = \frac{\text{₦ } 500,000}{\text{₦ } 3,344,706} \times 100\% \\ & = 14.95\% \end{aligned}$$

$$\begin{aligned} \text{Market Value of} & \\ \text{each ordinary share} & \quad = \frac{\text{₦ } 2,364,706}{210,000} \\ & = \text{₦ } 11.26 \end{aligned}$$

The increase in the proportion of debt to equity from about 17% to about 44.44% has increased WACC (due to increase in the cost of equity) and the market values of both the company and each share have dropped.

17.2.2 Net Operating Income (NOI) Approach

This is a theory of capital structure whereby the Weighted Average Cost of Capital (WACC) and the total value of the company remain the same regardless of the level of gearing. In this case the net operating income of the company is capitalized by WACC (K_o) to obtain the total value of the company. The market value of the debt is then deducted from this total value to get the value of the company's equity.

ILLUSTRATION 17-2

Using the information in illustration 17-1 and assuming WACC of 20 per cent. The following situation will obtain:

Earnings	₦ 500,000
WACC	0.20
Market Value of the Company	$\frac{₦ 500,000}{0.2}$
	= ₦2,500,000
Less market value of the debt	<u>₦ 500,000</u>
Market Value of equity	<u>₦2,000,000</u>

The cost of equity is therefore $\frac{₦500,000}{₦2,000,000}$ which is equal to 25% and the market value of equity per share is $\frac{₦2,000,000}{250,000} = ₦8.00$

Suppose, again, that the gearing level is increased by issuing ₦500,000 additional debt at 10% to buy back 62,500 ordinary shares at a market value of ₦8 per share. Leaving 187,500 shares in issue.

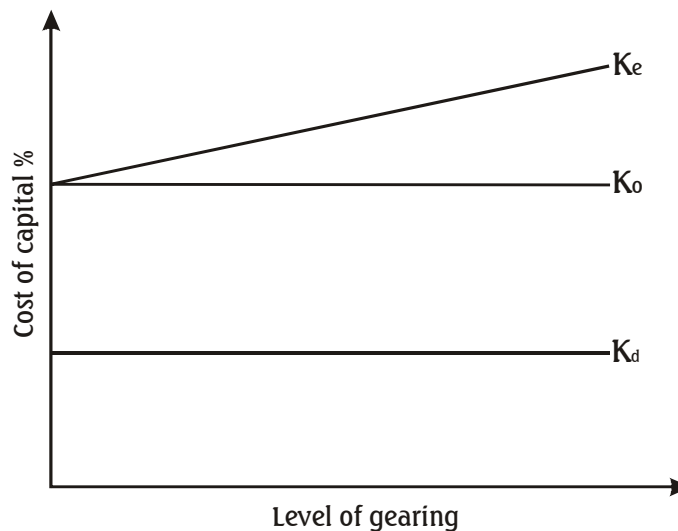
The following position will hold:

Earnings per annum	₦ 500,000
WACC	0.20
Market Value of the Company =	2,500,000
Market Value of debt	<u>1,000,000</u>
Market Value of Equity	<u>1,500,000</u>

$$\text{Cost of equity} = \frac{₦500,000 - (10\% \text{ of } ₦1,000,000)}{₦1,500,000}$$

$$= \frac{₦400,000}{₦1,500,000} = 26.67\%$$

$$\text{Market value of equity} = \frac{₦1,500,000}{187,500} = ₦8$$



The NOI approach says that the level of gearing (changes in debt/equity ratio) does not affect the total value of the company or the market value of the individual share. Investors are not bothered as to how the company finances its operations as this does not affect them either in total or as individuals. The reasoning behind this position, is that, as the level of gearing increases, the cost of equity also increases. However, the increase in the cost of equity is such that it does not outweigh the tax-shield benefits; in fact they are exactly offset by each other, hence there is a constant level of WACC (K_o) as gearing changes.

17.2.3 The Modigliani and Miller Theory

Modigliani and Miller (M & M) in their original version brought in a 'behavioural' factor to support the NOI approach on the absence of any relationship between total value of the company or its cost of capital and its level of gearing. M & M's belief is that the total value of the company depends on the future earnings stream of the company and the risk of those earnings and not on the way the company is financed. Thus, the discount rate used in evaluating any investment project has no relationship whatsoever with the method of financing the project. M&M made the following assumptions which are worth mentioning:

- (a) Perfect capital markets where there are transaction costs, information is perfect and investors' behaviour is rational;
- (b) The capital market has similar expectations vis-à-vis the future earnings of the company, which are assumed to be the present earnings;

- (c) Investors' views about the risk of companies in the same risk class are the same; and
- (d) Absence of taxation (initial position).

M&M brought in their behavioural support factor via the concept of arbitrage.

In the context of the theory of capital structure and value, arbitrage means that shares (and debentures) of identical companies (identical in all respects except in their capital structures) are being sold at different prices and investors will sell the high-priced shares and simultaneously buy the low-priced ones with a view to making short-term profit.

The illustration below will explain how it operates:

ILLUSTRATION 17-3

Consider two companies, AE Plc and DE Plc in the same risk class, which are identical in all respects except that AE Plc is an all-equity company while DE is a debt-equity company (levered). DE's capital structure includes 8% ₦2m debt which is also its market value. The earnings before tax of both companies are the same at ₦1m per annum.

Assume the cost of equity in the all-equity (unlevered) company is 20% and the cost of equity in the debt-equity (levered) company is 21%. What would be the position of the:

- (i) Traditional view
- (ii) M&M view

Regarding the values of both AE Plc and DE Plc ?

SUGGESTED SOLUTION 17-3

The traditional view

	AE Plc	DE Plc
	₦	₦
Earnings per annum	1,000,000	1,000,000
Less interest (8% of ₦2m)	-	160,000
Earning belonging to Equity	<u>1,000,000</u>	<u>840,000</u>
Cost of Equity	(0.20)	(0.21)
Market Value of Equity	5,000,000	4,000,000

Market Value of Debt	-	2,000,000
Total Market Value of the Company	<u>5,000,000</u>	<u>6,000,000</u>
Weighted average cost of capital	20%	16.67%
Debt/Equity ratio	0%	33 ¹ / ₃ %

The two companies are assumed, by the traditional view to have different market values.

The M & M view

The argument of M&M, however, is that this situation is not sustainable because shareholders in DE Plc, the levered company, would soon discover that they could earn a higher return by selling their interests, replicating the gearing, that is, converting corporate gearing with his own personal gearing and investing the entire sum in AL Plc the unlevered company. They are, if they do the above, carrying out arbitrage transactions. The sale of the shares of DE Plc and the purchase of the shares of AE Plc will:

- Lower the price of DE Plc shares thereby raising its cost of equity capital; and
- Raise the price of AL Plc thereby lowering its cost of equity capital.

Until the total market value of each company is the same, when arbitrage activity would then end.

Assuming, for example, Mr. Jacob owns 5% of the equity of DE Plc, the following arbitrage activity steps will occur:

- He would sell his 5% stake in DE Plc amounting to ~~₦~~200,000, that is 5% of ~~₦~~4m
- Replicate the corporate gearing of the company with his own personal gearing by borrowing ~~₦~~100,000 (5% of ~~₦~~2m) at 8%.
- Add this to the proceeds of sale of the shares (that is ~~₦~~200,000 + ~~₦~~100,000) and invest the total in AE Plc so as to secure 6% interest in its equity capital.

His position would now be as follows:

	₦
Income 6% of ₦ 1 million	60,000
Less Interest on ₦ 100,000 @ 8%	<u>8,000</u>
Net Income	<u>52,000</u>
	₦
Net Income before arbitrage: 5% ₦ 840,000	42,000

Mr. Jacob would be earning ~~₦~~10,000 more than his current earnings from his investment in DE Plc

Alternatively

(a) Mr. Jacob could use part of the ~~₦~~300,000 to acquire 5% interest in AE Plc that is 5% of ~~₦~~5m which is equal to ~~₦~~250,000.

(b) He would be entitled to 5% of ~~₦~~1m earnings of AE Plc which is equal to

₦50,000

Less: Interest on loan **8,000**

Net Income **42,000**

(c) He would have maintained his earnings and at the same time have an account of ~~₦~~50,000 for other investments.

M&M argued that rational investors will go on substituting corporate financial leverage with personal financial leverage, selling shares of DE Plc and buying those of AE Plc until the price of the former has dropped and the price of the latter has risen, such that there is an equilibrium point. At this point, the cost of equity in the company in DE Plc, will be higher than the cost of equity in AE Plc.

(d) The weighted average cost of capital in the two companies would be the same because both their market values and their earnings together with the associated risks were also the same.

Shortcomings of the M&M theory

(a) Personal financial leverage might not be exactly substitutable for corporate gearing as their risks to the investor might be different.

(b) Also, the interest costs might be different.

(c) The existence of transaction costs may limit the arbitrage operations.

(d) Taxation cannot be exempted in security transactions.

(e) Difficulty in getting companies with identical operating characteristics.

17.2.4 M & M (Post Tax) View

When tax is allowed, the consensus of most financial experts is that the astute use of debt in a company's capital structure might have positive effect on value. In view of the tax deductibility of interest, the

aggregate amount available for both lenders and shareholders will be greater in a leveraged company.

Using the example of AE Plc and DE Plc, and assuming company tax rate of 30%, the MM Post-tax view can be shown as follows:

	AE Plc	DE Plc
	₦	₦
Earnings per annum	1,000,000	1,000,000
Less interest (8% of N2m)	-	160,000
Earning before tax	1,000,000	840,000
Tax at 30%	300,000	252,000
Earnings after tax	<u>700,000</u>	<u>588,000</u>
Earnings available for all investors (lenders and shareholders)	700,000	748,000*

*~~₦~~588,000 + ~~₦~~160,000

The total earnings available to all investors is greater in the levered company by an amount equal to the interest times the tax rate that is ~~₦~~160,000 x 0.30 which is equal to ~~₦~~48,000. This is the tax-shield benefits which accrue to the levered company. Assuming the debt used is irredeemable, the present value of annual tax-shield benefits will be as follows:

$$\text{PV of tax shield benefits} = \frac{(C)(i)(tc) - (D)(tc)}{K_i}$$

Where K_i is the market interest rate (or yield) of the debt and is assumed to be equal to the coupon rate. C and tc the company tax rate. For company DE Plc PV of tax-shield benefits will be equal to ~~₦~~600,000 ($N2\text{ m} \times 0.30$). M & M contended that the tax-shield benefits have value which goes to increase the market value of the levered company by the amount of this tax-shield benefits. The additional value for DE Plc occurs because all investors in this company would be receiving every year ~~₦~~48,000 more than when there is no debt. The present value of ~~₦~~48,000/0.08 = ~~₦~~600,000. It is assumed that both the interest flows and the related tax-shield benefits have the same level of risk; hence the use of the same discount rate. The above can be shown by the formula:

$$V_L = V_u + D_{tc}$$

where:

V_L is the value of the levered company

V_u is the value of the unlevered company

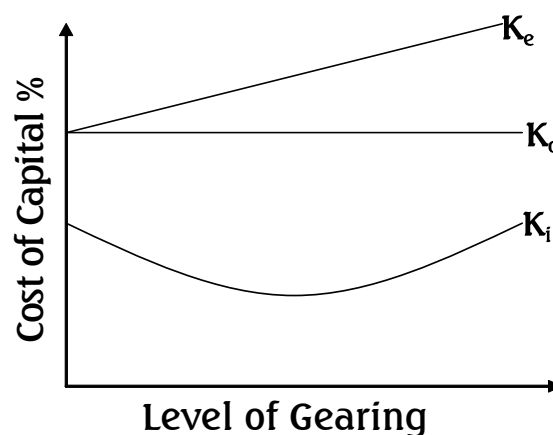
D is the value of the Debt

tc is the company's tax rate.

Given the cost of equity of 20% for AE Plc which has no debt, its market value will be $\text{₦}700,000/0.20$ which is equal to $\text{₦}3.5\text{m}$. The value of the tax-shield benefits is $\text{₦}600,000$. The total value of DE Plc the levered company is $\text{₦}3.5\text{m} + \text{₦}0.6\text{m}$ which is equal to $\text{₦}4.1\text{m}$.

It will be observed from the above equation of V_L that the greater the tax-shield benefits, the greater the value of the company all things being equal. In the same vein, the greater the level of gearing, the lower the overall cost of capital. MM, thus, altered their original view by factoring in company tax. The view implies that companies should continue to borrow because according to them there is an optimum level of gearing and this occurs at a level of near 100% debt financing. This situation is, however, not in line with the practical borrowing behaviour of companies in the capital markets; that is financing a company's operations with almost 100% debt.

MM(Post-Tax) View



17.3 SUMMARY AND CONCLUSIONS

Capital structure shows the relationship of debt to equity. The implication of this relationship for the value of the company is of great concern for the financial managers. There are two alternative views - the traditional view and the M&M (pre-tax) view. The traditional view which emphasizes the Net Income (NI) approach showed that the amount of debt in the capital structure affects the value of the company. The view opined that the greater the level of gearing the lower the WACC because of the impact of the tax deductibility of interests. However after reaching a borrowing level, the WACC continues to rise. It is at this point that WACC is minimized and total value of the company maximised.

Another approach - the Net Operating Income (NOI) approach believed that there is no relationship between the level of gearing and the value of the firm. This view stated that the variables that influence the value of the company are the future earnings of that company and their related risks as against the way the operations are financed.

MM came up with a strong defense for this latter view and backed it up with a behavioural factor. This factor hinges on the possibility of arbitrage transaction by the shareholders. MM gave their view under certain assumptions. These assumptions, which include absence of taxation, must be noted. M&M later brought in tax to assert that, because of tax deductibility of interests, the tax-shield benefits have value. As far as M&M (Post-tax) view is concerned, the value of the geared firm will be greater than the value of the ungeared company by the amount of the present value of the tax-shield benefits. The greater the debt a company takes on, the greater the tax-shield benefits and therefore the greater the value of the geared company when compared with the ungeared company. This view implies that a company can take on almost 100% debt financing; a situation which is not in tune with corporate financing behaviour.

*Refer to Comprehensive Questions and Suggested Solutions in Appendix II
Page 465*

17.4 REVISION QUESTIONS

17.4.1 MULTIPLE CHOICE QUESTIONS

1. Which ONE of the following is NOT an advantage of debt finance over equity finance in the same company?
 - A Tax deductability of interest
 - B Lower required return on capital
 - C Lower risk
 - D Easier redemption of capital
 - E Lower issuance cost.

2. According to Modigliani and Miller (M & M - original version) what is the effect of gearing increase on the cost of capital? Cost of capital:
 - A increases
 - B reduces
 - C increases and later reduces
 - D remains unchanged
 - E reduces and later increases.
3. According to net income approach to capital structure, what is the impact of increasing debt - equity ratio on the market value of the firm? Market Value:
 - A increases and later decreases
 - B remains the same
 - C decreases and later increases
 - D decreases and later reduces
 - E increases and later increases.
4. Absence of bankruptcy costs is one of the assumptions underlying M & M (Original version). What is the impact of the existence of bankruptcy costs on the market value of the firm as gearing increases according to M & M (later version) theory? Market value is expected to:
 - A increase at a constant rate
 - B increase at an increasing rate
 - C reduce at a constant rate.
 - D decrease at an increasing rate
 - E decrease at a decreasing rate
5. According to M & M theory (post - tax version) what is the difference between the value of unlevered firm and a levered firm in relation to corporate taxes?
 - A The coupon rate of the debt
 - B The market interest rate of the debt
 - C The tax rate of the interest
 - D The tax rate of the debt
 - E The principal amount of the debt.

17.4.2 SHORT ANSWER QUESTIONS

1. What is the traditional view on the overall cost of capital as gearing increases?
2. State the key principle involved in the total value approach to capital structure.
3. Investors in debt finance require a lower return than ordinary shareholders, because debt finance possesses a _____ risk.
4. What is that intangible assets factor that might affect a company's ability to borrow?
5. A geared company has in issue ~~N~~500,000 irredeemable debt finance and ~~N~~2m equity finance. Coupon rate of 15% is the same as market interest rate. The company's tax rate is 30%. What is the present value of the tax shield benefits of the debt?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

DIVIDEND POLICY

18.0 LEARNING OBJECTIVES

After studying this chapter, the reader should be able to:

- ♦ Understand the meaning of a company's dividend policy;
- ♦ Explain the differences between passive and active dividend policies;
- ♦ Advance theoretical reasoning for the relevance or irrelevance of dividend payment to the value of the firm;
- ♦ Discuss the practical factors that influence a company's dividend policy
- ♦ Explain the impact of stability of dividends on the value of a share;
- ♦ Mention the disadvantages of stable naira dividend payment and those of stable dividend pay-out ratio; and
- ♦ Explain other aspects of dividend decisions such as cash dividends, scrip dividends, scrip issues, share split, share consolidation and share re-purchase.

18.1 INTRODUCTION

Dividends are payments by the company to those who provide it with equity finance - the shareholders. From the viewpoint of these shareholders, dividends represent compensation for postponing consumption. The dividend policy of the firm relates to various decisions on payments of dividend. The firm regards dividend decision as a major aspect of the financing decision of the firm. The critical question then is whether profits should be distributed as dividends or retained within the firm to finance future expansion and growth. What will be the effect of either decision on the value of the firm? If the company decides to pay dividends, how much should be paid and how much should be retained? If there are investment opportunities, should the firm use the monies available for dividend to finance these investments or should it pay dividends and borrow later to finance the investment opportunities? Should the company follow a policy of fixed Naira amount per share per annum or a fixed percent of earnings per annum. All these questions require answers. The solutions and other aspects of dividends decisions including factors influencing payment of dividends will form the subject matter of this chapter.

18.2 PASSIVE AND ACTIVE DIVIDEND POLICIES

When a company follows a passive dividend policy, it means it is treating dividend payment as residual. This means that the determining factor as regards payment of dividend and how much to pay is the availability of profitable investment projects. These are projects with positive NPV. The idea is that as long as the company has projects whose returns are in excess of (or at least equal to) the required returns, it should continue to finance these projects and pay out nothing as cash dividends.

If, however, the company has no single profitable investment, it can pay 100 percent of the profits available for distribution as cash dividends. This implies that in between zero percent and 100 percent there will be various dividend payout ratios whose values will depend on availability of profitable projects.

On the other hand, the active dividend policy regards dividend payment as a critical factor in the determination of the value of the firm and hence, the wealth of its shareholders. This policy treats dividend payment not just as a way of sharing profits, it also looks at retentions as residue. The question that readily comes to mind when examining these two policies, is: are dividend payments really relevant to the wealth of the shareholders or are they irrelevant? The discussion below will focus on the theoretical arguments put forward by Modigliani & Miller (M & M) showing the irrelevance of dividends to the wealth of the shareholders.

18.3 IRRELEVANCE OF DIVIDENDS

Modigliani and Miller (M & M) strongly argued on how the value of the firm (and therefore the wealth of its shareholders) is unaffected by the way available profits are shared between retentions and dividend payout. They believe that the value of the firm is determined by the stream of its earnings or its pattern of investment rather than the pattern of distribution of its profits. Their contention is that as long as the firm has capital projects with positive NPV, it should continue to invest in them as this action will increase the value of the firm.

This M & M assertion was based on the assumptions of perfect capital market where there are:

- (a) No transaction costs;
- (b) No floatation costs;
- (c) No taxes on earnings; and
- (d) Certainty about the future earnings of the firm.

The following points appear to form the bases of M and M's argument:

- (i) If profits were distributed (instead of being retained) and external equivalent equity finance had to be raised to finance investment, the possibly reduced value of the share after financing plus the dividends paid will be exactly equal to the value of the share before financing. Dividend payments, according to M & M, thus have no effect on share value. The value of the share would have reduced because more shares were issued.
- (ii) If shareholders were expecting dividends and they did receive the dividends, they could replace exactly these dividends by selling shares and receiving cash. Thus, by this action, they could manufacture "home made" dividends. If on the other hand, the company paid them dividends, when in fact they did not need such cash, they could use the "free" cash to buy shares of the company on the stock market.

Given this scenario, the company is not doing for the shareholders anything they cannot do themselves. It is therefore not creating value. Based on the above, the fact that a company pays dividend or does not pay dividend, according to M & M is therefore immaterial to the investors.

18.4 RELEVANCE OF DIVIDENDS

The following are points put forward in favour of dividend payments.

18.4.1 "Bird in Hand" Argument

The traditional view of the theory of dividends is that dividends are the singular determinant of value of a share and that the receipt of the share of profits now, in form of income rather than in future, in form of capital appreciation, enhances the value of the share. This second position is in line with bird in hand is worth more than two in the bush argument as ~~Rs~~1 paid now in cash is worth more than ~~Rs~~1 supposedly retained as further investment. Aside from this, the payment of dividends help to resolve the uncertainty in the minds of investors about the future earnings potential of the company. Investors place greater reliance on the ability of the firm to earn profits in future and pay dividends, reduce the risk perception of the company and this increases the value of the company's shares, all things being equal.

18.4.2 Group Preferences

There are certain categories of investors who, because of their employment status or their tax position, would prefer less of current income and more of capital appreciation. On the other hand, there will be some groups who because of their economic activities would favour less of capital appreciation and more of current income. The

first group might consist of highly paid workers and high marginal income tax payers who would prefer to buy shares of companies that retain much of their profits. A company should identify such group and ensure that its dividend policy is geared toward their desire. On the other hand, there exists certain institutional investors such as pension funds administrators who may be tax exempt but require constant cash inflows to meet payments to pensioners. A company that has these groups of investors should emphasise dividend payments so as to keep their loyalty. Any dividend policy that is not in line with the group's desire will only encourage shift in investors' loyalty. Similarly, inconsistency of dividend policy will attract the same action. The effect is that investors who are not happy with a particular company's dividend policy would want to sell their shares of that company (and buy those of the company that meets their desire). The action of these investors would probably create a depressing effect on the share price and jerk up its cost of capital.

Although, another group of investors might be buying these shares, the process itself may have a psychological effect on the shareholders. The above argument typifies the 'clientele' or 'preferred habitat' concept.

18.4.3 Information and Cumulative Device

Payment of dividends can be used by a company to convey positive information to shareholders about the company's future profitability while a statement could also be issued. However, in order to make this statement about management's intention real, the current dividend-payout ratio might be increased. The belief of management here is that action speaks louder than words.

The payment of cash dividends is therefore meant to signal to investors that management actually knows and believes that the company's financial situation is better than what the share price is showing. If this view is correct, then, the increase in dividend-payout would be expected to create a positive impact on share price in the stock market.

18.5 FACTORS AFFECTING DIVIDEND POLICY

The theoretical aspects of dividend policy have, so far, been considered. The following will discuss the practical factors that should be taken into account when a firm is formulating a dividend policy.

(a) Legal Constraints:

The management of a company must recognise the existence of laws guiding payment of dividends. For example, a company should not

pay dividend out of capital and may only pay dividends, according to Companies and Allied Matters Act (CAMA 1990, as amended) out of:

- (i) Profits arising from the use of company's property;
- (ii) Revenue reserves; and
- (iii) Realised profit on a fixed asset sold

CAMA also specifies that dividends can only be declared on the recommendation of the directors, and any amount so recommended cannot be increased by the general meeting; although, it can be reduced.

(b) Future Financial Requirement

Once the legal constraints have been cleared, management should focus on its future financial needs including future investment opportunities. This should be done via budgeted sources and application of funds statements, budgeted cash flow statements and cash budget.

(c) Liquidity

Dividends are usually paid out of cash. Therefore, the amount of dividend paid by the company is largely influenced by the available cash resources. Cash has alternative uses within the firm; management may, therefore, want to give recognition to this, perhaps more important alternatives (and also be protected against the future) and may, therefore, decide not to have high target dividend-payout.

(d) Capacity for borrowing

A firm may not be liquid, but may be in a strong position to borrow at short notice. This ability can be by arranging a line of credit. The ability of a firm to borrow, often largely influences its ability to meet its short-term obligations as and when due, including payment of cash dividends.

(e) Access to The Capital Market

If the company is large enough and has good access to the corporate bond market, it needs not bother much about its liquidity situation for the purpose of paying cash dividends.

(f) Existence of Restrictive Covenants

Restrictions on payment of cash dividends may be entrenched in a loan agreement.

(7) Dilution of control

Payment of cash dividends, supported by subsequent raising of external finance may dilute the controlling interest of the existing shareholders, if they do not partake in the provision of such finance. These shareholders may, therefore, favour financing of investment opportunities from relatives.

18.6 STABLE DIVIDEND PAYMENT PER SHARE VERSUS STABLE PAYMENT RATIO

Another area of dividend policy which is of concern to management is which dividend payment policy to follow: stable dividend per share or stable pay-out ratio.

18.6.1 Stable Dividend Per Share Policy

The management of a company that follows this policy wants to be paying and maintaining an absolute naira amount of dividend per share. For example, 80kobo per share might be paid annually on regular basis notwithstanding that earnings are fluctuating or that the cash position is changing over time.

The share of a company that follows this policy usually attracts a premium because of preference for current regular income of certain investors, positive signaling effects and directives given to certain institutions. However, the following constraints limit the desire of firms to follow this policy.

- (a) It creates a financial commitment on the part of the company to maintain that fixed figure even in the face of profitable investment opportunities.
- (b) If the firm becomes illiquid, it still has to pay this fixed Naira dividend.
- (c) In a period when the level of earnings is low, the dividend payment must still be met.
- (d) Where the company is compelled to pay an amount below the usual fixed amount, it may cause a psychological problem with a possible negative effect on share price.
- (e) The company may be exposed to take-over bid, if it pays dividend below the usual fixed amount.

18.6.2 Stable Pay-Out Ratio

Under this policy, the company pays a fixed percentage of earnings as dividend every year. This implies a variable Naira amount every year, depending on each year's level of earnings.

The only advantage to the company which follows this policy is flexibility and convenience. The company only pays an amount of dividend that is supported by earnings. The company is not likely to have any problem paying dividends provided the earnings are substantially realised. However, the following disadvantages might occur to a company that follows this policy.

- (a) When dividends vary in line with earnings level, investors naturally look at the company as inconsistent. This may create a negative effect on share price.
- (b) A fall in earnings followed by a drop in dividend is a pointer to investors, of management's thinking about the future profitability of the company. If earnings drop but the dividend level is still maintained, investors might still have some confidence in the ability of management to weather through the storm.
- (c) Certain investors that require specific periodic income might rank the company very low and consequently try to dispose their shares with the attendant negative effect on share price.
- (d) Certain institutional investors, for example, the Pension Fund Administrators (PFAs) might need to abide with specific directives from the regulatory authority.

18.7 CASH DIVIDENDS

These are dividends recommended by the directors and approved and declared at the annual general meeting (AGM). They are subject to withholding tax and are normally paid out of cash. Declaration and payment might sometimes put pressure on the company's liquidity.

18.8 SCRIP DIVIDENDS

These are dividends also recommended by the directors and approved and declared at the annual general meeting (AGM). However, they are paid through issue of ordinary shares of the company as against being paid by cash. They essentially constitute a transfer to the shareholders' additional shares with no further cash coming from them. The following should be noted about scrip dividends:

- (a) The dividends have been declared, only they do not involve payment of cash.
- (b) Acceptance of scrip dividends by the shareholders is optional.
- (c) Scrip dividends are, like cash dividends, taxed.

- (d) The company would be able to conserve cash and use it for other worthwhile investment opportunities.
- (e) The issuance of scrip dividend is a way out of a company's liquidity problems.
- (f) The company might make some savings in finance charge and thus increase profitability by not borrowing to pay dividends.
- (g) There would be increase in ordinary share capital base and therefore reduced gearing level.
- (h) They are suitable for ordinary shareholders who are interested in capital gain.

18.9 SCRIP ISSUES

Scrip issues, also known as bonus issue, involve a mere book-keeping entry, capitalizing the existing reserves of the company and simultaneously issuing ordinary shares to the shareholders to the tune of the amount capitalised. Scrip issues are the result of a financial process, the details of which have been discussed earlier in this pack. It should be noted, however, that some authors also refer to scrip issues as stock dividends.

18.10 SHARE SPLIT

This is a reduction in the nominal or par value of a unit of share, the result of which proportionally increases the number of ordinary shares in issue. A company may, for example, make a share split of 2 for 1 by which the original nominal value of a share say ₦1 is reduced to ₦0.50 and the number of shares increases twofold. It should be noted that, unlike bonus issue, share split does not change the total shareholders capital. Management makes share split where it intends to achieve an appreciable decrease in the market value of a company's share. The ultimate purpose was to make the shares more marketable thereby possibly attracting more investors.

18.11 SHARE CONSOLIDATION

Share consolidation, also known as reverse share split, is a process whereby the nominal value of a share is increased; the result of which reduces the number of shares in issue. A 1 for 4 share consolidation implies that each shareholder would receive 1 new share for 4 old shares already held by him.

A nominal value of say 25k per share might be increased to ₦1 per share. An ordinary shareholder who currently has 2000 shares of 25k per share will now own 500 shares of ₦1 per share. Share consolidation is used where

management believes that the share is selling at a very low price and this process would probably jerk up the price on the stock market.

The announcement of share consolidation, like share split and bonus issue, is likely to create some signaling effects as this is usually taken by investors as a company in financial problems. In the case of share consolidation, management might just want to move the share price to a higher price range within which trading can be taking place at lower transaction costs.

Notwithstanding, management should critically assess the worthiness of share consolidation operation to avoid possible fall in the company's share price.

18.12 SHARE REPURCHASE

Share repurchase, also known as share buy-back or treasury shares, is the repurchase of the shares of a company from its shareholders by the company itself, either in the open market (stock exchange) or by tender offer.

A company may want to re-acquire its own shares for the purpose of achieving its share-option plans for its top managers. It may also want to buy back its own shares for use in a share-for-share exchange scheme in acquisition. Some companies may want all their shares to, now, be privately owned; hence management might repurchase those shares owned by external shareholders. In other cases, management might just want to redeem the shares. It should be noted that share re-purchase negates the view of the traditionalists on the theory of dividends that cash dividends are the sole determinant of the value of a share.

It should be noted that share re-purchase has just been recently legalised on the Nigerian stock market.

It is only in United States that share repurchases are popular; in other countries, they are illegal and yet in some they are uncommon because of their attendant tax consequence.

18.13 SUMMARY AND CONCLUSIONS

The dividend policy decision of a company is a critical factor in the financial management of that company. Some schools of thought believe there is a strong relationship between dividend payments and the value of the firm. These are the traditionalists. However, M & M believe that the patterns of dividend payments do not affect the value of the firm. Theoretical reasons were advanced in support of each position. Notwithstanding the theoretical propositions on theory of dividends, there are practical factors to be considered in determining the dividend policy of a firm. These include legal constraints, future financial requirements, liquidity, capacity for borrowing and so on.

Another aspect of the dividend policy of the firm is whether a firm should pay a fixed naira dividend-payout ratio, applied to annual profits. Although the latter policy might have its own virtue, the stable fixed naira payment per share is recommended because it generates investors' confidence in the ability of the management to profitably manage the company for an indefinite future period.

There are other considerations in dividend decisions that are worth mentioning. These are the scrip dividends, scrip issues, share split, share consolidation and share repurchase. Decisions regarding all these financial operations are normally made by management against the backdrop of the need to maximize shareholders wealth which is the principal financial objective of strategic financial management.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

18.14 REVISION QUESTIONS

18.14.1 MULTIPLE CHOICE QUESTIONS

1. When a company treats dividend payment as residual, it means
 - (i) paying dividends as much as possible to shareholders and using the balance, if any, to finance profitable investment.
 - (ii) paying a fixed percentage of annual after-tax profits as dividends every year
 - (iii) financing all profitable investments first and using the balance (if any) to pay dividends
 - A (ii) only
 - B (ii) and (iii)
 - C (i) only
 - D (i) and (ii)
 - E (iii) only

2. Which theory says that the value of the firm is unaffected by the way available profits are shared between retentions and dividend payments?
 - (i) Markowitz theory
 - (ii) Traditional theory of dividends
 - (iii) Modigliani and Miller (original version) theory
 - A (iii) only
 - B (ii) only
 - C (i) only
 - D (i) and (ii)
 - E (ii) and (iii)

3. The “bird-in-hand” argument point of dividend payments is that of
 - (i) CAPM
 - (ii) Traditional theory of dividend
 - (iii) M & M (original version)

- A (ii) only
- B (ii) and (iii)
- C (iii)
- D (i) and (ii)
- E (i) only.

4. Which of the following does NOT affect dividend payments?
- A Future financial requirement of the company
 - B Legal constraints
 - C Current year's profits
 - D Liquidity of the company
 - E Access to the capital market
5. Which ONE of the following statements about dividends is NOT correct?
- Dividends:
- A are recommended by directors
 - B are approved by the shareholders at the Annual General Meeting (AGM)
 - C can be increased by the shareholders at the AGM
 - D can be reduced by the shareholders at the AGM
 - E are subject to withholding tax law of the country.

18.14.2 SHORT ANSWER QUESTIONS

1. According to M & M (original version) theory what is "home-made" dividends?
2. State the main legal restriction on payment of dividends.
3. In terms of definition, what is the main difference between stable dividend payment and stable pay-out ratio?
4. In the theory of finance, which of the following statements is correct?
 - (i) Dividends are paid out of profits
 - (ii) Dividends are paid out of cash.
 - (iii) (i), (ii) or both.
5. Give another term for scrip issue.

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

THE NEW ISSUES MARKET

19.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ♦ Understand the nature of new issues market;
- ♦ Describe the methods of raising finance in the market;
- ♦ Itemize, serially, the steps involved in the procedure for making public issue of debt/equity;
- ♦ Appreciate the significance of pricing to the public issue of debt/equity;
- ♦ List the components of share issue costs;
- ♦ Itemize, serially, the steps involved in the procedure for making 'private placement' of debt/equity; and
- ♦ Explain rights issues and effects of such issues on shareholders' wealth.
- ♦ Explain bonus issues and effects of such issues on shareholder's wealth.

19.1 INTRODUCTION

As earlier discussed, companies finance their long-term investments with a mix of internally generated funds and funds raised externally through public issues, right issues and private placement of debts or equities. Also, the financial markets, in general, have been discussed. It is necessary to discuss how financial managers of companies raise these funds in the capital markets. The main focus in this chapter will be the primary or new issues market with emphasis on the methods that are used and the procedure in raising these funds.

These funds are provided by the 'surplus' sector of the economy mainly individuals and certain financial institutions such as insurance companies, pension funds, unit trusts and microfinance banks. Since companies, which mainly occupy the 'deficit' sector, do not have direct link with the savers, some financial institutions called financial intermediaries provide this very important link. These financial institutions include the commercial banks, the microfinance banks, insurance companies, pension funds and unit trusts. They help to channel the savings of the surplus sector to the deficit sector. Other prominent institutions are the Issuing Houses (Investment Bankers) with whom companies initially establish their link, the stockbroking firms (to the issue), the Registrars, the Reporting Accountants and the Solicitors to

the company. Each of these institutions plays one role or the other in the sale and purchase of securities relating to new issues. There are, of course, the regulatory authorities - the Nigerian Stock Exchange (NSE) or simply "The Exchange" and the Securities and Exchange Commission - 'SEC' - that ensure among other functions orderliness and transparency in the market and protection of the investing public.

19.2 THE NEW ISSUES MARKET

This market, also called "the primary market" is a market for new issues of securities, principally shares and at times debentures. Funds which are raised in this market are primarily long-term funds through the issuance of long-term fixed/variable-interest corporate securities and shares. These securities are bought by investing public who put down their funds in exchange for these securities. The buyer of these securities are known generally as investors. They may be lenders when they have contractual agreement with the issuing company for the receipt of periodic interest and repayment of their capital. They may also be part-owners of the issuing company when no such contractual agreement exists.

19.3 METHODS OF MAKING NEW ISSUES

There are five methods of making new issues in the primary market. These are offer for subscription, offer for sale, stock exchange introduction, rights offer and private placement.

19.3.1 Offer for Subscription

These are issues of shares or debentures made directly by the company to the public. The proceeds of issue go directly to the company to finance its fixed assets, other expansion programmes and working capital as stated in the prospectus. The company normally goes through an Issuing House which advises on such things as pricing and timing of the issue. This method may be used by companies coming to the market for the first time or already quoted companies. Underwriting is usually necessary under this method.

19.3.2 Offer for Sale

This is an offer of existing securities, to the public. There are two known forms this type of offer may take. Firstly, it might occur where the issuing company initially sells the shares to an issuing house which in turn sells the shares to the investing public at a slightly higher price. Secondly, it might occur where the shares were already owned by government and it decides to 'privatise' these holdings. In both cases, the proceeds go to the vendor and not the company. Most of the Federal Government parastatals that were sold under the

privatisation programme fall into the second category. Underwriting is, usually, not necessary in this case.

19.3.3 Stock Exchange Introduction

Under this method, the company already had a wide spread of shareholders and is only seeking quotation on the stock exchange. Some Nigerian companies got listed on the stock exchange via introduction. They had already satisfied the listing requirements of the "The Exchange" regarding the number and spread of shareholders.

19.3.4 Rights Offer

This is an offer to the existing shareholders of the company, usually at a price lower than the current market price. Details of this offer will be discussed later in this chapter.

19.3.5 Private Placement

Under this method, securities are sold to a select group of investors through special direct invitation to prospective investors who can only subscribe to such offer. Shares issued under this method would not be listed on the stock market, so subsequent trading in these shares on the exchange would not take place.

19.3.6 Offer by Tender

This is a variation of an existing method - offer for subscription. Under this method shares are offered to the public and prospective buyers are required to give the price they are willing to pay. The company would have a reserved price - the price below which the company will not sell. Offers can only be made at prices above this price. The price at which the issues are eventually made will be highest price which will absorb all the shares. This price is called the **striking price**. Prospective buyers who quoted higher than the striking price would be required to pay the striking price. This is the price at which all the shares would be sold at. This method of issue is suitable for companies going to the market for the first time, that is, making Initial Public Offer (IPO). This is because pricing may be difficult and it is, therefore, necessary to allow the public to fix the price.

19.4 PROCEDURE FOR NEW PUBLIC ISSUES OF DEBT/EQUITY

The steps which may slightly vary among Issuing Houses are:

- (a) The company appoints an Issuing House, intimating it of its intention to raise funds via the capital market;

- (b) The Issuing House advises the company on method of issue, pricing, timing and so on;
- (c) The Issuing House appoints the experts - Accountants, Solicitors and so on;
- (d) The Issuing House obtains necessary documents from the company and prepares the time-table for the issue;
- (e) Files application with the Stock Exchange and SEC;
- (f) Prepare Issue documents, that is, the draft prospectus, application forms and so on;
- (g) Arranges stakeholders' meeting to ratify the issue documents and review the situation;
- (h) The company holds the completion Board Meeting to approve all documents relating to the issue;
- (i) Documents are filed with the Corporate Affairs Commission (CAC);
- (j) The company advertises the issue in National dailies and sends out the prospectus to the stockbrokers and receiving banks;
- (k) Application lists are opened for a minimum of 21 working days (or 28 days for rights issue), extension could be requested for, if need be;
- (l) Application lists close. Receiving banks and stockbrokers submit returns to the registrar;
- (m) The Issuing House and the company agree on the basis of allotment and send the provisional allotment schedule to SEC for approval;
- (n) The allotment committee of SEC holds a meeting to approve the issue;
- (o) After approval, Issuing House gives instruction to the Registrar to issue shares/stock certificates to investors in line with final allotment lists;
- (p) Where an investor has opted for his shares to go through its Central Security Clearing System (CSCS) account, his records would be electronically updated;
- (q) In the event of over-subscription, the shares would be allotted to shareholders in an amount not exceeding 25% of excess proceeds, subject to increase in share capital and approval at an Annual General Meeting (AGM). Such excess monies received shall be held as deposit for shares pending allotment;

- (r) Issuing House gives instructions to the Registrar to release shares / stock proceeds to the company and returns to investors surplus monies in respect of unallotted requests;
- (s) Issuing House gives instruction to the stockbrokers (to the issue) to prepare Certificates of Compliance and sends same to the Nigerian Stock Exchange; and
- (t) The NSE admits the shares/stocks to the official list and trading commences immediately thereafter.

19.5 PRICING OF ISSUES TO THE PUBLIC

Pricing of direct issues to the public is a critical decision. The price must be such that the maximum amount of cash per share is raised on one hand and on the other hand the company avoids the risk of under subscription. If the price is unduly high, nobody will buy the shares. If it is unusually low enough cash might not be raised. As a matter of fact, the company must avoid putting a price which is at a discount to the current market price. If existing shareholders could not partake enough in the new issue as to maintain their original proportional position they would suffer a drop in their wealth. It would be similar to a situation where they do not take up their rights.

There are two ways to reduce the problems in pricing of issues:

- (a) The share can be underwritten; and
- (b) The shares can be issued via a tender offer.

19.6 SHARE ISSUES IN A FINANCIAL MARKET MELT-DOWN

Should new shares be issued when the prices of shares in general or that of the company are depressed? One school of thought says that it would not be fair to the existing shareholders if new shares are sold in a depressed market as outsiders would benefit by buying 'cheap' shares at the expense of the existing shareholders. It is claimed that new issues are unlike rights issue, where the shares still go to the existing shareholders. Another school of thought, however, disagrees by arguing that if the stock market is truly efficient, the present market price of a share will reflect the opinion of the generality of all investors on the value of the share at the time. There is no reason therefore to believe that, because share prices have recently fallen, they have greater chance of:

- (a) Increasing in value; or
- (b) Decreasing further in value; or
- (c) Remaining unchanged.

19.7 UNDERWRITING

This is a contract whereby, in consideration for a fee, an Issuing House undertakes to take up shares that are not bought in the new issue market. This ensures that the issue is a success. If the issue is unsuccessful either because of downturn in the market or because it is overpriced, the underwriter, not the company, bears the loss.

19.7.1 Underwriting Commission

This is the commission payable by the company to the main underwriter. This commission is normally fixed by the underwriters themselves, based on the number of shares they are underwriting, the offer price and, of course, the estimated risk of the shares being undersubscribed by the investing public.

There may also be sub-underwriting commission where the underwriting is sub-contracted by the main underwriter to a sub-underwriter. The **sub-underwriting commission** is the commission payable to the sub-underwriter. Also, there is **overriding commission**. This is the difference between the commission received by the main underwriter and the one paid to the sub-underwriter.

19.8 COST OF NEW ISSUES

The following are the components of the cost of new issues:

- (a) Listing fees: payable to the Stock Exchange and based on the amount to be raised.
- (b) Share valuation fees: payable to SEC and computed as a percentage of the nominal value of the shares that would be issued.
- (c) Issuing House fee: normally negotiated with the company and based on a percentage of the total amount to be raised.
- (d) Fees payable to the stockbrokers to the issue.
- (e) Receiving banks and stockbrokers commission.
- (f) Solicitor's fees.
- (g) Reporting Accountants' fees.

19.9 PROCEDURE FOR "PRIVATE PLACEMENT" OF DEBT/EQUITY ISSUES

The following are the steps involved in the private placement of debts or equities.

- (a) Appointment of an Issuing House;
- (b) Appointment of experts;
- (c) Preparation of time-table covering all the envisaged activities to be undertaken;
- (d) Review of all documents and information that have to be sent to SEC for approval;
- (e) Submission of documents in respect of valuation, sale and timing of the issue to SEC;
- (f) Preparation of the Placement Memorandum;
- (g) Dispatch of the Placement Memorandum to individuals, corporate bodies and financial institutions who must have had prior knowledge of the pending issue;
- (h) Application forms sent along with the Placement Memorandum;
- (i) Receipt of completed application forms and monies from the prospective private investors;
- (j) Monies received are put into a special account known as "the Issue Proceeds Account";
- (k) Returns and monies collected are analysed and provisional allotment schedules prepared;
- (l) Copies of the provisional allotment schedules are sent to SEC;
- (m) SEC fixes the allotment meeting date;
- (n) Allotment meeting takes place and final allotment is agreed;
- (o) A cheque is raised releasing the monies, less all unpaid fees, to the company;
- (p) Surplus funds are returned to the subscribers; and
- (q) Preparation of shares/ stock certificates and dispatch of same to subscribers.

19.10 RIGHTS ISSUES

Rights issues, also known as 'preemptive rights' or 'privileged subscription' are offers to the existing shareholders to subscribe cash for additional shares in the proportion of their existing holdings at a price which is appreciably below the current market price. The issues are normally conveyed to the shareholders through the issuance of a rights circular. The circular would specify the terms of the offer. These include:

- (a) The number of rights needed to subscribe for additional share(s);
- (b) The subscription price; and
- (c) The expiry date for the exercise of the right.

In addition, options would be given to a shareholder to exercise the right and take up the shares in full or sell all the rights to someone else or sell enough rights that will give him enough cash to subscribe for the balance or lastly to do nothing.

ILLUSTRATION 19-1

A company presently has in issue 1 million ~~N~~1 equity shares. It plans to make a 1 for 4 rights issue at a subscription price of ~~N~~3.60. Assume that the shares just before the rights issue were selling on the stock market at ~~N~~4.

Required:

- (a). Calculate the theoretical ex-rights price and the value of the right.
- (b). Advise a shareholder who has 2000 shares in the company on what to do on receipt of a rights circular and on the effect of his action on his wealth.

SUGGESTED SOLUTION 19-1

	Number of shares	Price	Value
		N	N
Original interest	4	4.00	16.00
Rights	1	3.60	<u>3.60</u>
Enlarged interest	5		<u>19.60</u>
Theoretical ex-rights price	$= \frac{\text{N}19.60}{5}$ $= \text{N}3.92 \text{ per share}$		

If after the issue, the shares are quoted at the theoretical ex-rights price there will be a fall in value of the company's share of 8k per

share, but to counter this adverse effect, shareholders would subscribe for new shares at a price of ₦3.60 which would then be worth ₦3.92, a gain of 32k (8k per old share, that is, $32k/4$), the effect of the rights issue is, therefore, to create a no gain, no loss situation.

Value of the right

This is the gain a shareholder is expected to make if he exercises his right. It is expressed as follows:

Theoretical ex-rights price - Subscription (rights) price

$$= ₦3.92 - ₦3.60 = ₦0.32 \text{ or } 32k$$

In terms of old shares this is equal to $32k/4 = 8k$

Note that this is exactly equal to the difference between the cum-rights price and the theoretical ex-rights price.

(b) Holder of 2000 shares

He has four options open to him

(i) Take up the rights in full

Value of interests before the rights issue = ₦8,000

i.e. 2000 shares x ₦4.

Value of interests after the rights issue

$$\text{No of Shares after the rights} = 2000 + \left(\frac{1}{4} \times \frac{2000}{1} \right) = 2500$$

Value = 2500 x ₦3.92 = ₦9,800

Less: Cash Utilised in subscribing for the rights

Value = 500 x ₦3.60 (₦1,800)

₦ 8,000

There is no effect on the shareholder's wealth.

(ii)	Sell all the rights	₦
	Value of interests before the right issue =	<u><u>8,000</u></u>
	Value of interests after the rights issue	
	(2,000 x ₦ 3.92)	7,840
	+ (500 x ₦0.32)	<u>160</u>
		<u><u>8,000</u></u>
	No effect on his wealth	

(iii) **Sell enough to provide cash for subscription**

$$\begin{aligned} \text{Proportion to sell} &= \frac{\text{Subscription Price}}{\text{Theoretical ex - Rights price}} \\ &= \frac{\text{₦ 3.60}}{\text{₦ 3.92}} \\ &= 91.8\% \end{aligned}$$

Value of interest before the rights issue	₦8,000
Value of interest after the rights issue	
Proceeds of sale of rights 459 @ ₦0.32 = 146.88	
Amount subscribed 41 @ ₦3.60 = (147.60)	
Value of interest = 2041 @ ₦3.92	₦8,000.72
No effect on wealth	

(iv)	Do nothing	₦
	Value of interests before rights issue =	8,000
	Value of interests after rights issue	
	= 2,000 x ₦3.92	<u>7,840</u>
	Fall in wealth =	<u><u>(160)</u></u>

If he does nothing, the shareholder would suffer a loss in his wealth.

So far, it has been assumed that the actual ex-rights price will be equal to the theoretical ex-rights price. However, this may not be so for the following reasons:

- General factors affecting the market as a whole may cause actual market price to fall short of or below the theoretical ex-rights price.
- Many shareholders off-loading their rights thereby creating excess supply on the market. The possible outcome is the actual price falling below the theoretical ex-rights price.
- Investors may not have faith in the management's ability to utilize the rights' funds efficiently and therefore maintain the same dividend

rate on the enlarged capital base. This is, also likely to cause the actual price falling below the expected market price.

- (d) Investors may, on the other hand, have maximum confidence that the use to which the rights funds are put is going to add value to the business; in this case the actual price may rise above the theoretical ex-rights price.

19.10.1 Pricing of Rights Issue

Pricing of rights issue is not as critical as pricing of new issues of shares to the investing public as a whole. From the point of view of investors, it would have been seen, from the above, that as long as a shareholder takes up his rights or sells them, his wealth would not be affected by the issue of rights by the company. Based on this reasoning, which was confirmed by various calculations, it can be said that a shareholder's wealth will not be equally affected by the subscription price of a rights issue. However, from the standpoint of companies, two points stand out.

- (a) A subscription price at a discount to the current market price exerts pressure on a shareholder to take up his rights or sell them. This has the effect of making the issue a success as regards the shares being fully taken up and the amount required by the company fully recovered.
- (b) A subscription price at an appreciable discount below the current market price will ensure that a fall in actual market price, following the date of announcement but before the date of the rights issue, does not cause the actual market price to fall below the subscription price. If this happens, investors would prefer buying the shares in the open market than subscribing for the rights. The natural result is the failure of the rights issue.

19.10.2 Factors to Consider When Making Rights Issues

The following factors are relevant:

- (a) Relatively cheap in terms of issue costs when compared with raising of equity finance.
- (b) Pricing of rights issues is not critical, as indicated above.
- (c) Failure rate is low. This is an assurance that a company will be able to obtain the funds it required.

- (d) Rights issues, creates a forced investment or forced sale environment, which may make the shares unpopular with its attendant adverse effect on share price. In order not to lose out by doing nothing, investors must either take up their rights or sell them. Notwithstanding that a partial sale is possible, investors must still do something.

19.11 BONUS ISSUES

Bonus issue was defined earlier and compared with scrip dividend/cash dividend. Its significance or otherwise as a method of raising additional equity finance will now be discussed. Bonus issues as a source of additional finance appear to be the most important to the company among the three main sources - bonus issues, rights issues and public issues.

In bonus issues, reserves are merely capitalized and 'free' ordinary shares are issued (for the amount so capitalized) to existing shareholders in the proportion of their present holdings, for example, on a 1 for 2 basis.

19.11.1 The Objective of Making Bonus Issue

The objective of making a bonus issue is to:

- (a) Increase the issued share capital to an amount which is more in line with its true value, based on book value of the company's net assets; and
- (b) Erase the misunderstandings created when dividends on ordinary shares are expressed as a percentage of issued capital whereas these dividends, were from profits earned by effective equity capital - that is, capital employed.

ILLUSTRATION 19-2

XY Plc has the following capital structure

	₦'000
4 million ordinary shares of 50k each	2,000
Revenue reserves	3,000
Profit and loss balance	<u>1,000</u>
	<u>6,000</u>

XY Plc decides to make a bonus (scrip) issue on a 1 for 2 basis by capitalizing part of its revenue reserves.

Required:

Using the above information, state and explain the effect of the issue in each case, on

- (a) The market price of the company's shares,
- (b) The ordinary shareholder's interests,
- (c) The preference shareholders' interests,
- (d) The creditors.

Show relevant calculations to support your answer

SUGGESTED SOLUTION 19-2**Workings:**

Balance sheet after the bonus issue	₦'000
6 million ordinary shares of 50k each	3,000
Revenue reserves	2,000
Profit and loss balance	<u>1,000</u>
	<u><u>6,000</u></u>

From the re-drafted balance sheet, the net assets total value has not changed at ₦6m. However, net assets value per share has dropped from

$\frac{₦6,000,000}{4,000,000}$	to	$\frac{₦6,000,000}{6,000,000}$
₦1.50	to	₦1.00

(i). Effect on Market Price

The market price is expected to fall to ₦1 following the bonus issue. However the actual market price may not fall up to this point because of the favourable impression bonus issues supposedly create in the minds of investors.

(ii). Effect on Ordinary Shareholders' Interest

Bonus issues do not have any real economic effects on shareholders' interest. A shareholder with say 10,000 ordinary shares will have his or her interest valued at ₦15,000 (10,000 x ₦1.50) before the bonus issue. After the bonus issue his or her interest will still be valued at ₦15,000 (15,000 X ₦1). However, if Naira dividend per share is maintained into the future, shareholders would obviously benefit as they would receive more cash dividends in future. Also reduction in market price at times enhances trading of the share which may perhaps put the share in higher price range.

(iii). Effect on Preference Shareholders' Interest

A bonus issue provides real benefit which can only come out of the equity of the company

(iv). Creditors

Bonus issue gives some benefit to the extent that distributable profits are now capitalised.

19.12 RESERVES AS FREE SOURCE OF FUNDS

It is often claimed that reserves constitute a free source of funds. However this is not so, as they have opportunity costs. Reserves represent funds that should have been distributed as cash dividends which when received can be invested in other assets. The cost of shares is the cost similar to that of the original shares of the same company.

19.13 FACTORS TO CONSIDER WHEN USING RESERVES TO FINANCE THE COMPANY'S LONG-TERM INVESTMENTS

The following factors are relevant:

- (a) Effect on shareholder's wealth.
- (b) Absence of issue costs.
- (c) Profits are risky.
- (d) Absence of dilution of control.

19.14 SUMMARY AND CONCLUSIONS

The new issues market is a market for issue of new shares and debentures. It is a long-term financial market where shares / debentures are newly sold and bought. A company goes to this market to enable it finance fixed assets and to some extent working capital.

The methods of raising funds by companies comprise mainly offer for subscription and offer for sale. Others are rights offer, offer by tender, private placements and introduction. Stock exchange introduction is not really a method of raising funds as no cash is coming to the company or its shareholders.

The procedure for raising funds via debt/equity must be known and properly followed. The engagement of the Issuing House by the company is very important. The method of issue to use, the pricing and timing of issues are better handled by professionals. A well experienced and well known Issuing

House should be engaged so as to guarantee the success of the issue. A public issue should as much as possible be under written.

Rights issues are very important sources of finance for the company. They are issues to existing shareholders who should either take up their rights in full or sell them so that their wealth is maintained. A 'do nothing' course of action might lead to a fall in value of an investor's wealth.

Bonus issues are issues also to existing shareholders but free of charge. Here reserves which already belong to the shareholders are only being capitalised. Thus, the issue might not have any economic effect on their interests.

*Refer to Comprehensive Questions and Suggested Solutions in Appendix II
Page 465*

19.15 REVISION QUESTIONS

19.15.1 MULTIPLE CHOICE QUESTIONS

1. Which of the following is NOT correct about New Issues Market?
 - A It is a market for existing securities.
 - B It is a primary market.
 - C It is a market for new issues of securities.
 - D It exists for making initial public offers (IPOs).
 - E Issues could be made by tender.

2. Which of the following is not really a method of raising capital from existing and prospective shareholders?
 - A Offer for sale.
 - B Offer for subscription.
 - C Rights offer.
 - D Stock Exchange Introduction.
 - E Offer by tender.

3. What is "overriding commission" in relation to underwriting activities of the primary market underwriters?
 - (i) Commission received by the main underwriter
 - (ii) Commission paid to the sub-underwriter
 - (iii) Differential commission between the commission received by the main underwriter and the commission paid to the sub-underwriter
 - A (i) only
 - B (iii) only
 - C (i) and (iii)
 - D (ii) only
 - E (ii) and (iii)

4. Which of the following is NOT a cost of new issues?
 - A Listing fees
 - B Brokerage Commission
 - C Solicitors' fees
 - D Reporting accountant's fees
 - E Shares Valuation fees

5. Which of the following is NOT correct about rights Issues?
 - A They are issues to the existing shareholders
 - B Issues are usually made at a higher price to the current market price of the company's share.
 - C Issues are means of raising funds by companies.
 - D Issues ensure maintenance of the proportional interests of the shareholders
 - E Pricing is not as critical as in initial public offering.

19.15.2 SHORT ANSWER QUESTIONS

1. State one main difference between offer for sale and offer for subscription.
2. A method of raising capital whereby offers are made by the company to a select group is called _____
3. State one way in which the problem of pricing new issues in the primary market can be reduced.
4. Give another name for rights issue (or offer)
5. In relation to the acceptance of the offer by existing shareholders, what is the main difference between bonus Issue and rights issue?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

THE SECONDARY CAPITAL MARKET

20.0 LEARNING OBJECTIVES

After studying this chapter, the readers should be able to:

- ♦ Understand the brief history and membership of the Nigerian stock exchange (NSE);
- ♦ State the roles of stock exchanges in general;
- ♦ Describe the trading mechanism of 'The Exchange';
- ♦ Itemise the steps involved in the acquisition/disposal, settlement and transfer procedures;
- ♦ Describe the trading, clearing and settlement processes of the Nigerian Stock Exchange/Central Securities Clearing System (CSCS);
- ♦ State the components of transaction costs on the Nigeria Stock Exchange;
- ♦ Explain the concepts of 'Pricing', 'Market Capitalisation' and 'Price Index';
- ♦ State the differences between the listing requirements of the first tier sector and the emerging markets sector;
- ♦ State the advantages and disadvantages of listing on the stock exchange;
- ♦ Explain the Central Securities Clearing System (CSCS) and state the steps involved in its clearing and settlement mechanisms;
- ♦ Discuss the forms of stock market efficiency in general;
- ♦ State the implications of stock market efficiency for both the investors and financial managers; and
- ♦ Assess the state of the Nigerian Stock Exchange vis-à-vis market efficiency.

20.1 INTRODUCTION

As earlier defined, capital markets are markets where long-term finance is raised by companies and Federal, State and local governments. The capital markets comprise the primary capital market - market for new funds - and the secondary capital market - market for existing (second-hand) securities.

The focus of this chapter is on the secondary capital market in which equities change hands between one investor and the other. Purchase and sale of stocks and shares do take place anywhere and such transactions do not have to be on the floor of an exchange building. Thus, the secondary capital market is

any place where quoted long-term securities of companies and government are traded. Notwithstanding the above, the most important part of the secondary capital market anywhere in the world is the country's official stock exchange or stock market. Most of these official stock exchanges fulfill a primary function as well as a secondary one. Most official stock exchanges particularly in UK and USA, are known to be forums for trading in international securities, in addition to local ones.

20.2 THE NIGERIAN STOCK EXCHANGE (NSE)

The Nigerian Stock Exchange (NSE) was incorporated in 1960 as a company limited by guarantee and started operations in Lagos in 1961. Formerly known as Lagos Stock Exchange, it presently has its Head-Office in Lagos and branches in Abuja, Kaduna, Port-Harcourt, Kano, Onitsha, Ibadan, Abeokuta and Yola, with each having a trading floor. The exchange started operation with only 9 securities (3 equities and 6 government stocks). The number of securities traded on the Nigerian Stock Exchange is about 300.

The NSE is governed by a team of shareholders elected at an Annual General Meeting. These shareholders constitute the governing council (Board) of the NSE. The Council is headed by a President (Chairman) while the National Secretariat is led by a Director General (DG) (Chief Executive Officer) who is responsible for the day-to-day administration of the exchange.

The duties of the Council include:

- (a) Policy making;
- (b) Enforcing discipline among members;
- (c) Making rules and regulations for dealing members;
- (d) Giving approvals to quotations and listing of securities;
- (e) Protecting the interest of the investing public; and
- (f) Investigating and settling disputes and complaints against and among members.

20.2.1 Membership

There are two types of membership - ordinary and dealing. The ordinary member is the registered member of the exchange. The dealing member is a person or an institution who in addition to being an ordinary member, is licensed by the council to trade in stocks, shares and bonds on "The Exchange". The dealing members are typically the stockbrokers and the issuing houses.

Shares and stock can only be bought and sold on the Nigerian Stock Exchange through dealing members. Nigerian Stock Exchange dealing members have two roles (dual capacity):

- (a) As market makers or dealers they can be likened to a trader in the street market and
- (b) As stockbrokers - they act as agents of the public who wish to buy or sell through the Stock Exchange.

In their role as dealers, they earn income.

20.2.2 Roles of The Stock Exchange

The roles of any recognised stock exchange market would include the following:

- (a) The existence of any recognized stock exchange gives liquidity to investors who may want to sell their shares for cash as and when needed. This is its principal role.
- (b) Also investors would have opportunities to diversify their portfolios of securities, if they want.
- (c) Existence of the exchange is vital to firms that wish to raise long-term finance. It enhances the success of the new issue.
- (d) The absence of secondary market facilities tends to make the raising of long-term funds very expensive in terms of returns demanded by investors.
- (e) Economic development of a nation may be hindered by lack of established secondary capital market which may result in lack of long-term investment finance.
- (f) Existence of an officially recognised stock market will ensure that securities traded in such markets do not only have established prices but are also efficiently priced.
- (g) Accountability and transparency can be guaranteed as there are rules and regulations which dealing members must abide with in the conduct of their affairs.
- (h) Investors are adequately protected as securities are, normally, properly screened before they are listed on the Stock Exchange.

- (i) Stock Exchange transactions can now take place through computer, internet, telephone, fax and are no longer limited to the trading floors of an exchange building.

20.2.3 The Trading System

The NSE made a dramatic change to its system of trading in stocks and shares when it introduced the Automated Trading System (ATS) e-trading in April 1999. Prior to this time, a system known as call-over system was in operation. This system involved shouting by brokers on the floor of "The Exchange" to declare their intentions to buy or sell stocks / shares.

The new system, that is electronic trading system, is a computerised one under which stockbrokers interact with one another through inter-connected work stations, that is across a network of computers. The main sub-systems of the automated trading system (ATS) are the work station (CPU, monitor and printer), the trading engine (the server) and the trading software (the horizon). The workstation is the electronic facility with which the brokers interact and each workstation is available for each broker (presently) on the trading floor of the exchange. Here brokers input their buy and sell orders on their systems. The trading engine is the computer server which generates the actual start of the day's market transactions (Open State) and matches brokers buy/sell order, followed by continuous trading. This is done before allowing the transaction, otherwise the transaction is rejected.

After brokers have input orders, into their individual systems, the server goes into the Computer Securities Clearing System CSCS Clearing House to verify if the account numbers entered by the brokers actually exist and if the stocks are available in the clients' accounts.

Trading on the ATS starts usually at 10.00am each trading day with the Pre-Open State (situation when brokers input their buy/sell orders which are yet to be matched and, therefore, subject to partial or total variations). At about 10.40 am trading moves to the Open/Continuous State. At 12 noon trading moves to the close state, that is, market closes. The ATS is configured for remote trading. Already stockbrokers in some branches are trading on line. Presently, some brokers engage in remote trading from their different offices.

20.2.4 Acquisition / Disposal, Settlement and Transfer Procedure

With the introduction of the ATS (The horizon) and the tight coupling in Feb 2000 of the horizon with the CSCS - (The Equator), this procedure took on a completely new format. But first, let us look at the certificate process for quoted securities only.

- (a) The investor approaches his stockbroker, and obtains the appropriate forms:
 - (i) Share transfer forms; and
 - (ii) Shareholders particulars form CSCS R005 (later de-emphasised).
- (b) He carefully completes these forms (type written or hand written in block capitals) and signs the appropriate place(s).
- (c) He submits his certificate and the completed forms to his stockbrokers.
- (d) The stockbroker fills the certificate deposit form, signs the relevant portion of the completed certificate, documents them and sends them to the appropriate registrar for verification.
- (e) After verification and within 48 hours, the registrar sends the documents directly to CSCS for further processing.
- (f) The CSCS assigns a Clearing House Number (CHN) to the shareholder.
- (g) It also assigns a CSCS computer-generated account number to the shareholder.

NOTE:

Whereas a shareholder has only one CHN regardless of the number of stockbrokers through which he carries out his investment activities, he would have one account number per stockbroker.

- (h) The CSCS processes the document for trading within 24 hours.
- (i) In lieu of the certificate, the shareholder would now have a statement of stock position as evidence of his stock position with the CSCS System. He gets this statement free every quarter and can also obtain it on special request on payment of ₦100.

- (j) He can use the statement as a collateral for a loan from the bank.

NOTE:

The Horizon is the ATS software, a tested securities trading solution which has been used in mature and emerging stock markets.

20.2.5 Trading, Clearing and Settlement Processes of the NSE/CSCS

- (a) The investor initiates the buy or sell order, going through his stockbroker.
- (b) He deposits his money with his stockbroker when he is buying, or deposits his certificate for verification when he is selling. When his certificate has been dematerialised (immobilised), he gives instruction to his stockbroker to sell from his shareholding account in the CSCS system.
- (c) He completes the necessary documentation including transfer form.
- (d) In respect of partial sale, he gives instruction to his stockbroker to sell from the stocks.
- (e) The stockbroker receives instructions from his client and fills the certificate of deposit form and sends them with the share certificate, if any, for verification to the registrar.
- (f) Stockbrokers verifies clients' signatures with the Registrar.
- (g) Completes a contract note and gives it to his client as evidence of the contract.
- (h) The registrar authenticates investors claims (certificates and transfer form) as presented through the stockbroker.
- (i) Sends verified certificates and signed transfer form and CD to the CSCS within 48 hours.
- (j) CSCS certifies that the shares are in its system and that stockbrokers can trade in the shares.
- (k) Transaction takes place on the exchange and transmitted to CSCS on real time basis via the ATS.
- (l) Transactions obtained from the Exchange are processed.

- (m) Stock brokers communicate their daily financial commitment to each other to the settlement banks (where each stockbroker maintains a trading account) via diskettes supported by hard copies.

It should be noted that all the above transactions are expected to be completed within 4 working days, that is, T + 3 (transaction day plus 3 working days)

20.2.6 Transaction Costs

Costs in respect of secondary market transactions include graduated broker's commission, VAT on the commission, stamp duty, SEC fee (buyer only) and NSE / CSCS for (seller only) brokers' charges can, however, be negotiated within a range approved by the Council of the exchange.

Currently, these are:

SELL SIDE

Stockbrokers Income	1.125(0.75 to 1.5)
NSE Fees*	0.50
CSCS*	0.45
Stamp duties	0.08
VAT on commissions	5%

BUY SIDE

Stockbrokers Income	0.75 to 1.50
SEC Fees	0.60
CSCS	0.10
Stamp duties	0.075
VAT on commissions	5%

The overall structure does change over time depending on the directives from the NSE or SEC.

20.2.7 Pricing, Market Capitalisation and Price Index

(a) Pricing

Conceptually, the major factor that influences the movement of price of a security in any stock market is demand for and the supply of the shares of the company. This will be reflected in the underlying fundamentals of the company, such as, profitability and dividend trend, earnings prospects, future dividend, growth

etc. This can be complemented by other non-economic factors. All these affect investors' biases which are consequently reflected in their respective instructions to their various stockbrokers to buy or sell a particular security.

The price movements over time on the NSE are usually reflected through the NSE price index.

(b) Market Capitalisation

This is the aggregate of the market values of all securities listed on the exchange as at a point in time. It is usually given at the close of business each trading day.

(c) Stock Market Index (NSE All Share Index)

This index is an aggregate of the market capitalisation of all the industrial equities listed on the NSE and expressed in terms of a base market value (Jan. 3 1984 = 100). Computed daily, it is a means of measuring the extent and direction of the general price movement on the NSE.

The NSE index is given by the formula:

$$\frac{\text{Current Market Value}}{\text{Base Market Value}} \times 100$$

$$\text{i.e. } \frac{\sum_{i=1}^n (P_a Q_a)_i}{\sum_{i=1}^n (P_n Q_n)_i} \times 100$$

P_a = Current market price of an ordinary share

Q_a = Current number of listed ordinary share

P_n = Current market price - base date

Q_n = No of listed shares - base date

$i = 1, 2, \dots, n$

n = no of constituents in the index.

20.2.8 Requirements for Listing

FULL LISTING (1 ST TIER)	EMERGING MARKET (FORMERLY SECOND TIER)
Registered as Plc	Registered as Plc.
Submission to exchange 5 year financial statements	Submission to the exchange 3 year Financial Statements.
Date of last audited accounts must not be more than 9 months	Date of last audited accounts must not be more than 9 months.
Amount that can be raised in the capital market unlimited	Amount that can be raised may not exceed ₦30 million.
Annual quotation fees based on market capitalisation	Annual quotation fees is a flat annual charge of ₦30,000.
At least 25% of share capital must be offered to the public	At least 10% of share capital must be offered to the public.
No. of shareholders must not be less than 300	No. of shareholders must not be less than 100.
After listing, company must submit quarterly, half-yearly and annual accounts.	After listing, company, must submit quarterly half-yearly and annual accounts

20.2.9 Advantages and Disadvantages of Listing

(a) Advantages of Listing

The advantages of listing include:

- (i) **Liquidity:** the exchange provides liquidity for investors;
- (ii) **Known prices:** prices are known and even deemed right in an efficient market;
- (iii) **Additional capital:** provides avenue for raising additional capital;
- (iv) **Publicity:** gives increased publicity for the company;
- (v) **Collateral:** enhances the value of security given as collateral for loans;
- (vi) **Marketability:** increases the marketability of shares and stocks; and

- (vii) Share price: provides improvement in share price due to efficient organisational structure.

(b) Disadvantages

The disadvantages of listing include:

- (i) High costs of obtaining quotation: cost of prospectus, fees payable to bankers and brokers;
- (ii) Costs of maintaining quotation: management time and efforts, stringent reporting requirements; and
- (ii) Highly demanding and rigorous rules.

20.2.10 The Central Securities Clearing System (CSCS)

The CSCS Ltd is a subsidiary of the Nigerian Stock Exchange (NSE) established to provide, central depository for share certificates of companies quoted on the NSE, clearing and settlement for all stock market transactions.

It also issues Central Securities Identification Numbers (CSIN) to shareholders and provides safekeeping and custodian services in conjunction with custodian members, for both local and foreign instruments.

In addition, the CSCS serves as sub-registry for all securities maintained in conjunction with the registrar of quoted companies.

(a) Clearing & Settlement Mechanism

The steps involved in the clearing and settlement system of the CSCS are:

- (i) Opening of account using information in the shareholder's transfer form.
- (ii) Receipt of transactions on line, real time, via the ATS of the NSE (Horizon).
- (ii) Dispatch by settlement banks, of schedule of balances on trading accounts to CSCS Limited.
- (iv) Processing of transactions obtained from the exchange.
- (v) Transmission on daily basis, information regarding stockbrokers financial commitments to the settlement banks through diskettes supported by hard copies.

- (vi) Transfer by settlement banks of the necessary debit and/or credit entries (electronically) to the respective brokers trading account using the CSCS schedule.
- (vii) Stock settlement by settlement banks on day T + 3 thereby achieving Delivery Versus Payment (DVP).

20.3 EFFICIENT MARKET HYPOTHESIS (EMH)

20.3.1 Meaning of Capital Markets Efficiency

Capital markets are said to be efficient when prices of securities in such markets fully reflect all information about the company, the industry to which it belongs and the economy as a whole. This means that any new information about a company coming into the market is immediately reflected in the price of the share of the company such that no investor can make an above average return on an investment. This is because in a supposedly efficient market, the price of a security is expected to fluctuate randomly around its true or intrinsic value.

It should be noted that efficient market does not mean 'perfect' market, although, both markets share common characteristics. 'Efficient' simply means security is price efficient. The price is right and represents the best estimate of the security's true value based on the available information. This is the basis of capital market efficiency.

20.3.2 Forms of Efficiency

Harry Markowitz asserted that market efficiency should be discussed under three headings - the weak form, the semi-strong form and the strong form.

(a) The Weak Form

This form of efficiency implies that information about past share price movements is already reflected in the current market price. Therefore the ability to forecast future prices cannot be enhanced based on the use of past information alone.

(b) The Semi-Strong Form

This form states that the current market price of a security, fully and immediately reflects all publicly available information including information from financial statements, chairman's report and news items. Here insider information is excluded.

(c) The Strong Form

This form of efficiency implies that ALL information both public and private (including insider information) is fully and immediately reflected in the current market price of the security. Insider information is said to be information that is known to management but unknown to the public.

It should be noted that the above levels of efficiency are in ascending order, that is, a market that is strong-form efficient must also be semi-strong and weak-form efficient.

20.3.3 Tests of Efficiency

Assertions relating to capital market efficiency are not directly testable. How can tests be carried out on whether all available information is fully reflected in prices of securities? Does the researcher personally have all the available information? Does he even know that some of this information exists?

Therefore, the only tests that could possibly be carried out are whether or not prices of securities behave in a way that appears consistent with efficiency. Such tests which have been carried out in mature capital markets have attempted to do this. The exposition is, however, beyond the scope of this pack.

20.3.4 Implications of the Efficiency of the Stock Market

The implications of the efficiency of the capital markets in general, and that of the stock market in particular will be explained from the points of view of:

- (i) Investors, and
- (ii) Financial managers.

(a) Investors

The implication is that investors should not waste their time looking for a security that would provide returns in excess of the normal or expected returns simply by analysing past information on the direction of share price or by analysing new economic information about the security or the company. It is only when an investor has access to information which has not come to the knowledge of the investing public at large that an above average return can be made.

(b) Financial Managers

The implications for financial managers are extremely important and underscore the key reason for the discussion of capital markets efficiency in the first instance. The implications border on the following:

- (i) Rational investors can astutely interpret the activities of a company's management and cannot be deceived by mere window dressing that has the effect of unnecessarily increasing the price of a share.
- (ii) Financial managers will be wasting their time waiting for a recovery of the price of the security in a depressed market before they come out with new issues. If the market is efficient and security prices emerge in a random fashion, there is no reason to believe that just because they were high in the past, they will move back to the old levels.
- (iii) Financial managers should be prepared to always release information about their activities to the market as any such information, particularly the positive one, will immediately be incorporated into the share price and result in an upward price movement for the benefit of the shareholders.
- (iv) Financial managers may not want to release negative information because such information might adversely affect them (a strong-form inefficiency). It is doubtful whether this could be sustained over a long term since, sooner or later, most information leak to the market. Moreover, if investors happen to know that managers do suppress negative information, they may be unfavourably disposed to such managers.
- (v) Investors in the stock market are very rational when they put values on risky financial assets. They, for instance, always search for similar assets (in terms of risk and return) and use their prices to cross check the particular asset that is being valued. In other words, because of their rational behaviour, they cannot be fooled. By and

large the import of market efficiency for the management is that financial managers are directly linked with investors through prices of securities and that prices do respond speedily and rationally to new information.

20.4 APPLICATION OF MARKET EFFICIENCY TO THE NIGERIAN STOCK MARKET

It would be observed from the above discussion of market efficiency that market inefficiency would imply that investors can make above average returns by exploiting the market with such inefficiency. If this is the yardstick for measuring the efficiency or otherwise of a stock market, it could be said that the Nigerian capital markets typify a semi-strong form of market efficiency. Some empirical events appear to support this view. One singular important observed event was the way prices on the Nigerian Stock Market astronomically rose from early 2008 only to nose-dive, to their present (2009) low prices. It was evident that the sharp increases in prices were not supported by any fundamentals of the country's quoted companies. They were merely driven by uneconomic events.

20.5 SUMMARY AND CONCLUSIONS

The secondary market is a market for existing securities. The backbone of the secondary market (the stock market) is the Nigerian Stock Exchange (NSE).

The NSE was incorporated in 1960 as a not-for-profit organisation (a company limited by guarantee) and started operations in 1961. There are two major types of membership - the ordinary member and the dealing member. The dealing member is the stockbroker. Stockbrokers buy and sell stocks and shares as agents of investors.

The NSE (like any other stock exchange) plays an important role in the secondary market. The singular most important function is that of liquidity for investors. It has other important functions including facilitating the trading in the new issues market.

The trading mechanism is e-trading, a computer-based trading system which along with its CSCS counterpart e-clearing and settlement process, ensures completion of shares and stocks transactions within 4 working days (T+3 days) i.e. Transaction day + 3 working days.

The Nigerian Stock Exchange has two major sectors - the first-tier sector and the emerging markets (formerly second-tier) sector.

The differences between the two sectors centre on the amount that can be raised in the new issue market, submission of financial statements, audited accounts and others.

Listing on the Stock Exchange has advantages and disadvantages. Its advantages, however, outweigh its disadvantages

The Stock Market efficiency implies efficiency of the price at which securities are bought and sold on the stock market. Prices are said to reflect three forms of efficiency - the weak form, the semi - strong form and the strong form. The Nigerian Stock Exchange belongs to the emerging markets group. The thinking in the Nigerian Capital Markets is that it belongs to the semi-strong category.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

20.6 REVISION QUESTIONS

20.6.1 MULTIPLE CHOICE QUESTIONS

1. Which of the following is a role of the Nigerian Stock Exchange (NSE)?
 - A Existence provides liquidity for investors
 - B Existence gives investors opportunity to diversify their portfolios of securities.
 - C Existence provides opportunity for companies that want to raise long-term capital.
 - D Determines prices on the stock market
 - E Enhances marketability of new issues.
2. Which of the following is correct with respect to the historical establishment of the Nigerian Stock Exchange (NSE)?
 - A Established in 1950 and started business in 1955
 - B Established in 1964 and started business in 1965
 - C Established in 1960 and started business in 1961
 - D Established in 1970 and started business in 1971
 - E Established in 1966 and started business in 1967
3. Which of the following is NOT true about the operations of the Nigerian Stock Exchange?
 - A It presently operates a 'call over' system of trading
 - B "The Exchange" currently operates Automated Trading System (E-Trading)

- C Trading usually starts at 10.00 am and ends 12.00 noon each day.
 - D Stockbrokers trade on the 'floor' of the Exchange as well as from their offices.
 - E The Automated Trading System (ATS) Software is known as "the Horizon"
4. Which of the following is the CORRECT requirement for listing on the Emerging Market Sector (formerly Second-Tier Market) of the Nigerian Stock Exchange?
- A Submission of 5 years financial statements
 - B Amount that can be raised is unlimited
 - C Annual quotation fees is a flat annual charge.
 - D At least 25% of share capital must be offered to the public
 - E Number of shareholders must not be less than 300.
5. Efficient Capital Market means
- A Perfect capital markets
 - B Imperfect capital markets
 - C Optimal pricing of securities by the market
 - D Good and balanced capital markets
 - E Easily accessible capital markets

20.6.2 SHORT ANSWER QUESTIONS

1. What is the name given to the system by which shareholders, under the new clearing and settlement system, exchange their certificates for accounts with the CSCS?
2. How does an investor buy or sell securities on the stock exchange?
3. What are the main functions of Registrars under the new E-Trading System?
4. Within how many days must buy and sell transactions be started and completed under E-Trading System?
5. What is the main disadvantage of listing shares on the Stock Exchange?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

PORTFOLIO MANAGEMENT

21.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ◆ Define the risk and return of a security;
- ◆ Define and calculate the expected return and risk of a security;
- ◆ Explain investors attitude to risk;
- ◆ Explain portfolio in the context of securities;
- ◆ Calculate the expected return and risk of a portfolio using portfolio theory;
- ◆ Determine investors optimal portfolio of securities using portfolio theory;
- ◆ Understand the concepts of 'diversification' "naïve diversification" and "superfluous diversification" and their implications for portfolio risk reduction;
- ◆ Understand the concept of Capital-Asset Pricing Model (CAPM);
- ◆ Differentiate between Systematic and unsystematic risks and give examples of each;
- ◆ Understand the use of CAPM in determining the expected return of a security;
- ◆ Explain the concept of beta (β) as a measure of risk and its implication for investors in stock market securities;
- ◆ Calculate the expected return and risk of a security using the CAPM model;
- ◆ State and explain the policies/strategies normally followed in portfolio management; and
- ◆ Understand the two main methods of Portfolio performance measurement.

21.1 INTRODUCTION

Financial managers should be interested in how securities on the stock market are priced by investors, in terms of returns required on those securities and the uncertainty (risk) attached to the achievability of those returns. The reasons are:

- (a) The way securities are priced by the market gives some insight into how the prices of new securities of a company are set in the new issues market.
- (b) There is strong relationship between investment decisions of security investors and those of the financial managers that typically invest in fixed assets. Investments in fixed assets are made on the basis of expected returns of a project and the risk attaching to those returns. Investors in a supposedly official market also set prices for securities on the basis of return and risk of the security.
- (c) Since it is the investors that provide the funds for their planned projects, financial managers need to understand the way these investors price their securities. This need becomes more important if it is realized that managers seek to maximise the wealth of the company's shareholders.

Having provided basis for the study of portfolio management, it is necessary, to know what the topic is about. Portfolio management in its narrower sense deals with planning of an efficient portfolio of securities, that is, combination of securities which, according to Markowitz, gives an investor the highest return for a given level of risk or alternatively the lowest level of risk for a given return.

In its wider sense portfolio management involves setting of investment objectives, specifying major policies and, based on a particular policy, designing specific strategies to follow. It also includes measuring the performance of the portfolio in relation to the objective(s) set.

In portfolio management, investors make use of the following financial theories and models

- (a) The traditional theory;
- (b) The portfolio theory (Markowitz model);
- (c) Capital Asset Pricing Model (CAPM);
- (d) Arbitrage Pricing Model (APM);
- (e) Fundamental Analysis;
- (f) Technical Analysis;
- (g) Random-Walk Theory (RWT); and
- (h) Efficient Market Hypothesis (EMH).

Some are techniques for reducing the risk of a portfolio while others are strategies for selecting securities into a portfolio. In addition there are portfolio performance measures such as:

(a) Money Weighted Rate of Return (MWROR); and

(b) Time-Weighted Rate of Return (TWROR).

However, there is need to understand, first, how expected return and risk of a single security are measured, for proper understanding of portfolio planning and review.

21.2 MEANING OF RETURN AND RISK OF A SECURITY

These are the two most important components of any security. In fact the basis for any security investment decision is the analysis of its risk-return relationship.

(a) **Return**

This is, for a quoted share, the sum of dividends received and capital appreciation during the holding period. It is expressed in percentage terms as:

$$R = \frac{D_i + (P_i - P_o)}{P_o} \%$$

where

R is the return of the security

D_i is the dividend payments during the holding period

P_i is the market price of the share at the end of the holding period

P_o is the market price at the beginning.

The return is known as Holding Period Return (HPR). The holding period assumed by the formula is one year or less. The holding period return may be historical or, where risk is ignored, anticipated.

(b) **Risk**

This is the likelihood that the actual return of a security will be different from the return being expected. Treasury bill, for example, is a risk-free security because it is certain its return will come, being a government short-term security. However the expected return on a share may or may not come and if it comes, it may be lower than the anticipated return. A share in this sense is a risky security. The riskier

the share, the more likely that the anticipated return will not be achieved.

21.3 MEASUREMENT OF RISK AND RETURN

Investment decisions are made in an uncertain environment. Here, it is range of returns that matters and not one period return. There is need, therefore, to make use of probability distribution of returns and the uncertainty surrounding the actual return that will be achieved.

(a) Expected Return

This is the mean or average of all possible returns weighted by their probabilities. It can be expressed as:

$$E(R) = P_1R_1 + P_2R_2 + P_3R_3 + \dots + P_nR_n$$

where

$E(R)$ is the expected return

R_i ($i = 1, 2, \dots, n$) is a possible return

P_i ($i = 1, 2, \dots, n$) is a possible probability that this return will be achieved

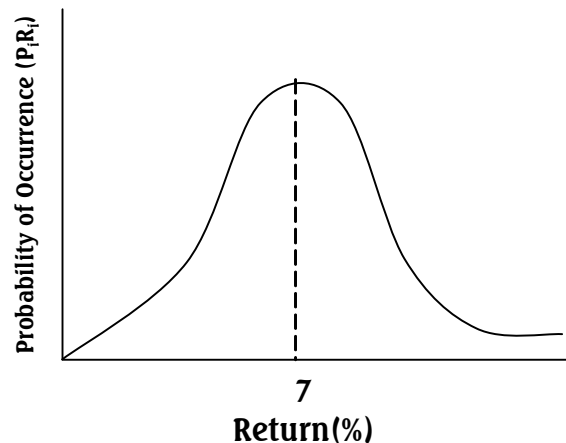
Alternatively it may be generally expressed as:

$$E(R) = \sum_{i=1}^n P_i R_i \text{ where } \sum \text{ is the summation sign}$$

(b) Risk

A very important measure of risk of a security is the Standard deviation (SD). The SD is a measure of total dispersion and therefore of the total risk of a security. The reason for the use of SD is that the distribution of returns of a security appears to conform to a normal (symmetric) distribution.

The SD is the square root of the variance. The variance is the sum of the squares of the deviations from the mean return weighted by their probabilities.



Normal Probability |distribution of Possible Returns.

When a distribution of all possible outcomes of an event occurs in a random fashion, and the distribution above the expected value is a replication of the distribution below the expected value, the distribution is said to be normal or symmetric as against being skewed or asymmetric. In this case any measure of downside risk will be equal to the measure of total dispersion about the expected value.

(c) Co-efficient of Variation (CV)

Where a decision has to be taken on alternative securities (at least two), there is need to calculate a further variable-the co-efficient of variation because the S.D. in its absolute form may be misleading if used. The co-efficient of variation of a security is simply its standard deviation divided by its expected return $[SD/(ER)]$. The CV is a measure of relative dispersion - a measure of risk per unit of expected return.

ILLUSTRATION 21-1

Mr. Richard Chukwu plans to invest ₦10,000 in company X at the beginning of the year. At the end of the year the possible values may be ₦10,400 or ₦10,600 or ₦10,800 or ₦11,000. These are all possible outcomes. Their probabilities respectively are 0.2, 0.3, 0.3, 0.2. Calculate the expected return, total risk and the relative risk of the security. Ignore tax

SUGGESTED SOLUTION 21-1**Expected Return E(R)**

Mr. Richard Chukwu - Investment in company X's share

Value at the end of the year (₦)	Return % (R_i)	Probability (P_i)
10,400	4	0.2
10,600	6	0.3
10,800	8	0.3
11,000	10	0.2

$$E(R) = R_1P_1 + R_2P_2 + R_3P_3 + R_4P_4$$

$$= (4 \times 0.2) + (6 \times 0.3) + (8 \times 0.3) + (10 \times 0.2)$$

$$= 0.07 \text{ or } 7\%$$

Total Risk (SD).

1 Possible Returns	2 Deviations from the mean return	3 Square of Deviation	4 Probability	Variance Columns 3 x 4
R_i	$E(R) - R_i$	$(E(R) - R_i)^2$	P_i	
4	3	9	0.2	1.8
6	1	1	0.3	0.3
8	-1	1	0.3	0.3
10	-3	9	0.2	1.8
				<u>4.2</u>

$$S.d = \sqrt{4.2}$$

$$= 2.1\%$$

Relative Risk (Co-efficient of Variation)

$$cv = SD/E(R)$$

$$= 2.1/0.07$$

$$= 0.3 \text{ or } 30\%$$

Note:

The combination of mean (or expected) return and standard deviation helps an investor to adequately evaluate a security so as to know whether the security gives enough return for its risk and to select from two (or more) securities which have the same return or the same degree of risk. It is assumed that the investor is a rational risk-averse, and will be prepared to take on additional risk only if he is appropriately compensated for it. Thus, where

the rational, risk-averse's investor has the option of selecting between two securities X and Y with the same rate of return, he will select the one with lower risk. Alternatively, if X and Y have the same degree of risk, he will choose the one with higher rate of return.

21.4 ATTITUDES TOWARDS RISK

The final choice of a security will depend on the investor's attitude towards risk. An investor may be risk averse, risk indifferent or risk prone. One way of assessing an investor's attitude towards risk is through a concept known as "Certainty Equivalent".

Certainty Equivalent is the amount of money which someone requires with certainty at a point in time to make him indifferent to an uncertain future amount at the same point in time. For example, if an individual's personal disposition towards the uncertain future is such that a certain amount of say ₦10,000 would give him the same utility (sales factor) as a risky ₦15,000 expected value, the ₦10,000 is his 'certainty equivalent' and he is presumed to be risk averse.

The usefulness of certainty equivalent in risk-return analysis of a security is that its comparison with the expected value of a risky investment can be used to define the attitude of an investor towards risk. Generally, if an investor's:

- (a) Certainty equivalent is less than the expected value the investor is risk averse;
- (b) Certainty equivalent is equal to the expected value the investor is risk indifferent; and
- (c) Certainty equivalent is greater than the expected value, the investor is risk prone.

The difference between the investors certainty equivalent and the expected value of a risky investment creates a risk premium. This is the additional expected return which the risky investment must provide for the investor to accept it. This pack will assume that investors generally are risk averse. This means that risky securities must provide higher expected returns than less risky securities, if they have to attract investors' monies. Also, an investor that wants low risk must be contented with low return. The higher the risk the higher the return (expected) and vice versa. Thus, nothing is free, "even in freetown", when it comes to investments.

21.5 PORTFOLIO RISK AND RETURN

The main focus is the risk and return of a portfolio of securities rather than of single security held on a stand alone basis. Investors put their monies in a 'portfolio' or group of securities.

(a) Portfolio Return

This is the weighted average of the expected returns of the individual securities that make up the portfolio. The weights represent the proportion of total investible funds put into each security. Portfolio return is expressed as:

$$E(R_p) = \sum_{j=1}^m W_j E(R_j)$$

Where W_j is the proportion of total funds invested in security j , $E(R_j)$ is the expected return for security "j" and "m" is the total number of different securities in the portfolio.

(b) Portfolio Risk

The risk of a portfolio, unlike the portfolio's expected return, is not the weighted-average of the individual securities standard deviation.

Returns of stock market securities co-relate and can be affected by common factors. This relationship between two or more securities within a portfolio is statistically known as co-variance. This relationship between securities and its impact on portfolio risk is the principle underlying Portfolio Theory.

21.6 PORTFOLIO THEORY

Portfolio theory, also known as co-variance approach or Markowitz approach helps an investor to select the combinations of securities (portfolios) which give him the highest returns for the risks involved. Once the investor factors in his utility function, he selects that portfolio which has the optimal risk-return relationship. Portfolio theory believes that an investor can reduce risk without reducing return by holding a portfolio of at least two securities instead of investing in single securities held in isolation. This is based on the existence of co-variance between securities, the degree of which will determine the extent of portfolio risk reduction.

Portfolio theory uses the concept of correlation co-efficient to mathematically represent the expected return and risk of a two-securities (X and Y) portfolio as follows:

$$\text{Expected Return } E(R_p) = W_x E(R_x) + W_y E(R_y)$$

Where X and Y are the securities, in the portfolio, $E(R_p)$ is the expected return of portfolio P, $E(R_x)$ is the expected return of security X and W_x is the proportion of the available investment funds invested in X, $E(R_y)$ is the expected return of security Y while W_y is the proportion (balance) of available funds invested in Y.

$$\text{Risk: } V_p = W_x^2 S.d_x^2 + W_y^2 S.d_y^2 + 2W_x W_y S.d_x . S.d_y . \text{Cov}_{xy}$$

Or

$$S.D_p = \sqrt{W_x^2 S.d_x^2 + W_y^2 S.d_y^2 + 2W_x W_y S.d_x . S.d_y . \text{Cov}_{xy}}$$

$$\text{Where } \text{Corr}_{xy} = \frac{\text{Cov}_{xy}}{S.d_x . S.d_y} \quad \text{and}$$

$$\text{Cov}_{xy} = \sum P_v (R_x - E(R_x))(R_y - E(R_y))$$

Where $S.d_x$ is the standard deviation of Security x

$S.d_y$ is the standard deviation of security y

Corr_{xy} is the correlation co-efficient between x and y

Cov_{xy} is the co-variance between x and y

21.6.1 Importance of Co-Variance (and the Correlation Co-efficient)

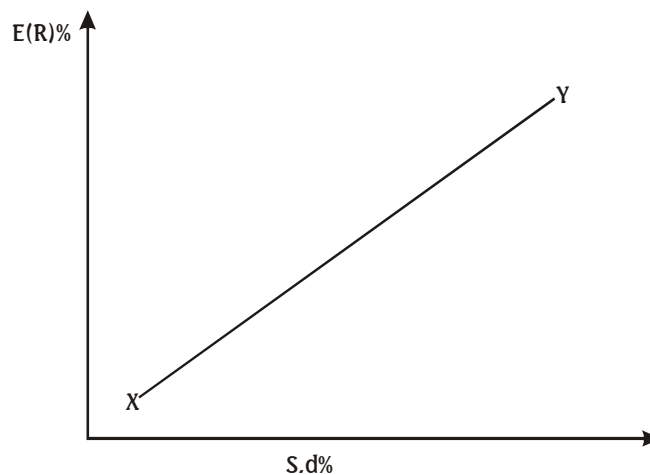
Co-variance is a statistical measure of the extent to which two securities' returns move together. If two securities, having the same probability perform well together or badly together their returns are said to be in the same direction; they would have positive co-variance. If their returns move in opposite direction their co-variance will be negative. If the movement of the returns of one is independent of the movement of the other's return their signs will cancel out and co-variance will be zero.

The correlation co-efficient (Corr_{xy}) is the co-variance of X and Y (Cov_{xy}) divided by the product of the standard deviations of the two securities. Correlation co-efficient is another way of quantifying the co-variance between returns on two securities (x and y). It can only take on values between -1 and +1. If correlation co-efficient is +1 it means the returns on two securities are perfectly positively correlated, if it is -1, they are perfectly negatively correlated, if it is zero, they are absolutely uncorrelated.

In practice, securities returns are not perfectly positively correlated. Similarly risky investments are not usually negatively correlated or even independent as they are affected by common factors. Thus, what exists in practice is low (or high) correlation between securities' returns, for example, 0.2, 0.3, 0.7, 0.8.

21.6.2 Implications of Correlation of Securities for the Investor

(1) Perfect Positive



Possible combination of X and Y when $\text{Corr}_{xy} = +1$. The risk of any combination of X and Y will simply be equal to the weighted average of individual securities' risks as follows:

$$V_p = W_x^2 S.d_x^2 + W_y^2 S.d_y^2 + 2W_x W_y S.d_x \cdot S.d_y$$

This is a perfect square which when re-arranged becomes:

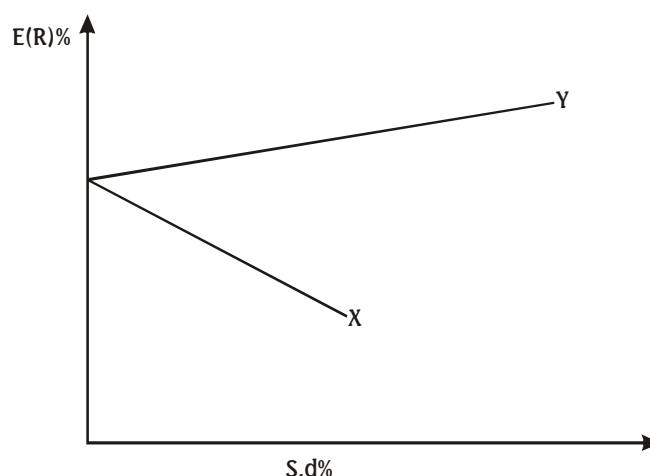
$$(W_x S.d_x + W_y S.d_y) (W_x S.d_x + W_y S.d_y)$$

Taking the square roots of both sides:

$$S.D_p = W_x S.d_x + W_y S.d_y$$

Any combination of X and Y with particular values of W_x and W_y will be on a straight line joining X and Y and no particular advantage will accrue by combining X and Y.

Suppose Corr_{xy} is less than +1. Then the right-hand side of the equation must be less than the weighted average of the risks of the individual securities. The implication of this is that as long as two securities are not perfectly correlated, some benefits could accrue from combining them.

(2) Perfect Negative

Possible combination of X and Y where $\text{Corr}_{xy} = -1$.

The risk of the combination of X and Y will greatly fall and can even fall to zero where the portfolio comprise only two securities. This, then, is a riskless portfolio.

Where $\text{Corr}_{xy} = -1$

$$V_p \text{ becomes } W_x^2 S.d_x^2 + W_y^2 S.d_y^2 - 2W_x W_y S.d_x S.d_y$$

This is also a perfect square which when re-arranged becomes

$$V_p = (W_x S.d_x - W_y S.d_y) (W_x S.d_x - W_y S.d_y)$$

Taking the square root of both sides

$S.D_p = W_x S.d_x - W_y S.d_y$, where the two vertical lines require absolute values. This means that whichever square root, has a positive value.

(3) Independent Correlation

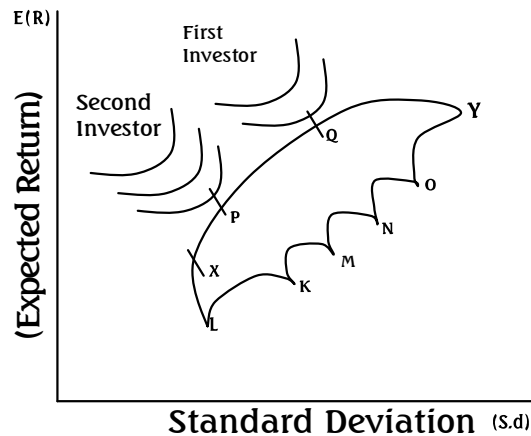
Here, Corr_{xy} will be equal to zero as the two securities are not affected by any common factors; any similar movements at all, will be mere coincidence.

$$V_p = W_x^2 S.d_x^2 + W_y^2 S.d_y^2$$

21.6.3 Optimal Portfolio (with n Securities)

Once an investor has knowledge of his utility function (basis for drawing up his indifference curves) he would be able to select his

optimal portfolio: that portfolio which maximises his utility as shown graphically below:



Optimal portfolio from nine securities for investors with different utility functions.

All combinations (portfolios) of more than two securities will lie within or on the above umbrella-shaped region. This region is known as **feasible region** and all portfolios lying inside this region are called **feasible portfolios**. The curve "xy" is known as **efficient frontier** and all portfolios lying on this curve are called **efficient portfolios**. Thus, XPQY are efficient portfolios: they are efficient because they dominate any other portfolio in the feasible region. Any portfolio on the efficient frontier, when compared with any other portfolio in the feasible region, has a higher return for the same risk level or a lower risk for the same return. An investor who wishes to select a portfolio on the xy curve that maximises his return for a given level of risk would need to construct his indifference curves and select that point where his indifference curve is tangent to xy curve. From the graph, the first investor would adopt Q as his optimal portfolio while the second investor would select P as his own optimal portfolio.

The two investors would probably make a different choice from the same efficient frontier because they obviously have different attitudes to the risk-return relationships of the individual efficient portfolios. These different attitudes are shown in their different utility functions and therefore their different indifference curves. In addition, the second investor might even have different opportunity set (all possible portfolios) and efficient frontier from the first investor because he may assess the expected returns and risks of the nine securities differently. In this case, he would have a completely different umbrella.

ILLUSTRATION 21-2

An investment analyst has provided the following data in respect of securities A and B:

	Expected Return	Risk
	₦	₦
A	2150	381
B	2250	637

A prospective investor believes that by combining securities A and B in the proportion 60% and 40% respectively, he could improve his position.

Required:

Calculate the portfolio return and risk where the correlation co-efficient is +1, -1, and 0

SUGGESTED SOLUTION 21-2

Portfolio risk is given by

$$S.d_p = \sqrt{W_A^2 S.d_A^2 + W_B^2 S.d_B^2 + 2W_A W_B S.d_A S.d_B \text{Corr}_{AB}}$$

(i) Correlation Co-efficient of +1

$$\begin{aligned}
 S.d_p &= \sqrt{(0.6)^2 (381)^2 + (0.4)^2 (637)^2 + 2(0.6)(0.4)(381)(637)(1)} \\
 &= \sqrt{52,258 + 64,923 + 116,495} \\
 &= \sqrt{233,676} \\
 &= \text{₦}483.40
 \end{aligned}$$

(ii) Correlation co-efficient of 0

$$\begin{aligned}
 S.d_p &= \sqrt{(0.6)^2 (381)^2 + (0.4)^2 (637)^2 + 2(0.6)(0.4)(381)(637)(0)} \\
 &= \sqrt{52,258 + 64,923 - 0} \\
 &= \sqrt{117,181} \\
 &= \text{₦}342.32
 \end{aligned}$$

(iii) Correlation co-efficient of -1

Sdp =

$$\sqrt{(0.6)^2(381)^2 + (0.4)^2(637)^2 + 2(0.6)(0.4)(381)(637)(-1)}$$

$$= \sqrt{52,258 + 64,923 - 116,495}$$

$$= \sqrt{117,181 - 116,495}$$

$$= \sqrt{686}$$

$$= \text{₹}26.19$$

21.6.4 Diversification

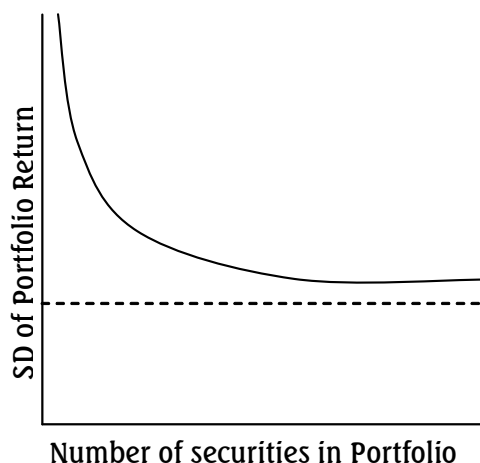
Diversification means investing in as many securities as possible so as to spread the return variability of the portfolio. Portfolios of securities should be consciously constructed in such a way, so as to reduce the risk of the portfolio (i.e. he should avoid putting all his eggs in one basket). An investor should for example, not put all his investment in one industry. This is what is called **naïve diversification**. Instead, he should spread his wealth over industries whose returns might be negatively correlated or have low level of positive correlation. If the same amount of money is invested in each of the industries, it is expected that the dispersion of return would be reduced. This is because some of each individual security's risk is offsetting. Benefits of diversification through risk reduction, are received as long as the securities are not perfectly and positively correlated.

Also, global investment in world financial markets tends to achieve greater diversification than investing in domestic securities alone. The swings in economic cycles may be different from country to country.

21.6.5 Size of Portfolio

It has just been stated that the portfolio risk can be lowered by combining securities that are not perfectly positively correlated. However, how many securities should be in a portfolio in order to substantially reduce risk and at the same time avoid Superfluous diversification? Evidence had shown that as the number of shares, selected at random in a portfolio increases, the total risk of the portfolio decreases at a decreasing rate. Thus, by having a moderate

size of portfolio of say between 10 and 20 securities chosen at random in equal Naira a high proportion of risk can be eliminated as shown below:



21.7 CAPITAL-ASSET PRICING MODEL (CAPM)

Capital-Asset Pricing Model (CAPM) arose from the complexity and very large size of computations needed in Portfolio Theory. Whereas, portfolio theory deals with co-variance between pairs of securities in a portfolio, the CAPM is concerned with the co-variance of the security with the market as a whole as mirrored by the market index return.

The CAPM divides the total risk (S_d) of a security into systematic and unsystematic risk.

Systematic risk (also known as **undiversifiable** or **market** or **unavoidable risk**) is the risk of the stock market as a whole. It is a risk caused by factors that affect the market as a whole example of such factors are interest rate, inflation, tax reform of National Assembly, changes in the global prices of oil, political factor and global economic meltdown.

Unsystematic risk (also known as **diversifiable** or **specific** or **avoidable risk**) is the risk that is unique to the security or the company or the industry in which the company operates, examples of such risks are poor management, competition, custom tariff, industrial strike and so on.

CAPM states that unsystematic risk of a security can be diversified away leaving only the systematic risk. Thus unsystematic risk can, through diversification, be reduced or even be eliminated if diversification is very efficient. On the other hand, the model claims that systematic risk, being the risk of the whole market cannot be so diversified away. No matter how many shares an investor buys, even if he buys all the shares on the stock market. The investor will still bear the risk of the stock market which is unavoidable.

The only relevant risk of a share is therefore its systemic risk. The implication of this for investors is that according to CAPM, they only need to bother themselves about the systematic risk of a security as this is the only risk for which they would be compensated. They should not expect to be rewarded for bearing a risk that is unique to the company. It is assumed they would have diversified away this type of risk.

(a) **CAPM - Mathematical Model**

CAPM defines the relationship between expected return and risk of an individual security in the form of an equation as follows:

$$E(R_i) = R_f + (E(R_m) - R_f) \beta \quad \text{where } \beta \text{ can also be represented by } \frac{\text{Cov}(im)}{\text{Sd}^2m}$$

and $E(R_i)$ is expected return on the security

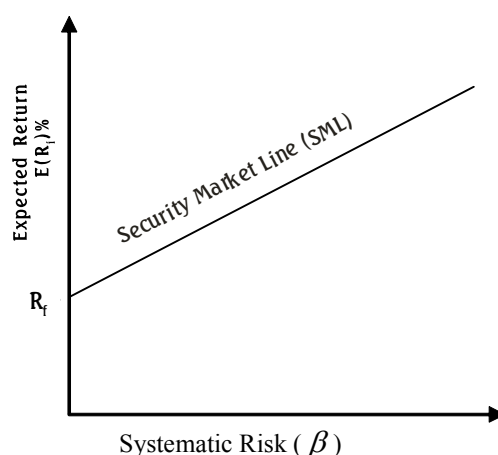
R_f is the risk-free return

$E(R_m)$ is the expected market return

β is the beta of the security

This equation, also known as the Security Market Line (SML) attempts to explain the expected return of a security as a function of its co-variance with the market as measured by its beta (β). The only factor which differentiates the returns of a security from all other returns is its beta factor (the extent to which the particular security's expected returns co-vary with the expected returns from the market as a whole: the market index return).

The underlying reasoning for the above equation is that some shares are more volatile than others in the market. Their returns respond more than proportionate to specified percentage changes in the market index return. Others vary less than proportionate. Still other shares' returns react exactly by the same proportion. If, for example, as a result of general factors affecting the market (systematic risk), the market index return increases by, say, 10 percent, should a particular share's return increase by more than 10%, or less than 10% or exactly equal to 10%. the beta of such security would be greater than 1, less than 1 and equal to 1 respectively.

(b) CAPM-Graphical Representation

Where a security has no risk, its expected return will be the risk-free rate. As beta increases the market would be demanding for an increasingly big risk premium over the risk-free rate.

(c) Beta (β): Measure of Risk

Beta provides a measure of a systematic risk of a security. The greater Beta is, the greater the systematic risk of the security and the higher are the expected returns of that security.

(d) Beta of a Security and Investor's Portfolio

An investor, depending on his attitude towards the market, that is, bullish or bearish, is able to build up a portfolio of higher or lower betas respectively in order to maximise the return or minimize the risk of his portfolio as the case may be. It should be noted however that return maximisation means taking on higher market risk.

(e) Assumptions of CAPM

- (i) Investors are rational and risk-averse and they are interested in maximizing expected utility of wealth;
- (ii) There are large number of buyers and sellers in the stock market;
- (iii) The only two characteristics of a security that engenders the interests of investor are its risk and return.
- (iv) There is in existence a risk-free rate of return and all investor lend or borrow without limit at this same rate;
- (v) There are no transaction costs;

- (vi) No taxation; and
- (vii) All investors have identical views of each security.

ILLUSTRATION ON CAPM 21-3

- (a) Toyin Adepte a valued client of your stock broking firm has asked for your advice on his investments portfolio. He holds the following securities in the stock market (having the listed risk characteristics (shown below) which is regarded as efficient:

	Shares		
	X	Y	Z
Standard Deviation	15%	14%	5%
Correlation Coefficient	40%	60%	80%
Amount invested %	30	40	30

The staff of the investment department of your firm has estimated the expected return on shares in general, on the basis of past return and inflationary expectation, to be 20%. It is expected that the risk premium will be about 5%. The risk of the market as measured by its standard deviation is 8%. All the three shares lie on the Securities Market Line (SML).

Calculate:

- (i) The expected return of your client's portfolio; and
- (ii) The risk of the portfolio.

Assume the Capital Asset Pricing Model (CAPM) approach

SUGGESTED SOLUTION 21-3**TOYIN ADEPATE**

- (i) Beta factor (β) has to be computed for each share using the formula:

$$= \frac{\text{Corrmj}\sigma_j}{\sigma_m}$$

$$X = \frac{0.4 \times 0.15}{0.08} = 0.75$$

$$Y = \frac{0.6 \times 0.14}{0.08} = 1.05$$

$$Z = \frac{0.8 \times 0.05}{0.08} = 0.5$$

Expected Return: $R_i = R_f + \beta(R_m - R_f)$

$$R_x = 0.15 + 0.75(0.05) = 18.75\%$$

$$R_y = 0.15 + 1.05(0.05) = 20.25\%$$

$$R_z = 0.15 + 0.5(0.05) = 17.5\%$$

$$ER_p = 0.30(0.1875) + 0.40(0.2025) + 0.30(0.175)$$

$$= 5.63\% + 8.1\% + 5.25\%$$

$$= 18.98\% \text{ or } 19\% \text{ approx.}$$

$$(ii) \quad \beta_p = 0.30(0.75) + 0.40(1.05) + 0.30(0.5)$$

$$= 0.23 + 0.42 + 0.15$$

$$= 0.80$$

Determination of R_f

$$R_m - R_f = 0.05$$

$$0.20 - R_f = 0.05$$

$$R_f = 0.20 - 0.05$$

$$= 0.15$$

21.8 ARBITRAGE PRICING MODEL (APM)

Arbitrage Pricing Model (APM), unlike the CAPM believes that the price of a security, based on its risk and return characteristics, is influenced by more than one single risk factor. In order to know whether a security is 'dear' or a cheap a small number of general economic risk factor could be examined. The model assumes efficiency of the stock markets in terms of 'forced' equality of the prices of two similar securities via arbitrage. A simple two-factor model can be represented by the following equation:

$$E(r_i) = r_f + \lambda_1 b_{1i} + \lambda_2 b_{2i}$$

where $E(r_i)$ is the expected return on a security

r_f is the return on a risk-free security

λ_1, λ_2 are the values of future (uncertain) macro economic factors such as inflation, interest rates.

b_{1i}, b_{2i} are measures of the degree of responsiveness of the security's return to a specified percentage change in a factor.

The parameter lambda (λ) represents the risk premiums (excess return) in respect of the types of risk connected with individual factors. For instance, λ_1 is the expected excess return (return above the risk-free rate) if b_{1i} is equal to 1 and b_{2i} is equal to zero. The b_{1i} and b_{2i} are, in short, the measures of the systematic or unavoidable or undiversifiable risk. λ can be positive (indicating risk aversion by the market to the factor involved) and negative (indicating the fact that the market is asking for lower return).

ILLUSTRATION 21-4

The share of Lekki Tourists Plc. is linked with the factors where the measures of the degree of responsiveness b_{1i} and b_{2i} are 1.5 and 0.8 respectively. If the risk-free rate (as evidenced by CBN Treasury Bill rate) is 10 percent, λ_1 5 percent and λ_2 is - 3 percent, calculate the expected return of the share.

SUGGESTED SOLUTION 21-4

$$\begin{aligned}
 E(R) &= r_f + b_{1i}(\lambda_{1i}) + b_{2i}(\lambda_{2i}) \\
 &= 0.10 + (1.5)(0.05) + 0.8(-0.03) \\
 &= 0.10 + 0.075 - 0.024 \\
 &= 0.175 - 0.024 \\
 &= 0.151 \text{ or } 15.10\%
 \end{aligned}$$

Note: It should be noted that the APM could be applied to factors more than two, say 4 as shown:

$$E(r_i) = r_f + \lambda_1 b_{1i} + \lambda_2 b_{2i} + \lambda_3 b_{3i} + \lambda_4 b_{4i}$$

21.9 INVESTMENT POLICIES STRATEGIES

There are two major policies - active portfolio policy (also known as aggressive: buy & sell) and passive portfolio policy (also known as defensive, buy and hold or buying for long pull). The following strategies are normally pursued under active policy.

21.9.1 Fundamental Analysis

Here analysts believe that a share has an intrinsic or true value which is the present value of all future cash flow that arise from ownership of the share. They further believe that although all investors have perfect information about each security, the process of incorporating information into price is still defective and consequently there could be significant differences between share prices and intrinsic value which can be profitably exploited. The fundamentalist utilises the dividend valuation model

$$P_o = \frac{D_1}{1+r} + \frac{D_2}{(1+r)^2} + \dots + \frac{D_n}{(1+r)^n} \text{ or } \sum_{i=1}^{\infty} \frac{D_i}{(1+r)^i} \text{ which can be further}$$

modified into $P_o = \frac{D_0(1+g)}{r-g}$ - Gordon's Growth model. It assumes

that D_0 will be obtained at a constant growth rate of g . Readers should note that D_0 is the dividend first paid. If the intrinsic value obtained is higher than the current share price the share is considered undervalued and should be bought. If it is lower than the actual share price, it is overvalued and should be sold.

21.9.2 Technical Analysis

Technical analysis believe that security prices particularly share prices, are fairly valuable and anyone who can successfully predict the direction of interest rates (and therefore bond prices) and share prices can correctly time investment to beat the market. The objective is to obtain an above-average-return.

Technician's use information about past share price to predict the trend of future share price. Chartists contend that share prices move in trends and patterns which periodically repeat themselves so that the key to making gains is to recognise these patterns before others. Technicians make use of charts and graphs of share price information and mechanical trading rules.

21.9.3 Random Walk Theory (RWT)

This theory which is largely an extension of the fundamental theory also believes that a share has an intrinsic value but that this value will be altered as new information becomes available. The behaviour of the investors is such that the actual price will fluctuate at random around the intrinsic value. The theory also postulates that successful share price changes are independent of each other as past share price behaviours contain no information that can influence the present or future share price level.

21.9.4 EMH - Efficient Market Hypothesis

Efficient Market Hypothesis extends the idea of Random Walk Theory (RWT) and states that if a market is perfectly efficient, then at all times, prices should perfectly reflect the information available to investors and their advisors. Thus, it will not be possible for an analyst to conclude that a particular share is cheap or expensive when compared with its intrinsic value.

Details of the forms of market efficiency had already been discussed under stock market efficiency.

21.10 PERFORMANCE MEASUREMENT

21.10.1 Objectives of Performance Measurement

Performance measurement, via the use of relevant performance measures, is normally carried out for the following purposes.

- (a) To know whether the originally set portfolio objectives have been achieved.
- (b) To compare the investor's portfolio performance with the portfolios which have similar objectives.
- (c) To provide a check on the activities of the fund managers

21.10.2 Measurement of Return

There are two main methods of measuring the return of a portfolio: the money weighted rate of return (MWROR) and time-weighted rate of return (TWROR)

(a) Money-Weighted Rate of Return

This is a simple method used to compute the overall return on capital invested over a specified period of time. It is calculated by dividing the total return from a portfolio over a period by the weighted average sum invested in the portfolio over the period. Return considers both capital appreciation (or loss) and income.

ILLUSTRATION 21-5

On January 1 an investor's portfolio was valued at ₦100,000. At the end of March he withdrew ₦20,000 but he invested a further ₦30,000 at the end of September. On 31st December, the Portfolio was valued at ₦120,000 including re-invested income. Calculate the money-weighted average rate of return on the portfolio.

SUGGESTED SOLUTION 21-5

	₦
Initial Value	100,000
Add new investment	<u>30,000</u>
	130,000
Less Withdrawals	<u>20,000</u>
	110,000

Final Value	<u>120,000</u>
Total Return	<u>10,000</u>
Weighted Average sum Invested	N
Jan. - Mar. N 100,000 x 3/12	25,000
Apr. - Sept. N 80,000 x 6/12	40,000
Oct. - Dec. N 110,000 x 3/12	<u>27,500</u>
	<u>N92,500</u>
MWROR = $\frac{N10,000}{N92,500} =$	10.81%

This rate can be thought of as the rate of interest which the initial portfolio plus net new money would have had to earn in a deposit account in order to accumulate to the actual value of the portfolio at the end of the year.

This is useful for an individual but inadequate and sometimes misleading for an institutional investor.

(b) Time-Weighted Rate of Return

When comparing the performance of fund managers, this will be the appropriate method to use as it recognizes the effects of timing of cash inflows which may be beyond the control of the manager. To do this, three steps should be followed:

- (i) Determine the date on which each cash flow occurs and the value of the portfolio on each such date;
- (ii) For the period before and after the cash inflow, calculate the price relatives by dividing the value of the fund at the end of the period by the value at the beginning; and
- (iii) Multiply the price relatives together and subtract 1 to get the time-weighted rate of return as a decimal.

ILLUSTRATION 21-6

Assume the above portfolio was valued on 30th September at ~~N~~110,000, calculate the time weighted rate of return of the portfolio.

SUGGESTED SOLUTION 21-6

TWROR will be calculated as follows:

$$\text{January 1 to September 30: Price Relative} = \cancel{N} \frac{110}{80} = 1.375$$

$$\begin{aligned}
 \text{October 1 to December 31: Price Relative} &= \frac{120}{140} = 0.857 \\
 \text{Product} &= 1.375 \times 0.857 = 1.1784 \\
 \text{Subtract 1 gives } &1.1784 - 1 = 0.1784 \\
 &= 17.84\%
 \end{aligned}$$

21.11 SUMMARY AND CONCLUSIONS

Portfolio management is concerned with how investors construct, evaluate and measure the performance of their portfolios of securities. Portfolio here means combinations of securities. There are various portfolio management techniques - the planning techniques (Portfolio Theory and CAPM), the strategising techniques (the fundamental theory, the technical theory, the random walk theory and the efficient market hypothesis) the arbitrage pricing model and the measurement techniques (the money-weighted rate of return and the time-weighted rate of return).

Portfolio theory's approach to portfolio planning looks at the expected return of a portfolio and the total risk of that portfolio as measured by its standard deviation. CAPM's approach considers only the systematic risk of the portfolio, believing that the unsystematic risk has been well diversified away. It uses the concept of beta to measure this risk. There are two types of policies to follow in managing a portfolio of securities - the active policy (buy and sell) and the passive policy (buy and hold). Those who follow the active policy usually adopt any of the following strategies - Fundamental theory, Technical analysis, Random walk theory and efficient market hypothesis. The essence of planning lies in control. Thus, performance of a portfolio needs to be measured and compared with the earlier objectives set for the portfolio. The main two methods of measuring performance are the money-weighted and the time-weighted rates of return.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

21.12 REVISION QUESTIONS

21.12.1 MULTIPLE CHOICE QUESTIONS

1. In relation to ordinary shares investment, return in relative terms for one year means:
 - A. Dividends
 - B. Dividends plus capital appreciation
 - C. $\frac{\text{Dividends plus capital appreciation}}{\text{Price at the start of the year}}$

- D.
$$\frac{\text{Dividends min us capital appreciation}}{\text{Price at the start of the year}}$$
- E.
$$\frac{\text{Dividends plus capital appreciation minus capital depreciation}}{\text{Price at the start of the year}}$$
2. The risk of a security is the _____ of that security
- A. Systematic risk
B. Unsystematic risk
C. Unique risk
D. Total risk
E. Identifiable risk
3. A portfolio comprises two securities X and Y. Where 60% of the investable sum is put on X and the balance on Y. If the expected return of X is 20% while that of Y is 30%, what is the portfolio expected return?
- A. 60%
B. 25%
C. 24%
D. 20%
E. 30%
4. The risk of a portfolio of securities is:
- A. The average of the risks of the individual securities
B. The weighted average of the individual securities
C. The addition of the individual securities' risks
D. The difference between the highest and the lowest amounts of the risks of the individual securities
E. Not the weighted average of the individual securities
5. The following information is given about a security. The correlation coefficient of the security is 0.60 and its total risk is 20%. If the market risk is 10%, what is the systematic risk of the security?
- A. 1.20
B. 0.01
C. 0.12
D. 0.90
E. 0.60

21.12.2 SHORT ANSWER QUESTIONS

1. State two most important components of a security.
2. Mean or average of all possible returns weighted by their probabilities is called _____
3. In portfolio theory, what is that important relationship that is required to be able to compute the risk of a portfolio

4. When two portfolios of securities lie on the “efficient frontier” how does an investor determine his or her optimal portfolio?
5. State that important risk characteristic that differentiates capital assets pricing model (CAPM) from portfolio theory.

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

WORKING CAPITAL MANAGEMENT

22.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ♦ Explain the concepts of gross and net working capital;
- ♦ Understand why working capital is required and how it is financed;
- ♦ Calculate the 'operating cycle' and 'cash cycle' of a company;
- ♦ State and explain the factors influencing the working capital requirements;
- ♦ Know and itemise the dangers of excessive working capital; and
- ♦ Explain the ways in which working capital is financed and the approaches to determining the mix of working capital.

22.1 INTRODUCTION

The earlier chapters have been devoted to the treatment of the management of fixed assets and long term financing.

In this part, discussions will be focused on working capital management. There are two concepts of working capital - Gross and Net.

Gross working capital refers to current assets while the net working capital refers to the difference between current assets and current liabilities. However, the following discussions will emphasise the net current assets which is also known as net working capital as it is more appropriate than the gross working capital.

What are current assets and current liabilities?

Current assets are those assets that can be easily converted into cash within a short period of time (say one year) and include: cash, short-term securities, debtors (accounts receivable), bills receivable and stock (inventory). Current liabilities on the other hand are those claims of outsiders which are payable within a short period of time (say one year) and include: creditors (accounts payable), bills payable and outstanding expenses.

Net working capital indicates the liquidity position of the firm and as such current assets should be sufficiently in excess of current liabilities. In most cases, analysts always prefer a company to maintain the level of current assets at twice the level of current liabilities, hence the 2:1 ratio rule.

A weak liquidity position will pose a threat to the solvency of a company and will make it unsafe and unsound. A negative working capital means a negative liquidity and may prove to be harmful to the reputation of a firm while excessive liquidity is also bad. Therefore, prompt and timely action should be taken by management at all time to improve and correct the imbalances in the liquidity position of the firm.

Investment in working capital (current assets) should just be adequate because excessive investment impairs profitability while inadequate investment can threaten solvency as the firm may not be able to meet current obligation. However, there is no precise way to determine the exact amount of working capital for firms since the data and problem of each company are different.

22.1.1 Financing Working Capital

As there is no precise way to determine the exact working capital need of a firm, there is also no specific rule as to how current assets should be financed. Since every company has a minimum amount of permanent working capital, a portion of the working capital should be financed with permanent sources of funds, such as equity, share capital, debentures, long-term debt, preference share capital or retained earnings and the balance by short term sources.

In this respect, it is the constraints of the individual company that should determine the capital mix of their investment in current assets and not the rule of thumb since working capital involve cost of funds, they should be put to productive use.

22.1.2 Need for Working Capital

There is hardly any business firm which does not require working capital. Hence, the need for working capital to run the day-to-day business activities of a firm, cannot be over-emphasised.

In order for a firm to achieve the wealth maximisation objective, it would have to earn sufficient return from its operations. To be able to earn a steady amount of profit, a firm would have to invest enough funds in working capital to generate sales. Current assets are needed because sales do not convert into cash instantaneously; there is always an operating cycle involved in the conversion of sales into cash.

What then is operating cycle? Pandey (2003) defines operating cycle as the time duration required to convert sales, after the conversion of resources into inventories (stocks), into cash. He further divided the operating cycle into three phases; thus:

- (a) Acquisition of resources such as raw materials, labour and overheads
- (b) Manufacturing of products. This includes conversion of raw materials into work in progress and finished goods.
- (c) Sales of the finished product either for cash or on credit (which creates accounts receivable).

The length of the operating cycle of a manufacturing firm is the sum of the inventory conversion period and debtors conversion period. This is also referred to as “gross operating cycles”.

The inventory conversion period is the total time needed for production and sales. It includes: raw material conversion period, work-in-progress conversion period and finished goods conversion period. The debtors conversion period is the time required to collect the outstanding debts from customers. However, a company may acquire goods or services on credit thereby postponing payment. The period during which payment is postponed is known as payable deferral period. It is the length of time the firm is able to defer payments on various purchases. The difference between the (gross) operating cycle and payable deferral period is known as net operating cycle or cash conversion cycle. The following formulae can be used for calculating the length of each operating cycle.

Raw Material Conversion Period

$$= \frac{\text{Raw Material Inventory}}{\text{Raw Material Consumption}} \times \frac{365}{1} \text{ days}$$

Work-in Progress Conversion Period

$$= \frac{\text{Work – in – progress}}{\text{Cost of Production}} \times \frac{365}{1} \text{ days}$$

Finished Goods Conversion Period

$$= \frac{\text{Finished Goods Inventory}}{\text{Cost of Goods Sold}} \times \frac{365}{1} \text{ days}$$

Debtors Conversion Period

$$= \frac{\text{Debtors (Accounts Receivable)}}{\text{Credit Sales}} \times \frac{365}{1} \text{ days}$$

Payables Deferral Period

$$= \frac{\text{Creditors (Accounts Payable)}}{\text{Credit Purchases}} \times \frac{365}{1} \text{ days}$$

22.2 WORKING CAPITAL REQUIREMENT

There are no set rules or formulae to determine the working capital requirements of firms. Several factors, each having a different importance, influence working capital needs of firms. Therefore, an analysis of relevant factors should be made in order to determine total investment in working capital. The factors are described as follows:

- (a) **Nature of Business:** The nature of the business of a firm determines its working capital requirements. Some companies require small working capital while others are working capital intensive; for example, retail businesses and construction firms need to invest substantially in working capital and nominal amount in fixed assets. On the other hand, public utilities have a very limited need for working capital and have to invest abundantly in fixed assets.
- (b) **Sales and Demand Conditions:** The working capital needs of a firm are related to its sales. In addition, the availability of fund, type of the products and sales environment has a bearing on the extent of working capital requirement. The class of customers, the price and quality of the product, the location of the business as well as the climate are some of the factors that determine the level of demand. Some products also have a high degree of seasonal changes, for example, household consumptions.

A growing firm may need to invest funds in fixed assets in order to sustain its growing production and sales. This will in turn increase investment in current assets to support the enlarged scale of operation. It is, therefore, of importance that proper planning be done by such firms to finance their increasing needs for working capital. In addition, firms dealing in seasonal products should ensure that their financial plan or arrangement is flexible enough to take care of some abrupt seasonal fluctuations.

- (c) **Technology and Manufacturing Policy:** The production process has a lot of impact on the working capital requirement of a firm. An extended manufacturing time span means a larger tie-up of funds in inventories. Thus, if there are alternative technologies of manufacturing a product, the technological process with the shortest manufacturing cycle may be chosen because the longer the manufacturing cycle (time lag of production from the input of raw materials to finished goods) the larger will be the firms working capital requirements.
- (d) **Credit Policy:** The credit policy of the firm affects the working capital by influencing the level of debtors. Even though, the credit terms to be granted to customers may depend upon the norms of the industry to which the firm belongs, the firm has the flexibility of shaping its credit policy within the constraint of the industry norms and practices.

In order to ensure that funds are not tied up unnecessarily in debtors, the firm should follow a rationalised credit policy based on the relevant factors. The firm should adopt a liberal credit policy since a high collection period may lead to a tie-up of large funds in book debts while a slack collection procedure can increase the chance of bad debts.

- (e) **Availability of Credit:** The working capital requirements of a firm are also affected by the credit terms allowed by its suppliers. A firm will need less working capital if liberal credit terms are available to it. The availability of credit from banks also influences the working capital requirements of the firm. A firm which can get bank credit easily on favourable terms will operate with less working capital than a firm without such a facility.
- (f) **Operating Efficiency:** The operating efficiency of the firm relates to the optimum utilisation of resources at minimum costs. A firm may be able to efficiently control its operating costs and utilising current assets. With operating efficiency (better utilisation of resources i.e. material, labour and overheads) the use of working capital is improved and the pace of cash conversion cycle is accelerated. Thereby improving profitability and reducing pressure on the working capital.
- (g) **Price Level Changes:** Price level changes is an important factor in decision making. The increasing shifts in price level make functions of the financial manager difficult. Therefore, a good financial manager should be able to anticipate the effects of price level changes on working capital requirements of the firm and make adequate provision for it.

A firm will require to maintain higher amount of working capital during rising price levels as same levels of current assets will need increased investments. However, companies which can immediately revise their product prices with rising price levels will not face a severe working capital problem.

Thus, effect of rising prices will be different for different companies; some will face no working capital problem while working capital problems of others may be aggravated.

22.3 ISSUES IN WORKING CAPITAL MANAGEMENT

Working capital management refers to the administration of all aspects of current assets namely cash, marketable securities, accounts receivable (debtors) and inventories and current liabilities (accounts payable, bills payable, bank overdraft etc). The financial manager must determine levels of composition of current assets. He must see that right sources are tapped to finance current assets and that current liabilities are paid in time. Therefore, as the largest portion of the financial manager's valuable time is devoted to working capital problems, it is necessary to manage working capital in the best possible way to get the maximum benefit.

As it is not possible to estimate working capital needs accurately, the firm must decide about the levels of current assets to be carried. Given a firm's technology and production policy, sales and demand conditions, operating efficiency etc its current assets holdings will depend upon its working capital policy which may be either conservative or aggressive. Both policies involves a risk-return trade-offs. A conservative policy means lower return and risk while an aggressive policy produces higher return and risk.

Since liquidity and profitability has been identified as the two important aims of the working capital management, a firm should maintain a balance between the two. Liquidity in this context refers to the firm's continuous ability to meet maturing obligations while profitability refers to the firm's ability to increase the shareholder's wealth.

Meanwhile, to ensure solvency, the firm should be very liquid but there is a cost associated with maintaining a sound liquidity position as considerable amount of the firms will be tied up in current assets. To the extent that this investment is idle, the firm's profitability will suffer.

On the other hand, to have higher profitability, the firm may sacrifice solvency and maintain a relatively low level of current assets. When this happens, the firm's profitability will improve as less funds are tied up in idle current assets, but the solvency of the firm would be threatened thereby exposing the firm to greater risk of cash shortage and stockout.

Dangers of excessive working capital include:

- (a) Unnecessary accumulation of inventories
- (b) Indication of defective credit policy and slack collection period.

- (c) Management inefficiency
- (d) Tendencies of accumulating inventories tend to make speculative profits grow.

Dangers of inadequate working capital include:

- (a) It stagnates growth as it becomes difficult for the firm to undertake profitable projects for non-availability of working capital funds.
- (b) It becomes difficult to implement operating plans and achieve the firms profit target.
- (c) Operating inefficiencies creep in when it becomes difficult even to meet day-to-day commitments.
- (d) Fixed assets are not efficiently utilised for the lack of working capital funds, thus, the firm's profitability would deteriorate.
- (e) Shortage of working capital funds render the firm unable to avail attractive credit opportunities.
- (f) The firm loses its reputation when it is not in a position to honour its short term obligation.

22.4 FINANCING CURRENT ASSETS (WORKING CAPITAL)

There are three major types of financing working capital. These are: long-term financing, short-term financing and spontaneous financing.

- (1) **Long-Term Financing:** These include ordinary share capital, preference share capital, debentures, long term borrowing, retained earnings, etc.
- (2) **Short-Term Financing:** This is obtained for a period of less than one year. It is mostly arranged from banks and other financial institution in the money market. It may also be arranged through public deposits, commercial paper, factoring of receivables etc.
- (3) **Spontaneous Financing:** This type of short-term funds is automatically sourced internally in the course of business and include trade credit and outstanding expenses. A firm is expected to utilise these sources of finance to the fullest before embarking on the other sources, that is long-term and short term financing.

In order to determine the mix of short-term and long-term sources in financing current assets a firm usually follows the following approaches which are

normally referred to as: matching approach, conservative approach and aggressive approach.

- (a) **Machine Approach (Sometimes Called Hedging Approach):** In this approach, the firm uses long-term financing to finance fixed assets and permanent current assets while short-term finance is used to finance temporary or variable current assets.
- (b) **Conservative Approach:** The financing policy of the firm is said to be conservative when it depends more on long-term funds for its financing needs by financing its permanent assets and also a part of temporary current assets with long-term financing. In this respect, the firm has less risk of facing the problem of shortage of funds but would be less profitable in terms of cost and flexibility in payment.
- (c) **Aggressive Approach:** This policy is said to be followed by the firm when it uses more short-term financing than warranted by the matching approach. Under this policy the firm finances a part of its permanent current assets with short-term financing which makes the firm to be more risky.

The discussions above on the three approaches tends towards firms adopting a balanced approach that is, financing permanent current assets by long-term sources and temporary current assets by short-term sources of finance.

Overall, a firm should maintain a balance between liquidity and illiquidity by maintaining a sound working capital position. Both excessive as well as inadequate working capital positions are dangerous. Excessive working capital means idle funds which earn no profits while shortage of working capital not only impairs the firm's profitability but also results in production, interruption and inefficiencies.

In addition to maintaining a balance between liquidity and illiquidity, consideration of assets and financing mixes are also crucial to the working capital management.

22.5 SUMMARY AND CONCLUSIONS

The working capital of a company is also known as its current assets. The components are stock (inventory), debtors (accounts receivable), bills receivable and cash. The company's current liabilities consist of claims of outsiders to the company that have one year or less to go. Examples are creditors (accounts payable), bills payable and outstanding expenses. When current liabilities figure is deducted from the figure of current assets, the result is known as net working capital.

Working capital is required for a company's survival in the short-run. It is a reflection of the liquidity position of the company. It shows the extent to which a company is able to meet its day-to-day financial obligations and take advantage of opportunities. A company must maintain a balanced relationship between the components of its working capital. To this end it should, at any point in time, know its 'operating cycle' and 'cash cycle'. For a manufacturing company the operating cycle is the period of time it takes a company to convert the acquisition of raw materials to cash that is from the day the raw materials were bought to the day cash is received from debtors. When the amount of time taken to pay creditor is removed, there is then what is termed the 'cash cycle'.

In addition to knowing its operating and cash cycles, a company should be able to determine its working capital requirements. The factors to consider in determining such requirements include the nature of the business, the sales and demand conditions, the technology and manufacturing policy, the credit policy and so on.

A company must try to maintain an optimum balance of its working capital position. It might maintain an aggressive or conservative working capital policy. Whatever policy that is adopted involves a trade off between risk and return, that is, between liquidity and profitability.

The financing of working capital is also an important corporate decision. Financing may be long-term, short-term or spontaneous. There are approaches usually adopted in order to determine the mix of these sources of finance. These are the matching approach, the conservative approach and the aggressive approach.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

22.6 REVISION QUESTIONS

22.6.1 MULTIPLE CHOICE QUESTIONS

1. The following are the main components of working capital EXCEPT:
 - A Stock
 - B Debtors
 - C Creditors
 - D Bank overdraft
 - E Bank loan
2. Cash cycle is:
 - (i) operating cycle
 - (ii) operating cycle - payable deferral period
 - (iii) operating cycle + payable deferral period

- A (i) only
B (ii) only
C (iii) only
D (i) and (ii)
E (i) and (iii)
3. Which factor does not directly influence the level of total investment in working capital?
- A Nature of business
B Sales and demand condition
C Marketing policy
D Availability of credit
E Credit policy
4. If a company's assets could not meet its liabilities, it means the company is
- (i) illiquid
(ii) insolvent
(iii) unprofitable
- A (iii) only
B (i) and (ii)
C (i) and (iii)
D (ii) only
E (i) only
5. What is matching concept?
- (i) Short term finance is used to finance long-term assets
(ii) Current assets are financed with current liabilities
(iii) Current assets are financed by long-term finance
- A (iii) only
B (ii) and (iii)
C (ii) only
D (i) and (ii)
E (i) only

22.6.2 SHORT ANSWER QUESTIONS

1. What is working capital?
2. What is spontaneous financing?
3. How is the operating cycle of a manufacturing company determined?
4. What is the importance of working capital to the financial manager?
5. What is overtrading?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

MANAGEMENT OF CASH

23.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ♦ Understand the motives for holding cash and the management of cash;
- ♦ Explain the technique of cash planning with respect to cash budget preparation;
- ♦ Identify and discuss the cash forecasting techniques available to a company;
- ♦ State and discuss cash collection and payment methods for efficient cash control;
- ♦ Explain the methods for determining optimum cash balance under certainty and uncertainty; and
- ♦ Discuss issues in respect of investing surplus cash in marketable securities.

23.1 INTRODUCTION

The importance of cash to a business cannot be over-emphasised. It is the most important current asset for the smooth operations of a business. For a business to run on a continuous basis, it should keep sufficient cash, neither more nor less, since cash shortage disrupts the firm's operation while excessive cash will simply remain idle without contributing anything towards the firm's profitability. For these reasons, the major function of the finance manager will be to maintain a sound cash position. The term cash includes: coins, currency and cheques held by the firm and balances in its bank accounts. Sometimes near-cash items, such as, marketable securities or time deposits are also included.

23.2 MOTIVES FOR HOLDING CASH

Why do firms need to hold cash? The firm's need to hold cash are categorised into three by the economist as follows: transactions motive, precautionary motive and speculative motive.

- (1) **Transactions motive:** This requires a firm to hold cash to conduct its business in the ordinary course. Normally, the firm needs cash primarily to pay for purchases, salaries and wages, taxes, etc. However, the need to hold cash would not arise if there were perfect synchronisation between cash receipts and cash payments, that is, enough cash is received or available when payments are to be made. But since cash receipts and payments are not perfectly synchronised, the firm should maintain some cash balance to be able to make required payments when cash payments exceed cash receipts.

- (2) **Precautionary motive:** This is the firm's need to hold cash to meet future contingencies. It provides a cushion or buffer to withstand some unexpected emergency. The amount required for this purpose depends upon the predictability of cash flows and is also influenced by the firm's ability to borrow at short notice when the need arises.
- (3) **Speculative motive:** The speculative motive relates to the holding of cash for investment in profit making opportunities as and when they arise. The opportunity to make profit may arise when the security prices change. The firm may hold cash when it is expected that interest rates will rise and security prices will fall or when it is expected that materials' price will fall.

However, business firms do not normally engage in speculations. Thus, the primary motives to hold cash and marketable securities are: the transactions and precautionary motives.

23.3 CASH MANAGEMENT

Cash management is concerned with the managing of cash inflows, cash outflows and cash balances held by the firm at a point in time. It is difficult to predict cash flows accurately particularly the inflows. In addition there is no perfect coincidence between the inflows and the outflows of cash. In order to resolve the uncertainty about cash flow prediction and lack of synchronisation between cash receipts and payments, there is a need for a firm to develop necessary strategies for cash management. The firm should therefore evolve appropriate strategies in the following area of cash management.

- (a) **Cash planning:** Cash inflows and outflows should be planned to project cash surplus or deficit for each of the planning period that is preparation of cash budget.
- (b) **Managing the cash flows:** The flow of cash should be properly managed.
- (c) **Optimum cash level:** The firm should decide about the appropriate level of cash balances.
- (d) **Investment of surplus cash:** The surplus cash balances should be properly invested to earn profits.

23.3.1 Cash Planning

Cash planning is a technique to plan and control the use of cash. It involves developing a projected cash statement from a forecast of

expected cash inflows and outflows for a given period. The forecasts may be based on the present operation or the anticipated future operation. It may be done on daily, weekly or monthly basis. This depends on the size of the firm and the philosophy of its management.

(a) Cash Budget

The most important tool to plan for and control cash receipts and payments is the cash budget. According to Weston and Copeland (1986) a cash budget is a summary statement of the firms expected cash inflows and outflows over a projected time period. It gives information on the timing and magnitude of expected cash flows and cash balances over the projected period. This information helps the financial manager to determine the future cash needs of the firm, plan for the financing of these needs and exercise control over the cash and liquidity of the firm.

The time horizon of a cash budget differs from firm to firm. Cash forecasts are needed to prepare cash budgets and this may be done on short or long-term basis. Forecast covering periods of one year or less are considered short term while those extending beyond one year are considered long term. The most commonly used methods of short-term cash forecasting are.

- (i) The receipts and disbursements (payments) method; and
- (ii) The adjusted net income method.

The receipt and payments method is generally employed to forecast for limited periods such as a week or a month while the adjusted net income method is preferred for longer durations ranging between a few months to a year. Both methods have their merit and demerits.

In the case of receipts and disbursements approach, the cash flows can be compared with budgeted income and expense items while the adjusted net income approach shows a company's working capital and future financing needs.

(b) Receipts and Disbursements Method

The prime aim of this method is to summarise the cash inflows and cash outflows, during a predetermined period. It is simply called the cash budget. The first step in the preparation of a cash budget is the estimate of cash inflows. Three broad sources of cash inflows can be identified. These are: operating, non-

operating and financial. Cash sales and collections form the most important part of the operating cash inflows while the non-operating cash flows include sale of old assets, dividend and interest income. The financial sources include borrowings and issuance of securities.

The next step in the preparation of a cash budget, is the estimate of cash outflows and this include:

- (i) Operating outflows that is cash purchases, payments accounts payables, wages and salaries; etc
- (ii) Capital expenditures;
- (iii) contractual payments such as repayment of loan and interest charges, tax payments, etc; and
- (iv) discretionary payments such as ordinary and preference dividend.

Once the forecasts for cash receipts and payments have been developed, they can be combined to obtain the net cash inflow or outflows for each period and this would indicate whether the firm has excess cash or deficit. The peak cash requirements would be indicated. If the firm has a policy of maintaining minimum cash balance, arrangement must be made to maintain this minimum by borrowing from banks in periods of deficit.

Alternatively, the firm can delay its capital expenditure or payments to creditors or postpone payment of dividends.

ILLUSTRATION 23-1

Given the following estimates, prepare a cash budget for Fidelis Ayua Plc for a period of six months from Jan 2009.

1. Prices and costs are assumed to remain unchanged
2. Credit sales are expected to be 80 percent of total sales
3. 60 percent of credit sales are to be collected after one month i.e. the month after the sale and 20 percent after two months and 20 percent after three months.
4. Actual and forecast sales are as follows:

Actual	₦'000	Forecast	₦'000
Oct 2008	12,000	Jan 2009	10,000
Nov 2008	14,000	Feb 2009	8,000
Dec 2008	16,000	Mar 2009	10,000
		April 2009	6,000
		May 2009	10,000
		June 2009	8,000
		July 2009	12,000

5. The company expects a profit margin of 25 percent on sales.
6. Anticipated sales of each month are purchased and paid a month before the sale.
7. The estimated operating expenses are as follows:

	₦'000		₦'000
Jan	2,000	April	3,000
Feb	1,500	May	2,050
Mar	2,500	June	3,200

These are paid in the month in which they are incurred.

8. Interest on 10 percent debenture is to be paid half-yearly
9. Company tax of ₦2 million is due in March
10. Purchase of machinery is to be made in May
11. The company has a cash balance of ₦5 million as at 31st December 2008. The company hopes to maintain a minimum balance of ₦5 million from the beginning of February 2009. Funds can be borrowed on a monthly basis at 20 percent per annum in case of need.

12. Interest on the borrowed fund is payable on the first of the month after the borrowing.

13. The sum of ₦10 million is payable as rent on a monthly basis.

SUGGESTED SOLUTION 23-1

Fidelis Ayua

CASH BUDGET

Forecast 2009

A. Inflows (₦'000s)

	Jan	Feb	Mar	Apr	May	June
Total sales	10,000	8,000	10,000	6,000	10,000	8,000
Credit sales (80% of sales)	<u>8,000</u>	<u>6,400</u>	<u>8,000</u>	<u>4,800</u>	<u>8,000</u>	<u>6,400</u>
Cash sales	2,000	1,600	2,000	1,200	2,000	1,600

Collections:

One month 60%	7,680	4,800	3,840	4,800	2,880	4,800
Two months 20%	2,240	2,560	1,600	1,280	1,600	960
Three months 20%	<u>1,920</u>	<u>2,240</u>	<u>2,560</u>	<u>1,600</u>	<u>1,280</u>	<u>1,600</u>
Total Inflows (A)	<u>13,840</u>	<u>11,200</u>	<u>10,000</u>	<u>8,880</u>	<u>7,760</u>	<u>8,960</u>

B. Outflows ₦'000

Purchases 75% of sales	6000	7,500	4,500	7,500	6,000	9,000
Rent	1,000	1,000	1,000	1,000	1,000	1,000
Operating expenses	2,000	1,500	2,500	3,000	2,050	3,200
Equipment	--	--	--	--	8,000	--
Interest on debt 15%	--	--	--	--	--	500
Company tax	--	--	<u>2,000</u>	--	--	--
Total Outflows	<u>9,000</u>	<u>10,000</u>	<u>10,000</u>	<u>11,500</u>	<u>17,050</u>	<u>13,700</u>
Net cash flows (NCP)	4,840	1,200	--	(2,620)	(9,290)	(4,740)
Beginning of month	5,000	9,840	11,040	11,040	8,420	5,130
Beginning of borrowings	--	--	--	--	6,000	5,000
Interest on borrowings	--	--	--	--	--	(100)
Repayment of borrowings	--	--	--	--	--	--
Total end of months cash	<u>9,840</u>	<u>11,040</u>	<u>11,040</u>	<u>8,420</u>	<u>5,130</u>	<u>5,290</u>

Advantages of Cash Budget

- (i) It gives a complete picture of all the items of expected cash flows i.e. cash inflows and cash outflows.
- (ii) It helps a firm to manage its cash position.

Disadvantages of Cash Budget

- (i) Its reliability is reduced because of the uncertainty of cash forecasts.
- (ii) It fails to highlight the significant movement in the working capital items.

(c) Adjusted Net Income Method

This method involves the tracing of working capital flows. It is sometimes called the sources and uses approach and it is one of the statements in a published account.

Its benefits are

- (i) It highlights the movements in the working capital items and thereby helps to keep control on a firm's working capital
- (ii) It helps in anticipating a firm's financial requirement.

Its limitation

It fails to trace cash flows and therefore its utility in controlling daily cash operation is limited.

23.4 MANAGING CASH COLLECTION AND PAYMENTS

Once the cash budget is prepared and appropriate cash flow established, the financial manager should ensure that there is no significant variance between the projected cash flows and the actual cash flows. To be able to achieve this, requires an efficient cash management through proper control of cash collection and disbursement. The objective should be to accelerate cash collection as much as possible and de-accelerate or delay cash disbursements as much as possible.

23.4.1 Accelerating cash collection

A firm can conserve cash and reduce its cash requirement provided it could speed up its cash collection. Cash collection can be accelerated by the use of:

- ♦ Lock boxes;
- ♦ Local depository bank; and
- ♦ Cash transfer systems including e-payments.

(a) Lock boxes

This arrangement requires the firms to organise collection of cash by having remittances mailed directly to a post office box that is opened by a bank. Cheques are mailed to the local post office box maintained by a local bank instead of being sent to the headquarter of the firm. The use of lock boxes speeds the collection of cheques as well as the movement of remittances, since the cheques are deposited before, rather than after, the accounting is done. However, where small amounts are involved, the cost of a lock box may outweigh its benefits.

(b) Local Depository Bank

This is very similar to lock boxes technique. In this system, local banks are appointed as collection centres. Customers are directed to pay to the appointed local bank where transfers are made to the company's headquarters account. Sales executives could also be directed to collect cheques from the customers and pay directly to the appointed local banks.

(c) Cash Transfer Systems (e-payment credit card etc.)

Customers are given the firms account number to which payments are to be made for direct credit to the company's account. However, technology has improved so much that the issue of cash collection has been made very easy. The problem has been reduced while the clerical function has been partly transferred to the banks. This has helped in reducing cost, improve internal control and reduce the possibility of fraud.

23.4.2 Controlling Disbursement

The effective control of cash disbursement can help the firm in conserving cash and reducing the financial requirements. The firm

should make payments using credit terms to the fullest extent since there is no advantage in paying sooner than agreed. By delaying payment as much as possible, the firm will be able to make maximum use of trade credit. This may, however, endanger the firm's credit worthiness. In addition, the supplier may build implicit costs in the prices of the goods supplied. Thus, keeping in view the norms of the industry, the firm should pay within the term offered by the supplier since paying early may not necessarily result in any substantial advantage to the firm unless cash discounts are offered.

While for accelerated collections, a decentralised collection procedure may be followed, for a proper control of disbursements a centralised system may be advantageous.

23.5 DETERMINING THE OPTIMUM CASH BALANCE

One of the primary responsibilities of the financial manager is to maintain a sound liquidity position of the firm. This he does by ensuring that there is availability of cash to meet the firm's obligation when they become due.

A firm maintains the operating cash balance for transaction purpose. It may also carry additional cash as a buffer. The amount of cash balance will depend on the risk-return trade-off. If the firm maintains a small cash balance, its liquidity position weakens, but its profitability improves as the released funds can be profitably invested. On the other hand, if the firm keeps a high cash balance, it will have a strong liquidity position but low profitability since the potential profit foregone on holding large cash balance is an opportunity cost to the firm. Therefore, the firm should maintain optimum just enough - cash balance.

23.5.1 Optimum cash balance under certainty

Baumols Model

This model considers cash management similar to an inventory management problem. It provides a formal approach for determining a firm's optimum cash balance under certainty. It attempts to minimize the sum of the cost of holding cash and the cost of converting marketable securities to cash.

It is based on the following assumptions:

- (a) The firm is able to forecast its cash needs with certainty.
- (b) The firm's cash payment occur uniformly over a period of time.
- (c) The opportunity cost of holding cash is known and it does not change over time.

- (d) The firm will incur the same transaction cost whenever it converts securities to cash.

The formula for the optimum cash balance is as follows:

$$\text{Optimum cash balance} = \sqrt{\frac{2cT}{k}}$$

$$C^* = \sqrt{\frac{2cT}{k}}$$

where:

C^* is the optimum cash balance

c is the cost per transaction

T is the total cash needed during the year

k is the opportunity cost of holding cash balance

The model is shown graphically as follows:

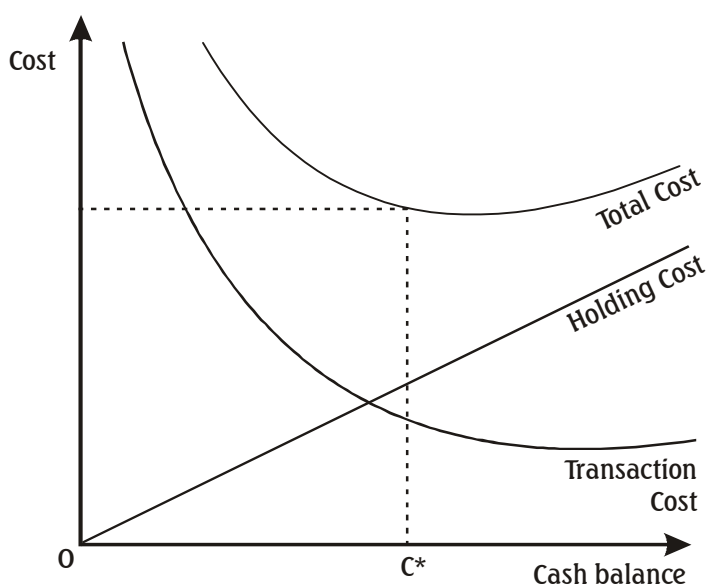


ILLUSTRATION 23-2

Babatunde Fishery Plc estimates its total cash requirement as ₦5 million in 2009. the company's opportunity cost of funds is put at 20 per cent per annum. The company anticipates a transaction cost of 0.01 per cent of cash requirement per transaction whenever it converts its short-term securities to cash. Determine the optimum cash balance

SUGGESTED SOLUTION 23-2

$$\text{Optimum cash balance} = \sqrt{\frac{2cT}{k}} \text{ i.e. } C^* = \sqrt{\frac{2cT}{k}}$$

where

C* The optimum cash balance

c is the cost per transaction

T is the total cash needed during the year

k is the opportunity cost of holding cash

$$\begin{aligned} \text{Therefore } C^* &= \sqrt{\frac{2(0.01\% \text{ of } \text{N}5 \text{ million}) \text{N}5 \text{ million}}{0.20}} \\ &= \sqrt{\frac{2 \times \text{N}500 \times \text{N}5 \text{ million}}{0.20}} \\ &= \text{N}158,113.88 \end{aligned}$$

23.5.2 Optimum cash balance under uncertainty**The Miller - Orr Model**

The limitation of the Baumol model is that the cash flows fluctuate. However, firms in practice do not use their cash balance uniformly nor are they able to predict daily cash inflows and outflow. The Miller-Orr model overcomes this shortcoming and allows for daily cash flow variation.

It assumes that net cashflows are normally distributed with a zero value of mean and a standard deviation.

The formula for determining the distance between upper and lower control limits called Z is as follows:

$$\text{Upper limit} - \text{Lower limit} = \frac{3}{4} \times \text{Transaction cost} \times \text{cash flow variance}$$

$$\text{Upper limit} - \text{Lower limit} = \frac{3}{4} \times \text{Transaction cost} \times \text{cash flow variance} / \text{Int. rate})^{\frac{1}{3}}.$$

$$Z = \left(\frac{3}{4} \times \frac{c\sigma}{1} \right)^{\frac{1}{3}}$$

$$\text{Upper limit} = \text{Lower limit} + 3Z$$

$$\text{Return point} = \text{Lower limit} + Z$$

$$\text{Average cash balance} = \text{lower limit} + 4/3z$$

where:

c = the transaction cost

i = the interest rate

σ = the standard deviation of net cash flows.

23.6 INVESTING SURPLUS CASH IN MARKETABLE SECURITIES

A firm holds extra cash to meet unpredictable financial needs more so when cash flows cannot be predicted with certainty. The cash so held is called the precautionary balance and is usually invested in the short-term money market instruments.

Instead of holding excess cash for precautionary balance, the firm may meet its precautionary requirements as and when they arise, by short-term borrowings. The choice between holding liquid assets and short term borrowings will depend upon the firms policy regarding the mix of short-term financing. Even though, a number of marketable securities may be available in the market, the finance manager must decide about the portfolio of marketable securities in which the firms surplus cash should be invested.

In choosing among alternative investments, the firm should examine the three basic features of security, that is, safety, maturity and marketability. The firm would be interested in receiving a high return on its investment as much as possible but the higher the return, the higher the risk. Therefore, the firm would like to invest in very safe securities as the cash balance invested in them is needed in the near future. Thus, the firm would tend to invest in the highest yielding marketable securities subject to the constraint that the securities have acceptable level of risk.

In addition, the firm would like to consider the maturity of the investment in order to invest its excess cash on short term securities for safety reasons.

Finally, the convenience and speed with which the security can be converted to cash would be considered. As the funds invested in marketable securities would be needed by the firm in the near future, it would invest in the securities which are readily marketable.

The types of short-term investment available are normally money market instruments. These include, treasury bills, commercial papers, certificates of deposits, bank deposit, etc, details of which have been discussed in earlier chapters.

23.7 SUMMARY AND CONCLUSIONS

Cash is the most liquid asset of the company. The fundamental rule is that a company should not hold more cash than is necessary so as not to lose some profitability and should not have less than is needed so as not to suffer liquidity problems. The question then is how much cash should be held? Firstly, however, the motives for holding cash should be known. These are transaction motive, precautionary motive and speculative motive.

The need to achieve the right balance between too much cash and too little cash gives rise to management's concern for effective and efficient cash management. The areas of cash management where appropriate strategies are required include cash planning, cash flows management, optimum cash level determination and investment of cash surplus.

The most commonly used short-term cash forecasting are the receipts and disbursements method and the adjusted net income method. Efficient cash management is achieved through proper control of cash collection and disbursement. Efficient cash collection system would involve the use of lock boxes, local deposit, bank cash transfers method and so on. As part of the control of cash disbursement, a company should use credit terms to the fullest extent, but ensure that its credit rating is not adversely affected. Financial managers have the responsibility of determining the optimum cash balance for a company. This, they try to do in a certain environment using Baumols model and in an uncertain environment using the Miller-Orr model. A good financial manager should not keep idle cash as this type of cash does not earn any income. He should, therefore, look, as much as possible, for marketable short-term investments in which he can invest surplus funds.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

23.8 REVISION QUESTIONS

23.8.1 MULTIPLE CHOICE QUESTIONS

1. Cash management is concerned with all the following EXCEPT
 - A Cash planning
 - B Managing receipts and disbursements
 - C Ensuring only a fixed amount of cash is paid each year as dividend
 - D Determining the optimum cash level
 - E Investing surplus cash while arranging for short term temporary financing in advance
2. Who is that person in a business organisation whose function is most closely related to cash management?
 - A The cost accountant
 - B The treasurer

- C The financial accountant
- D The management accountant
- E The auditor

3. The following are the components of a cash budget EXCEPT

- A Receipts from debtors
- B Payment to creditors
- C Depreciation
- D Repayment of loan
- E Previous period cash balance

4. The following are methods of accelerating cash collections EXCEPT

- A Speed up preparation and dispatch of invoice
- B Arrange for fast payment procedure by customer
- C Increase the time payments remain uncollected.
- D Adopt E-payments system
- E Arrange for a local deposit bank

5. One single factor that has almost rendered the position of treasury managers within the organisation ineffective is

- A Improved management skills
- B Economic meltdown
- C Falling turnover
- D Technology
- E Improvement in postal delivery

23.8.2 SHORT ANSWER QUESTIONS

1. State one motive for holding cash.
2. Mention one method of short-term cash forecasting
3. State one advantage of E-payment system in relation to cash management.
4. What is the optimum cash balance to hold?
5. State one instrument of the financial market that may be available for investment of short-term funds which is in excess of requirements.

(Refer to Suggested Solution to Revision Questions in Appendix 1, Page 445)

MANAGEMENT OF ACCOUNTS RECEIVABLE AND ACCOUNTS PAYABLE

24.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ◆ Understand how a company determines its credit and collection policies;
- ◆ Understand the procedure for evaluating the credit risk of a particular debtor;
- ◆ Discuss factoring procedure and know the types of factoring that can be undertaken;
- ◆ Explain the costs and benefits of factoring;
- ◆ Discuss the overview of trade credit; and reasons for granting credit;
- ◆ Explain credit terms with respect to discounts; and
- ◆ Give the advantages and disadvantages of granting discount.

24.1 INTRODUCTION

Customers to whom the firm's products or services are sold on credit are called trade debtors or simply debtors. It involves an element of risk and implies futurity.

In most firms, debtors constitute a substantial proportion of current assets after inventories. Since substantial amounts are tied-up in trade debtors, it needs careful analysis and proper management.

A firm's investment in accounts receivable or debtors depends on the volume of credit sales and collection period. The financial manager can influence the volume of credit sales and collection period through credit policy which includes:

- (a) Credit Standards and Analysis;
- (b) Credit terms; and
- (c) Collection effort.

A firm may follow a lenient or stringent credit policy depending on the nature and type of customers. For example, a company following a lenient credit policy, may grant credit for longer periods to customers whose credit worthiness is not fully known or whose financial position is doubtful. In contrast, a firm following a stringent credit policy may grant credits on a highly selective basis only to those customers who have proven credit worthiness and who are financially strong. However, the best policy will be to adopt credit policies ranging between stringent to lenient.

The goal of the firm's credit policy is to maximise the value of the firm by establishing an optimum credit policy. To achieve this goal, the firm will have to evaluate its credit policy in terms of both return and costs of additional sales. In short, the firm's credit policy will be determined by the trade-off between opportunity cost and credit administration costs and bad debts losses.

24.2 ESTABLISHING CREDIT POLICY

In establishing an optimum credit policy, the financial manager must consider some decision variables which influence the level of receivables. These variables include:

- (a) Credit standards and analysis;
- (b) Credit terms; and
- (c) Collection policy and procedures.

24.2.1 Credit Standards

These are the criteria which a firm follows in selecting customers for the purpose of credit extension. The firm may have tight standards, that is, it may sell mostly on cash basis and may only extend credit to the most reliable and financially strong customers.

In such cases, the firm may not have bad-debt losses but may not be able to expand sales. The profit so sacrificed on lost sales may be more than the costs saved. On the other hand, if the credit standards are loose, the firm may have larger sales but at the expense of bad-debt losses and huge balance of debtors.

In effect, the choice of optimum credit standards involves a trade off between incremental return and incremental costs.

24.2.2 Credit Analysis

Credit standards influence the quality of the firm's customers. There are two aspects of the quality of customers, namely:

- (a) The average collection period which determines the speed of payment by customers.
- (b) The default rate which can be measured in terms of bad-debt losses ratio (default risk). Default risk is the likelihood that a customer will fail to repay the credit obligation.

In order to estimate the probability of default, the following three C's should be given consideration: character, capacity, and condition.

- (i) Character refers to the willingness of the customer to pay, that is, moral factor.
- (ii) Capacity, refers to customers ability to pay, that is real worth of security offered by the customer and its financial position.
- (iii) Condition refers to the prevailing economic and other condition which may affect the customer's ability to pay.

Information on the above variables may be collected. However, collecting credit information involves cost and time. Depending on these two factors, that is, time and cost, any or a combination of the following sources may be employed:

- (a) **Financial statements:** This is one of the easiest way to obtain information regarding the financial condition and performance of the prospective customer. The published financial statement of public limited companies are easily available.
- (b) **Bank references:** This is another source for collecting credit information. A customer can be requested to instruct his banker to provide information required by the firm.
- (c) **Trade references:** A firm can ask the prospective customer to give trade references. It may insist to give the names of such persons or firms with whom the customer has current dealings. To guard against a customer furnishing misleading references, the firm can insist on furnishing the reference of people or firms of repute.

- (d) **Other sources:** This include the customer, credit bureau etc.

The information so collected should be used along with the firm's credit investigation and analysis, that is, analysis of credit file, analysis of financial ratios and analysis of the nature of the customer's business and its management, to categorize customers according to their credit worthiness and default risk as follows:

- (i) Good accounts;
- (ii) Doubtful debts; and
- (iii) Bad debts.

The above categorisation will assist the firm in deciding about the extension of credit to good accounts and rejecting the credit request of bad accounts while devoting more time to doubtful (marginal) accounts.

To assist in the above categorisation of debtors, the following numerical credit scoring models may be used. These include:

- (i) **Adhoc approach (AA):** This refers to the development of numerical credit scoring to determine customers' credit worthiness.
 - (ii) **Simple discriminant analysis, (SDA):** This refers to using empirical analysis such as ratio analysis, namely:
 - ♦ Earnings before depreciation, interest and taxes (EBDIT) to sales.
 - ♦ Operating cash flows to sales.
- (e). **Multiple discriminant analysis (MDA):** This is the technique that combines many factors according to the importance (weight) to be given to each factor and determine a composite score to differentiate good customers from bad ones.

Credit scoring models, such as multiple discriminant analysis (MDA) are based on objective factors and help a firm to quickly distinguish between good and bad customers hence they can be consistently and objectively applied by any credit appraiser.

Credit scoring models can be misleading since they are based on past data. As such, the firm may refuse credit to a number of marginally good customers. Similarly, a customer who has been regular in paying in the past may fail to do so in the future. Therefore, a firm needs to

go beyond credit decision; it may have to rely on good judgment also. Firms should have a long term perspective and should think in terms of securing dependable customers who will stay with it.

24.2.3 Credit Terms

Credit terms are the conditions under which the firm sells to customers on credit. These conditions are the credit period/credit limit and the cash discount.

(a) Credit limit

Credit limit is the maximum amount of credit which a firm will extend to a customer at a point in time. Once a decision has been taken to extend credit to an applicant (customers), the amount and duration of the credit will have to be decided. The magnitude of the credit will depend upon the amount of contemplated sale and the customer's financial strength. Where the customer is a frequent buyer, a credit limit will be established based on his normal buying pattern while in the case of a customer who is not fairly regular in settling his debt, the credit limit may be fixed with reference to the outstanding amount. The credit limit are usually reviewed periodically and may be revised downward if slow payment is observed. A customer may at times, ask for a credit in excess of his credit limit. At such time, the firm may accept or reject depending on the circumstances of the firm and its analysis of the risk-return trade-off of the request.

In addition to extending credit limit to a customer, the firm also has to determine the duration of the credit, keeping in view the industry norm.

(b) Credit period

This is the length of time for which credit is extended to customers. It is generally stated in terms of a net date. For example, if the firms credit terms are 'net 60', it is expected that customers will pay not later than 60 days.

A firm's credit period may be governed by the industry norms but the firm can lengthen or tighten its credit period depending on its objective.

The firm may tighten its credit period if customers are defaulting too frequently and bad-debt losses are building up. On the other hand, the company may lengthen its credit period in order to

increase its operating profit through expanded sales, on the expectation that the cost of extended profit will be less than the incremental operating profit.

(c) Cash discount

Pandey (2003) defines cash discount as a reduction in payment offered to customers to induce them to repay credit obligations within a specified period of time which will be less than the normal credit period.

It is usually expressed as a percentage of sales. The terms usually indicate the rate of discount and the period for which it is available. If the customer fails to pay within the period offered, he must make payment within the allowed credit period. For example, credit terms may be expressed as '2/15 net 40'.

This means that a 2 percent discount will be granted if the customer pays within 15 days; if he fails to pay within the 15 days, he must make payment within 40 days.

A firm uses cash discount as a tool to increase sales and accelerate collections from customers. In this respect the level of receivable and associated costs may be reduced. The cost involved is the discount taken by customers.

24.2.4 Collection Policy and Procedure

A firm should develop a collection policy which will ensure prompt and regular payment. This is needed for fast turnover of working capital, keeping collection costs and bad debts within limits and maintaining collection efficiency. Regularity in collection of debts keeps debtors alert and they tend to pay their dues promptly.

A clear-cut collection period procedure should be established and the collection procedures for delinquent accounts established in unambiguous terms. To avoid the loss of slow paying customers to competitors, they should be handled tactfully as the collection process initiated quickly without giving any chance to them may antagonise them.

The responsibility for collection and follow up should be explicitly fixed. It may be entrusted to the accounts or sales department or to a separate department. The sales and accounts department should co-ordinate their activities and work together to ensure smooth collection of debts. The co-ordination between the two departments should be

formalized and firmly established. Some customers may be willing to make payment but may be in tight financial position thereby unable to pay on due date. This may be due to recessionary condition or other factors beyond the control of the customers; such cases need special considerations. The collection procedure against them should be initiated only after they have overcome their financial difficulties and are unwilling to pay.

The firm should also decide about offering cash discount for prompt payment and also ensure proper monitoring to avoid a situation where some customers may try to shortchange the firm. Therefore, the firm should follow a well laid down collection policy and procedure to collect dues from its customers. When the normal credit period granted to a customer expires, and payment has not been made the firm should send a polite letter to the customer reminding him that the account is overdue. If there is no response, the firm may send progressively, strongly worded letters followed by telephone calls, e-mails and personal visit. If the payment is still not made, the firm may initiate a legal action or place the debt in the hands of a debt collector after examining the customers financial condition. If the financial condition is weak, legal action may be delayed to avoid hastening the customers insolvency which may be detrimental to the firm. It should be noted that, it is better to be patient and wait or accept, reduced payment in the settlement of the account instead of losing the whole debt.

In addition to the above steps, a firm needs to continuously monitor and control its receivables to ensure the success of its collection efforts. Some methods that could be adopted are average collection period method, the aging schedule method and the collection experience matrix.

(a) Average collection period:

It measures the quality of debtors in an aggregative way and is calculated as follows:

$$\frac{\text{Debtors}}{\text{Credit Sales}} \times \frac{365}{1} \text{ days.}$$

The average collection period so calculated is compared with the firms stated credit period to judge the efficiency of recoveries

(b) Aging schedule: This method breaks down receivables according to the length of time which they have been outstanding as follows:

Outstanding Period days	Outstanding Amount of Receivables ₦'000	Percentage of Total Receivables %
0 - 30	1,000	25.00
31 - 40	2,000	50.00
41 - 50	500	12.50
51 - 60	400	10.00
Over 60	100	2.50
	<u>4,000</u>	<u>100.00</u>

The above two methods have certain limitations which make the third method, that is, the collection experience matrix, to be superior. These limitations are:

- (i) They are based on aggregate data.
 - (ii) They fail to relate outstanding receivables of a period with the credit sales of the same period.
- (c) **Collection experience matrix:** The sales over a period of time are shown horizontally and associated receivables vertically in a tabular form.

An example of collection experience matrix is as follows:

TABLE 24-1						
Month	Jan.	Feb.	Mar.	Apr.	May	Jun.
Sales ₦'000	500	350	450	280	310	420
Credit Sales						
January	400					
February	250	270				
March	50	170	360			
April	0	70	210	230		
May	0	0	30	140	250	
June	0	0	0	40	150	320

TABLE 24-2						
Month	Jan.	Feb.	Mar.	Apr.	May	Jun.
Sales ₦'000	500	350	450	280	310	420
%Credit Sales						
January	80.0					
February	50.0	77.1				
March	10.0	48.6	80.0			
April	0	20.0	46.7	82.1		
May	0	0	6.7	50.0	80.6	
June	0	0	0	14.3	48.4	76.2

Table 24.2 contains information on the percentage credit sales collected out of the total credit sales for the months in which they are shown. For example, out of the total credit sales in January, 80 per cent ($\frac{400}{500}$), 50 per cent ($\frac{250}{500}$) and 10 per cent ($\frac{50}{100}$) were outstanding during the months of January, February and March respectively. In other words 20 per cent of the debts were paid, at the end of January, 50 per cent at the end of February, 90 per cent at the end of March and the balance collected during the month of April resulting in a nil balance at the end of April. Credit of other months can also be analysed in the same way. Thus, the table gives an idea of the manner in which the firm collects a given month's sale.

24.3 FACTORING

Credit management is a specialised activity which involves a lot of time and effort. It is very problematic and therefore requires some professional skills. Because of the problematic nature of debt collection and the time factor, some firms do assign their credit management and collection to specialist organisations, called factoring organisations. Factoring is a popular mechanism for managing, financing and collecting debts. It is a method of converting a non-productive, inactive asset (receivables) into a productive asset (cash) by selling receivables to a company that specialises in debt collection and administration. It is not yet common in the Nigerian business environment but it is gradually being introduced to the banks by some companies and individuals. However, the use of debt collectors is more pronounced.

Biscoe (1975) defines factoring as a business involving a continuing legal relationship between a financial institution (the factor) and a business concern (the client) selling goods or providing services to trade customers (the customers) whereby the factor purchases the client's accounts receivable and in relation thereto, controls the credit extended to customers and administers the sales ledger. On the other hand at the Unidroit convention on international factoring held in 1988, factoring was defined as a contract between the suppliers of goods/services and the factor under which the supplier and its customers (debtors) other than those for the sale of goods bought primarily for their personal, family or household use: the factor is to perform at least two of the following functions:

- (a) Finance for the supplier, including loans and advance payments;
- (b) Maintenance of accounts (ledgering relating to the receivables);
- (c) Collection of accounts (ledgering relating to the receivables); and
- (d) Protection against default in payment by debtors.

Notice of assignment of the receivables is to be given to debtors. The above definitions clearly indicate the functions of a factor which can be summarised as follows;

Maintenance of sales ledger and credit administration, for example:

- (a) Helps and advises the client from the stage of deciding credit extension to customers to the final stage of book debt collection;
- (b) Maintains an account for all customers of all items owing, to ensure collection on due date;
- (c) Helps client to decide whether or not and how much to extend to customers;
- (d) Provides information to clients about market trends, competition and customers credit worthiness;
- (e) Makes a systematic analysis of credit information for its proper monitoring;
- (f) Prepares credit and collection reports for the use of the client;
- (g) Collection of debts and protection against bad debts (protection against default i.e. undertakes all necessary collection activity);
- (h) Financial assistance i.e. extending cash advance against book debts. The maximum advance a factor provides is equal to the amount of factored debt less:
 - (i) the factoring commission,
 - (ii) interest in advance, and
 - (iii) reserve required to cover bad-debts losses.
- (i) Providing other services like information on prospective buyers, financial counseling; management of liquidity, financing acquisition of inventories, providing facilities for operating letters of credit, and so on.

24.3.1 Factoring Procedure

Usually the firm sends the customers order to the factor for evaluating the customers credit worthiness and agrees to buy receivables before the firm dispatches goods to the customer. The customer will thereafter be informed that his account has been sold to the factor to whom he will be instructed to directly make payment. To perform his credit evaluation and collection of receivables for a large member of clients,

a factor may maintain a credit department with specialised staff. Once the factor has purchased a firm's receivables and he agrees to own them, he will have to provide protection against any bad debt losses to the firm.

24.3.2 Types of Factoring

The followings are the four popular types of factoring facilities:

- ◆ Full service non-recourse (old line) factoring;
- ◆ Full service recourse factoring;
- ◆ Bulk/agency factoring; and
- ◆ Non-notification factoring.

(a) Full service non-recourse factoring

In this method, book debts are purchased by the factor, assuming 100 percent credit risk. The total amount of invoice have to be paid to clients in the event of debt becoming bad. Based on the agreement between the client and the factor, the factor may advance cash up to 70-80 percent of the book debts immediately to the client. In view of the advance, payments will be domiciled to the factor who will then maintain the customer's account and prepares age-wise reports of outstanding book debts for onward dispatch to the client, periodically. This method is said to be very popular in the USA where it is also known as "old line" factoring.

(b) Full service recourse factoring

Under this method, the factor does not take full responsibility for the debts. The client is, therefore, not protected against the risk of bad debts. Any advance made to the client against book debts will have to be refunded to the factor of the customers.

Most companies practice recourse factoring since it is not easy to obtain credit information and the cost of bad debt protection is very high. This type of factoring is often used as a method of short-term financing rather than pure credit management and protection service. It is less risky from the factor's view point and thus less expensive to the client than non-recourse factoring. It is also preferred when large spread of customers with relatively small amount per customer is involved.

(c) **Bulk/agency factoring**

Under this method, the factor finances the book debts either on recourse or without recourse. It is basically used as a method of financing book debts. The client maintains the sales ledger and administer the credit.

(d) **Non-notification Factoring**

In this type of factoring, customers are not informed about the factoring agreement. The factor maintains the sales account ledger in the name of a sales company to which the client sells his book debts. The factor deals with the client's customer through a sales company and performs all his usual functions without disclosure to the clients customers. In effect, there is a fourth party, which is the sales company.

24.3.3 Costs of Factoring

There are two types of costs involved in factoring. These are:

- (a) The factoring commission or service fee; and
- (b) The interest on advance granted by the factor to the firm.

The factoring commission or service fee: This is the remuneration paid to the factor for the professional services rendered, such as, evaluation of credits, collection of debts and other services. It is usually expressed as a percentage of the net face value of debts factored.

The interest on advance granted by the factor to the firms: This is usually above the bank's rate.

24.3.4 Benefits of Factoring

- (a) Factoring provides specialised service in credit management and thus, helps the firm's management to concentrate on technology, production, marketing, personnel and other management functions.
- (b) Factoring helps the firms to save cost of credit administration such as, cost of credit investigation, evaluation and collection of debts and bad debt losses.

While factoring may be beneficial to the client it is necessary for a firm to evaluate the costs and benefits associated with it before arriving at a decision regarding the employment of a factor.

24.4 OVERVIEW OF TRADE CREDITS

As mentioned in an earlier chapter on working capital management, there are three ways of financing working capital. These are: long-term financing short-term financing and spontaneous financing. Apart from long-term financing which is recommended for use to finance permanent current assets, short-term financing and spontaneous finance - trade credit and outstanding expenses - are the major sources of financing working capital. In this section, the focus will be on trade credit as a method of financing working capital.

Trade credit in this context refers to the credit that a customer gets from suppliers of goods in the normal course of business. It is a situation in which a firm makes purchases for which payment is not made immediately to the supplier. This source of finance is mostly used by small firms, such as market women, who finds it difficult to raise funds from banks or other sources in the capital markets. Trade credit is mostly an informal arrangement and is granted on an open account basis. The open account trade credit appears as sundry creditors or accounts payable on the buyer's balance sheet as a current liability.

The procedure for granting trade credit is as follows:

A supplier sends goods to the buyer on credit which the buyer accepts thereby agreeing to pay the amount due as per sales terms in the invoice. However, he does not formally acknowledge it as a debt as he does not sign any legal instrument. Once the trade links have been established between the buyer and the seller they have each other's mutual confidence and trade credit becomes a routine activity which may be periodically reviewed by the supplier.

24.4.1 REASONS FOR GRANTING CREDITS

The following may be considered, among others:

- (a) To boost sales.
- (b) Type of product. In Nigeria most firms dealing in food/ beverages, cosmetics, dairy products and so on are used to granting trade credits to their distributors above their deposits. These distributors in turn grant credits to the wholesalers who also grant credit to the retailers. This is very common among the market women at the main markets such as Oke-Arin, Oyingbo and so on.

The firms so involved include: PZ Cussons Nigeria Plc, Unilever Nigeria Plc, Nestle Nigeria Plc, Cadbury Nig Plc, Wamco and so on.

- (c) Launching of new products. This is to enable the firm to penetrate into the market.

24.4.2 Credit Terms

Credit terms refer to the condition under which the supplier sells on credit to the buyer and the buyer is required to pay the credit. These conditions include the due date and the cash discount (if any). The **due date** is the date by which the supplier expects payment while the **cash discount** is the concession offered to the buyer to encourage him to make prompt payment. The typical way of expressing credit terms is, for example, as follows. '2/10 net 30'. This implies that a 2 percent discount is available if the credit is repaid on the 10th day and in case of failure to meet the deadline, payment will be due by the 30th day.

Where a trade discount is involved, the buyer should take a decision whether or not to take advantage of the discount by comparing the opportunity cost of foregoing cash discount with the cost of other sources of credit e.g. bank borrowing. This could be done by using the example below:

ILLUSTRATION 24-1

Suppose BB Enterprises is extended ₦150,000 credit on terms of '2/10 net 30'. Calculate the interest rate.

SUGGESTED SOLUTION 24-1

BB Enterprises will either pay $N150,000 - \left(\frac{2}{100} \times \frac{150,000}{1} \right)$

$= ₦150,000 - ₦3,000 = ₦147,000$ by the end of the discount period i.e 10th day or the full amount ₦150,000 by the end of the credit period i.e 30th day.

If the firm forgives cash discount and does not pay on the 10th day it can use the ₦147,000 for an additional period of 20 days and implicitly paying ₦3,000 in interest. If a credit of ₦147,000 is available for 20 days by paying ₦3,000 as interest, the interest rate

will be $\frac{3000}{147000} \times \frac{360}{20}$ assuming 360 days for the year.

i.e. $0.3673 = 36.73\%$

The rate may be compared with the bank lending rate and if better, it will be reasonable for the company to take advantage of the cash discount.

However, if a company fails to pay on due date, it will be stretching its accounts payable. This may be very costly as it may affect the credit worthiness of the firm and may also lead to increase cost through payment of penalty in form of interest.

24.4.3. Advantages Of Trading On Credit

- (a) **Easy availability:** Unlike other sources of finance trade credit is relatively easy to obtain hence, it is mostly used by small firms which generally find it difficult to raise funds from the capital market.
- (b) **Flexibility:** Trade credit grows with the growth in firm's sales
- (c) **Informality:** It is an informal, spontaneous source of finance. It does not require much negotiation and formal agreement.

24.4.4 Disadvantages of Trading on Credit

- (a) It involves implicit cost. The cost of credit may be transferred to the buyer via the increased price of goods supplied to him.
- (b) Loss of credit rating (where credit is abused). This may lead to suppliers either, no more extending credit or cancelling totally credit supplies to the company.

24.5 SUMMARY AND CONCLUSIONS

Investment of funds in accounts receivable (debtors) is one function of the financial managers of a company and involves a trade-off between risk and profitability. If other companies are giving credit and a company is not giving, that company will be losing profits to its competitors. On the other hand if the extension of credit is not properly controlled by good credit collection policies and procedures the company will be facing substantial degree of risk. There is, therefore, a need to determine the optimum investment in debtors. The decision variables that are required to establish an optimum credit policy include, credit standards and analysis, credit terms and collection policy and procedures.

In order to enhance the effectiveness of credit management, management may factor out some of the company's debts to professionals. Factoring typically converts a non-productive asset into a productive one and sometimes serves as a way of raising finance by the company. It also protects the company against default by debtors. Types of factoring include, full service non-

recourse, full service with recourse, bulk/agency factoring and non-notification factoring.

The investment in debtors is partly financed by trade creditors. A company that gives credit and does not take credit is likely to be visiting its bankers for overdrafts from time to time. This, obviously, has some effect on profitability. Trade credit appears to be a costless source of funds. In reality, however, trade credit may also have cost. This is where a company is given a cash discount and the company does not take advantage of the discount. The advantages of trade credit include, ease of availability, flexibility, and informality. The disadvantages include, possibly higher cost (when compared with cash purchases), and loss of credit rating which might eventually result in credit supplies being cancelled with the attendant result on profitability.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

24.6 REVISION QUESTIONS

24.6.1 MULTIPLE CHOICE QUESTIONS

1. A firm's credit and collection policies comprise the following decisions EXCEPT
 - A Quality of debts
 - B Length of credit period
 - C Size of cash discount
 - D Volume of sales
 - E Costs of collection

2. The following are the sources of credit information EXCEPT
 - A Insider information from within the company
 - B Financial statements
 - C Bank references
 - D Trade references
 - E Customers credit bureau

3. The following are the functions of a factor EXCEPT
 - A Advises the client on credit extension
 - B Maintains accounts for customers
 - C Provides information to clients

- D Helps the client to sell to customers
E Prepares credit and collection reports
4. Which of the following is NOT an advantage of trading on credit?
- (i) Easy availability of credit
(ii) Flexibility, as trade grows with the growth in firm's sales
(iii) Can be used as collateral for a loan
- A (i) only
B (ii) only
C (iii) only
D (i) and (ii)
E (ii) and (iii)
5. Customers can be categorised for the purpose of analysing credit, according to:
- (i) Good accounts
(ii) Dormant accounts
(iii) Doubtful accounts
- A (i) only
B (i) and (iii)
C (ii) only
D (ii) and (iii)
E (i) and (ii)

24.6.2 SHORT ANSWER QUESTIONS

1. State two factors that must be taken into account in determining a company's optimum credit policy
2. What are the two aspects of credit analysis that determine the quality of debtors?
3. What are the '3 Cs' of credit' to consider when a firm is considering whether or not to extend credit to a customer?
4. Give the meaning of this credit term: "2/10 net 45"
5. Mention one benefit of factoring a company's debts.

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

INVENTORY CONTROL

25.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ♦ Understand the motives for inventory control;
- ♦ Give the two major management decisions on inventory control and the key objective to be achieved;
- ♦ Mention the two major categories of stocks involved in inventory control and graphically demonstrate their behaviour;
- ♦ Determine graphically or calculate the economic order quantity;
- ♦ Calculate the main control levels to which management pays attention; and
- ♦ Explain the new approach to inventory control - the Just-in-Time (JIT) approach.

25.1 INTRODUCTION

Inventories constitute a large size of the working capital of a business, hence, it is absolutely imperative to manage it efficiently and effectively to avoid unnecessary investment. A firm neglecting the management of inventories will be jeopardizing its long-run profitability and may ultimately fail.

It is possible for a company to reduce its levels of inventories to a considerable degree without any adverse effect on production and sales by using simple inventory planning and control techniques. The reduction in excessive inventories carries a favourable impact on a company's profitability.

25.2 TYPES OF INVENTORIES

Inventories are stocks of the product a company is manufacturing for sale and the components that make up the product. For a trading company, inventory is made up of finished goods while for a manufacturing company, there are various forms of inventories, such as, raw materials, work-in-progress and finished goods.

25.3 REASONS FOR INVENTORY MAINTENANCE

Maintaining inventories involves tying up of the company's funds and incurrance of storage and handling costs. It is, therefore, expensive to maintain. Why then do companies hold inventories? Amey and Egginton (1973) identified three reasons as follows:

- (1) **Transactions motive:** That is, to meet demand for the stock item, where the size of demand is known with certainty or replenishment of stocks is immediate when stock-out occurs.
- (2) **Precautionary motive:** That is, either (or both) the demand for the stock item or the re-supply 'lead-time' is uncertain because it varies between one occasion and the next. To avoid customer dissatisfaction and lost sales 'buffer stocks' or 'safety stocks' may be held to reduce the likelihood that the company runs out of supply.
- (3) **Speculative Motive:** That is, a decision may be taken to increase current stocks in anticipation of a price rise, so as to make a speculative profit. The major control issue for speculative stock holding is administrative: there is a clear need to ensure that limits to a firm's financial risks in speculative stockholding are established and observed.

A company should maintain sufficient stock of raw materials at any given time to streamline production. This is important since it is not possible for a company to procure raw materials whenever it is required because of the time lag between the demand for materials and its supply. The purchase and delivery of materials may also be delayed because of strike, transport disruption or short supply.

Apart from the delay, a firm may want to purchase and hold stock of raw materials in order to take advantage of quantity discounts and also because of anticipated price increase.

However, work-in-progress inventory usually builds up because of the production cycle, that is, the time span between introduction of raw materials into production and emergence of finished goods hence an efficient firm should try to make production cycle smaller, by improved techniques.

On the other hand, stock of finished goods are usually maintained for sudden demands from customers because a firm cannot produce immediately when goods are demanded by customers.

A substantial stock of finished goods is also maintained by firms dealing in seasonal goods to meet the peak demand. Otherwise, failure to supply goods to customers when demanded may lead to loss of the firm's sales to competitors.

Therefore, the level of stock of finished goods would depend upon the co-ordination between sales and production as well as the production time.

25.4 OBJECTIVE OF INVENTORY MANAGEMENT

The above discussions clearly show that the firm is faced with two conflicting needs, that is:

- (a) To maintain a large size of stock (inventory) for efficient and smooth production and sales operations; and
- (b) To maintain a minimum investment in stock to maximise profitability.

Since it has been established that the firm's objective is to maximize the shareholders wealth, the objective of inventory management should therefore be to determine and maintain optimum level of investment in inventories. This could only be achieved if the firm is able to avoid excessive and inadequate level of inventories and maintain sufficient inventory for the smooth production and sales operations. In effect, the firm should always avoid a situation of over investment or under investment in inventories. Thus, the optimum level of the firm's inventory should lie between the two points of excessive and inadequate inventories.

However, an effective inventory management should:

- (a) Ensure a continuous supply of raw materials to facilitate uninterrupted productions;
- (b) Maintain sufficient stocks of raw materials in periods of short supply and anticipate price changes;
- (c) Maintain sufficient finished goods inventory for smooth sales operation and efficient customer service;
- (d) Minimise the carrying cost and time; and
- (e) Control investment in inventories and keep it at an optimum level.

25.5 EFFECTS OF HOLDING EXCESSIVE INVENTORY

The major dangers of over investment in stocks are:

- (a) Unnecessary tie-up of the firm's funds and loss of profit. This involves an opportunity cost as the fund's tied up cannot be used for any other purpose
- (b) Excessive carrying costs such as the costs of storage, handling, insurance, recording and inspection etc - these costs will increase in proportion to the volume of inventory and will therefore impair the firms profitability.

- (c) Chances of loss of liquidity. It may not be possible to sell inventories (particularly raw materials) in time and at full value if excessive inventories are carried for a long period except under conditions of inflation and scarcity.
- (d) Physical deterioration of inventories. In case of certain goods or raw materials, deterioration occurs with the passage of time; also mishandling and improper storage facilities may also lead to deterioration.

25.6 EFFECTS OF INADEQUATE INVENTORIES

The dangers of under-investment in inventories are:

- (a) **Production hold-ups** - Inadequate raw materials and work-in-progress inventories will result in frequent production interruptions
- (b) **Failure to meet delivery commitments** - when finished goods inventories are not sufficient to meet the demand of customers regularly, they may shift to competitors and this will result into loss of sale thereby affecting the profitability of the firm.

25.7 INVENTORY MANAGEMENT TECHNIQUES

To manage inventories efficiently, will require solutions to the following two questions.

- (a) **How much should be ordered?** - this relates to the problem of determining the economic order quantity (EOQ) which requires the analysis of costs of maintaining certain level of inventories
- (b) **When should it be ordered?** - this arises because of uncertainty and it requires determining the re-order point

25.7.1 Economic Order Quantity (EOQ)

This is the inventory level which minimises the total of ordering and carrying costs. It is the optimum inventory size, that is, the order size at which annual total costs of ordering and holding are the minimum. There are three approaches to determining the economic order quantity (EOQ). These are: the trial and error approach, the formula approach and the graphic approach.

In determining the economic order quantity (EOQ), it is assumed that total annual demand is known with certainty and usage of materials is steady. Also, the ordering cost per order and carrying cost per unit are assumed to be constant.

What are ordering costs and carrying costs?

- (a) **Ordering Costs:** Ordering costs is used in case of raw materials (or supplies) and includes costs incurred in the following activities: requisitioning, purchase ordering, transporting, receiving, inspecting and storing. The cost increases in proportion to the number of orders placed, thus, the more frequently inventory is acquired, the higher the firms ordering costs. On the other hand, if the firm maintains large inventory levels, there will be few orders placed and ordering costs will be relatively small. Therefore, ordering costs decrease with increasing size of inventory
- (b) **Carrying or Holding Costs:** This is the costs incurred for maintaining a given level of inventory. These costs include storage (warehousing costs, stores handling costs and clerical staff cost etc) insurance, taxes, deterioration and obsolescence.

The three approaches to determining the economic order quantity (EOQ) can be illustrated as follows:

ILLUSTRATION 25-1

Given the following data for a firm:

Estimated material annual requirement (A) = 600 units

Purchasing cost per unit ₦20 (P)

Carrying cost per unit (C) ₦2.00

Ordering cost per order O ₦40.00

Determine the economic order quantity (EOQ) using

- (a) The trial and error approach
 (b) Formula approach
 (c) The graphic approach

SUGGESETD SOLUTION 25-1

- (a) The trial and error approach

Order size (Q)units	600	300	200	150	120	100
Average Inventory (Q/2)units	300	150	100	75	60	50
No of Orders A/Q	1	2	3	4	5	6
Annual Carrying costs $C \times Q/2$ ₦	600	300	200	150	120	100
Annual Ordering cost $O \times A/Q$ ₦	40	80	120	160	200	240
Total Annual Costs (₦)	640	380	320	310	320	340

The above computations show that the total annual cost is minimum, i.e. ~~£~~310, when the number of orders in the year is 4. The economic order quantity, therefore, is 150 units.

The trial and error or analytical approach is somewhat tedious to calculate the EOQ. The easy way is to use the order-formula approach.

(b) Order formula approach

This approach is derived from the formula: $\sqrt{\frac{2AO}{C}}$

where

A represents annual requirement (annual demand)

O represents ordering cost per order

C carrying cost per unit

Therefore substituting for A , O and C in the formula, the EOQ

$$\text{will be } \sqrt{\frac{2 \times 600 \times 40}{2}}$$

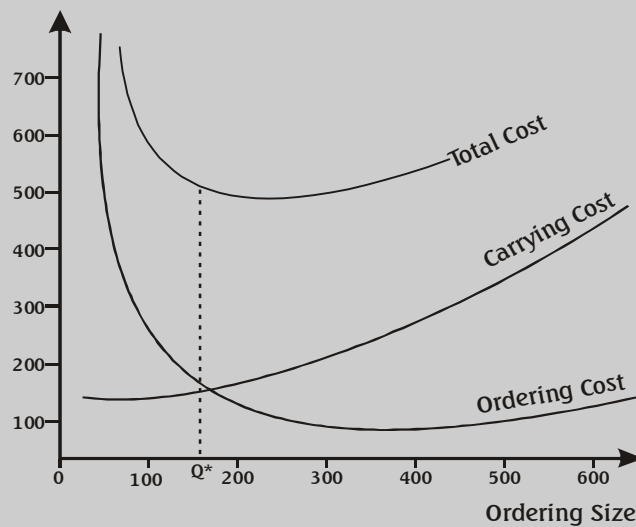
$$= \sqrt{24,000}$$

$$= 154.92$$

$$\approx 155 \text{ units}$$

(c) Graphic approach

Using the trial and error data, the EOQ can be presented graphically as follows:



EOQ = Point $Q^* = 155$ units

25.7.2 When To Order

The economic order quantity EOQ answers the question of how much to order but the question, when to order has not yet been answered. This is a problem of determining the re-order point.

(a) Re-order point

Re-order point is the inventory level at which an order should be placed to replenish inventory. It is the level that will be maintained for consumption during the lead time. To be able to do this under certainty, it will be necessary to know:

- (i) The lead time, that is, the time it takes to replenish inventory when an order is placed;
- (ii) Average usage; and
- (iii) Economic order quantity EOQ.

When there is no fluctuation in the usage and lead time (that is, under certainty), the re-order point will be: lead time x average usage.

That is: Re-order point = lead time x average usage.

ILLUSTRATION 25-2

Assuming that the economic order quantity is 300 units and average usage is 30 units per week.

Calculate the re-order point when the lead time is 0 and when the lead time is 3 weeks.

SUGGESTED SOLUTION 25-2

If the average usage is 30 units per week, then it will take 10 weeks to use the 300 units, that is, $300/30 \text{ wks} = 10 \text{ weeks}$

When the lead time is 0

The re-order point = 0 i.e. $0 \times 3 \text{ wks}$

In that case the order should be placed at the end of the 10th week since there is no lead time

However, when the lead time is 3 wks, the order should be placed 3 weeks before the final usage of the EOQ i.e. $10 \text{ wks} - 3 \text{ wks} = 7 \text{ wks}$, that is, when the EOQ remains $3 \times 30 \text{ units}$, that is, 90 units.

(2) Safety Stock

In case of uncertainty it is difficult to predict usage and lead time accurately since demand for materials may fluctuate from time to time. If the usage increases and the delivery of inventory is delayed, the firm can face a problem of stock-out which can prove to be costly. In order to guard against a stock-out the firm may maintain a safety stock as cushion against expected increased usage and/or delay in delivery time:

Therefore, the formula to determine the re-order level when safety stock is maintained will change so as to incorporate the safety stock. The new re-order level formula will be:

Re-order point = Lead time x average usage + Safety Stock

ILLUSTRATION 25-3

Using illustration 25.2 and assuming reasonable expected stock-out is 15units per week, the firm should maintain 45units i.e. (15units x 3weeks). Thus, the re-order level will be 90units + 45units = 135units while the maximum inventory will be EOQ + safety stock i.e. (300 + 45) units = 345units.

25.8 JUST-IN-TIME (JIT)

Just-In-Time is a system in which a firm purchases materials and parts and produces components just when they are needed in the production process, the goal being to have zero inventory because holding inventory is non-value added activity.

Just-In-Time is a new computer technologically based system of inventory control evolved in the Japanese manufacturing systems with the acronym JIT. The main objective of JIT was to keep the level of inventory at the barest minimum (if not at zero). The intention was to continually reduce the ordering costs, which EOQ assumed to be fixed, to a level where EOQ will be reduced to say 1 unit. The philosophy behind JIT holds the view that these cost reduction efforts would also reduce (if not expunged) safety stock and their attendant costs. The ability of a company to actualise the JIT dream would, however, depend on the nature of the company's manufacturing process and the custom and culture of the industry from which it gets its supplies.

Just In Time manufacturing involves obtaining goods from suppliers at the latest possible time (i.e. when they are needed on the production time) thereby avoiding the need to carry any materials or components inventory. Reduced

inventory levels mean that a lower level of investment in working capital will be required in certain environment where the cost of a stock out is high. JIT is appropriate, for example in a hospital, where the cost of a stock-out for certain items could be fatal. The main features of JIT system include the following:

- (a) Deliveries will be small and frequent, rather than in bulk. Production runs will also be shorter.
- (b) Supplier relationship must be close since high demands will be placed on suppliers to deliver on time and with 100 percent quality.
- (c) Unit purchasing prices may need to be higher than in a conventional system to compensate suppliers for their need to hold higher inventories and to meet more rigorous quality and delivery requirements.
- (d) Production process improvements may be required for a JIT system to function to full effectiveness. In particular, set-up time for machinery may have to be reduced, workforce teams re-organised and movement of materials within the production process minimised.

25.9 FINANCIAL MANAGER AND STOCK CONTROL

The finance manager has no operating responsibility to control inventory. The financial manager's role is to analyse the behaviour of inventory and report its implications to operating managers. He should see that an optimum amount of funds is invested in inventory and should also be familiar with the inventory control techniques.

The aim is to reduce inventory investment and increase the firms prospects of making more profits thereby satisfying the shareholders wealth maximisation objective of the firm.

25.10 SUMMARY AND CONCLUSIONS

Inventories constitute a major component of the current assets of the company. They, therefore, need to be astutely managed and controlled. Lack of proper management may result in both short and long-run adverse effect on the profitability of the company.

The control of inventory, from the standpoint of management involves major decisions-determining the economic order quantity (EOQ) and determining the appropriate control levels. Both decisions must be such that the value of the company is increased, or at the least maintained.

If inventory control would involve such efforts and cost on the part of management, why does a company need to keep stocks at all? Stocks like

cash, are kept for three main motives - transactions, precautionary and speculative. The objective to be achieved by the above decisions are to avoid excess stocks and to avoid not having enough stocks. Management, in keeping excess stocks, would be incurring some costs, principally, interest on capital tied down, rent and insurance of warehouse, pilferage, obsolescence and so on. These are known as stock holding costs. On the other hand, when management keeps inadequate stocks, there might be lost sales, disruption in production runs, loss of document, loss of customer goodwill and so on. These are called ordering costs. These two categories of costs are dramatically opposed to each other. When one category of costs is rising (holding costs) with respect to increase in quantity ordered, the other (ordering costs) is falling. The optimum level of the quantity ordered (herein referred to as the economic order quantity) is that quantity at which the aggregate of the two categories of costs is minimised. At this level the value of the company is presumably maximised. The EOQ was described both mathematically and graphically.

The relevant control levels to which management must pay attention are the re-order level (or point), minimum level and maximum level of stocks. The re-order level gives the right time management should place an order, the minimum level shows the level of safety stocks, that is, the level below which might create problem of stock-out for the company and maximum level - the level above which further investment would amount to wasteful investment and therefore loss of value to the company.

In a just-in-time system there should be no lead time that is the lead-time should be zero. The system assumes that immediately an order is placed, the goods are supplied.

The major concern of the financial managers is not so much of the day-to-day administrative control of investment but of the need to minimise the costs of investment in stocks, so that the long-run profitability of the company can be maximised.

*Refer to Comprehensive Questions and Suggested Solutions in Appendix II
Page 465*

25.11 REVISION QUESTIONS

25.11.1 MULTIPLE CHOICE QUESTIONS

Use the following information to answer questions 1 and 2

Annual demand for material K is:	10,000 units.
Stock holding cost per unit per annum:	50k
Economic Order Quantity:	3162 units
Ordering cost per order:	₦250
Orders are placed in months.	

1. How often are orders placed?
 - A. Every 6 months
 - B. Monthly
 - C. Once in a month
 - D. Every 3 months
 - E. Every 4 months
2. What is the total ordering costs for the year?
 - A. ₦790.60
 - B. ₦1,000.60
 - C. ₦250.60
 - D. ₦40.60
 - E. ₦12.60
3. From financial management standpoint, what is the main objective of stock control?
 - A. Maximise total investment in stocks
 - B. Minimise the ordering cost
 - C. Minimise the holding cost
 - D. Minimise the total investment in stocks
 - E. Maximise the annual demand
4. Which of the following is the most important inventory holding cost?
 - A. Forgone quantity discount
 - B. Loss of customers goodwill
 - C. Lost sales opportunity costs
 - D. Interest on capital
 - E. Transportation costs
5. Which is re-order level?
 - A. (Minimum usage x minimum lead time) + EOQ
 - B. (Average usage x average lead time) + safety stocks
 - C. (Average usage x average lead time) + EOQ
 - D. Maximum usage - (average usage x average lead time)
 - E. Maximum usage x minimum lead time.

25.11.2 SHORT ANSWER QUESTIONS

1. In inventory control, a strategic decision that aims at near zero inventory level is referred to as _____
2. State ONE non-monetary factor affecting the economic order quantity.
3. What name is given to the minimum stock level?
4. In stock control, what is lead time?
5. In terms of inventory costs, what is the optimal order quantity?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

CORPORATE RESTRUCTURING MERGERS AND ACQUISITIONS/TAKE OVER

26.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ◆ Explain the concepts of "mergers" and "acquisitions" (M&A);
- ◆ Explain the term synergy as it relates to M&A;
- ◆ State and explain the motives for going into merger arrangement;
- ◆ State and explain the three main types of merger.
- ◆ Understand the process of valuing a whole company;
- ◆ Explain the concepts of 'strategic acquisition and financial acquisitions;
- ◆ Evaluate the impact of strategic acquisitions on the shareholders of each of the two companies involved in a merger;
- ◆ Explain the methods of financing mergers;
- ◆ Know the term 'hostile takeover';
- ◆ State and explain the possible defenses against hostile takeovers;
- ◆ State and explain anti-takeover devices;
- ◆ Know the factors in assessing the success of mergers; and
- ◆ Itemise the legal conditions precedent for schemes of mergers.

26.1 INTRODUCTION

Corporate restructuring occurs when a company carries out a fundamental change in the structure of its operations or its financial position - its investments in the assets of the company and the way and manner those investments are financed. This may arise from either a change in the economic environment in which it operates or in the objectives it earlier set for itself.

One way by which such a change can come is through mergers and acquisitions (M&A).

It should be noted that any form of restructuring that is carried out by the company should seek to add value, thereby maximising shareholders' wealth.

26.2 MEANING OF "MERGERS" AND "ACQUISITIONS"

One method a company follows in achieving growth, apart from internal investment in fixed assets, is to buy business organisation as a whole. This is done through a merger or acquisition. Although, used interchangeably, there is a slight difference between the two. A 'merger' occurs when two separate companies join together to form a single one. Here the two companies go into liquidation and an entirely new one is formed to acquire their shares. Alternatively the life of one company is, in law, terminated (still in physical existence as a division or branch) and the other one remains

An acquisition or takeover occurs when one company buys shares in another company substantial enough to acquire a controlling interest. The former is called the bidding company while the latter is called the target company.

26.3 SYNERGY

Synergy refers to the effects (synergistic effects) of combining resources instead of using them independently. Any merger should create (synergy) in order to add value. The concept, usually expressed as $2+2=5$ states that combination of inputs produces a greater output than the sum of the separate individual output.

26.4 MOTIVES FOR MERGERS

The following factors have been advanced as reasons for mergers:

- (a) **Access to the market**
Merger may create greater access to the market for the bidding company thereby, continually increasing sales.
- (b) **Access to source of supply**
The target company may be the supplier of a critical raw material for the bidding company. The latter may want to protect or control this source to ensure continued supply.
- (c) **Reduction/Elimination of Competition**
Where the two companies compete in the same market for their output, a merger may bring a larger market share which may enable the enlarged company to raise prices without a cut in sales volume.
- (d) **Operating Economies**
These are advantages to be gained from operating on a large scale. They come in form of lower prices being paid for raw materials, lower set-up costs from large production runs and so on.

- (e) **Better management**
The assets of the target company may either be underutilised or untapped because of poor management. This will create an opportunity for the bidding company to inject better and skilled managers to enable the target company's potentials to be discovered and fully utilised.
- (f) **Diversification**
Here, the bidding company merges with another company in a totally different activity in order to make up for a fall in its traditional core business or to reduce the risk arising from cyclical savings in returns. By doing this it is believed that the two companies' returns would not be perfectly correlated.
- (g) **Signalling effect**
A merger announcement may be a positive signal that the company's future potential is big. To the extent that the company's share is undervalued (that is actual market price is less than its intrinsic value) information about an impending merger may jerk up the market price.
- (h) **Stronger asset base**
A company in a high risk industry with high level of earnings in relation to its net assets, may want to mitigate its risk by acquiring another company with a lot of assets.
- (i) **Enhance quality of earning**
Similarly, a company may improve its risk complexion by acquiring another company with more stable earnings.
- (j) **Improved liquidity**
The acquiring company's liquidity might improve if the target company has substantial 'free cash flow, that is, cash lying idle (and not intended to be used as dividends) because of lack of profitable investments.
- (k) **Lower Cost**
This occurs, if management believes that it is cheaper to achieve growth via merger.
- (l) **Tax**
This is a deliberate strategy to acquire tax losses that may be used as tax relief, with a view to paying lower tax.

26.5 ECONOMIC JUSTIFICATION FOR MERGING

All the above factors must be assessed in the light of the following two major alternative economic conditions, to justify mergers:

- (a) The additional cash flows discounted at a rate that adequately reflects the risk of these cash flows, must have positive net positive value or
- (b) The reduction in the risk level attaching to the bidding company existing cash flows is such as to reduce its previous required rate of return.

ILLUSTRATION 26-1

Big Plc runs an existing business whose net cash inflows in the next six years are expected to be ₦2m per annum. The level of risk attached to these cash flows is assessed by investors in general to attract 12 per cent per annum. The market's perception of Small plc is such that it's required rate of return is 13% per annum. Big plc plans to acquire the whole ordinary share capital of Small Plc. The company predicts annual net cash inflows of the enlarged company to be ₦3m for each of the next six years. The company's required rate of return is expected to fall to 10 per cent per annum. Should Big plc acquire Small plc? If the answer is 'yes' what is the maximum price and minimum price that should be paid by Big plc for Small plc? In reality, how much will be paid.

SUGGESTED SOLUTION 26-1

Workings:

Pre-merger Present Value of Big Plc's cash flows	=	₦2m x 4.111	=	₦8,222,000
Pre-merger Present Value of Small Plc's cash flows	=	₦1m x 3.998	=	₦3,998,000
Post Merger present value of Enlarged Big Plc cash flow	=	₦3m x 4.355	=	₦13,065,000

The cash flows of the companies are discounted at 12%, 13% and 10% costs of capital respectively using their related annuity factors.

Based on the above calculations, Big plc should go ahead with the merger. Additional cash flows of ₦4,843,000 (₦13,065,000 - ₦8,222,000). Also, investor's perception of the risk of the enlarged Big plc has reduced as shown in the reduced discount rate of 10% per annum after the merger.

The maximum price Big plc should pay for Small plc is ₦4,843,000. The minimum price is ₦3,998,000. This is the price below which the shareholders of Small plc will not go. The actual price will be negotiated between ₦3,998,000 and ₦4,843,000.

Note:

- (a) Part of the ₦4,843,000 could be traced to enlarged Big Plc's cash flows being discounted at lower cost of capital because of lower risk perception of the enlarged company.
- (b) It is possible that the ₦4,843,000 surpasses the actual current market value of Small plc for the following reasons:
 - (i) The Small plc expected cash flows might be less than ₦1m; the enlarged company might be able to produce more expected cash flows than the sum of the expected cash flows of the individual companies.
 - (ii) The risk attaching to the enlarged company might be less than the overall risk level of the separate parts.

26.6 TYPES OF MERGERS

There are three main types of merger, these are:

- (a) **Horizontal merger**
This involves combination of two companies engaged in similar activities. This type of merger usually results in removal of duplicate facilities and filling of the supply gap to meet increased demand for the companies' products.
- (b) **Vertical Merger**
This occurs where bidding company decides to integrate forward to take advantage of the sales outlet of the target company or integrate backward to have access to the source of raw materials of the target company.
- (c) **Conglomerate Merger**
This is a combination of two companies that are totally different in activities. This type of merger is normally undertaken for diversification purposes.

26.7 VALUATION OF A COMPANY

An important preliminary exercise to any merger or takeover is the valuation of the company to be acquired. The valuation of a company is different from the valuation of a single share in that in addition to the purchase of future cash flows, the buyer is also in a position to control the level of these cash flows. The basis of valuation can be cash flows, earnings or assets or some mixture of the three. Valuation is an exercise that would not give a precise outcome. Within the above three bases there are a number of recognised

methods all of which can result in different outcomes. The final price to be put on a company will depend on the negotiations and astute bargaining by both parties. The methods in themselves can only give the parameters (minimum and maximum price) within which negotiations can take place.

26.7.1 Methods of Valuation

The following methods are usually recognised:

- (a) **Present value of future cash flows.**
This is the discounted cash flow (DCF) techniques. Here the buyer is buying the difference in present value terms, between the post merger combined estimated cash flows and its own pre-merger estimated cash flows.
- (b) **Market Price**
Where the company is quoted, the bidder would pay a price that hovers around its market value. Where changes are expected in future, which it is believed would greatly affect the future cash flows or financial plans of the company, then the buyer should be prepared to pay a premium above the market value of the company.
- (c) **Earnings**
There are two methods that use the earnings approach - the yield and the price-earning ratio.
 - (i) **Yield method**
This method capitalises the maintainable earnings (using the most recent earnings) of the company at a pre-determined rate of return (yield) which investors would expect from an investment similar to the one under consideration (Investors opportunity cost of capital). The steps involved are:
 - ◆ Examine some past periods' earnings;
 - ◆ Estimate the maintainable earnings after making appropriate adjustments to the most recent earnings;
 - ◆ Determine an agreed expected rate of return on funds that could be put in the next best alternative investment (investors opportunity cost of capital);
 - ◆ Capitalise the maintainable profits at the rate established above.

ILLUSTRATION 26-2

Assume a company's maintainable profits after tax figure is ₦1.25m and the expected rate of return in such companies is 16%, then a possible purchase price would be arrived at as follows: ₦1,250,000/0.16 which is equal to ₦7,812,500.

This is an easy method of valuation. However the problem is that past earnings are used in establishing the average maintainable earnings. Although the estimates (based on actual past data) could be useful in round table negotiation, it is doubtful if they could help in arriving at accurate maintainable future profits.

(ii) Price earnings ratio (or multiple) method

This approach is a very important and the most common approach to establishing the value of a particular merger. It is a popular stock market ratio, hence, it is well suited for establishing the value of a company the funding of which comes from the capital markets. Financing is an integral part of investment whether organic (internal) or inorganic (external via M & A). The price earnings ratio is usually taken as the multiple of earnings of a company which investors are prepared to pay (stock market P/E ratio) taking account future earnings and growth potentials. It is normally expressed as: price per share

divided by earnings per share. That is, $\frac{MV}{EPS}$

(d) Assets values

This approach is viewed as alternative to earnings method, here the bidder is buying a set of assets and not future earnings. The bidder would need to efficiently manage the assets in order to achieve future earnings. The importance of continuity of management is worth noting here. The assumption in the earnings approach is that the old managers will remain to continue to maintain the present level of earnings. If they will not stay after the merger, it is expected that another approach should be considered; hence the assets value approach.

ILLUSTRATION 26-3

You are the finance manager of Abbey Plc which has just reported reasonable profits, available to the ordinary shareholders to the tune of ₦1.25m. The company has declared a dividend of 15 Kobo per ordinary share of ₦1.00. The company is presently facing liquidity problems, even with the good profits which maintain the previous pattern of overall growth, but with cyclical swings.

Abbey Plc has gotten a proposal from Joe Plc suggesting that the two companies should merge. Joe Plc is a relatively new company (incorporated five years ago) which has achieved a fantastic but stable growth in profits and whose products serve as raw materials for the operations of Abbey Plc. The most recent profits of Joe Plc were ₦1.875m. after tax and interest with an ordinary dividend of 10kobo per ₦1 share. The rationale underlying the merger proposal, according to Joe Plc, is that their company has also been having liquidity problems and that by merging both of them could solve these common problems. Joe's initial proposal did not give details but just suggests that facts-finding discussions should be started and that to make these discussions consequential they should assume that the profits of each of the two companies will increase by 10 percent next year and that for the purpose of this merger, the price - earnings ratio would be 10 for Abbey Plc and 15 for Joe Plc. The top management has summoned a meeting to discuss the issue and has directed you to analyse the implications of the suggestion of Joe Plc and to itemise the financial factors which you would consider as regards this analysis.

An extract of the most recent balance sheets of Joe Plc and Abbey Plc are shown below.

Balance Sheets extract as at 31st December, 2008

	Joe Plc N'000	Abbey Plc N'000
Net assets	<u>15,000</u>	<u>12,500</u>
Financed by:		
Share Capital		
Ordinary shares of N1 each	3,750	2,000
10% Preference shares	-	500
Reserves	7,500	10,000
12% Debenture stock	<u>3,750</u>	<u>-</u>
	<u>15,000</u>	<u>12,500</u>

SUGGESTED SOLUTION 26-3

Workings

Earning Per share:

Joe Plc	=	<input type="text"/>
Abbey Plc	=	<input type="text"/>
P/E ratio - Joe Plc	=	15

Abbey Plc	=	10
Market Price - Joe Plc	=	£7.50 (i.e. £0.50 x 15)
Abbey Plc	=	£6.25 (i.e. £0.625 x 10)
Market Value - Joe Plc	=	£28,125,000 (£7.50 x 3,750,000)
Abbey Plc	=	£12,500,000 (£6.25 x 2,000,000)

Valuation is not an exact exercise, so the implications of the suggestions of Joe Plc will be analysed along the following lines.

- (a) The value of Abbey Plc via the earnings (P/E ratio) interestingly coincide with its net assets value: £12.5m as against £12m adjusted net assets. On the other hand there is a wide gap between the value of Joe Plc (via P/E ratio): £28.125m and its adjusted net assets of £11.250m. The earnings valuation is exactly 2.5 times the assets valuation.
- (b) The relative big difference in the above valuation could only be explained if it can be proved that the earnings growth prospects of Joe Plc are much better than those of Abbey Plc. Alternatively Joe Plc should convince Abbey Plc that its assets (Joe Plc's) are substantially worth more than what the book values portend.
- (c) The information given says that Joe Plc has a fantastic past growth record of profits over the last five years. This is historical. Present values relate to the future and not the past.
- (d) Joe Plc suggested P/E ratio of 15 for itself and 10 for Abbey Plc. These figures might have been erroneously based on past growth performance as the information gives a future growth potential of 10% for both companies. Unless it can be proved that the differential in past growth patterns will continue into the future, Abbey Plc has relatively been unduly penalised with respect to P/E ratio.
- (e) Abbey Plc should immediately start negotiating with the directors of Joe Plc for possible improvement in the terms of the merger.
- (f) One point which can immediately be raised is the fact that their company has a lower level of financial leverage and if they have to borrow in the immediate future to solve their liquidity problems it is their assets that will be used as collateral for more loan capital.
- (g) Abbey Plc should make a counter proposal. It could negotiate for better terms than those proposed by Joe Plc, which are really a preliminary offer; an initial asking price which appears to favour Joe Plc.
- (h) The initial valuation placed on the two companies (via the P/E ratios)

which is £28.125m and £12.5m suggests, roughly, a ratio of 70% to 30%. This will serve as the basis of their relative shareholdings in the enlarged company.

- (i) Abbey Plc might base its counter proposal on assets values, that is the respective contribution of each company to the assets of the new enlarged company. There may still be a revaluation of the assets, but based on the adjusted net assets values as they are now, the interests in the new company should roughly be in the neighborhood of 50:50 (i.e. £12.5m as against £11.25m)
- (j) Although Joe Plc may not accept this new arrangement, Abbey Plc should be quick in telling Joe Plc that it (Joe Plc) now has liquidity problems despite its past growth record.
- (k) Obviously, there is a wide gap between the two proposals (70:30 versus 50:50). There is a lot of room for negotiation. A comprised position might be 60:40 in favour of Joe Plc, with Joe Plc taking over Abbey Plc and issuing its shares in exchange for its assets. As a matter of fact, based on the most recent earnings, the earnings contribution to the new enlarged company is in the ratio of 60:40 for Joe Plc and Abbey Plc respectively.
- (l) The analysis of the earnings per share before and after the merger for the two groups of shareholders on the basis of 60:40 will be carried out as follows:
 - (i) At present, Joe Plc has 3,750,000 ordinary shares and Abbey Plc has 2,000,000 ordinary shares. Based on a 60:40 ratio and assuming Abbey Plc is merging into Joe Plc, Joe Plc needs to issue 2,500,000 ordinary shares of its own to the shareholders of Abbey Plc. The enlarged Joe Plc will now have 6,250,000 ordinary shares.
 - (ii) The combined earnings for the enlarged Joe Plc, allowing for 10% growth will be £3,437,500 [$(£1,250,000 + 1,875,000) \times 1.10$]. The post-merger earnings per share will be £0.55 that is
 - ♦ The shareholders of Joe Plc would be unaffected by the merger, based on earnings per share. (EPS before the merger is £0.50 per share and allowing for 10% growth, it will be £0.55 per share).

- ♦ The shareholders of Abbey Plc would receive 2,500,000 ordinary shares. This means for every 4 of their old shares, they would receive 5 new shares in Joe Plc. Their 4 old shares, would earn £2.75 (i.e. $4 \times £0.625 \times 1.10$). After the merger, their 5 shares would earn £2.75 (i.e. $5 \times £0.55$). There is also no change in their position; based on 60:40 sharing ratio.

- (m) The two companies would have to astutely negotiate to see which company will be able to improve its position at the cost of the other.
- (n) The financial factors that would be considered in the final negotiation include:
 - (i) Details of Joe Plc previous years growth;
 - (ii) The probability that each company will earn 10% profits growth;
 - (iii) The liquidity position of Joe Plc;
 - (iv) The likelihood of borrowing after the merger;
 - (v) The effect the merger would have on future profitability of enlarged Joe Plc.; and
 - (vi) The quality of the two companies' assets.

Note: The above illustration exemplifies a typical valuation problem which usually displays the following characteristics:

- (a) Lack of exactitude;
- (b) The use of two major approaches - earnings approach and assets approach;
- (c) Determination of minimum and maximum prices; and
- (d) Determination of final price, only, through negotiations.

26.8 STRATEGIC ACQUISITION VERSUS FINANCIAL ACQUISITION

A strategic acquisition: is one where the acquiring company is buying the target company in order to achieve its strategic objectives. A company may want guaranteed supply of a critical raw material which is in short supply and therefore acquire the supplying company. The whole objective is to save costs.

Financial Acquisition: Is one that has the objective of buying a collection of assets, disposing some of these assets, reducing costs and running what is left of the business as efficiently as possible. Here, the company is run on stand-alone basis and not part of the overall strategy of the business.

26.8.1 Acquisition as a Strategic Investment

This involves share-for-share exchange as against paying cash as consideration. Here, a "ratio of exchange" which reflects the relative importance of the two companies with respect to some variables must be determined. Two such variables that will be explained here are:

- (a) Earnings per share
- (b) Market value per share

Earning Per Share Effect

Here the impact of any acquisition on the earnings per share (E.P.S.) of the enlarged company is examined.

ILLUSTRATION 26-4

Company X Plc is planning to buy company Y Plc. The financial information on the proposed purchase is shown below:

	COMPANY	
	X Plc	Y Plc
Current earnings	£10,000,000	£4,500,000
Number of shares in issue	2,000,000	1,500,000
Earning Per share	£5.00	£3.00
Price per share	£40.00	£15.00
Price earning ratio	8	5

Company Y Plc has accepted the offer of £20.00 per share, to be received in shares of company X Plc.

Determine the financial effect of this acquisition on the shareholders of both company X Plc and company Y Plc regarding their earnings per share.

SUGGESTED SOLUTION 26-4

The exchange ratio is £20/40 which is one share of company X for every 2 shares of company Y. or 0.5 of X for 1 of Y.

Total number of ordinary shares of company X to be issued to shareholders of company Y = 750,000

Combined post acquisition number of shares = 2,750,000

Combined post - acquisition earnings = £14,500,000 assuming no change in level of earnings of both companies.

POST MERGER

Earning per share of enlarged company X Plc = ₹5.27

The merger improves the EPS of company X from ₹5 to ₹5.27. However old company Y's shareholders suffer a drop in their EPS from ₹3 to ₹2.64 that is ₹5.27/2.

Note that for each share of old company Y, a shareholder holds $\frac{1}{2}$ of new company X's share.

Note 1: Dilution in Earning Per Share

A very important point to note is that as long as the price earning (P/E ratio) received by the target company shareholders is greater than the P/E ratio of the bidding company, there will be dilution in EPS of the bidding company's share. Assume, for illustration, that the agreed offer price is ₹27. The P/E ratio of company Y will now be 9, that is, ₹27/3 as against the original P/E ratio of 6.67 (₹20/3).

The ratio of exchange is ₹27/₹40 which translates to 0.675 of every share of company X for 1 share of company Y. the number of company X shares to be issued will now be 1,015,500. Total number of shares for the post-merger enlarged company X will be 3,015,500 and its post-merger EPS will be ₹4.81 that is (₹14,500,000/3,015,500). Company Y had a P/E ratio of 6.67 (i.e. ₹20/N3) and a P/E ratio of 9 (₹27/3). The impact of P/E ratio of 6.67 (less than company X P/E ratio of 8) is to increase the post-merger EPS of company X share and the impact of P/E ratio of 9 (greater than company X P/E ratio of 8) is to reduce the post-merger EPS of the enlarged company. Thus the initial post-merger EPS for the enlarged company can increase or decrease; the extent of which will depend on:

- (a) The relative amount of their pre-merger earnings; and
- (b) The proportion of their pre-merger P/E ratios.

Note: 2: Earnings Growth

It should be noted that the possible initial dilution in earnings per share could be eliminated if earnings are expected to grow. How soon this elimination will occur will depend on the rate of future growth rate in earnings. The longer it takes to eliminate dilution, the less attractive is an acquisition.

Market Value Per Share Effect

The main concern here is the ratio of exchange based on market price. This is determined as follows:

Market price of the bidding company's share	x	Number of shares offered to the target company's shareholder per one share of their company.
--	---	---

Market Price of the Target Company's Share

Assuming in the case of company X and company Y, in illustration 26.4 company X offer three-eighths of its share to each of the shareholders of company Y. then the ratio of exchange

$$= \frac{\text{Market Price of X}}{\text{Market Price of Y}}$$

The ordinary shares of the two companies will exchange for 1 to 1, based on market price. If there is relative stability in the market price of the enlarged company at £40, the position of the shareholders of both companies are not better than their pre-merger positions with respect to market value. The bidding company must offer a price higher than the current market price, for the target company's shareholders to be induced by a 1 for 1 exchange. Probably the bidding company would offer 0.40 of the value of its share i.e. £16 a share.

26.9 PERFORMING THE PRICE - EARNINGS RATIO MAGIC

A company is not expected to pay a higher market price where there is no expectation of synergy, better management or existence of under pricing. However, where the bidding company has a higher P/E ratio and this figure is expected to be maintained after the merger the company's shareholders could still be better off; even when a higher price is paid.

ILLUSTRATION 26-5

Assuming the same information in illustration 26-4 on the merger of company X Plc and company Y Plc except that company X is now offering 0.40 of its share for each share of company Y. or N16 (that is £0.40 X £40).

SUGGESTED SOLUTION 26-5

The exchange ratio is

Share of Y Plc are being offered N16 for each share of X Plc they own. They no doubt gain from the acquisition based on market price because their share was formerly priced at $\square 15$.

The number of shares that X Plc will now issue = 800,000 ($0.40 \times 2,000,000$). The post - merger situation will be as follows:

The Enlarged X Plc

Total Earnings	$\square 14.500,000$
Number of shares in issue	2,800,000
Earning per share	$\square 5.18$
Price earning ratio	8
Market price	$\square 41.44$

The shareholders of both companies have gained from the acquisition. The reason is the difference in the two companies price earning ratios.

If the market is fooled by this artificial growth it means a company can apparently continue to create value for its shareholders via only acquisitions of companies with lower price - earning's ratios.

However, if the capital market are efficient it might not be possible for a company that cannot exhibit real growth potential to maintain the same level of price-earning ratio.

In an efficient market with no expectations of synergy the expected post-merger P/E ratio would somehow near the weighted average of the two companies pre-merger P/E ratios. In this case, the bidding company would not be able to increase shareholders wealth through mere acquisition of companies with lower P/E ratios.

26.10 FINANCING OF MERGERS

The following methods are the ones normally used by the acquiring company. The method chosen must be attractive to the target company's shareholders and be acceptable to the acquiring company.

(a) Cash

The attraction of cash is that it can be used without incurring any cost. However its receipt may attract immediate capital gains tax. From the acquiring company's standpoint, liquidity may be low and cash is raised by public issue of securities or by borrowing at a relatively great cost.

(b) Ordinary shares in the acquiring company

Ordinary shares may be attractive if they are still interested in equity investments. However, disposal may create a problem for those who are not keen in holding shares any more. From the acquiring company's point of view, cash may be raised in the capital markets or borrowed in order to pay for the acquisition. Notwithstanding, issue of shares has an opportunity cost for the shareholders of the bidding company as the shares could well have been issued for cash.

(c) Loan Stocks of the bidder

From the view point of the bidder, loan stocks would not dilute control as lenders don't usually have voting rights. From the viewpoint of shareholders of the target company, they would be entitled to fixed income and fixed capital repayments; therefore, less risk. The disadvantages however are that the bidding company would have fixed commitment as to interest and capital repayment default of which may lead to liquidation and the shareholders of the target company would need to make complete change in their investment culture, habits and attitudes towards risk and return.

26.11 TAKEOVERS, TENDER OFFERS AND DEFENCES

The discussions on mergers so far, have focused on areas which involve negotiations between managements and directors of the two companies. In some cases, as identified below this may not be so and the merger may be 'unfriendly'.

(a) Takeovers

This is the acquisition of one company (the target) by another company (the bidder) in such a way as to constitute an unfriendly or hostile merger. Here many attempts to buy into the company are revisited by the directors of the target company for the following reasons:

- (a) The price being offered might be regarded as too low
- (b) It might be thought that the whole activity has no economic basis.
- (c) Protection of their self-interest.

(b) Tender Offer

Hostile takeovers are characterized by the making of tender offers. A tender offer is an offer made by a company to the present shareholders of another company at a specified price which is usually higher than the current market price. The objective is to eventually obtain a controlling interest in the target company. The offer is made directly to the shareholders who are prepared to relinquish their interests: the

price is appreciably higher than the current market price to encourage shareholders to surrender their shares. A tender offer allows the acquirer to sideline the management of the target company. Tender offers are normally communicated to the shareholders either through publication in the financial newspapers or through direct mailings to them. There is also in existence the second-tier tender offer. Here the first-tier would be at a higher price and with consideration wholly in cash. The second-tier, offers to take the balance at a price lower than the first-tier offer price and consideration in a mix of cash and securities.

(c) **Defences against hostile takeovers**

The target company, through its management, may use the following defensive tactics:

- (i) **Management appeal:** management tries to convince shareholders to reject the offer on the ground of low price.
- (ii) **Cash dividends and share split:** payment of cash dividend or issue of a share split.
- (iii) **Legal action:** at times management takes legal action with a view to frustrating the bidder
- (iv) **White knight:** Management may seek a 'white knight' where every other step fails. A white knight is a 'friendly' bidder who is asked by the target company to buy shares from the hostile bidder and /or launch a friendly counter bid with a view to frustrating the hostile bidder.

26.11.1 Anti-takeover Devices (Repellant)

These are more formal devices that are put in place before the actual takeover attempt. Their objective is to make an undesirable takeover more difficult. Such devices include:

- (a) **Borrowing heavily and using the proceeds to pay a large one-off cash dividend to shareholders.** This action, of course, might further borrowing, possibly for financing the acquisition.
- (b) **'Poisoning' the takeover attempt by a device known as "poison pill".** It is used by the target company to make itself less attractive to the potential bidder.

One way of doing this is for the company to issue rights usually, convertible preference shares to its shareholders.

This type of issue might not be of interest to the potential bidder as the issue would contain discouraging terms. The objective of this action is to compel the potential bidder into talking directly to the board of directors after it might have acquired sufficient number of shares in the target company.

- (c) Spread the terms of the company's board such that not many directors would stand for re-election each year. Thus there would be need for more votes to be able to elect many directors that favour a takeover.
- (d) Making resolutions for merger approvals to require more than a simple majority, say two - thirds majority.
- (e) Requiring that a 'fair price' which is fixed in advance be paid to minority shareholders. Where a 'fair price' is not agreed, the company could insist that only a two-thirds or three-fourths majority must approve the price offered.
- (f) Providing for only say two-thirds or three-fourths majority for any amendments (including previously approved anti-takeover provisions) to the Articles of Association.
- (g) Entering into highly involving management contracts with top managers which could cause commitments to payment of high compensation if the company is taken over ('golden parachute').
- (h) Entering into an agreement with an outside group that has substantial interests in the company, not to increase their shareholding for a period of many years. This is called **standstill agreement**.
- (i) Buying back the shares held, by threatening party at a premium over the market price. This offer which is not extended however to other shareholders is known as "greenmail" - The objective is to encourage the party to abandon the threat.

26.11.2 Effects of anti-takeover devices on shareholders' wealth

Two reasons have been advanced for putting barriers in the way of corporate control by prospective bidders.

- (a) To protect management jobs; and
- (b) To protect shareholders' interests.

While it could be said that management could be well protected by these devices, it is debatable when the interests of shareholders could actually be protected. While many of these devices might not significantly increase the share price, the 'greenmail' definitely has the effect of reducing the shareholder's wealth. Also, standstill agreement could have negative effects on share price.

26.12 SUCCESS OF MERGERS

The success of any merger can be assessed from three perspectives:

- (a) The views of managers of merged companies taken from practical interviews with them;
- (b) The size of the accounting profits of the merged companies compared with the profits before the merger; and
- (c) Market values of the shares of the merged companies before and after the merger.

Evidence from the mature capital markets for corporate control in U.K and USA showed that mergers, according to the managers in the first category, did not bring any benefits. The reasons for failure were ascribed to management's attitudes towards poor management practices in the target company and lack of knowledge of the bidders of the target company and its industry among others. Evidence from the second perspective showed that average profitability after the merger was significantly lower than the pre-merger profitability. Evidence of impact on market values showed that shareholders of the target company realised good increases in wealth compared with their pre-merger position. The premium paid by the bidder was given as the reason for this. The impact on market values of the shares of the shareholders in the acquiring company was not clear.

However, for any merger or takeover to be justified, the expected synergy and / or improved management must result in an increase in shareholders' wealth which is in excess of the premium paid for the takeover. In Nigeria the market for corporate control has not been very active. The only mergers that hit the headlines were the government policy - driven bank mergers of 2005. The only visible effect that was seen was the increase in the capital base of each of the then twenty-five banks and their ability to withstand the current financial meltdown. May be some of them would have gone under by now, if they had not merged.

Tests similar to those of the mature markets cannot be carried out here because in the first instance these mergers were not value driven.

Moreover there is dearth of information in the Nigeria Capital Markets for corporate control.

26.13 REGULATIONS OF MERGERS IN NIGERIA

Mergers in Nigeria are guided by the provisions of the Companies and Allied Matters Act (CAMA 1990 as amended). The details of all these legal provisions are beyond the scope of this pack.

However, according to the Act (CAMA) the conditions for a scheme of mergers to be effective and binding include the following:

- (a) The special resolutions to be proposed at the court ordered meetings must be duly passed.
- (b) Securities and Exchange Commission (SEC) must approve the terms and conditions of the scheme as agreed by the majority of the shareholders of both companies.
- (c) The scheme must have been approved by a majority representing three - fourths in value of the shareholders of each of the two companies voting either in person or by proxy, at their separate meetings convened by order of the court.
- (d) The court must sanction the scheme and confirm the cancellation of the target company, the merger of its assets and liabilities and undertakings, with those of the bidding company as provided in the scheme; and the dissolution of the target company without winding up.
- (e) Delivery of the office copy of the Court Order to the Registrar - General of the Corporate Affairs Commission (CAC)

26.14 QUALITATIVE FACTORS IN MERGERS AND ACQUISITIONS

The qualitative factors in mergers and acquisitions would include the following:

- (a) **Legal:** There should be confirmation that the companies coming together have no legal problems.
- (b) **Product:** There should be potential for product improvement or superiority.
- (c) **Management:** Bidders management's lack of knowledge of the target company or its industry may cause merger to fail.
- (d) **Managements capabilities** should be properly evaluated.
- (e) **Culture:** Discussions on the culture of each company should be started as early as possible. Differences in culture have caused mergers to fail.

- (f) Management attitudes towards the merger exercise as whole.
- (g) Lack of proper post-merger integration. There should be an integration plan.

26.15 SUMMARY AND CONCLUSIONS

Mergers and acquisitions (M&A) are a way of expanding and growing a business by purchasing another company in its entirety. M&A have the objective of maximising shareholders wealth through creation of what is known as 'synergy'. The motives for mergers are many and they include access to source of supply, access to more market opportunities, reduction in competition, operating economies, better management, diversification, market signal, strong asset base and so on. For any merger to be economically justified, the following factors must exist:

- (a) Discounted additional cash flows must be positive; and
- (b) There should be reduction in post merger risk level.

There are three main types of mergers - the "horizontal", the "vertical" and "conglomerate" mergers.

A very important starting step for any M & A activity is to value the target company. The two major valuation approaches are the earnings approach and the assets approach.

There are variations of these two approaches. Another very important method of valuing a company is the discounted cash flow (DCF) method. This method is not frequently used because of its complexities in terms of estimating future cash flows and determining the appropriate discount rate.

The valuation process is not an exact exercise. The final value arrived at, is usually a function of astute negotiation between the parties involved.

An acquisition must be undertaken so as to achieve the strategic objective of the company. In strategic acquisitions, the consideration is invariably the shares of the acquiring company. A very critical factor in using this form of consideration is the determination of the "ratio of exchange". Other forms of consideration are cash and loan stocks.

There are "friendly" as well as 'unfriendly' or 'hostile' mergers. The latter are referred to, technically, as takeovers. Hostile takeovers are characterised by defensive tactics of target company management and anti-takeover devices which must have been designed even before the announcement of the takeover activity. Defensive tactics include management appeal to the

shareholders, large one-off cash dividends, share split and "white knight". Anti-takeover devices, nicknamed repellent, take the form of heavy borrowing, "poison pill", resolutions requirements, management contracts, 'standstill' agreements and 'greenmail'. The success of mergers should be measured mainly in terms of the effects on shareholder's wealth. Aside from the financial factors, other factors (qualitative) are also important to the success of any merger.

*Refer to Comprehensive Questions and Suggested Solutions in Appendix II
Page 465*

26.16 REVISION QUESTIONS

26.16.1 MULTIPLE CHOICE QUESTIONS

Use the following information to answer questions 1 and 2

Big Plc intends to acquire Medium Plc which has the following data

Earnings per share	<input type="checkbox"/> 2.00
Dividend per share	<input type="checkbox"/> 1.20 (has just been paid)
Number of shares	500,000
Current market price per share	<input type="checkbox"/> 24.00

- If the calculated cost of equity is 10% and a constant perpetual growth rate of 7% in earnings and dividends is expected, what is the expected value of Medium Plc share?
 - ☐ 30.00
 - ☐ 40.00
 - ☐ 42.80
 - ☐ 48.00
 - ☐ 24.00
- If the current market price of Big Plc is ☐ 64 and Big Plc intends to acquire Medium Plc at a premium of 33.33%, what will be the exchange ratio?
 - 2 shares of Big Plc for every 5 shares of Medium Plc
 - 1 share of Big Plc for every 2 shares of Medium Plc
 - 2 shares of Big Plc for every 1 share of Medium Plc
 - 5 shares of Big Plc for every 2 shares of Medium Plc
 - 3 shares of Big Plc for every 5 shares of Medium Plc
- Which of the following is NOT a motive for merging?
 - Improved management effectiveness
 - Economies of scale
 - Access to source of raw materials
 - Risk reduction
 - Increase competition.
- Which of the following is NOT a form of divestment?
 - Partial sell-off
 - Corporate spin-off

- C Equity buy-back
- D Voluntary liquidation
- E Equity carve-out

5. The sale of a division to the management of that division whereby the purchase is financed by a third party group-investor is called _____

- A Management buy-in
- B Management sale
- C Management buy-out
- D Management carve-out
- E Leveraged buy-out

26.16.2 SHORT ANSWER QUESTIONS

1. The economies obtained from a merger as a result of the performance of the combined firms being greater than the addition of their separate performances are referred to as _____
2. A merger whereby two companies in the same industry are involved is known as _____
3. What is the term given to the irrational behaviour of the bidding company's management whereby excessive premium is paid for the target company's benefits?

Use the following information to answer questions 4 & 5

Major Plc has an existing business which is expected to bring in net cash inflow of £2m for each of the next 5 years. The market expects 15% per annum rate of return. Major Plc intends to acquire Minor Plc. The predicted annual net cash inflows for the enlarged Major Plc amount to £3m for the next 5 years. The required rate of return is expected to be 12% per annum.

4. Calculate the value of the enlarged Major Plc
5. What is the maximum price Major Plc is expected to pay for Minor Plc?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

OTHER FORMS OF CORPORATE RESTRUCTURING

27.0. LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ◆ Understand what divestment means and its purpose;
- ◆ Appreciate the various types of divestments;
- ◆ Explain the term "Going private" and its application to corporate restructuring;
- ◆ Explain the advantages and disadvantages of "going private";
- ◆ Explain the term "buy-ins" as a form of corporate restructuring;
- ◆ Explain the term "strategic alliance" as a means of carrying out corporate restructuring; and
- ◆ Explain the main two types of strategic alliance-"joint ventures" and "virtual companies".

27.1 INTRODUCTION

In the last chapter some aspects of mergers and acquisitions/takeover were discussed. As a result of new thinking in the corporate management process, other forms of company restructuring have emerged. Companies thought of the need to focus on 'core' activities hence the emergence of such forms of restructuring as divestment, buy-ins, share repurchase, reverse takeover, and so on.

27.2 DIVESTMENTS

Divestments, also known as divestitures or demergers arise from the need to concentrate on core activities of the business so as to create value for the shareholders.

The following are examples of divestments:

27.2.1 Sell-Offs

These occur where one company sells part of its business to another company usually for cash or securities. It is expected that the disposal will create value. The decision criterion is whether the present value of the stream of future cash flows of the part sold will be less (if it remains) than the value received.

27.2.2 Spin-Offs

A spin-off involves the incorporation of part of the business as a separate company and the issue of its shares to the shareholders of the company from which this part spin-off. There is no change in ownership. Spin-offs may arise from:

- (a) The need to carve out a separate identity for that part of the business.
- (b) The need of the company to avoid its takeover. Spinning off a valuable part of a company may make the remaining company unattractive to an acquirer.

27.2.3 Management Buy-Outs (MBOs)

In a MBO, the company sells a particular part of the business to the management of that part of the business, possibly because the part or division no longer fits in to the overall strategic objective of the company.

Where financing of MBOs come mainly from loans raised by the managers from banks, the arrangement becomes **leveraged buy outs (LBOs)**.

27.2.4 Voluntary Liquidation

This occurs where the company is sold in its entirety. A decision to do this should be made against the backdrop of value creation for the shareholders. The basis of sale should be that the value of the company when liquidated is greater than the present values of its stream of future cash flows if not liquidated. The idea is that the assets when sold separately to individual buyers would have higher value than when sold as a whole as in merger.

27.2.5 Equity Carve-Outs

This is similar to a spin off. In an equity carve out however, ordinary shares issued in respect of the division go to the public. The initial public offering (IPO) is only in respect of some of the subsidiary shares. The parent company does not relinquish total control as it continues to hold some of the shares of the subsidiary.

In this case only a minority interest is sold with the sale proceeds representing a source of equity finance.

27.3. GOING PRIVATE

Going private simply means converting a public company into a private one. The privately held shares are owned by a select group of investors with substantial holdings in the hands of the managers of the company. Cash is usually paid to the public shareholders as compensation. The reasons for a public company going private include:

(a) Costs

Going and remaining public involves a lot of costs including those of registering the shares, administrative expenses of processing and paying dividends, administrative expenses of filing reports with NSE and SEC, high costs of conducting Annual General Meetings (AGM) etc.

(b) Avoidance of Embarrassment

Meeting with stockbrokers and financial analysts when making "facts-behind-the-figures" presentation and the embarrassing questions that are often thrown to the Chief Executives.

(c) Focus on Long-term Economic Earnings

The need to focus on long-run economic earnings rather than on periodic accounting earnings, submission of quarterly, half-yearly and yearly returns.

(d) Enhancement of Incentives

When managers increase their participation in the equity ownership of the company there is a tendency for these managers to work harder, longer and more efficiently than before. The financial advantages are obvious.

However, going private has some disadvantages. These include:

- (i) Transaction Costs:** The amount of money payable to investment bankers, lawyers can be high.
- (ii) Investors lack of liquidity:** Resulting in tying down a lot of capital with the company.
- (iii) Restricted marketability:** Shares must first be offered to the directors before they could be sold to outside parties (Right of first refusal).

27.4. BUY-INS

In buy-ins, a group of individuals, who are unconnected with a company, makes an offer to purchase a part of that company. Many buy-ins involve large-scale financing: Buy-in often occurs when the major owner of a one-man family business is planning to retire.

27.5. STRATEGIC ALLIANCE

Where a company clearly sees the synergy (benefits) from merging with another company but lacks the resources to execute a strategic merger, it can enter into a strategic alliance with that company.

Also called co-operative arrangements, strategic alliances differ from mergers in that members keep their legal and physical existence. One typical example of a strategic alliance is the one formed between a company and its supplier in order to make JIT inventory system work effectively. This will help the strategic objective of the company to be achieved.

27.5.1 Joint Ventures

This is one form of strategic alliance where two or more companies agree to form a separate Company which will be managed in such a way that will achieve their individual corporate objectives.

27.5.2 Virtual Companies

A virtual company has been defined as one that is involved in large-scale outsourcing of its business activities. This is a recent development in USA where it is known as Virtual Company. Outsourcing, which is now the main function of a virtual company, allows a company to focus on its core activities where it has competitive advantage. When outsourcing is now taken too far by a company, for example, where a manufacturing company outsources its production activities, the company becomes a virtual company. A virtual company might for instance, because of the value it attaches to its brand name, outsource all its manufacturing processes and give all its time to the management of its brand. Similarly, if a company's core competences were in marketing and distribution and not in manufacturing, the company might contract out the manufacturing aspect and concentrate on marketing and distribution so that it can obtain a competitive edge.

27.6 SUMMARY AND CONCLUSIONS

In view of new thinking that has evolved in the management process, many forms of corporate restructuring have emerged, apart from mergers and acquisitions. These include divestments (or divestitures), going private, buy-ins and strategic alliances. All forms of restructuring have the objective of creating values for the owners of the business.

Divestments can be in the form of sell-offs, spin-offs, management buy-outs (MBO), leveraged buy-outs (LBO), voluntary liquidation and equity carve-outs.

Strategic alliances can be in the form of joint ventures and what is termed virtual companies.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

27.7 REVISION QUESTIONS

27.7.1 MULTIPLE CHOICE QUESTIONS

1. The following are examples of divestments EXCEPT
 - A Sell-off
 - B Spin-off
 - C Buy-ins
 - D Voluntary Liquidation
 - E Equity carve outs.

2. Which of the following is NOT a good reason for a public company going private?
 - A High costs of going public and remaining there.
 - B Avoidance of embarrassment in certain situations.
 - C Focusing on long-term economic earnings rather than short-term profits
 - D Making shares to be more marketable
 - E Enhancement or incentives to work harder.

3. Where a group of individuals outside the company makes an offer to purchase a part of the company, this is known as
 - A Equity carve-out
 - B Sell-offs
 - C Buy-outs
 - D Buy-ins
 - E Spin-offs

4. When a company sells a particular part of the business to the management of that part of the business, this is known as _____
- A Sell-offs
 - B Spin-offs
 - C Management buy-outs
 - D Equity carve outs
 - E Debenture carve outs,
5. Which one of the following is NOT a disadvantage of 'going private'?
- (i) Investors' lack of liquidity
 - (ii) Restricted marketability of the shares
 - (iii) Clientele effects.
- A (i) only
 - B (ii) only
 - C (iii) only
 - D (i) and (iii)
 - E (ii) and (iii)

27.7.2 SHORT ANSWER QUESTIONS

1. A company which is involved in large scale outsourcing of its business activities is called _____
2. State the main difference between strategic alliance and merger.
3. What is the main difference between spin-offs and sell-offs?
4. What are leveraged buy-outs?
5. What should be the economic justification for a company going into voluntary liquidation?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

FINANCIAL MANAGEMENT OF SMALL AND MEDIUM SCALE ENTERPRISES (SMEs)

28.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ◆ Know the financial objectives of SMEs;
- ◆ Know the Capital Investment appraisal method usually used by SMEs;
- ◆ Explain how risk should be incorporated into the appraisal processes of SMEs and state whether or not SMEs managers should diversify risk;
- ◆ State and explain the various sources of finance available to SMEs;
- ◆ Mention the problems typically faced by SMEs in accessing finance;
- ◆ Explain gearing (financial leverage) in SMEs;
- ◆ Understand the process of valuing SMEs shares; and
- ◆ Explain the dividend policy of SMEs.

28.1 INTRODUCTION

The small and medium scale enterprises have no universally accepted definition. The criteria commonly used, however, to describe small and medium scale enterprises (SMEs) are number of employees, capital invested, sales turnover and total assets base. Notwithstanding the absence of an exact definition, the following may be said to be the features of SMEs:

- (a) The ownership of the firm and its control are not often separated: both are in the hands of a few closely related people, probably within the same family.
- (b) The company's shares are usually not quoted on the stock market
- (c) The informal relationship among employees in the organization dominates the formal relationship.
- (d) In most cases, their outputs are locally sold and their inputs are similarly, locally sourced.
- (e) Management structure is uncomplicated hence, there is speedy decision-taking process.

Since the 1970s, the government at the centre and other stakeholders in the private sector had been showing very keen interest in SMEs. This is probably due to the recognition of their great potentials for creating job opportunities, enhancing capacity building and promoting the economic development of the nation. In order to take advantage of maximum benefits accruable from establishment and operation of SMEs, various agencies and specialized financial institutions were set up by the Federal Government. These include Small and Medium Enterprises Development Agency (SMEDAN), the Nigerian Bank of Industry, Community banks now Microfinance banks. However, because of certain factors (some of which will be discussed in this chapter) the objectives for which these institutions were set up have, up to now, not been achieved.

The focus of this chapter will be on the financial manager's activities that can be specifically identified with SMEs. Some of them will be discussed in the context of company financial objectives, capital investment appraisal and its attendant risk, available sources of finance and attendant problems of accessing funds, gearing, valuation and dividend policy.

28.2 COMPANY FINANCIAL OBJECTIVES

In a large company, where ownership is separated from control, it had been said that management should maximise shareholders wealth. In a SME, the managers are also likely to be substantial shareholders. In this situation, the action which management will take is uncertain. On one hand, managers might be maximising their own welfare; on the other hand they might be pursuing the pure wealth maximisation objective to the letter. What is certain, however, is that shareholders in SMEs have other purposes for investing in the enterprises. Managers do, as much as possible, understand these personal purposes and attempt to fulfill them for their shareholders. It should be noted, however, that the wealth maximisation objective still remains important.

28.3 CAPITAL INVESTMENT APPRAISAL

28.3.1 Appraisal Techniques

Managers in SMEs invariably use the less sophisticated but incorrect appraisal methods such as payback period and accounting rate of return. As mentioned above, wealth maximisation still remains an important objective with which SMEs managers must reconcile themselves. A company that continually takes financial decisions that systematically reduce value, instead of adding value, would sooner or later go into extinction. Under this circumstance, the correct though sophisticated technique like NPV or IRR should be used in SMEs appraisals.

28.3.2 Capital Investment Appraisal under Uncertainty

How should risk be incorporated into the investment appraisal process in SMEs? It has been said that in a large firm, the discount rate to use should be the one that incorporates only the systematic risk of the securities of the firm. The reason for this is that the firm's shareholders are assumed to hold only a small proportion, by value, of the firm's total shares in well-diversified portfolios. However in a SME, this position does not hold: investors are not expected to be so well-diversified. Although, they may hold shares in different companies, the amount of investment in a SME, as a percentage of the total portfolio is likely to be large. For this reason the discount rate to use in SME investment appraisal should incorporate both systematic and unsystematic risk. Perhaps, such other devices as sensitivity analysis, certainty equivalent method, worst-possible, best-possible approach may be incorporated.

28.3.3 Risk Diversification and Reduction

In a large firm, shareholders who were assumed to be already well-diversified will not gain any extra benefits where managers carry out further diversification of their operations within the company. However in a SME, and for reason adduced above, the managers may diversify the firm's operations, (as shareholders might not be able to do this themselves) with the objective of reducing unsystematic risk.

28.4 SOURCES OF FINANCE FOR SMES

The following are the sources of finance available to SMEs:

28.4.1 Start-up Capital

This is finance introduced into the business by the owner. It usually arises from the personal accumulated savings of the owner himself, cash and property inherited by him from say his late parents, grants from his living parents, relatives and friends, loans given to him by individuals and association such as co-operative societies and so on. In Nigeria all these constitute a major source of establishment capital for a SME. The advantage of all these sources is that funds can be accessed speedily and in some cases without any explicit interest cost. However, the amount that is usually raised through these sources is, in most cases small.

28.4.2 Internally Generated Funds

Although, both small and large firms rely heavily on internally generated funds for future expansion and growth, the small to medium

firms put much greater reliance on these funds. This is because of the greater difficulty they have in accessing external finance. Internally generated funds represent profits earned in the past but not distributed as dividends to owners of the business (retained profits).

28.4.3 Debt Finance

The commercial banks constitute a very important source of debt finance for the SMEs, although, they are mainly involved in the provision of overdrafts. They charge between 2% and 5% above their prime lending rates. Some SMEs, however, have access to medium-term and long-term loans.

28.4.4 Equity Finance

This is finance given by individuals and institutions who want to be part-owners of a SME. Commercial banks can, by law, also participate in the equity of SMEs. By Section 21 of the Banks and Other Financial Institutions Act (BOFIA) 1991 (as amended), a commercial bank may acquire or hold a part of not more than 40 per cent of the share capital of any agricultural, industrial or venture capital company; provided such equity participation is not more than 10 per cent of the bank's shareholders' fund unimpaired by losses; and total amount of holding for all companies is not more than 20 per cent.

As a compliment to government policy measures in the promotion of SMEs, the commercial banks, through the Bankers' Committee, also established a scheme known as 'Small and Medium Industry Equity Investment Scheme (SMIEIS)'. The scheme, which is now defunct, required all banks in Nigeria to set aside 10 per cent of their profits before tax for investment in form of equity in eligible industries in the real sector of the economy, specifically in agro-allied, information technology and telecommunications, manufacturing, educational establishments services, tourism and leisure, solid minerals, construction and any other activity as may be determined from time to time. It should be noted, however, that the rate of actual disbursement of this fund to prospective beneficiaries was very low. Consequently, the scheme was discontinued with; on the coming on stream of microfinance banks.

SMEs can also access, although to a limited extent, equity finance via the medium of the Second-Tier Securities Market (SSM) of the Nigerian Stock Exchange (NSE). The conditions for entering this market were relaxed, compared with those on the first-tier. The objective was to create for the SMEs, access to the Nigeria Stock Market. SSM, like SMIEIS, achieved little success in terms of provision of long-term equity funds for the SMEs.

28.4.5 Specialised Funds

(a) **The Bank of Industry**

In her bid to take maximum advantage of the potentials of SMEs, the Federal Government established the Bank of Industry (BOI). This bank took over the activities of the defunct Nigerian Bank for Commerce and Industry (NBCI) the National Economic Reconstruction Fund (NERFUND) and Nigerian Industrial Development Bank (NIDB) all of which had responsibilities for promoting cottage and small and medium enterprises.

(b) **Microfinance Banks**

In view of the problems faced by SMEs in raising finance from commercial banks, the Federal Government, through the Central Bank of Nigeria (CBN), established community banks specifically to cater for the needs of SMEs. Community banks were recently transformed into Microfinance Banks (MFBs).

In accordance with the CBN guidelines for MFBs in Nigeria, the permissible activities of a MFB shall, among others, include:

- (i) Provision of credit to its customers, including formal and informal self-help groups, individuals, and so on.
- (ii) Promotion and monitoring of loan usage among its customers by providing ancillary capacity building in such areas as record keeping and small business management,
- (iii) Operation of micro leasing facilities, microfinance related hire-purchase and arrangement of consortium lending and supervision of credit schemes to ensure access of microfinance customers to inputs for their economic activities
- (iv) Investment in shares or equity of anybody corporate; the objective of which is to provide microfinance services to poor persons.
- (v) Encouragement of investment in cottage industries and income-generating projects for poor persons as may be prescribe by the CBN.

In view of the above provisions, it could be said that SMEs stand a good chance in securing finance from MFBs.

(c) Venture Capital

Venture capital may be described as capital which is provided for new, growing companies whose founders possess, the necessary entrepreneurial talents but lack finance and business management skills. The following are the characteristics of Venture Capital:

- (i) High risk investment instead of the normal risk investment associated with quoted shares.
- (ii) Not just portfolio of securities; instead there is a close working relationship between the SME and the providers of venture capital.
- (iii) It is neither a short-term investment nor a permanent long-term investment. The acquisition of shares in the SME is expected to be for a medium-term say 3 years after which the investment will be realized at a profit.

Four types of venture capital can be identified, depending on the state of the small/medium term enterprise:

- (i) **Seed Capital**
This is capital required by a new company during a long period of research and development.
- (ii) **Start-Up Capital**
This is a variation of the Seed Capital. Here research has been completed and the product has been developed. Positive cash flow is expected within a short period of time. In the meantime, funds are needed to support operations in anticipation of positive cash flow.
- (iii) **Growth Capital**
This is additional capital needed by young companies that have started well, but are still growing.
- (iv) **Development Capital**
This is capital needed for expansion by an already established company with sound operational track.

Venture Capitalists are usually involved in the financing of high-risk projects; hence they normally ask for high rate of return. Also, monitoring of small companies takes a lot of their time.

Venture capitalists, in addition, usually consider how to exit, at a profit, from their investments. This is referred to as "the exit route" and simply means how they will be able to sell their shares. The following possibilities exist.

- (i) The company arranges for its shares to be quoted on the Stock Exchange.
- (ii) The company is sold to another company.
- (iii) The company is sold to its existing management (management buy-out).
- (iv) Replacement with another venture capitalist.
- (v) The company is sold to a group of individuals which had not had any previous relationship with the company (management buy-in).
- (vi) The company is liquidated.

28.4.6 Others

Other sources of finance available to SMEs are the on-lending arrangement made by the Federal Government with international financial institutions and multi-lateral funding agencies like African Development Bank (ADB), International Finance Corporation (IFC) United Nations Development Program (UNDP), International Labour Organisation (ILO) and United States Agency for International Development (USAID)

28.5 FINANCING PROBLEMS OF SMEs

It will be seen from the above that the financing problems of SMEs do not arise from that of availability; rather it is due to lack of accessibility. The inability of SMEs to access the much needed funds for growth can be ascribed to many factors. These factors will be highlighted from the points of view of the banks, the Venture Capitalists, the SMEs themselves and the government.

28.5.1 The Banks

(a) Short-termism

The banks are short-termists in the area of lending to businesses. Probably due to the fact that most of their funds are secured on short-term basis (short-term deposits), banks are naturally not disposed to lending long-term.

(b) Risk Perception

Banks perceive SMEs as high-risk enterprises and would not just provide funds for these enterprises. Where they do, they demand for prohibitive rate of return.

(c) Management Fees

The banks believe that SMEs loans constitute a high demand on their time: they therefore charge high administrative costs. Furthermore, the fact that these costs have to be spread over small issues, makes it even much more expensive to SMEs to access bank finance than large firms.

(d) Risk Assessment

The banks often find it difficult to assess the risk of projects presented by SMEs. This might be due to improper presentation of information by the SME proprietors. Where the information is accurate and properly presented, the banks are often biased in their assessment of risk in an attempt to overprotect themselves. This is particularly evident in the case of SMEs with no capital of their own.

(e) Stringent Conditions

The banks often give stringent conditions to the SMEs many of which are difficult to comply with. One particular inhibitive condition is the demand for security for the loan. Many SMEs do not have such security to put them as collateral.

28.5.2 The Venture Capitalists

(a) High Yield

The venture capitalist's demand for high yield. He is not satisfied with just dividends for equity investment. Scarcely can SMEs obtain projects that can be profitable in the face of such high finance costs.

(b) Short-term Expectations

Venture Capitalists also require this high-yield within say a period of three years whereas the high technologically based industries in which they are investing take a much longer research and development period. They therefore, experience delay in generating cash.

(c) Pressure on Management Time

Venture Capitalists believe that SMEs take up a lot of their management time. Their contention is that SMEs would need close monitoring and much specialist advice during their developmental stage.

28.5.3 The SMEs Themselves

Lack of accessibility to finance may be caused by the SMEs themselves for the following reasons:

(a) Lack of Security

A SME's inability to provide collateral or its inability to provide adequate collateral might be one reason it cannot access a bank's funds.

(b) Information and Communication gap.

Many SMEs do not know of the existence of available sources of finance that meet their specific needs. Their common port of call for financial assistance, is the local branch manager of a bank.

(c) Project's Viability

At times, SMEs might not have bankable projects. Projects that are not viable are being taken to the banks and the response they get is usually negative.

(d) Project Presentation

The improper presentation of project's proposal is another reason that SMEs cannot access banks' finance. Also information that is provided might be inadequate

(e) Lack of Management Expertise

SMEs do not normally have the required expertise in the areas of production, maintenance, finance and so on. They, therefore, cannot produce good business plan.

(f) Lack of Transparency

There is often no transparency in the information provided on project's proposal. Data is often manipulated to suit their requests.

(g) Poor Record Keeping

This is a common accounting practice by SMEs. They do not possess a good accounting information system that will give out accurate, timely and relevant information.

(h) Financial Ineptitude

Some SMEs managers are so financially naïve and inept that they believe they just do not have to borrow. This might be ascribed to the fear of dilution of control.

28.5.4 The Government

(a) Lack of Infrastructure

This is a problem that affects many firms including SMEs. Lack of good roads, epileptic supply of electricity and absence of good water supply substantially increase the costs of running an organization.

(b) Lack of Adequate Publicity

Although, the Federal government had been doing a lot in educating the citizens on the available sources of finance for SMEs, the publicity is not enough to achieve the required success.

(c) Inadequate Supervision

There is still evidence that the established institutions, for example, the MFBs are not strictly following the CBN guidelines. The cost of accessing many MFBs funds is still very high. The existence of high interest rates might not be unrelated to inadequate supervision on the part of CBN officials.

(d) Lack of Institutional Co-ordination

There is no institutional co-ordination of the Federal government efforts and the efforts of its agencies in ensuring that SMEs have access to finance. There is need, for example, for the government agencies - the Small and Medium Enterprises Development Agency (SMEDAN), the CBN - to design programmes for accessing funds for the SMEs, organise seminars and workshops and so on. Although the agencies might have been doing some of these activities, they have not been doing enough to achieve the required success.

(e) Lack of Transparency

There appear to be lack of transparency in the credit processes of the institutions that were specifically set up in the past for the financing of SMEs. This resulted in poor repayment programmes, high rate of bad debts and eventual failure of these institutions.

28.6 GEARING IN SMEs

As earlier indicated, the SMEs shareholders are not likely to be well-diversified as their counterparts in large firms. They, therefore, still face substantial unsystematic risk and consequently higher financial risk which is the result of the level of capital gearing.

In the discussion on capital structure, it was opined that a firm might have an optimal level of gearing; a level at which the increased risk of gearing to shareholders, balances the tax benefits to the firm. This optimal level is, likely to be low for SMEs.

28.7 VALUATION OF SMEs

The current market price of a share of a large quoted firm is likely to approximate the share's true value; given an efficient stock market. However, this situation does not hold for the share of a SME. SME is assumed here not to be quoted on the stock market and therefore its share presumably has no price. Thus, other methods of valuation will be briefly discussed. These are dividend yield, price-earnings, net assets and discounted value approaches.

28.7.1 Dividend Yield

This approaches attempt to establish the value of a share of an unquoted SME via the medium of the yield of the share of its quoted counterpart. This approach is based on the belief that two firms which are similar in all respects (size, turnover, gearing and dividend pay-out), except that one is quoted, should have the same dividend yield.

ILLUSTRATION 28-1

X Plc and Y Ltd are two companies similar in size, turnover, gearing and dividend pay-out. X Plc is quoted on the Stock Exchange while Y Ltd is unquoted. The gross dividend yield for X Plc is 15 per cent and Y Ltd has just paid annual dividends of 18K per share net. Calculate the value of the share.

SUGGESTED SOLUTION 28.1

Using the formula; Dividend Yield =

And using X Plc yield as a proxy for Y Ltd yield,

Then, 15% = $\frac{18K}{\text{Value of share}}$

$$15\% = \left[\frac{0.20}{P_y} \right]$$

$$(0.15) P_y = 0.20$$

$$P_y = \frac{0.20}{0.15}$$

$$= 1.33 \text{ per share}$$

P = Price
Y = Y Plc

Note

- (a) Withholding tax of 10% is assumed
- (b) Practical problems of using this approach
 - (i) The problem of getting a quoted firm which is similar in all respects to the unquoted firm under consideration
 - (ii) The extent to which dividends represent the singular influencing factor in share price determination.
 - (iii) The use of historical information (past dividends level) to determine future share price. Prices are more likely to be affected by future dividends rather than past dividends
 - (iv) The limitation in transferability (and therefore marketability) of the share of the unquoted shares which appear to make them less valuable.

The dividend yield approach is usually used when valuing minority shareholdings. The reason is that the minority shareholders receives only dividend: he has no control over the running of the affairs of the company.

28.7.2 Price-earnings Multiple

This approach believes that two similar firms will have the same P/E multiples

ILLUSTRATION 28-2

L Plc and K Ltd are two companies similar in size, turnover, earnings and financial leverage. L Plc is quoted while K Ltd is unquoted. The P/E multiple for L Plc is 15, the after-tax earnings per share for K Ltd

have been \square 0.50 per annum over recent years. Calculate the value of each share of K Ltd.

SUGGESTED SOLUTION 28-2

Using the formula, $P/E =$

And using L Plc P/E multiple as a surrogate for K Ltd P/E multiple

Then, $15 =$

$= \square 7.50$

Note: All the limitations under dividend yield approach also apply except that this approach is not affected by the dividend policy of a company.

The P/E multiple approach is normally used when valuing majority shareholdings where the shareholder is said to have some influence over the operations of the company.

Net Assets

This approach values the company on the basis of the values of its individual assets.

ILLUSTRATION 28-3

The balance sheet of M Ltd is as follows:

	\square 'm
Assets	
Fixed Assets	55
Net Current Assets	50
	<u>105</u>
	\square 'm
Financed By:	
Ordinary shares of 50k each	40
Profit and Loss accounts	35
Shareholders funds	<u>75</u>
Long-term debt capital	30
	<u>105</u>

Calculate the value of each M Ltd's share.

SUGGESTED SOLUTION 28-3

$$\begin{aligned}
 P_m &= \boxed{} \\
 &= \boxed{} \\
 &= \boxed{0.9375} \\
 &= \boxed{0.94 \text{ or } 94\text{k per share approx.}}
 \end{aligned}$$

Note: The above computation is based on the book (accounting) values of the assets and liabilities of M Ltd. It may seem better to use the current market values and also put a value on the company's goodwill.

28.7.3 Discounted (Present Value) Approach

This approach discounts all estimated future net cash flows of the firm to their present value equivalents. This approach is the most logical of all, as it strives to arrive at the economic value of the firm its true or intrinsic value. However, there are problems. The principal ones are the difficulty in capturing and estimating all future cash flows and the problem of finding a suitable discount rate that reflects the risk of the firm's future cash flows. This later problem can, perhaps, be solved by using the CAPM, utilizing the firm's industry average beta (β) as a proxy for the firm's beta (β).

28.8 DIVIDEND POLICY OF SMEs

Dividend policies of SMEs are not fundamentally different from those of large companies. The major difference is the clientele effect. Directors of SMEs should have knowledge of their shareholders' preferences and the knowledge should influence the firm's dividend policy. Thus, the directors should factor, almost at all times, these preferences into their dividend decisions. This is because shareholders may not be able, in practice, to sell their shares and buy those of the company that satisfies their dividend desires.

28.9 SUMMARY AND CONCLUSIONS

The particular characteristics of SMEs in relation to their investment and financing decisions have been discussed. These decisions, should be made, like in large firms, against the backdrop of the strategic objectives of the

SME. These strategic objectives, as in a large firm, should be the SME's financial objectives. In a typical SME, however, these financial objectives should reflect more the needs and desires of individual shareholders than is the situation in a large firm. Although, shareholders wealth maximisation is still a relevant factor in a SME it is not likely to be a heavily weighted objective.

When managers of SMEs appraise capital investments, they, probably because of their level of professional skills, invariably use incorrect but unsophisticated appraisal methods such as payback period and accounting rate of return. They should instead, as much as possible, use the DCF methods such as NPV and IRR.

When projects are being evaluated under uncertainty how will risk be built into the evaluation process? As shareholders of SMEs are assumed to hold inefficient portfolios (and therefore face total risk), CAPM-derived discount rate cannot be used. Managers of SMEs would therefore be expected to turn to such devices as sensitivity analysis, certainty equivalent method and worst-possible, best-possible approach: Also, for the same reason of not being well-diversified, managers of SMEs should as much as possible diversify the operations of the firm for the purpose of risk reduction.

Virtually, every person or group appreciates the importance of SMEs to the Nigerian economy. Their financing problems had long attracted the attention of all persons that are concerned with their growth and potentials. The sources of finance available to SMEs have therefore been identified. However, the problem appears to be less of sources and more of accessibility of SMEs to capital. Various causes of SMEs inability to access capital have been highlighted and these can be traced to the banks, the venture capitalists, the SMEs themselves and the government. The principal causes might be said to be, among others, costs, lack of collateral, information and communication gap, absence of management expertise, fear of dilution of control, short-termism on the part of the banks and lack of infrastructure on the part of government. Previous action by government and private institutions to align them with large companies had not been quite successful. Despite the fact that most SMEs are unquoted, there is still need to value them. There are several approaches to valuing a SME. Each approach, in practice, appears to produce a different value.

This is because valuing an unquoted firm involves a lot of value judgment. The final figure to be taken is likely, therefore, to be subject of negotiation and compromise among the stakeholders. The optimal level of financial leverage for the SMEs is expected to be low where tax benefits of the SMEs are low compared, with the increased risk of leverage to shareholders.

The dividend policy of a SME is more likely to be more in tune with the preferences of the individual shareholders than will be the situation in a large company.

*Refer to Comprehensive Questions and Suggested Solutions in Appendix II
Page 465*

28.10 REVISION QUESTIONS

28.10.1 MULTIPLE CHOICE QUESTIONS

1. A Plc and B Plc are two firms similar in all respects except that A Plc is quoted and B Plc is unquoted. The P/E ratio of A Plc is 15, the after-tax earnings per share for B Plc have been N0.50 per annum in recent years. Calculate the value of each share of B Plc
 - A ☐ 30.00
 - B ☐ 7.50
 - C ☐ 15.00
 - D ☐ 25.00
 - E ☐ 20.00
2. The most important source of finance for a new, expanding and entrepreneurial company is:
 - A Equity Capital
 - B Loan Capital
 - C Convertible debenture capital
 - D Venture Capital
 - E Preference Share capital
3. In the context of dividend policy, one major difference between small firm and a large firm is _____
 - A Size
 - B Financial signalling
 - C Clientele effects.
 - D Information contents of dividend
 - E Dividend payments.
4. The financial intermediaries recently established to specifically cater for the interests of small firms are the _____
 - A Commercial banks
 - B Nigerian banks for commerce and industry
 - C Microfinance banks
 - D Merchant banks
 - E Nigerian Industrial Bank.
5. The government agency established to take care of the interests of small firms is
 - A Small and Medium Enterprises Development Agency (SMEDAN)
 - B Securities and Exchange Commission (SEC)
 - C Nigerian Stock Exchange (NSE)
 - D Small and Medium Industries Equity Investment Scheme (SMIEIS)
 - E Nigerian Deposit Insurance Corporation (NDIC)

28.10.2 SHORT ANSWER QUESTIONS

1. In the context of diversification State ONE reason why a small firm would want to use higher discount rate than a big firm in discounting future pre-tax cash flows?
2. In the valuation of the unquoted shares of small firms, what problem arises when the price-earnings ratio of a similar but quoted company is used as proxy?
3. State ONE main factor that differentiates equity capital from venture capital.
4. in the context of the 5cs of lending (lending guidelines for commercial banks), what particular problem do small firms face in obtaining loans from commercial banks?
5. Given the level of sophistication of small firms' managers, which cashflow investment appraisal technique would you advise for use?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

INTERNATIONAL FINANCIAL MARKETS

29.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ♦ Explain foreign exchange trading and quotations;
- ♦ Describe arbitrage activity of the foreign exchange market;
- ♦ Explain the term "parity conditions" and their usefulness in estimating future exchange rates;
- ♦ Mention and explain the major international risks;
- ♦ State and explain the main types of foreign exchange risks;
- ♦ Explain the implication of foreign exchange risks for financial management;
- ♦ Explain how foreign exchange risk could be managed;
- ♦ Mention and briefly explain the various devices for hedging foreign exchange risks; and
- ♦ Know the relevant international financing institutions that could be of assistance to the financial managers.

29.1 INTRODUCTION

The financial managers of companies are increasingly being involved in the events happening in the global financial markets. The investment and financing decisions are continually being made in an international environment. They, therefore, need to be concerned with what is going on in the foreign exchange market and more importantly the risks associated with international capital investments and financing. The international risks that are unique to financial management are mainly foreign risk and political risks. These risks have implications for capital budgeting, cost of capital, issues of debt and equity, working capital management and so on. A financial manager must be able to anticipate those risks that particularly affect the company's operations, quantify them and use appropriate currency and other hedges to minimise the company's exposure to them.

29.2 FOREIGN EXCHANGE MARKET

29.2.1 Foreign Exchange Trading

This is trading in one country's currency for that of another in order to take care of transactions bordering on purchase and sale of goods

internationally, investment in securities, tourism, transfer of funds from one country to another, international capital investments and financing of such capital investments. Trading takes place in a market known as foreign exchange market. This market comprises large commercial banks which could be found in well known financial centres such as New York, London, Tokyo and Lagos. The kinds of money that are traded are bank deposits or transfers of deposits denominated in foreign currency. There are four segmented foreign exchange markets in Nigeria - the official market, the inter-bank market, the parallel market and the black market.

29.2.2 Foreign Exchange Rate Quotation

The exchange rate is the price of one currency in terms of another, that is, the number of units of one currency that could be bought with one unit of another currency. Please note that 'price' refers to the price of the foreign currency that is being sold. There are two methods of quoting with the method used varying from country to country. The two methods are direct and indirect.

- (a) **Direct Quote:** This is the number of units of the domestic currency that will be exchanged for one unit of a foreign currency. An example of a direct quote is between Naira and US dollar where ₦150 can be exchanged for \$1, usually expressed as ₦150/\$1 and described as the naira price of a dollar. Nigeria's foreign exchange system uses this method.
- (b) **Indirect Quote:** This is the number of units of foreign currency that will be traded for 1 unit of the domestic currency. In London, for example, the exchange rate quotation between pounds and dollar is normally expressed as so much dollars per a unit of pounds that is \$1.68 per £1 and expressed as the dollar price of £1 (\$1.68/£1). This is an example of indirect quote and is also known as a reverse quote. It is easily obtained by just inverting the numerator and the denominator for example ₦150/\$1 reciprocal is $1/150 = 0.0067$. This means \$0.0067 will exchange for ₦1.00.

29.2.3 Types of Exchange Rates

There are two types - spot rate and forward rate. The spot rate is the rate, as agreed now, for exchanging one currency for another for immediate delivery.

The forward rate is the rate, as agreed now, for exchanging one currency for another at a specified future date.

The Spread

Banks normally display their buying rates and their selling rates. The lower prices are their buying rates while the higher prices are their selling rates. The difference between the selling rate and the buying rate is known as the 'spread.' The spread in any currency will depend on the currency trader, the currency that is being traded and the trading bank's general view of the conditions operating in the foreign exchange market at the point in time.

Rates are quoted on daily basis. A hypothetical table of a typical one-day Nigerian foreign exchange market quotes is shown below:

	Bid (₦/\$)*	Offer (₦/\$)*
Spot fixing	133.1000	133.4000
Tenor	Forward fixing (₦/\$)	Swap points (Rates)(₦/\$)
30days	134.7111/135.0147	1.6111/1.6147
60days	136.3173/136.6245	3.2173/3.2245
90days	137.9186/138.2295	4.8186/4.8295
180days	142.6936/142.0152	9.5936/9.6152

*The bid price is the dealer's/buying price while the offer price is its selling price.

Although, the theoretical spread is 0.3, in practice, the spread that is normally obtained in the market for major traded currencies is usually less than one-tenth of one percent (that is one per mille). On the above trading day, the actual spread might be about 0.0023.

In order to obtain a forward rate for a particular tenor add or subtract the swap rate to the spot rate depending on the direction of exchange (up or down). Thus the swap rate is the difference between the forward rate and the spot rate.

The major currencies of the world with their international currency symbols and their international standard codes (ISO) are stated below:



*Not really major

**Naira is, presently, not a freely traded currency.

Exchange rate quotations are available for all countries where their currencies are freely traded. In countries where free movements of currencies are not allowed, for example Nigeria, the Federal Government normally conducts all foreign exchange trading at an official exchange rate, notwithstanding the conditions currently obtainable in the market. Nigeria presently conducts her foreign exchange transaction through the Dutch Auction (Retail) System. This system can be changed by the Central Bank of Nigeria at any time.

29.2.4 Currency Arbitrage

The foreign exchange market is presumably an efficient market, that is, price information is available on line in real time. Since currencies are homogeneous commodities (dollar is dollar anywhere in the world) exchange rates tend to be equal globally. If the situation were different, it means then that the market is not efficient and arbitrage efficiency will force the rate to be equal worldwide. What is arbitrage in the context of currency transactions? Arbitrage is an activity which exists where two assets, similar in all respects, are being traded at different prices in different locations. In the context of currency trading, it refers to the practice of buying a currency in the market where the price is low and simultaneously selling it in the market where the price is high with a view to making short-term profit. As arbitrage is going on, the lower price is being pushed up with buying activity while the higher price is being pulled down by the selling activity; until the exchange rates in the different locations are so close that the additional costs of doing any further buying and selling will outweigh the additional profits to be obtained. At this point, the exchange rates are said to be "transaction cost close" and the arbitrage activity ends.

Suppose, for example, United Bank for Africa in Lagos is quoting the Naira/Us dollar exchange rate for 133.1000-133.4000 and International Bank of New York is quoting 132.2000-132.5000. Assume

that Naira is a freely traded currency. The situation creates an arbitrage opportunity. It means an arbitrage could buy \$10,000 at International Bank offer price of 132.5000 and simultaneously sell the \$10,000 to United Bank of Africa at its bid price of 133.1000. The sales proceeds will be ₦1,331,000 while cost will be ₦1,325,000 with total arbitrage margin of ₦6,000 or ₦0.60 per dollar. If this type of margin opportunity were created, the demand to purchase dollars from International bank would make it raise its offer price above 132.5000 while the drive to sell dollars to United Bank for Africa will make it to reduce its bid. Arbitrage activity through this process, pushes the prices of different dealers to levels where there would be no more arbitrage margin.

The bid-offer spread is the only transaction cost in the wholesale banking foreign exchange market. Therefore when the quotes of two different banks are different by only the spread that was quoted in the market by these two banks, then, there is opportunity to make arbitrage profit. Using the above example, assume as a result of arbitrage activity, United bank for Africa's new quote is 133.0050-133.3050 and that of International bank of New York is 132.7050-133.0050.

The situation now is such that arbitrage profit is eliminated. The offer price of International bank New York which is 133.0050 is equal to the bid price of United Bank for Africa. The difference between the bid and the offer price of each bank is the same. The spread in each case is ₦0.30. There is no more opportunity for arbitrage.

29.2.5 Triangular Arbitrage

This is an arbitrage involving more than two currencies. Banks quote foreign exchange rates in terms of dollars; the dollar is therefore referred to as the "numeraire" of the system. Under this system, it is easy to compare dollar exchange rates for different currencies. Thus if the exchange rate between Naira and dollar (₦/\$) and that between Rand and dollar (R/\$) are known the exchange rate between Naira and Rand (₦/ R) can easily be calculated. Assume ₦/\$ is equal to 150 and R/\$ is equal to 6.2480, then ₦/ R = 24.0076. the approach here is the use of simple algebra. If ₦/\$ = N150 while R/\$ = R6.2480 then ₦/ R = ₦/\$ divided by R/\$ = ₦150 ÷ 6.2480 = 24.0076. The rate being computed here is referred to as cross rate. If it is observed in a market that one of the three rates is not in tune with the other two exchange rates, there is an arbitrage opportunity. Suppose in Nigeria the ₦/\$ is ₦149.50 instead of ₦150. Then skilful trader in the foreign exchange market would notice this and speedily move in. The trader could begin by purchasing \$10,000 at ₦149.50 that is use up ₦1,495,000. He

proceeds to use the dollars to purchase Rand at 6.2480R per 1 dollar giving out 62480R. The 62480R could then be used in Lagos to buy Naira at N/R of 24.0076 to give approximately ₦1,500,000. The initial amount of ₦1,495,000 has yielded ₦1,500,000 with an arbitrage margin ₦5,000 excluding transaction costs; which should be deducted to get the true arbitrage profit. Again, a good thing about the arbitrage activity is its efficiency (arbitrage efficiency) which ensures that the exchange rates go back to their original international equilibrium levels. If initially it was thought that the Naira price of dollar at ₦149.50 was too low (underpriced) in Nigeria then the selling of Naira for dollars by the arbitrageurs will be expected to make dollars more expensive and probably pushing up the price back to ₦150.

The essence of knowing the cross rate lies in the fact that where there is limited trading in two currencies, for example between Naira and Rand, the active currency say the dollar could be used to work out the exchange rate between these two relatively inactive currencies.

29.3 FOREIGN EXCHANGE RATE DETERMINATION

The role of foreign exchange market arbitrage in ensuring that the price of a foreign currency (foreign exchange rate) remains the same in different markets has just been discussed. This type of arbitrage activity is not done in foreign exchange market alone. It is expected that it would occur in any market where similar items are traded in different locations - the goods market, the financial assets (securities) markets and so on.

The tendency for similar items to sell for the same prices worldwide provides some linkages between certain economic variables and exchange rates. These linkages or relationships are referred to as parity conditions.

Parity Conditions

These are relationships among potential determinants of foreign exchange rates and also the relationship between spot and forward exchange rates which attempt to explain the long-run changes in exchange rates. Such relationships exist between prices of goods and exchange rates (absolute purchasing power parity), between relative inflation rates and exchange rates (relative purchasing power parity), between relative interest rates and inflation rates (international Fisher effect) and differential between forward exchange rates and spot exchange rates (interest rate parity). All the above relationships attempt to explain why exchange rates vary over time.

29.3.1 Purchasing Power Parity (PPP)

This is a theory which attempts to provide a link between prices of goods globally and exchange rates. It states that changes in exchange rates over time could be traced to changes in the prices of similar goods produced and sold internationally. The position of PPP is that an identical goods or service should, subject to transportation costs and any other restrictions, sell at the same price worldwide regardless of where it is produced. This is referred to as the law of one price. This law is the basis of the PPP. If, according to PPP, the price say in one market/country changes relative to the other market/country, the exchange rate between the two markets (countries) should adjust to offset such a change. So the two prices, measured in common currency remain the same.

29.3.2 Absolute Purchasing Power Parity(APPP)

In its absolute form, the PPP looks at the exchange rate as the ratio of general price levels between countries. Assuming two countries, Nigeria and US, the PPP proposition could be expressed by the following equation.

$$P^{\text{N}} = S \times P^{\text{US}}$$

Where P^{N} is the price index in Nigeria
 P^{US} is the US price index
 S is the spot rate

If this equation (which is the law of one price) is re-written then

$$P^{\text{N}}/P^{\text{US}} = S$$

This means that the exchange rate between any two currencies (say Naira and US dollar) is equal to the ratio of their price indices.

29.3.3 Absolute PPP and the Law of one price

If the law of one price is true the PPP exchange rate can be calculated from the comparison of the prices of identical goods denominated in different currencies assuming market efficiency. The implied PPP exchange rate can then be compared with the actual market rate to see whether the relevant currency is trading at a market rate that is close to the implied rate.

29.3.4 Relative Purchasing Power Parity (RPPP)

This is another view of PPP and is concerned with relationship between expected inflation rates and exchange rates. The relative PPP can be expressed by the following equation:

$$\frac{P_X^T}{P_X^0} = \frac{P_Y^T}{P_Y^0} \times \frac{S_T}{S_0}$$

Where $\frac{P_X^T}{P_X^0}$ is the expected inflation rate (or percentage change in price index) in country X
 $\frac{P_Y^T}{P_Y^0}$ is the expected inflation rate (or percentage change in price index) in country Y
 S_T is the expected spot rate at time T
 S_0 is the spot rate today

Assume that country X is the domestic country and country Y is the foreign country. The relative PPP says that if inflation rate in country X is expected to be higher than expected inflation rate in country Y, then the value of the currency of country X is expected to depreciate in relation to the currency of country Y. The exchange rate will adjust in favour of country Y. Another way of stating the relative PPP is to say that the expected inflation differential (difference between inflation rates) between two countries is equal in equilibrium, to the expected movement in spot rates.

Note: this formula can simply be approximately stated as:

$$\frac{\Delta P}{P} \approx \frac{\Delta S}{S}$$

ILLUSTRATION 29-1

Suppose the expected inflation in the next 12 months in Nigeria is 10% while expected inflation rate in US in the next 12 months is 6%. If the spot rate now is ₦150 to \$1, what is the expected spot rate of exchange at time T (S_T)?

SUGGESTED SOLUTION 29-1

Applying the formula

$$\frac{10\%}{6\%} = \frac{S_T - 150}{150}$$

that is $0.10 - 0.06 =$

$$\begin{aligned}
 150(0.10 - 0.06) &= S_t - 150 \\
 150(0.04) &= S_t - 150 \\
 6 + 150 &= S_t \\
 156 &= S_t
 \end{aligned}$$

The expected future spot rate in 12 months time will, in equilibrium, be 156 to \$1.

29.3.5 Interest Rate Parity

The interest rate parity says that interest rates differential between two countries is equal in equilibrium to the differential between the forward exchange rate and the spot exchange rate. It can be expressed theoretically as:

$$F_0 - S_0 = \frac{S_0(i_X - i_Y)}{1 + i_Y}$$

where i_X is the current interest rate in country X.

and i_Y is the current interest rate in country Y.

F_0 is the current forward rate of exchange between the two currencies

S_0 is the current spot rate between the two currencies

The currency of the country with lower rate of interest will sell at a premium in the forward market against the currency with the higher interest rate.

Note: the above formula can simply be approximated as

$$F_0 - S_0 = S_0(i_X - i_Y)$$

ILLUSTRATION 29-2

The following interest rates are observed.

Interest rate in Nigeria ($i_{\text{₦}}$) 15%

Interest rate in U.K ($i_{\text{£}}$) 10%

Assume $S =$ 200 that is 200 to exchange for £1. What is the forward rate F_0 ?

SUGGESTED SOLUTION 29-2

Using the formula

$$\frac{0.15 - 0.10}{0.10} = \frac{F_0 - 200}{200}$$

$$0.15 - 0.10 = \frac{F_0 - 200}{200}$$

$$0.05 = \frac{F_0 - 200}{200}$$

$$200 (0.05) = F_0 - 200$$

$$10 = F_0 - 200$$

$$10 + 200 = F_0$$

$$F_0 = 210$$

A 12-month forward rate of N210 would be expected to give a 12-month forward premium equal to the 0.05 interest differential. Suppose the actual forward rate is N215, what will the profit-seeking arbitragers do? Buy pounds, and immediately sell the pounds forward for Naira because the future price of pounds (N215) is higher than that implied (N210) by interest rate parity. These actions would tend to increase the spot rate S_0 and lower the forward rate F_0 until the forward premium is brought back in line with the interest differential. The interest rates could also move; movement of funds into pound investments will depress the pound interest rate whereas the movement out of Naira investments would tend to raise the Naira rate.

29.3.6 Market Expectation (Expectation Theory)

These are the expectations of foreign exchange dealers with respect to future direction of some economic variables such as interest rates, inflation, budget deficit, foreign trade and so on. The assessment by the market, of a country's future regarding these economic indices, will affect the buying and selling of the currency of that country. In view of the problem of forecasting, the forward rate quoted today in the market is usually taken as the best estimate of future spot rate. The expectation theory states that the percentage difference at any point in time between the forward rate and the spot rate is equal in equilibrium to the expected percentage change in the spot rate. It is represented by the following equation.

$$\frac{F_0 - S_0}{S_0} = \frac{S_1 - S_0}{S_0}$$

where F_0 is the forward rate quoted today
 S_0 is the spot rate now
 S_t is the expected future spot rate

29.4 INTERNATIONAL RISKS

These are risks that are unique to those companies whose economic activities extend beyond the borders of the countries in which they are incorporated.

There are two major categories of such risks. These are foreign exchange risk and political risks:

29.4.1 Foreign Exchange Risks

Foreign exchange risks are risks arising from unexpected change in exchange rate. There are three main types-transaction exposure (risk), translation exposure and economic exposure.

(a) Transaction Exposure or Risk

This type of risk or exposure arises from uncertainty about the future domestic (Naira) value of a transaction which is denominated in foreign currency and to be settled at a future date. This risk affects mainly import and export transactions but may also affect the economic value of the firm to some extent. This is because of the impact of unexpected changes in exchange rate on the profitability of future transactions.

(b) Translation Exposure or Risk

This risk, also known as **accounting exposure**, is the risk arising from the need to convert, at the end of the financial year, foreign-currency denominated assets and liabilities of a subsidiary into the parent's company currency. It is the risk of having to report a loss (or a gain) because of the rules that are used in making such conversions.

(c) Economic Exposure or Risk

This is the risk of changes in the value of the firm arising from the unexpected change in the exchange rate. Economic exposure focuses on the present values (in real domestic currency) of the long-term cash flows and how these are sensitive to changes in exchange rate. This is the most important of the three as it has direct effect on the value of the firm.

29.4.2 Implications of Foreign Exchange Risk for Financial Management of Multinational Firms (MNFs)

The implications are indicated as follows:

(a) Capital Budgeting

The foreign exchange risk premium adds to the discount rate for the project. This premium is necessary because of the effect of the economic exposure - impact on estimated cash flows and remittance of profits, interests and capital.

(b) Cost of Capital (Required Return)

This could go up as a result of increased risk perception of the MNF by the parent company.

(c) Sourcing for International debt and equity finance

International investors would require a foreign exchange risk premium where the MNF is located in a country with highly volatile currency.

(d) Capital Structure

Foreign exchange risk might lower the optimal debt - equity ratio as it might increase the risk of the company as perceived by lenders.

(e) Valuation of debt and Equity

MNFs that are set up in countries with highly volatile currencies would pay foreign exchange risk premium to international investors.

(f) Working Capital Management

The impact of foreign exchange risk on movement of funds makes this aspect of financial management more difficult to handle.

29.4.3 Political Risks

These are risk arising from unexpected political events caused by government action. These political events might take any of the following forms:

- (a) Exercise of control over transfer-pricing mechanism of the group.**
- (b) Discriminatory taxation of foreign-owned subsidiary companies' profits.**

- (c) Restriction on the right to remit proceeds of interest, dividends and so on.
- (d) Dictating the shareholding pattern such that the nationals participate effectively.
- (e) Changes in government policies that create adverse effects on operations of all foreign-owned subsidiary companies.
- (f) Take over of MNF completely with or without compensation (expropriation).
- (g) Restriction on employment of non-nationals.
- (h) Political interference by foreign governments.
- (i) Goal divergence - sharp variances between objectives of government and objectives of the foreign-owned subsidiary companies.
- (j) Corruption - a way of life in many countries with Nigeria, as of now, not being an exception.

Note: Political risks are micro risks, that is, risks that affect all the subsidiary companies (foreign-owned) and not one subsidiary. Thus the issue of their implications for financial management is not really relevant.

29.5 MANAGEMENT OF FOREIGN EXCHANGE RATE RISK

Financial managers of a multinational firm can, and do manage foreign exchange rate risk through what is called "hedging". Hedging, in the context of foreign exchange risk management, simply means seeking protection against unexpected future changes in exchange rate. This implies, from the viewpoint of financial managers of a MNF, anticipating the risk, recognizing it, quantifying it and taking appropriate action to reduce, if not, totally eliminate such risk. There are a number of ways of doing this. These can be broadly divided into internal hedging and external hedging. However there is what is termed 'natural' hedging after which hedging, in a pro-active sense, starts. Hedging can, therefore, be categorised as follows:

- (a) Natural Hedging
- (b) Internal Hedging
 - (i) Cash management; and
 - (ii) Adjustments on movements of funds within the group.

- (c) External hedging
 - (i) International financing; and
 - (ii) Currency hedging.

29.5.1 Natural Hedging

The nature of the business of a firm and therefore the pricing of its cash inflows (revenues) and its cash outflows (costs) determines the extent to which it is naturally protected against unexpected exchange rate fluctuations. If both its cash inflows and cash outflows are either globally priced or domestically priced, there is little exposure to unexpected changes in exchange rate. If, on the other hand, the firm's cash inflows are globally priced while its cash outflows are domestically priced (and vice versa), it faces possible risk of fluctuations in exchange risk. The important point is that it is through strategic decisions with respect to markets, pricing, operating and sourcing for raw materials that a company could reduce its natural exchange rate risk. The financial manager is only concerned with the amount of risk remaining after natural hedging. It is this remaining risk he would take pro-active steps to reduce through both internal and external hedging.

29.5.2 Internal Hedging

(a) Cash Management

If a firm knew that the currency of the country in which its subsidiary was located were going to depreciate it could take the following actions:

- (i) Minimise its cash reserve by converting part of this into stocks and physical assets.
- (ii) Invoice goods in the domestic currency
- (iii) Cut down trade credit given to customers
- (iv) Speedily convert debtors into cash
- (v) Depending on interest rates, borrow in local currency of the country where the subsidiary is located to replace money earlier advanced by the parent company.

If it were not possible to predict the direction of the movement of exchange rate, match monetary assets with monetary

liabilities such that possible exchange rate losses are offset by exchange rate gains.

(b) Adjustment on movement of funds commitment

The company could do what is referred to as '*leading*' and '*lagging*' in relation to remittances of funds between subsidiaries in different locations.

'Leading' means speeding up the timing of payments or receipts in foreign currencies and '*lagging*' means delaying as much as possible the timing of payments or receipts in foreign currencies. Suppose, a US based firm has subsidiaries in Nigeria and South Africa and the reasoning is that Naira is going to have upward revaluation but the Rand will be steady; the Nigerian subsidiary sells roughly \$200,000 worth of goods to the South African subsidiary each month; the normal credit period is 3 months after delivery; the US parent company could change this credit terms and ask the South African subsidiary to "lead" by paying immediately.

As part of adjustments within the group, a financial subsidiary could be set up in tax-friendly countries. Under this arrangement, an exporting subsidiary would sell goods to the financial subsidiary which resells them to the ultimate buyer. This is being done, as a tax avoidance strategy, because the location where revenue is earned is important for the purpose of taxation.

Here, the financial subsidiary is invoiced in the selling unit's domestic currency which in turn re-invoice in the buying unit's domestic currency. By this, the financial subsidiary can then manage centrally all intra firm transactions' risk.

In addition to the above, intra firm payments (such as dividends, interest and royalties) transfer pricing and netting arrangements are carried out in such a way as to achieve the firm's overall tax management objective.

29.5.3 External Hedging

(a) International Financing

If a company is going to be adversely affected by depreciation of the currency of the country in which its subsidiary is based, it can raise loan in that country to counter this adverse effect. There are many sources of external financing available. These

include commercial bank loans in the country where the subsidiary is located, Eurodollar financing, international bond financing and so on.

(b) Foreign currency hedging

Another way by which financial managers could hedge against unexpected changes in foreign exchange rate is to make use of various devices provided by many currency markets, for example, they could:

- ◆ Buy or sell forward exchange contracts in the forward contracts markets
- ◆ Buy or sell future contracts in the future contracts market
- ◆ Buy or sell call or put currency options in the currency options market
- ◆ Arrange for currency swaps in the currency swaps market.

(i) Forward Contract (Currency)

A forward contract is a contract for purchase and sale of a foreign currency at a specified future date at the exchange rate, determined now. This type of contract is particularly useful for hedging against transaction risk. **Spot and forward contracts** quotations have earlier been discussed.

For example, foreign currency say dollar may be selling at a premium or discount to the domestic currency say Naira. If the spot rate of ₦/\$ is ₦150, a quote of ₦150.80 in the forward contract market indicates that the dollar is selling at a forward premium to the Naira whereas a quote of ₦149.50 to the dollar means the dollar is selling at a forward discount to the Naira. The dollar will buy more Naira in the first case (premium) and less Naira in the second case (discount) for future delivery than they do for current delivery. It should be noted that it is the foreign currency that, is being bought and sold.

ILLUSTRATION 29-3

K Ltd, a Nigerian exporter, is expecting \$100,000 in three months time for goods already dispatched to US. It intends to convert the dollars to Naira when the money is received in three months time. Currently the dollar is selling to the Naira at ₦150/\$1 and 149.50 (90 days) in the forward contract market.

If K Ltd wishes to avoid exchange rate risk, it should sell the \$100,000 forward 90days. When it delivers the \$100,000 90days hence it will receive ₦14,950,000. If the spot rate stays at ₦150 in 90 days, of course, K Ltd would have been better off if it had not sold dollars forward. K Ltd would have paid ₦0.50 per dollar or ₦50,000 in total to ensure its ability to convert dollar to Naira. On an annualized basis, the cost of the protection would be:

$$1.35\% \text{ i.e. } (0.50/150 \times 365/90)\%$$

It should be noted that if Naira has appreciated against dollar beyond ₦149.50 say ₦145, K Ltd would have gained by not waiting for 90 days to receive and convert dollar. It would have collected ₦14,500,000; an exchange loss of ₦450,000 (excluding opportunity cost savings in avoidable transaction costs).

(ii) Currency Futures Contract

This is a standardized contract for the purchase and sale of foreign currency where delivery takes place at a specified future date at a specific price. Futures are closely related to forward contracts, but they differ in the following cases:

- ◆ Few currencies are bought and sold;
- ◆ Contracts are standardised; and
- ◆ Trading takes place in specific locations and in specified currencies including for example, British Pound, Canadian Dollar, Japanese Yen and so on.

(iii) Currency Options

This is a contract that entitles the holder the right to buy (call option) or sell (put option) a given amount of foreign currency at a specified price during the exercise period. Unlike forward and future contracts, currency options allow the hedging of only

one sided risk. It is only adverse currency movements that can be hedged whether it is call or a put option. The holder has the right but not the obligation to buy or sell the currency during the exercise period. If the right is not exercised, the option expires. The holder pays a premium for the protection offered by an option.

(iv) **Currency Swaps**

Currency swaps transaction involves two currencies and two parties under which each party agrees to exchange debt obligations denominated in each party's country currency. One party's interests commitment will be settled by the other party. On redemption, the principal amounts will be exchanged normally at a pre-denominated exchange rate. It should be noted that there is no physical exchange, here, in that, the only payment that is made is for the cash flow difference.

29.6 THE MAJOR INTERNATIONAL FINANCIAL INSTITUTIONS

29.6.1 The World Bank Group

The World Bank Group consists of three financial institutions. These are:

- (a) The International Bank for Reconstruction and Development (IBRD);
- (b) The International Development Association (IDA); and
- (c) The International Finance Corporation (IFC).

The three institutions have the common aim of assisting, developing countries in raising the standard of living of their citizens by providing funds for long-term developmental programmes.

The objectives for setting up World bank include the following:

- (a) Assisting in the reconstruction and development of the territories of members, by facilitating investment of capital for productive purposes
- (b) Promoting long-range balanced growth of International trade and the maintenance of equilibrium in the balance of payments by encouraging international investments for the development of the productive resources of member countries.

- (c) Ensuring that the most urgent needs are satisfied first by granting or guaranteeing loans.

29.6.1.1 The International Bank for Reconstruction and Development (IBRD)

The International Bank for Reconstruction and Development (IBRD) was established in 1944, after the famous Bretton Woods Conference. Member nations' subscriptions form the capital base of IBRD.

29.6.1.2 The International Development Association (IDA)

The International Development Association (IDA) was established in 1960 as a concessionary institution, specifically to provide financial support to the less developed countries, which because of debt servicing costs cannot borrow on conventional terms. The IDA could lend for up to 30 to 50 years with up to 10 years moratorium, and the loans were at low interest rates.

The association is open to all members of the World Bank.

29.6.1.3 The International Finance Corporation (IFC)

The International Finance Corporation (IFC) was established in July, 1956, as an affiliate of the World Bank, to promote the growth of productive investments and assist enterprises, which will contribute to the economic advancements of its developing member countries. The objectives of the Corporation are incorporated into its Articles of Agreement.

29.6.2 Other International Financial Institutions

29.6.2.1 The International Monetary Fund (IMF)

During the Second World War which had disastrous consequences on most European countries, most of the industrial centres in Europe were damaged and excessive imports and borrowings had to be made to prosecute the war. This led to prolonged deficits in the balance of payment accounts of most of the countries after the end of the war.

A meeting was held in Bretton-Woods, USA in 1944 to find solutions to the already highlighted problems. At the end of the meeting, two institutions emerged, thus:

- (a) The International Bank for Reconstruction and Development (IBRD) which, as the name implies, was to provide fund for reconstructing the economy of member countries and undertaking development programmes. The IBRD, when combined with its allied institutions like International Development Association (IDA), are now known as the World Bank (or simply "the Bank:").
- (b) The International Monetary Fund (the IMF or the "Fund") was to see to the solution of the balance of payment problems of member countries and ensure smooth international payment mechanism.

A country willing to join one of the two organizations must join the other. The Bank's policies and activities are guided by its charter known as the "Articles of Agreement."

The Articles of the IMF charter set out its aims as follows:

- (a) Promotion of international monetary co-operation.
- (b) The expansion and balanced growth of international trade, to ensure that the issues of effecting payments do not constitute an impediment to trade.
- (c) The promotion of exchange rate stability.
- (d) Maintenance of high level of employment and real incomes with member countries, through gains from trade and necessary assistance.
- (e) The encouragement of friction-free exchange arrangements - by assisting in ensuring easy convertibility of currency.
- (f) The avoidance of retaliatory or competitive devaluation of currency.
- (g) Providing assistance to a country in solving its balance of payment problems, for example, through the provision of advice on fundamental re-structuring of the economy.
- (h) Reduction in the balance of payment problems.
- (i) Maintenance of surveillance over exchange rate policies.
- (j) Avoidance of discriminatory currency practices (Article 4, Section 3).

- (k) Creating a reserve base for members
- (l) Establishment of multi-lateral payment system

The "Fund", unlike the "Bank", is not a development institution, but it assists small needy countries. It does not lend money for developmental purposes. The Fund therefore, does not have the benefit of financing viable programmes through which its loans could be repaid. Since it is not per-se an '-aid'- institution and does not lend for developmental purposes, its facilities are usually difficult to obtain.

Nigeria joined the IMF in 1961.

29.6.2.2 The African Development Bank (ADB)

The ADB was established on 4th August, 1963, with its headquarters in Abidjan, Cote D'Ivoire .

All Independent African Countries are free to become members of the ADB. The objectives of establishing the Bank include the need to:

- (a) Render financial assistance to the African Countries which are in need of funds to finance development projects;
- (b) Encourage regional cooperation in the areas of finance among African countries.

The functions of the ADB include the following:

- (a) The provision of assistance in the selection and detailed studies of projects which it intends to finance.
- (b) The provision of finance for those projects which foster African cooperation in the areas of infrastructure, trade and regional development.
- (c) Undertaking such activities that may further the objectives of establishing the Bank.

29.7 SUMMARY AND CONCLUSIONS

The financial managers of companies involved in international transactions should be aware of the on-goings in the financial markets worldwide including having some knowledge of how transactions are conducted in the foreign exchange markets.

Foreign exchange trading means trading one country's currency for another: The price of one currency in terms of the other is called the exchange rate. There are two methods of quoting in the foreign exchange market - the direct and the indirect. There are also two types of exchange rates - 'spot rate' and 'forward rate.'

There are two prices normally displayed by a dealer - the bid price which is the price at which it wants to buy and the offer (ask) price which is the price it wants to sell. The difference between the bid price and the offer price is called the "spread".

Arbitrage activities ensure efficiency of the foreign exchange market. Currencies are homogeneous commodities, hence, they should command one price globally at a point in time. If not, arbitragers would set in and ensure there is an optimum condition. Triangular arbitrage involves more than two currencies and allowed cross rate to be calculated between two currencies which are not actively traded.

Some relationships have been observed between certain economic variables and exchange rates. These relationships tend to throw light on reasons for exchange rate fluctuations. They are referred to as parity conditions and include purchasing power parity (PPP), Interest rate parity (IRP) and relationship between forward rate and spot rate where forward rate is expected to reflect what the future spot rate will be (expectation theory).

The financial manager considers international risks that affect companies engage in international activities. There are two major categories of such risks - foreign exchange risks and political risk. The foreign exchange risks can be further classified into transactions risk/ exposure, translation risk/ exposure and economic risk/exposure. The most important, from the standpoint of the financial managers, is the economic exposure. This risk impacts directly on the shareholders wealth as it has to do with future cash flows.

Foreign exchange risk has implications for the financial manager in the areas of capital budget, cost of capital, sourcing for international finance, capital structure and so on.

Political risks are those risks arising from unexpected political events caused mainly by the central government action. The most biting of all of them is 'expropriation' which means depriving the owners of a business of their wealth.

Foreign exchange risk can be managed through hedging devices both internally and externally. Internal hedging devices include cash management, and adjustment of intra-firm accounts. External hedging include the utilisation of such devices as international financing and currency market hedging.

In international financing, the financial manager may need the financial assistance of international financial institutions such as the ADB, IMF and so on. Their intermediation functions are very important for the financial managers of firms engaged in cross-border activities.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

29.8 REVISION QUESTIONS

29.8.1 MULTIPLE CHOICE QUESTIONS

1. On a trading day, a commercial bank displays the following quote (the normal two-way quotes to be ignored) for a three-month forward contract; N149/\$1. The current rate of exchange is N150 to \$1. This means that dollar is selling at a _____
 A Future rate
 B Future discount
 C Forward discount
 D Forward premium
 E Future premium
2. What is the name given to a market for trading currencies among banks for delivery in the future?
 A Foreign exchange market
 B Forward discount market
 C Forward exchange market
 D Spot exchange market
 E Forward premium market.
3. Assuming the expected inflation rate in Nigeria in the next 12 months is 10 per cent while that of US for a similar period is 7 per cent, what is the approximate expected spot price of dollar in 12 months time if the current exchange rate is \square 135/\$1 and the purchasing power parity (PPP) holds?
 A \square 130.90
 B \square 135.03
 C \square 139.05
 D \square 145.00
 E \square 142.00

4. Contracts to trade currency for delivery at a future date in organised exchanges are called _____
 - A Forwards
 - B Options
 - C Swaps
 - D Futures
 - E Hedges
5. What is the name given to a legal and free foreign exchange market that exists as an alternative to a regulated official market?
 - A Dutch Auction market.
 - B Black market
 - C Spot market
 - D Forward market
 - E Parallel market.

29.8.2 SHORT ANSWER QUESTIONS

1. In relation to foreign exchange quotations, what is 'spread'?
2. Simultaneous purchase and sale of a foreign currency having two prices in two different markets so as to make short term profit is called _____
3. What is the name given to that macro risk involving seizure of a foreign company subsidiary's assets without paying compensation?
4. State ONE practical way of seeking protection against political risk.
5. Which foreign exchange risk affects the cash flows and therefore the value of the company?

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

INTERNATIONAL CAPITAL BUDGETING AND FINANCING

30.0 LEARNING OBJECTIVES

After studying this chapter, readers should be able to:

- ♦ Know the reasons for investing abroad;
- ♦ Evaluate a typical foreign capital product;
- ♦ Calculate the cost of capital for evaluating foreign capital investments;
- ♦ Know the motives for sourcing for funds abroad;
- ♦ Explain the main sources of foreign funds;
- ♦ Explain the capital structure that should be used for calculating the cost of capital of multinational firms (MNFs); and
- ♦ Explain the principle of international taxation and the methods for minimising the tax liability of a multinational firm.

30.1 INTRODUCTION

International capital budgeting refers to evaluation of prospective worldwide capital investment with a view to determining whether or not to invest abroad in the first instance, in which foreign company or countries to invest and the optimal project(s) to undertake; based on specified decision criteria. Capital investment having international dimension are generally called Foreign Direct Investments (FDIs) as against portfolio of international securities. However, the focus of this chapter is on FDIs.

A typical example of FDI is when a company plans to establish a subsidiary company in another country. The company undertaking the FDI is known as the parent company. The country where the parent company is legally resident (that is incorporated) is the home country while the country in which the investment is taking place is regarded as the host country. The parent company is called a multinational firm (MNF) and where there is a high degree of international spread of ownership and management, a transnational firm (TNF). A multinational firm (MNF) can therefore be defined as a combination of firms of various nationalities linked by ownership, contractual relationships and management control. A critical decision which a multinational firm must take is how the investments to be undertaken are to be financed. How should a subsidiary of a MNF raise external funds? Should it borrow in the host country or should it borrow in the global capital markets and convert the borrowed

funds into the currency of the host country? Factors that are pertinent to these questions will be discussed in this chapter. Aside from these two major areas (investments and their financing) other areas that should be of interest to the financial managers of a multinational firm include the cost of capital determination, cash management and the taxation implications, in both the home and host countries, of the FDI.

Although the above problem areas also affect the purely domestic firms, the multinational firms do face more complex problems in that there are additional problems relating to foreign exchange risk, political risk and tax regulations in both foreign country and at home and the financing plan in the host country.

30.2 THE INTERNATIONAL CAPITAL INVESTMENT DECISION

30.2.1 Reasons for Investing Abroad

The first question is why a company wants to invest abroad. The primary reason for a company investing in another country is to enable it obtain a higher rate of return from the FDI than it would have obtained on domestic investments in the same risk class. Alternatively, to earn returns in excess of the normal rate of return (abnormal profits), which would have been earned on investments at home. The other reasons, which are strategic in nature, include the following:

- (a) Inefficiencies in the host company's products, factors and securities markets. Such inefficiencies if they exist, could be turned into opportunities by the MNE. For example a MNE could take advantage of an underpriced labour (compared with their productivity) by executing capital projects in labour-intensive, less developed countries.
- (b) Enhancement of management expertise or technology.
- (c) Possible benefits from variations in exchange rates.
- (d) Tax avoidance.
- (e) Political safety: Establishing subsidiaries in countries that are not likely to seize the firm's assets without compensation (expropriation).
- (f) Protection of profit margin.
- (g) Deprivation of another firm of any abnormal profit.
- (h) Diversification: obtaining economies of scale through horizontal or vertical merger.

30.2.2 Appraisal Process

There are two stages:

- (a) Determine the cash flows to be generated, in the currency of the host country assess the viability of the profit based on these cash flows.
- (b) Determine if the cash flows which are remitted to the parent company in the home country justify the initial cash outflow from the parent company.

It should be noted that the relevant cash flows are the remittable free cash flows.

The above are the two major stages. Within these two stages:

- (i) Select the appraisal method; this is usually the Adjusted Present Value (APV) method;
- (ii) Based on the APV of the project, cost of capital will be calculated; and
- (iii) Adjust the cash flows to reflect the degree of financial leverage. This is done by adding to the operations flows, the cash benefits of the interest tax shield and all other financial effects relating to the investment.

It should be noted that the cash flows available to the ordinary shares (Parent Company's Interest) are the cash flows after deducting tax (in both the home and the host countries) and interest payments on debt.

The formula for APV is stated below:

$$\text{APV} = \boxed{\phantom{\text{APV} = \frac{-I}{1+r} + \sum_{t=1}^{F_1} \frac{CF_t}{1+r} + \sum_{t=1}^{F_1} \frac{FE_t}{1+r_f}}}$$

Where

- I = the initial investment
- t = the year of cash flow
- F₁ = final year of the project
- CF = estimated remittable operations cash flows in year t
- r = discount rate
- FE = additional financial effects on cash flows in year t
- r_f = discount rate applied to FE

The different terms of the formula are normally discounted at different rates to reflect their different degrees of risk. The remittable cash flow should be discounted at the appropriate cost of equity capital while

the foreign exchange risk and political risk are best accounted for by using sensitivity analysis.

The financial effects include capital allowances, subsidies, preferential credit terms granted by government, tax reduction or tax holiday provided as incentive for incurring the capital expenditure. The financial effects can be discounted, using current market interest rates because they are fixed in nominal terms over time.

ILLUSTRATION 30-1

Molus coal extractors, a coal mining company based in United States of America, has been awarded a dollar contract in Nigeria to apply its new tin recovery technology to some tin mines in the Northern part of the country. These tin mines are no more yielding profitable amounts of ore under traditional mining. Molus, estimates that the cost of establishing the foreign operation in Nigeria will be \$20million. The project is expected to have a duration of two years during which remittable operating cash flows from the new tin extracted will be \$15million per annum. Besides this, the new operating unit will give Molus the opportunity to repatriate an additional \$2million per annum in funds locked up in Nigeria during the era of exchange controls. Assume 5 percent discount rate for operating cash flows and 8 percent for funds that will now be free from controls. Ignore tax and exchange risks.

SUGGESTED SOLUTION 30-1

APV approach will be used as follows:

$$\begin{aligned}
 \text{APV} &= -\$20 + \$15/(1.05) + \$15/(1.05)^2 + \$2/(1.08) + \$2/(1.08)^2 \\
 &= -\$20 + \$14.3 + \$13.6 + \$1.85 + \$1.72 \\
 &= -\$20 + \$27.90 + \$3.57 \\
 &= \$11.47 \text{ million}
 \end{aligned}$$

All figures are in \$' millions.

The adjusted present value of the tin recovery project is \$11.47million positive. The MNF can compare this value with the APV of other projects it is evaluating, in order to decide whether or not to include it in its capital expenditure plan of the year.

30.3 COST OF CAPITAL

This is the discount rate that should be used in evaluating foreign projects. The complexity which the cost of capital of a multinational firm has, in addition to the difficulty of computations, is selecting the appropriate cost of capital to use: the subsidiary's overall cost of capital or the parent's overall cost of capital. The subsidiary calculates its own overall cost of capital which it uses for its normal capital investments. The parent company requires a rate of return (cost of equity) which is at least equal to its opportunity cost of capital.

For a multinational firm, the opportunity cost of capital will be the global risk-free rate plus a premium for risk. This premium will depend on where the project is to be executed. If the subsidiary is based in a country with variability of cash flows (risk) similar to that of the home country, the premium would be the same. However, if the subsidiary (and its project(s)) is in a developing country, the premium would probably be higher.

The cost of capital to use in appraising a foreign capital investment is the parent company's cost of capital. It is the cost of its share of the equity capital that is really relevant. This is because the parent company sees its opportunities from the global point of view and not in terms of the host country market.

30.3.1 Cost of Capital and Adjustment for Risk

There are two methods of building risk into the appraisal process.

- (a) **Adjust the discount rate:** Here, a single premium will be added to the overall cost of capital of the group. The size of the premium will be a function of:
 - (i) The location of the project; and
 - (ii) Variability of the project's cash flows (business risk).

For example, a US company whose cost of capital in US is 18 percent before tax might add a 5 percent premium if the investment is based in South Africa and 8 percent premium if it is based in Nigeria. This is a simple but conceptually wrong risk-adjusting method.

- (b) **Dual Adjustment:** In this case, the parent company's cost of capital will be partly adjusted to make allowance for the project's business risk and the cash flows will be partly adjusted. The critical problem here, is in arriving at the quantum of risk premium to be allowed for business risk. Notwithstanding, it should be noted that the relevant risk in this case is the

systematic risk of the project as measured by the project beta. This is the recommended approach in the field of international finance.

After an appropriate cost of capital had been determined, based on operations cash flows, all other factors (financing effects) should be incorporated either by adjusting their relevant cash flows or making use of sensitivity analysis. This implies the use of APV as earlier discussed.

30.3.2 Problems of Estimating Cost of Capital for Individual Foreign Project

Estimating cost of capital, whether in respect of a domestic project or foreign project, is a difficult process. The process becomes more difficult when a foreign project is involved. The problems include the following:

- (a) Estimating the risk premium required by the equity market;
- (b) Estimating the measure of undiversifiable risk;
- (c) Quantifying the fluctuations in exchange rate; and
- (d) Quantifying the effect of political risk and building it into one discount figure.

ILLUSTRATION 30-2

A major multinational firm, based in UK, is planning to invest in one of the Independent Power Projects (IPP) in Nigeria. The MNF intends to transfer to Nigeria, only equity funds. It wants to use APV appraisal technique and therefore requires the cost of capital to use for evaluating the project. The following information is provided: the undiversifiable risk for UK projects similar to the one to be executed is 1.2. However, if the IPP project were to be executed in Nigeria, the undiversifiable risk would be raised by the UK market to 1.6 to reflect the special risks of investing in Nigeria. The risk-free rate of return that can be obtained by the use of the parent company's funds is 6 percent. The expected rate of return for UK equity investors in general is 16 percent.

Required:

Calculate the cost of equity capital.

SUGGESTED SOLUTION 30-2

The CAPM formula will be used, that is:

$$\begin{aligned} E(R_i) &= R_f + \beta_i(R_m - R_f) \\ E(R_i) &= 6\% + 1.6(16\% - 6\%) \\ &= 6\% + 16\% \\ &= 22\% \end{aligned}$$

This is the cost of capital that will be used to discount the future cash flows remittable to the parent company.

30.4 SOURCES OF FUNDS FOR FOREIGN SUBSIDIARIES

Before going into availability of funds, the question that should be asked is why firms need foreign funds.

30.4.1 Motives for Sourcing Funds Abroad

The motives are:

- (a) To satisfy the needs of transnational firms that have, in recent times, grown in numbers and activities;
- (b) To provide a natural hedge for international securities;
- (c) To have access to cheaper source of funds;
- (d) To assist users of foreign exchange, where the domestic capital markets are already saturated;
- (e) To have borrowed funds in the same currency as assets values; and
- (f) To take advantage of taxation benefits given in other countries and not available in the home country;

30.4.2 Sources of Funds Abroad

Major sources available for subsidiaries include:

- (a) The subsidiary's retentions plus depreciation;
- (b) Funds generated and/or transferred within the group: equity (cash and non-cash), loans given by the parent company, loans given by other companies within the group, leads and lags created in inter-company movements of funds;
- (c) Local equity or/and borrowing from host country; and
- (d) Global financial markets.

30.4.3 Borrowing in the Host Country

In relation to sources of funds, one pertinent question arises: why do many multinational firms prefer to borrow as much as possible in the host country?

The following reasons could be advanced:

- (a) Avoidance of losses arising from possible depreciation of the host country currency.
- (b) Zero effect on parent company's cash flows where funds generated locally were enough to service the loan and repay capital
- (c) Reduction in the negative effects which possible naturalization of the subsidiary's assets might cause.

Where a decision is to be taken on whether or not to borrow from the host country, the relevant cost is the effective cost of borrowing which is equal to the interest to be paid plus or minus appreciation or depreciation respectively in the exchange rate between the host country and the country in which the borrowing is to take place.

This can be expressed by the following equations:

$$\text{Effective cost} = \text{interest on loan} \\ \pm \text{appreciation/depreciation in exchange rate}$$

This cost should be expressed in present value terms.

ILLUSTRATIONS 30-3

Assuming the cost of borrowing in US is 8 percent and Naira is expected to depreciate against the US dollar by 10 percent per annum. The effective cost of servicing the loan taken in US should be approximately 18 percent. If the cost of borrowing in Nigeria is less than 18 percent, it will be advantageous to borrow in Nigeria if, for instance, \$100,000 is borrowed in US to establish business in Nigeria, interest of \$8,000 is paid at the end of each year and capital is repaid at the end of the second year. The US dollars are converted to Naira and the debt is serviced in Nigeria. The rate of exchange at the time of the loan was \$150 to \$1. What is the effective cost of borrowing?

SUGGESTED SOLUTION 30-3

	U.S		NIGERIA	
End of year	Loan	Interest	Loan	Interest
0	\$100,000		N15,000,000	
1		(\$8,000)		1,320,000
2		(\$8,000)	N18,150,000	1,452,000

Effective cost of servicing the loan is obtained by solving for r (using the internal rate of return method) in the following equation

$$\text{At 18\% NPV} = -15,000,000 + 1,118,600 + 1,042,800 + 13,035,000 = 196,400$$

$$\begin{aligned} \text{At 25\% NPV} &= -15,000,000 + 1,056,000 + 929,280 \\ &= +11,616,000 \\ &= -1,398,720 \end{aligned}$$

Through Interpolation r can be obtained as follows:

that is r is just about 18.86%

30.4.4 Issuing Shares on the Local Stock Exchange of the Subsidiary Country

This means listing of the subsidiary company on the local stock exchange. This has advantages and disadvantages.

(a) Advantages

The advantages include the following:

- (i) There is wider spread of ownership with the attendant risk reduction;

- (ii) It is a source of funds that provide an escape route as buyers of shares can easily be found if a situation calls for disposal;
 - (iii) Controls on movement of cash in and out of the host country can be avoided; and
 - (d) The demand on information from the parent company can be reduced.
- (b) **Disadvantages**
- (i) As a quoted company, flexibility in management, hitherto enjoyed may be reduced. For example it might not be easy again to utilise transfer price for the benefit of the group.
 - (ii) The MNF might loose some control in decision making. The host country government might want to ensure that important decisions are made by the subsidiary and not by the parent company.
 - (iii) There might be need to comply with the host country stock exchange rules on certain critical matters, for example, the interest of the minority shareholders
 - (iv) Where substantial shares are not held by the parent company, a take-over might occur.

30.4.5 Global Equity Markets

Global Equity Market refers to international transactions in equities, where companies cross-list equities in a number of national markets and investors from one country buy shares in foreign markets.

Many countries in the world have stock markets that are open to foreign investors and also open to foreign companies that want to raise funds through the issue of securities in the currency of the domestic stock market. The reasons for cross-listing of securities include the following:

- (a) To avoid joining a large queue where approvals on timing of coming to the market have to follow some prescribed procedures.
- (b) To provide opportunities for nationals of another country to buy shares of the company
- (c) To create a much wider capital base

- (d) To provide accommodation for very large issues which may not be possible in a single domestic market
- (e) To help the company to be known worldwide

30.4.6 Capital Structure

The capital structure of a company provides an important base for the computation of the cost of capital. An important point is in the case of MNF, where there is argument on which capital structure to use for the computation of the MNF cost of capital: that of the subsidiary or of the overall group. The consensus is that it is the group's capital structure that should be used and not the subsidiary's capital structure.

The reason is that, the use of the subsidiary's capital structure (and by implication its financial leverage level) might be misleading. The followings have been advanced to support this position.

- (a) **Government Subsidy**
The borrowing by the subsidiary might have been highly subsidised by the host government so as to encourage foreign direct investments (FDIs) in the country. Thus the financial leverage (gearing) level might be much higher than what is regarded as normal in the parent company's country. In calculating the cost of capital, the subsidy should be allowed for, by including the related interest savings in the estimated cash flows.
- (b) **Guaranteed Loans**
High level of debts might have been secured by parent company's guarantees. These debts have been granted on the strength of the group assets and not on the strength of the subsidiary's assets.
- (c) **Policy Decision**
Substantial debts must have been obtained via deliberate policy decisions of the MNF to raise fund via borrowing instead of through equity.

The MNF should be interested in global capital structure and should try to achieve an optimal structure. It is the global capital structure that interests investors and creditors in evaluating the financial strength of a multinational firm.

30.5 INTERNATIONAL TAXATION

Financial managers of multinational firms should have a good knowledge of the principles of international taxation so that they could manage their international activities in such a way as to reduce tax liability (tax avoidance).

30.5.1 Principles of International Taxation

The discussion of the principles will centre on the following points:

- (a) Taxation of profits.
- (b) Apart from the tax that would have been paid on subsidiary's profits, there may be additional tax to be paid by the parent company at home.
- (c) The taxation base may be the global profits of the parent company.
- (d) In addition to tax on profits, there may be withholding tax on dividends, interest and possibly royalties transferred out of the country.
- (e) It is usual for the home country to grant a tax credit for taxes already paid on profits earned in foreign countries where there is double taxation agreement.
- (f) In order to attract foreign direct investments (FDIs) some host countries do give generous tax allowances and even provide tax havens - zero profits tax and no withholding tax.

30.5.1.1. Tax Rate

The tax rate may be based on the rate that would have been paid if the profits were earned in the home country (domestic neutrality) or at host country tax rate (foreign neutrality). In the latter case, there is no additional tax burden at home. Multinational firms usually prefer this latter approach so as to be able to compete effectively with their counterparts in the host country. However, the usual approach, in practice, is the "domestic neutrality".

30.5.1.2 Double-Taxation Treaties

These are international agreements between say two countries whereby cross-border transactions like dividends, and interest are not allowed to suffer tax twice; the principle of "foreign neutrality" or that of "domestic neutrality". Lower withholding tax rates, may also be included in the treaties.

30.5.1.3 Deferred Taxation

Foreign subsidiary's profits may be taxed either when they are earned or when they are received in the home country in the form of interest or dividends via remittance from the host country.

30.5.1.4 Remittance to Associated Companies

Where profits are remitted to associated companies that are regarded as tax havens, such profits will not be subject to additional tax in the parent company's country.

30.5.1.5 Transfer Pricing

Tax authorities are interested in inter-firm transfer prices. There are rules that guide decisions on acceptable transfer prices. There are, for example, rules relating to determination of market price in arm's length transactions and of normal profit mark-up.

30.5.2 Management of International Taxation

International taxation is one of the complex areas of multinational financial management; It, therefore, requires proper management. The methods available to a MNC for minimising tax liability include the following:

- (a) Locations of subsidiaries should be carefully selected. High-tax countries should be targeted so as to ensure there are enough expenses to create negative profits before tax.
- (b) High profit-earning subsidiaries, should be located in countries with low taxes.
- (c) A purely financial subsidiary should be located in an overseas financial centre. (tax haven).
- (d) Transfer pricing policies should be such that low profits are reported as earned in high-tax countries and high profits in low-tax countries. A re-exporting arrangement can be made such that goods are first sent to the low-tax country before being sent to the ultimate destination.
- (e) Advantage should be taken of tax holidays and other tax incentives provided by some countries to attract FDIs.
- (f) Borrow in countries with high tax rates.

30.6 SUMMARY AND CONCLUSIONS

International capital budgeting and financing are areas of financial management that should be of particular interest to financial managers of multinational firms. Although the principles are the same, whether domestic companies or multinationals, there are additional problems which the MNFs face. These include foreign exchange risks and their management, political risks and how to incorporate them into the capital budgeting process, taxation of profits and how to minimise taxable liability and what the financing policy should be. The typical areas of financial management that have international dimensions include capital budgeting, cost of capital, international sources of funds, capital structure and international taxation.

The strategic motives for investing abroad include the existence of the inefficiencies in the host country's goods, factors and securities markets, looking for enhanced management expertise, taking advantage of variability of exchange rates, avoiding tax and so on.

The evaluation of foreign capital investment entails two stages: the determination of cash flows and the assessment of the visibility of the project, based on these cash flows and justification of the foreign investment based on the remittable cash flows. The Adjusted present value (APV) technique is normally used in the evaluation process as it is necessary to also discount any possible financial effects. There is need to determine the cost of capital that will be used in discounting the operations cash flows to their present values. The cost of capital that is most appropriate for evaluating foreign projects is the parent company's cost of capital and not the subsidiary's cost of capital. There are two methods of incorporating risk into the cost of capital that will be used; adding a single risk premium to the overall cost of capital (weighted-average cost of capital) or partly adjusting the cash flows and adding a premium to take care of business risk of the project. The recommended approach is the dual adjustment.

There is also motives for sourcing for funds abroad. These include the need to satisfy the requirements of transnational firms (TNF), the need to provide natural hedge for international securities, the need to have access to cheaper source(s) of funds and so on. The sources of funds available include local equity i.e. listing on host country stock market, borrowing in the host country and global equity market. The capital structure that should serve as basis for the calculation of the cost of capital should not be that of the subsidiary; but that of the parent company. The main reason is the possible existence of imperfection in the debt-equity relationship (gearing or financial leverage) arising from highly subsidised loans, guaranteed loans and policy decisions.

The international aspects of financial management of a MNF should be of

great interest to MNF financial managers. They need to have a good knowledge of the principles involved so as to be able to apply the right techniques that will minimise the MNF's tax liability. The specific areas of interest are the tax base (taxable profits), the tax rate, double-taxation treaties and so on. The factors that will influence the effective management of the global tax system would focus on strategic location of subsidiaries, establishment of a financial centre and transfer pricing policies. The ultimate objective will be to reduce tax liability.

Refer to Comprehensive Questions and Suggested Solutions in Appendix II Page 465

30.7 REVISION QUESTIONS

30.7.1 MULTIPLE CHOICE QUESTIONS

1. In appraising a foreign investment which cash flows are relevant?
 - A Cash flows generated in the host country.
 - B Cash flows generated in the home country
 - C Free cash flows remittable to the subsidiary company by the parent company.
 - D Free cash flows remittable to the parent company by the subsidiary
 - E Cash flows remittable to the subsidiary company by fellow subsidiaries.

2. When calculating the cost of capital to use in appraising a foreign investment, which capital structure should be used as a base? Capital structure of
 - A the subsidiary company
 - B the parent company alone
 - C the overall group
 - D another subsidiary.
 - E all the subsidiaries.

3. Which capital budgeting technique should be used in evaluating a foreign project?
 - A Profitability Index technique (PI)
 - B Internal Rate of Return technique (IRR)
 - C Present Value technique (PV)
 - D Adjusted Present Value technique (APV)
 - E Unadjusted Present Value technique (UPV)

4. The international financial institution that is concerned with countries having balance of payments problems is called _____.
 - A African Development Bank (ADB)
 - B African Export-import Bank (AFREXM)
 - C International Finance Corporation (IFC)
 - D International Monetary Fund (IMF)
 - E European Central Bank (ECB)

5. The currency of members of the European Union (EU) is called

- A Euro dollar
- B Euro currency
- C Euro
- D Euro mark
- E Euro Sterling

30.7.2 SHORT ANSWER QUESTIONS

1. What is the overriding objective of a multinational firm (MNF) for establishing a foreign subsidiary?
2. State one reason why the use of the subsidiary's capital structure may be misleading?
3. State the two main stages involved in the evaluation of foreign capital projects
4. What is the major problem normally encountered in building foreign exchange risk into the computation of cost of capital?
5. State two main sources of funds available to foreign subsidiaries.

(Refer to Suggested Solution to Revision Questions in Appendix I, Page 445)

APPENDICES

APPENDIX I

SUGGESTED SOLUTION TO REVISION QUESTIONS

CHAPTER ONE-

1. E
2. D
3. C
4. D
5. D

SHORT ANSWER QUESTIONS

1. Long-term investment decisions and long-term financing decisions.
2. Whether to distribute profits or to retain profits for future expansion.
3. Amount involved is usually very large and decisions normally go into the distant future and once made often irretrievable.
4. Creating value for the owners of the business (shareholder wealth maximisation).
5. Relating with other managers in the preparation of short-term plans, monitoring and control.

CHAPTER TWO

1. D
2. D
3. C
4. D
5. E

SHORT ANSWER QUESTIONS

1. Behave responsively and responsibly by providing welfare facilities, avoiding water and air pollution, oil spillage, supporting sport programmes and so on.
2. It serves as the basis for all decisions made in the company.
3. Goal divergence, or sub optimisation.
4. (i) Measurement problem; or
(ii) Normative problem.

5. (i) Maximisation of profit simply by expanding the scale of operation and not in relative terms

OR

- (ii) Maximisation of profit could be achieved at the expense of jeopardising long-run benefits.

CHAPTER THREE

1. C
2. E
3. C
4. A
5. E

SHORT ANSWER QUESTIONS

1. Choice of appraisal technique such as payback period
 - (i) Instead of a superior technique such as present valueOR
 - (ii) Refusal to undertake substantially, beneficial but highly risky projects.
2. Window dressing
3. (i) Vagaries of stock market prices or
 - (ii) Stock market meltdown.
4. Wide dispersal of shareholders
5. Managers taking actions that might drive down the price of the company's shares.

CHAPTER FOUR

1. B
2. D
3. C
4. A
5. B

SHORT ANSWER QUESTIONS

1. Corporate governance
2. Provision of basic facilities, education for children, award of scholarships, support for sport development and so on. (any one)
3. Corporate wealth maximisation (CWM)
4. Promotes capital markets efficiency, company directors enjoy market confidence (any one)
5. Official corruption

CHAPTER FIVE

1. D
2. D
3. D
4. B
5. A

SHORT ANSWER QUESTIONS

1. Money market instruments have lower risk when compared with capital market instrument.
2. Bankers Acceptance - 3 parties. Commercial papers - 2 parties.
3. Both income and capital values could be eroded by inflation.
4. Par value: Value stated in the issue document.
Market Value: Value as determined by investors in the bond market.
5. Act as agents for and on behalf of investors in the purchase and sale of shares and stocks.

CHAPTER SIX

1. C
2. C
3. A
4. C
5. D

SHORT ANSWER QUESTIONS

1. Corporate Planning
2. Strategic Planning
3. Positive return
4. Strategy
5. Objective.

CHAPTER SEVEN

1. D
2. C
3. C
4. D
5. E

SHORT ANSWER QUESTIONS

1. E- Commerce
2. Electronic data interchange (EDI)
3. MIS - Programmed decisions e.g. inventory control
DSS - Semi-programmed decisions: decisions on whether or not to close a department.
4. Semi-structured problems
5. Tactical level.

CHAPTER EIGHT

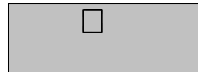
1. E
2. B
3. A
4. C
5. E

Workings

$$\begin{aligned}
 2. \quad & \square 500,000 (1.08)^{10} \\
 & = \square 500,000 \times 2.1589 \\
 & = \square 1,079,462
 \end{aligned}$$

This is future value of a sum involving the use of formula $(1+r)^n$

$$3. \quad \square 895,500 = A(14.487)$$



$$A = \square 61,814$$

This is a future value of ordinary annuity problem involving the use of formula



$$\begin{aligned}
 4. \quad & PV_{a/n} = \square 27,200 (6,710) \\
 & = \square 182,512
 \end{aligned}$$

This is a present value of ordinary annuity problem involving the use of formula



5. This is the application of 'Rule 72' Just divide 72 by the rate i.e. 8 to get the number of year

**SHORT ANSWER QUESTIONS**

1. Sinking fund investment programme
2. $\square 29,335,000$
3. Annuity due (or annuity in advance)
4. $\square 718,648.94$
5. Financial decisions are about present and future cash flows both of which do not have the same real values. Future values therefore have to be discounted to their present value equivalents before decision can be taken. Example, is capital investment decisions.

Workings

$$\begin{aligned}
 2. \quad & \square 5m (5.867) \\
 & = \square 29,335,000
 \end{aligned}$$

This is a future value of annuity 'problem'

$$4. \quad \square 2 = A + A$$



$$2 = A + A (1.783)$$

$$2 = A + 1.783A$$

$$2 = 2.783A$$

$$A = \boxed{}$$

$$\boxed{718.648.94}$$

This is an example of annuity due where the first investment is separately identified and 'n' reduces by 1.

CHAPTER NINE

1. C
2. A
3. B
4. E
5. D

Tutorials

3. Payback period = $\boxed{}$

$$= \frac{\boxed{}}{\boxed{}}$$

= 4 years

5. Perpetuity: $\boxed{}$

$$= \frac{\boxed{}}{\boxed{}}$$

= $\boxed{2,250,000}$

SHORT ANSWER QUESTIONS

1. Amount involved is usually very substantial and decision once made is almost always irretrievable.
2. (i) Relatively easy to understand and use
(ii) Has liquidity advantage which encourages managers who are shorttermist.
3. Wrong present values and therefore distorted decisions.
4. Positive NPV adds value and therefore enhances shareholders wealth Negative NPV operates in reverse.

5. Accept all projects whose Internal Rate of Returns are greater than predetermined hurdle rate or the company's cost of capital and vice versa.

CHAPTER TEN

1. E
2. D
3. C
4. D
5. E

SHORT ANSWER QUESTIONS

1. Annual Equivalent value (AEV) method obtained by the formula $NPV / \text{Annuity Factor}$. Where annuity factor represents present value of ₹1 per year for 'n' years @ x percent.
2. Subjectivity in the choice of foreseeable future or the finite horizon.
3. Real Rate =
4. Replacement
5. Hard capital rationing: Inability to raise funds because of limited sources of supply.
Soft capital rationing: Capital constraint is imposed from within probably because of, say, limited management skill.

CHAPTER ELEVEN

1. D
2. A
3. E
4. C
5. D

SHORT ANSWER QUESTIONS

1. Initial investment very high and could spread over two years or more
2. The use of unduly high discount rate
3. Example: PV of ₹1000 obtainable in 15 years time @ 12% gives ₹182.70

PV of £1000 obtainable in 15 years time @ 25% gives just £35.20

4. Optimum level analytical model
5. Goal congruence: Top management should ensure that individual managers' objectives are aligned, as much as possible with the overall strategic goal of the company.

CHAPTER TWELVE

1. B
2. B
3. C
4. E
5. B

Tutorials - 3

Year	£	£	@12%
0	1,000,000 x 1.0	(1,000,000)	(1,000,000)
1	700,000 x 0.8	560,000	500,000
2	600,000 x 0.7	420,000	334,821
		NPV	<u><u>165,179</u></u>

SHORT ANSWER QUESTIONS

1. Uncertainty - outcomes of events cannot be predicted with any degree of certainty.
Risk - outcomes of events could be predicted with some degree of certainty and probabilities attached.
2. A risk-adjusted factor that is used to convert risky cash flows into certainty cash flows
3. (i) Calculate individual NPVs and from there obtain the ENPV using relevant probabilities.
(ii) Calculate the expected value of each of the inputs and use the result to get the expected NPV directly.
4. A graphic approach for arranging a project's possible streams of cash flows
5. The process involves collecting samples from the probability distributions of uncertain elements in typical cash flow and computing the present value in each case.

CHAPTER THIRTEEN

1. B
2. C

3. C
4. D
5. B

SHORT ANSWER QUESTIONS

1. 37.23%: $2/98 \times 365/20$
2. The company should not accept the offered discount as it has to borrow at 40% to be able to enjoy a lower interest savings of 37.23%.
3. Conversion right is expressed in terms of conversion price or conversion ratio.
4. Conversion value is the market value of the quantity of shares into which a unit of loan stock will be converted. It can be expressed as conversion ratio. \times market price of the share at the time of issue.
5. Exchange ratio is the number of shares which the holder of a warrant is entitled to buy for each warrant.

CHAPTER FOURTEEN

1. C
2. B
3. B
4. B
5. E

SHORT ANSWER QUESTIONS

1. Zero - coupon bond.
2. A debenture whose interest will be paid infinitely.
3. Interest yield is the yield that will be obtained if the fixed interest security were not to have maturity whereas yield to maturity is the yield that would be obtained from a redeemable fixed interest security.
4. (i) Both are fixed-income securities.
(ii) They are both valued as perpetual securities.
5. Through the use of the formula

$$g = \boxed{}$$

where D_n is the dividend rate in year n

D_1 is the dividend rate in year 1

n is the number of years for which dividends have been paid

CHAPTER FIFTEEN

1. D
2. B
3. E
4. C
5. A

SHORT ANSWER QUESTIONS

1.
 - a. Identify the cheaper method of financing the asset
 - b. Evaluate the economic viability of the project

Note:

This writer opines that the issue of which step comes first is unsettled. If the first step comes first, it has the advantage of accepting a project which would otherwise have been rejected if leasing is cheaper than borrowing. If the second step comes first, it has the advantage of saving time and cost (in practice), if the project is not viable in the first instance. This implies that the financial manager does not need to bother about method of financing if the project is never viable.

One thing that is clear, however, is that the project's NPV must be positive or in the least, equal to zero.

2. Direct leasing - 2 parties (lessor, lessee)
Leveraged leasing - 3 parties (lessor, lessee and financier)
3. In practice, leasing is almost always more expensive than borrowing. (Lease payments contain both interests and profits to the lessor)
4. Cash flows of the project itself.

Domiciliation: undertaking from the beneficiaries of the project to remit proceeds directly to the bank.

- 5 (i) tax-deductible interest cost
- (ii) capital allowances tax impact

CHAPTER SIXTEEN

1. D
2. B
3. E
4. D
5. C

Tutorial

2. i.e.

$$= 0.07 + 0.10 = 0.17 \text{ or } 17\%$$

3. 17% - Capital Structure: Equity only.

4.

$$= 0.07 \text{ or } 7\%$$

SHORT ANSWER QUESTIONS

1. Both variables are equal. In fact there are two ways of looking at the rates.
- 2
 - i. The incoming project should have the same risk level as the existing company's projects.
 - ii. Financing of the project is going to be in the same mix as the existing capital structure.
3. Internal rate of return (IRR) approach.
4. Issue costs to be deducted from the gross proceeds to arrive at the net proceeds that serve as the base.
5. Interest that is chargeable on such funds.

CHAPTER SEVENTEEN

1. D
2. D
3. A
4. E
5. D

SHORT ANSWER QUESTIONS

1. Overall cost of capital decreases and later increases
2. Total value of the firm remains the same irrespective of the firm's capital structure.
3. Lower
4. Quality of assets
5. ₹150,000 (i.e. ₹500,000 x 0.30).

CHAPTER EIGHTEEN

1. E
2. A
3. A
4. C
5. C

SHORT ANSWER QUESTIONS

1. 'Home made' dividend means shareholders replicating (replacing exactly) cash not received from the company by borrowing to satisfy their cash dividends requirements.
2. Dividends cannot be paid out of capital
3. (i) Stable dividend pay-out means paying a fixed amount per annum regardless of the level of profits.
(ii) Stable pay-out ratio implies paying a fixed percentage of profits available for dividends every year so that actual amount paid will be fluctuating depending on the level of profits.
4. Dividends can only be paid out of cash. Dividends represent distribution of profits and not "payment of profits".
5. Bonus issue or Capitalisation of reserves.

CHAPTER NINETEEN

1. A
2. D
3. B
4. B
5. B

SHORT ANSWER QUESTIONS

1. Cash moves directly to the company from the public in offer for subscription whereas the company does not receive cash in offer for sale; it goes directly to the existing shareholders.
2. Private Placement
3. (i) Through underwriting of the issue
(ii) Using offer by Tender method
4. Pre-emptive rights

OR

Privileged Subscription
5. Bonus issue does not involve 'options', whereas rights issue could be accepted or rejected at a cost.

CHAPTER TWENTY


1. D
2. C
3. A
4. C
5. C

SHORT ANSWER QUESTIONS

1. Dematerialisation
2. He or she approaches a stock broker
3. (i) Actively involved in verification process (dematerialisation of old share certificates)

- (ii) Still keep records of ownership and transfers although on a E-format basis.
 - (iii) Effect payments of dividends and bonuses on-line (E-bonus and E-dividend menus).
- 4. 4 working days (T + 3 working days).
 - 5. High costs of listing and maintaining quotation.

CHAPTER TWENTY-ONE

- 1.. E
- 2. D
- 3. C i.e. $(0.6 \times 0.2) + (0.4 \times 0.3) = 0.12 + 0.12 = 24\%$
- 4. E
- 5. A i.e. 

SHORT ANSWER QUESTIONS

- 1. Risk and Return
- 2. Expected Return
- 3. Co-variance between each pair of securities in the portfolio.
- 4. That portfolio where the investor's indifference curve is tangent to the efficient frontier.
- 5. Portfolio theory looks at total risk (systematic plus unsystematic) whereas CAPM considers only the systematic risk of the security.

CHAPTER TWENTY-TWO

- 1. E
- 2. B
- 3. C
- 4. D
- 5. C

SHORT ANSWER QUESTIONS

1. Current assets less current liabilities
2. Trade creditors and other creditors and accruals that arise spontaneously in the company's day-to-day operations.
3. By getting the sum (in days) of raw material conversion period, work-in-progress conversion period, finished goods conversion period and debtors conversion period.
4. Large amount of money is invested in working capital; the management of which also take substantial amount of management time and efforts.
5. Overtrading means the scope of company's operations (turnover) is so large that it could not be supported by the current level of working capital.

CHAPTER TWENTY-THREE

1. C
2. B
3. C
4. C
5. D

SHORT ANSWER QUESTIONS

1. Transaction or precautionary or speculative
2. Receipts and disbursement payments method
3. No need to keep cash balance; has the effect of increasing profitability
4. The level where holding costs of cash and transaction costs is equal
5. Treasury bills

CHAPTER TWENTY-FOUR

1. D
2. A
3. D
4. C
5. B

SHORT ANSWER QUESTIONS

1. a. Credit standards and analysis
 b. Credit terms
2. a. The average collection period
 b. The default rate
3. Character, capacity and condition
4. This means that the supplier has extended credit for 45 days. However if payment is made within 10 days, the buyer would be entitled to 2% discount.
5. Factoring helps the firm to save cost of credit administration.

CHAPTER TWENTY-FIVE

1. E
2. A
3. D
4. D
5. B

Tutorial

1.
2. = 790.60

SHORT ANSWER QUESTIONS

1. Just - in - time (JIT)
2. Annual demand
3. Buffer stock or safety stock
4. Period of time between when an order is placed and when the goods arrive.
5. Optimal stock quantity is the quantity at which the stock holding cost is equal to the stock ordering cost.

CHAPTER TWENTY-SIX

1. C
2. B
3. E
4. C
5. E

Tutorial

1.



2. Market price of Medium at 33.33% premium is $24 \times 1\frac{1}{3} = \text{₹}32$

Exchange rate will be $\frac{32}{64} = \frac{1}{2}$ i.e 1 share of Big for every 2 shares of Medium

SHORT ANSWER QUESTIONS

1. Synergy
2. Horizontal merger
3. Hubris hypothesis
4. ₹10,815,000
5. ₹5,028,000

Tutorials

4. Value of the enlarged Major Plc.

$$\text{₹}3\text{m} \times 3.605 = \text{₹}10,815,000 \text{ where}$$

3,605 is the annuity factor for 12% required rate of return

5. Pre-merger value of

$$\text{Major} = \text{₹}1.5\text{m} \times 3.352$$

$$= \text{₹}5,028,000 \text{ where } 3.352 \text{ is the annuity factor for } 15\% \text{ required rate of return}$$

CHAPTER TWENTY-SEVEN

1. C
2. D
3. D
4. C
5. C

SHORT ANSWER QUESTIONS

1. Virtual Company.
2. In Strategic alliances individual parties keep their legal and physical existence.
3. In spin-offs, there is no change in ownership as the existing shareholders still own that part of the old business that was spin-off. This is contrary to sell-offs.
4. Leveraged buy-outs are typical management buy-outs where financing of the acquisition was done by outside financial group.
5. The value of the company when liquidated should be greater than the present values of a stream of future cash flows when not liquidated.

CHAPTER TWENTY-EIGHT

1. B
2. D
3. C
4. C
5. A

Tutorial

1. $P/E \times EPS = 15 \times 0.50 = 7.50$

SHORT ANSWER QUESTIONS

1. Shareholders of small firms are not so diversified as their counterparts in big firms, hence discount rate reflects both systematic and unsystematic risk
2. Problem of finding an exactly identical company that is quoted on the stock market.
3. Venture capitalists investments are not permanent. They are usually for a medium term and are expected to be released, at a profit, after that period.

4. Collateral
5. Payback period

CHAPTER TWENTY-NINE

1. C
2. C
3. C
4. D
5. E

Tutorial

3.

$$1x - 1y =$$

$$= 0.10 - 0.07 =$$

$$\text{i.e. } 135(0.03) =$$

$$4.05 + 135 = F_0$$

$$\text{i.e. } F_0 = 139.05$$

SHORT ANSWER QUESTIONS

1. Difference between the selling rate and the buying rate quoted by a currency dealer.
2. Arbitrage
3. Expropriation
4. Take an insurance
5. Economic exposure (or risk).

CHAPTER THIRTY

1. D
2. C

- 3. D
- 4. D
- 5. C

SHORT ANSWER QUESTIONS

- 1. To earn a rate of return on the foreign direct investment (FDI) which is higher than that which would have been earned by similar projects at home.
- 2.
 - (i) Loan may be subsidised by the host government
 - (ii) High level of borrowings might have been made possible by the guarantee provided by the parent company.
 - (iii) Policy decision may be to borrow as much as possible in the host country instead of financing via equity (any one of the above)
- 3.
 - (i) Evaluate the cash flows of the project in the host country
 - (ii) Evaluate the cash flows remittable to the home country
- 4. Determining the foreign exchange risk premium
- 5.
 - (i) Funds transferred within the group: equity and loan
 - (ii) Funds generated by the subsidiary: retentions
 - (iii) Funds from outside the group e.g. borrowing

APPENDIX II

COMPREHENSIVE QUESTIONS AND SUGGESTED SOLUTIONS

QUESTION 1

K Plc and J Plc are quoted companies. The following is the extract of the balance sheets of the two companies.

	K Plc £'000	J Plc £'000
Ordinary share capital		
Authorised - 2,000,000 shares of 50k each	<u>1,000</u>	<u>1,000</u>
Issued and fully paid 1,000,000 shares of 50 each	500	500
Reserves	<u>1,750</u>	<u>150</u>
Shareholders funds	<u>2,250</u>	<u>650</u>
6% irredeemable debenture	-	2,500
	<u><u>2,250</u></u>	<u><u>3,150</u></u>

Each of the two companies has operating profits of £500,000 and these are expected to remain unchanged for an indefinite future. The profits of each of the companies are generally regarded as identical in term of risk. It is the policy of each company to distribute all available profits as dividend, at the end of the year. The current market value of K Plc ordinary shares is £3 per share cum div. An annual dividend is due to be paid in the very near future.

J Plc has just made annual dividend and interest payments both on its ordinary share and its debentures respectively. The current market value per share of the ordinary share is N1.40 ex div. each debenture stock (Nominal £100) is worth £50 in the market.

Required:

Calculate the cost of equity capital for K Plc and the weighted average cost of capital (WACC) for J Plc

SUGGESTED SOLUTION 1

K. Plc

Cost of Equity capital		
Market price ex div:		
Total dividends	=	£500,000
Issued shares	=	£1,000,000
Dividend per share	=	£500,000/1,000,000
	=	£0.50 per share
Market price Ex div	=	£3-N0.50
	=	£2.50
Cost of Equity capital (K_e)	=	0.50/2.50
	=	20%

J Plc

Cost of Equity capital

Profit after tax (including interest)	500,000
6% Debenture (interest)	(150,000)
Earnings after interest	<u>350,000</u>

Dividend per share = 0.35

Share price

 K_e

1.40

= 25%

Cost of debenture

= 12%

WACC

	Capital Structure	Cost	Hash Total
Ordinary Share Capital	1,400,000	25%	350,000
Debenture	<u>1,250,000</u>	12%	<u>150,000</u>
	<u>2,650,000</u>		<u>500,000</u>

WACC = 18.87%

Alternatively this could be obtained as follows:

=

=

= 18.87%

QUESTION 2

Chief Jejelaiye, a valued client of your stock broken firm has asked for your advice on his investment portfolio. He holds the following securities of the stock market (having the listed risk characteristics shown below.

	X	Shares y	Z
Standard deviation	12%	10%	5%
Correlation co-efficient	50%	70%	80%
Amount invested %	40%	40%	20%

The expected return of the market is 18%.

The risk premium is expected to be about 7%.

The risk of the market as measured by its standard deviation is 10%. All the three shares lie on the Securities market line (SML)

Required:

Calculate the following variables, that will be used during your discussion with chief Jejeleite.

- (i) The expected return of your clients portfolio
- (ii) The risk of the portfolio

SUGGESTED SOLUTION 2

The beta factor has to be completed for each share through the application of the formula.

Expected Return $R_i = R_f + \text{input} (R_m - R_f)$

$$R_x = 0.11 + 0.60 (0.07) = 15.20\%$$

$$R_y = 0.11 + 0.70 (0.07) = 15.90\%$$

$$R_z = 0.11 + 0.40 (0.07) = 13.80\%$$

$$\begin{aligned} E(R_p) &= 0.40 (0.1520) + 0.40 (0.1590) + 0.20 (0.1380) \\ &= 6.08\% + 6.36\% + 2.76\% \\ &= 15.20\% \end{aligned}$$

$$\begin{aligned} \text{input}_p &= 0.40 (0.60) + 0.40 (0.70) + 0.20 (0.40) \\ &= 0.24 + 0.28 + 0.08 \\ &= 0.60 \text{ OR } 60\%. \end{aligned}$$

QUESTION 3

- (a) NES Plc and CAD Plc are two companies quoted on the stock market in the Food Beverages and Tobacco sector. Both companies are similar in all respects except that NES Plc is geared while CAD Plc is ungeared. NES Plc has a paid-up equity share capital having a market value of 1.2m while CAD Plc has an equity capital with a market value of 1.5m. NES Plc also has a debt capital of 600,000 with a coupon rate of 12 percent which is equal to the market interest rate. Each of the two companies earns an operating profit of 300,000.

Required:

Assuming John holds 15 percent of NES Plc shares would you advise him to carry out an arbitrage activity?

- (b) Modigliani and Miller (M & M - original version) believe that the pattern of financing a company does not affect its value as, according to them, arbitrage efficiency would ensure that this discrepancy in value does not occur. What are the assumptions underlying this position?

SUGGESTED SOLUTION 3

(a)	Capital structure	NES PLC	CAD PLC
		£	£
	Equity capital (market value)	1,200,000	1,500,000
	12% Debentures	600,000	-
		<u>1,800,000</u>	<u>1,500,000</u>
		£	£
	Operating profits	<u>300,000</u>	<u>300,000</u>
	John's investment in NES Plc is currently 15% of the equity		
	that is 15% of N1,200,000	=	£180,000
	profit after tax of NES Plc is	=	£300,000 - (12% £600,000)
		=	£300,000 - £72,000
		=	£228,000
	John's interest	=	15% of £228,000
		=	£34,200

(i) If John carries out arbitrage activity, he would sell his investment in NES Plc which will give him £180,000

(ii) He would borrow 15% of the debt of NES Pls i.e. $N600,000 \times 0.15 = £90,000$
Total funds available for investment = £270,000

(iii) John will now invest 15% in CAD Plc or $£1,500,000 \times 0.15 = £225,000$.
John return in CAD Plc will be equal to £45,000 (or $£300,000 \times 0.15$).
The interest on loan borrowed will be 12% of £90,000 = £10,800.

This amount will be deducted from his overall return of £45,000 to have a net return of £34,200.

(iv) This is the same return he earned on his investment in NES Plc. However he earned this return with a surplus of £45,000 ($£270,000 - £225,000$) still in his hands for further investment elsewhere.

Alternatively John could invest the whole £270,000 in NES Plc. if he does this he will be expecting N54,000

Less interest on loan £10,800

Net income =
= £43,200

This is higher than the existing net income of £34,200 by £9000.

Advice: John would be better off carrying out the arbitrage activity.

(b) Assumption

- (i) Perfect capital markets where:
- ♦ Information can be obtained by all investors at no cost.
 - ♦ Investors are rational, utility maximisers.

- ◆ Personal borrowing can be substituted for corporate borrowing on the same terms
 - ◆ There are no taxes and other market imperfections.
 - ◆ There are no transaction costs
- (ii) Firms could have the same risk characteristics.

QUESTION 4

- (a) You are given the following information relating to material X in respect of company A.

Usage per working day	30 units
Costs of placing an order	200
Unit Cost of material	5
Cost of warehousing per annum	10%

Assume 250, working days in a year.

Required

- (i) Calculate the Economic Order Quantity (EOQ)
 - (ii) Give THREE assumption underlying the calculation, in general, of EOQs
- (b) The following information is given in respect of company B.

Average usage	-	100 units per week
Lead time	-	1 - 2 weeks
Maximum usage	-	150 units per week
Minimum usage	-	40 units per week
EOQ	-	400 units

Required: Calculate

- (i) The maximum level of stock
- (ii) The minimum level of stock
- (iii) The re-order level

SUGGESTED SOLUTION 4

- (a) (i) Company A

applying the formula

EOQ

=

= 2449.5

= 2450 approximation

- (ii) Assumption
- ◆ Known rate of demand
 - ◆ Known and constant stockholding cost
 - ◆ Known and constant ordering cost
 - ◆ Known and constant unit price
 - ◆ Instantaneous stock replenishment.
- (b) (i) Maximum Level
 $= \text{Re-order level} - (\text{Min usage} \times \text{min lead time}) + \text{EOQ}$
 $= 300 - (40 \times 1) + 400$
 $= 300 - 40 + 400$
 $= 660 \text{ units.}$
- (ii) Minimum Level
 $= \text{Re-order level} - (\text{Average usage} \times \text{Average lead time})$
 $=$
 $= 150 \text{ units}$
- (iii) Re-order level
 $= \text{Maximum usage} \times \text{maximum lead time}$
 $= (150 \times 2) \text{ units}$
 $= 300 \text{ units.}$

QUESTION 5

- (a) Explain briefly, the concept of “Corporate Governance”
- (b) State TEN principles of Corporate Governance
- (c) Give TWO benefits of good Corporate Governance

SUGGESTED SOLUTION 5

- (a) Corporate Governance is concerned with the promotion of a culture in which the directors give priority to the pursuit of the best ethical practice in the management of an organisation. Corporate governance focuses on many aspects of management practices including accountability of the board of directors, transparency in the disclosure of the affairs of the company, honest approach to the management of risk, recognition of all stakeholders’ interests and sincerity of purpose in the establishment of audit committees and conduct of annual general meetings (AGMs).
- (b) Principles of corporate governance include the following:
- (i) Laying solid foundation for effective and efficient management of the organisation and for oversight functions of the various committees of the Board;
 - (ii) Structuring the Board in such a way as to create value for the company;
 - (iii) Promoting ethical and responsible decision making;
 - (iv) Safeguarding the integrity of financial reporting;
 - (v) Making empirical, timely and credible, disclosure to the regulatory authorities

including behaving responsibly in the ‘facts behind the figures’ presentations to the Nigerian Stock Exchange (NSE);

- (vi) Recognition of, and respect for the rights of all stakeholders;
 - (vii) Ensuring sincerity of purpose in the management of risk particularly in the area of risk diversification;
 - (viii) Adhering to the “Code of conduct for Company Directors” on Corporate Governance;
 - (ix) Ensuring the fulfilment of the company’s social responsibilities to consumers by, for example, abstaining from producing and selling fake and/or adulterated products;
 - (x) Ensuring the fulfilment of the company’s social responsibilities to the public by for instance, preventing water and air pollution; and
 - (xi) ensuring the fulfilment of the company’s social responsibilities to the community in which it operates by providing basic facilities such as education for the children, award of scholarships, boreholes, recreation facilities and so on.
- (c) Benefits of good corporate governance include:
- (i) Good corporate governance;
 - (ii) Instils investors’ confidence in the directors of the company;
 - (iii) Promotes market efficiency and integrity;
 - (iv) Enhances financial stability and growth;
 - (v) Has the potential for attracting foreign direct investment;
 - (v) Creates a very competitive environment;
 - (vi) Enhances accountability and therefore assures good performance by the directors; and
 - (vii) Promotes effective and efficient use of scarce resources.

QUESTION 6

- (a) State and explain, briefly, THREE areas of financial management practices that receive support from the Decision support systems of a typical Information and Communication Technology (ICT) environment.
- (b) Give THREE differences between Management Information Systems (MIS) and Decision Support Systems.

SUGGESTED SOLUTION 6

- (a) The following areas of financial management practices that get support from Decision Support Systems (DSS) are:

- (i) Financial planning;
- (ii) Capital budgeting; and
- (iii) Optimisation of financial problems involving complex and interacting variables that limit the achievement of the firm's strategic objectives(s).

(i) **Financial planning**

Financial managers receive immense support from DSS when he takes long-term financial planning decisions involving many assumptions that jointly affect these decision. Where there is need to test the effect of say a change in any of the assumptions on the result (sensitivity analysis), computerised financial planning models can be programmed to carry this out instantaneously. The specific areas of financial planning that receive this type of support from DSS include, the effect of different sales volumes, different selling prices, different input costs on the forecast figures in the projected financial statements.

DSS provide support where there is need to assess different financing plans and their impact on the critical variables such as earning per share (EPS), debt-equity ratio (gearing) and so on.

DSS, in addition to the above, provides support where there is need to alter an initial plan based on the result of previous forecasts. For example capital might be a constraint, and it might be necessary to scale down the scope of activities.

(ii) **Capital budgeting**

DSS provides the much needed support in the areas of estimating cash flows and incorporating risk and inflation into the capital budgeting process. Financial managers also get support from DSS when they evaluate the effect of alternative discount rates on projects net present values. DSS are particularly useful in the evaluation of advanced manufacturing technology (AMT) projects where cash flows that have to be estimated go into fairly distant future. Spreadsheet programmes containing capital budgeting present values models, are particularly useful in this respect.

(iii) **Optimisation problems**

DSS model base might have optimising models such as linear programming models. These models could be used to provide solutions to problems involving optimisation of a given objective (profit maximisation or cost minimisation) in the face of many (at least more than two) interacting variables and complex relationships. The limiting factors might be labour, machine hours, capital and others whose incidences jointly affect profit or cost.

- (b) Given the advancement in technologies in the area of information and communication it is necessary to highlight some differences between the traditional Management Information Systems and Decision Support System. Some of the differences are stated on page 473.

QUESTION 7

The Board of BM Plc of the Building Material sector has recently decided to achieve positive growth and better opportunities through merger. The Board, after a thorough search, unanimously agreed to pick FM Plc, a company in the same sector.

As the Financial Manager of BM Plc, you have been asked to critically examine, based on the information stated below, the possible acquisition of FM Plc using market price approach.

	Dividend per share	Share price	No of shares
BM Plc	2	54	1,000,000
FM Plc	1	18	540,000

The dividends were covered by earnings 1.5 times for BM Plc and 2.0 times for FM Plc. After an in-depth analysis, you observe that the market expects a perpetual growth of 10 per cent each year in the earnings and dividends of FM Plc and these earnings and dividends are expected to increase to about 12% each year under the management of BM Plc. BM Plc does not intend to incur any additional capital expenditure. Similarly it does not expect any change in the risk complexion of the company, following the merger. Thus, the entire growth is expected to arise purely from the effective utilisation of FM Plc assets. It is expected that the market after the merger would retain BM Plc's price-earnings ratio.

- Calculate the increase in value arising from the merger.
- Evaluate the gains or losses that are likely to accrue to the shareholders of BM Plc if it acquires each share of FM Plc at a premium of one-third of its current market price.
- What are the financial effects, in terms of value, of the merger on the shareholder of FM Plc assuming the new exchange ratio is two shares of BM Plc for every five shares of FM Plc?

- (iv) Assuming the market does not expect any increased growth rate as indicated in the question, assess the gains or losses arising from the merger.

SUGGESTED SOLUTION 7

Workings

Earnings per share (EPS)

$$\text{BM Plc} = \text{₹}2 \times 1.5 = \text{₹}3.00$$

$$\text{FM Plc} = \text{₹}1 \times 2 = \text{₹}2.00$$

P/E ratio

$$\text{BM Plc} = 54/3 = 18$$

$$\text{FM Plc} = 18/2 = 9$$

$$\text{Exchange ratio (based on market price)} = 18/54 = 0.333 \text{ or } 1/3$$

This means BM Plc will issue 1/3 of its own share for every 1 share of FM Plc

(i) Without Merger

	BM Plc	FM Plc
	₹	₹
Total earning (1,000,000 x 3) (540,000 x 2 x 1.10)	3,000,000	1,188,000
Value 3,000,000 x 18 1,188,000 x 9	54,000,000	10,692,000

$$\begin{aligned} \text{Combined value} &= 54,000,000 + 10,692,000 \\ &= \text{₹}64,692,000 \end{aligned}$$

With Merger

	BM Plc	FM Plc
	₹	₹
Total earnings (3 x 1,000,000) (2 x 1.12 x 540,000)	3,000,000	1,209,600

$$\text{Combined total earnings} = \text{₹}4,209,600$$

$$\text{Combined total no of shares } 1,000,000 + 1/3 \text{ of } 540,000$$

$$= 1,180,000 \text{ shares}$$

$$\text{Combined EPS } \boxed{} = \text{₹}3.57$$

Expected

Market post-merger P/E ratio: 18

$$\text{Total value of enlarged BM Plc} = 3.57 \times 18 \times 1,180,000 = \text{₹}75,826,800$$

Increase in value arising from the merger

$$= \text{₹}75,826,800 - \text{₹}64,692,000$$

$$= \text{₹}11,134,800$$

(ii) New Price Level = ₹24 i.e. ₹18 x 1 1/3

At N24, the exchange ratio becomes 0.444 of BM Plc shares for each share of FM Plc

Total number of shares become 1,000,000 + 240,000 of BMC Plc = 1,240,000 shares

$$\begin{aligned}
 \text{Post-merger EPS} &= \text{N}4,209,600 / 1,240,000 = \text{N}3.39 \\
 \text{Pre-merger EPS} &= 3.00 \\
 \text{Gain} &= 18 (\text{N}3.39 - \text{N}3.00) \\
 &= \text{N}7.02
 \end{aligned}$$

- (iii) New Exchange ratio: 0.40 of BM Plc shares for each share of FM Plc
 Total number of shares $1,000,000 + 216,000 = 1,216,000$
 Post-merger EPS $= \text{N}4,209,600 / 1,216,000$
 $= \text{N}3.46$ per each share enlarged BM Plc

FM Plc share will exchange for 0.40 of BM Plc. Therefore EPS equivalent of each old FM share $= \text{N}3.46 \times 0.4 = \text{N}1.38$

$$\begin{aligned}
 \text{Post-merger value} &= 1.38 \times 18 = \text{N}24.84 \\
 \text{Pre-merger value} &= 2.20 \times 9 = \text{N}19.80 \text{ (i.e. } 1,188,000 / 540,000 \times 9) \\
 \text{Gain per share} &= 5.04
 \end{aligned}$$

- (iv). There are no expected synergistic effects. The expectation is therefore that post merger Plc ratio will approach the weighted average (weighted by their earnings) of the two pre-merger P/E ratio i.e. $(3 \times 18) + (2 \times 9) = 72/5 = \text{N}14.4$. Multiply this figure by combined post-merger earnings give $\text{N}4,209,600 = \text{N}60,618,240$. Hence no increase in shareholders' wealth.

QUESTION 8

It has been said in several quarters and by many stakeholders that "small firms are at a disadvantage in terms of obtaining finance in the capital markets"

Required:

- (a) State and explain FIVE reasons why small firms are at a disadvantage in obtaining finance.
- (b) Does this indicate a bias against small firms in the capital markets or can it be explained by the normal economic factors operating in the markets?

SUGGESTED SOLUTION 8

- (a) Substantial amount of savings do flow into the hands of financial intermediaries which prefer to lend to big companies rather than to small business for the following reasons:
 - (i) Costs of managing small debts per N1 invested are very high.
 - (ii) Less is known about small firms compared to large firms.
 - (iii) The general belief is that small firms are highly risky from the standpoint of insolvency and liquidation.
 - (iv) Most small firms are not quoted on the stock market and investors need an "exit route" for realisation of their investment if necessary.

- (v) Small firms do not possess accounting systems which guarantee transparency in the handling of financial matter.
- (vi) Small firms are naturally discouraged from approaching the stock exchange as it is a difficult and expensive process.
- (b) It does not necessarily mean that there is bias against small firms in the capital markets. It appears the normal economic factors are at work. The additional return expected by lenders might not be justified by the extra risks involved. Moreover the attendant administrative costs which are normally passed to borrowers, might not be within the reach of small firms.

QUESTION 9

A US multinational firm intends to undertake a \$200 million project in Nigeria. The project will have a life of two years. During this two-year period, the operating cash flows are expected to be \$125 million each year. In addition, the agreement provides for the repayment of \$15 million each year, representing funds that were compulsorily held in the country during the regime of exchange controls. The shareholders of the US firm require a rate of return of 10 percent. However, it is believed that the discount rate for the exchange control avoidance could be 6 percent because of the low degree of uncertainty attaching to these cash flows.

Required:

Using the appropriate project evaluation technique, advise whether the project should be undertaken.

SUGGESTED SOLUTION 9

The appropriate technique is the Adjusted Present Value (APV)

The APV of the project will be as follows:

APV

= \$

= \$

= \$64.45

Note: All figures are in \$million.

The project should be undertaken as it has a positive NPV of \$64.45 million taking into consideration both the operating cash flows and the financial effects.

SOLUTION 10

- (a) In the context of financial management of firms, define “international risks” and give TWO examples of such risks.
- (b) Mention FOUR major areas of financial management practices that are affected by international risks and give in EACH case one instance of how it is affected.
- (c) State six devices that could be used by financial managers to reduce international risks.

SUGGESTED SOLUTION 10

- (a) International risks are those risks that are unique to those firms that are engaged in cross-border business activities.

Examples are:

- (i) Foreign exchange risk and
- (ii) Political risks

- (b) (i) **Capital budgeting**
How capital budgeting is affected
- ◆ Risk premium increases the 'benchmark' rate
 - ◆ Extra premium on the top of the required rate of return needed to cover foreign exchange risk.
 - ◆ Projects which would have been accepted might become unacceptable because of foreign exchange risk.
- (ii) **Cost of Capital**
Required rate of return is increased because of foreign exchange risk
- (iii) **Sourcing for debt and equity finance**
International investors require extra risk premium where they have large investments in countries with highly volatile currencies.
- (iv) **Valuation of debt and equity**
Lower values will be attached to investments in countries with very unstable currencies.
- (v) **Working Capital Management**
Additional complexity because of the impact of foreign exchange risk on movement of funds among countries

(Any 4)

- (c) Devices that could be used by financial managers for minimising international risks.
- ◆ Invoicing in home currency
 - ◆ Accelerating or decelerating payments of currencies expected to appreciate or depreciate respectively (leading and lagging)
 - ◆ Accelerating or accelerating receipts of currencies expected to depreciate or appreciate respectively.

All the above steps are referred to as internal hedging

- ◆ Trading in forward exchange contracts
- ◆ Trading in futures contracts
- ◆ Buying or selling of call or put currency options
- ◆ Entering into currency swap arrangements

(Any 6)

APPENDIX III

CASE STUDY

CASE STUDY I

Ade Pharmacy Ltd., a small drug marketing company located at Matori Industrial Estate was incorporated about five years ago for the purpose of manufacturing and selling pharmaceutical products. The company is owned 100 per cent by a couple who are in their mid-sixties.

The current global economic meltdown has seriously affected their drug manufacturing business. Sales are falling, operation costs are increasing in leaps and bounds and the company's profit reduced considerably. However, the profit has remained stable for sometime now. Faced with the reduction in the profit figure and the present increase in exchange rate, the couple who are both directors of the company, decided to do away with the company by offering it for sale at the asking price of N10 million. 'The worst has happened' they said. They are of the opinion that the business is no more meeting their aspirations hence their decision. They thought of going into another business.

Ronki Plc, a quoted pharmaceutical company (listed in the emerging market sector), similar in all respects to Ade Pharmacy Ltd. has offered to take over Ade Pharmacy Ltd. The shares of Ronki Plc are presently quoted on the exchange at ₦3.60 per share. Its last dividend payment was 10 kobo per share. This dividend was 'covered 2 times.

The most recent balance sheet of Ade Pharmacy Ltd is as follows:

ADE PHARMACY LTD

BALANCE SHEET AS AT 31 DECEMBER 2009

Net Assets	₦'000 <u>3,000</u>
Financed by:	
1,500,000 ordinary shares of 50k each	750
Profit and loss balance	<u>2,250</u> <u>3,000</u>

The net assets of the company which stood at ₦3million as at 31 December 2008 is made up of fixed assets of ₦4.5million, current assets of ₦2 million and current liabilities of ₦3.5million. The company's profit before taxation have recently being hovering around ₦175,000 per annum. It is believed that this figure will be maintained for an indefinite period having stabilized at around that figure for sometime.

The above was the position of Ade Pharmacy Ltd when it offered the company for sale.

Required

- (a) Give TWO reasons why the global economic melt down has been impacting negatively on the Nigerian economy and consequently on the Nigerian industries in general.
- (b) In terms of management information, give TWO reasons for the inability of the company to have failed to foresee the situation which would have made them take preventive action to mitigate their present predicament.
- (c) Prepare relevant information that would assist in justifying the price that is put forward by the company and make your comments as appropriate.

- (d) Advise Ronki Plc on its intention to take over Ade Pharmacy Ltd.

SUGGESTED SOLUTION

- (a) (i) Nigeria is an import oriented company with over 90% of her foreign exchange earnings dependent on export of crude oil. Also our foreign reserves and other assets are kept subsequently in US dollars. US is the greatest consumer of our oil and US economy is one of the worst hit by the economic melt down.
- (ii) Nigeria is a developing nation. It needs substantial foreign direct investments. These investments might not be forthcoming in the near future because of this meltdown. Besides, the ones already made are currently being realised thereby putting the economy, particularly the banking industry, in a precarious financial situation.
- (b) As a small private company, Ade pharmacy's accounting information system might be so grossly inadequate that the director might not be having necessary information that would help them assess the future.

The directors might lack adequate management skill to be able to forecast, prepare budgets and analyse future events and their consequences on their company.

- (c) (i) Value of Ade Pharmacy using Earning Approach.
Earnings per share (EPS) – Ade pharmacy = $175,000/1,500,000 = \text{₦}0.12$. Ade pharmacy is a private company, but it has Ronki Plc whose statistics can be used as surrogate:

Ronki dividend per share (DPS) = $\text{₦}0.10$. This is covered twice; its earnings per share (EPS) is therefore $2 \times \text{₦}0.10 = \text{₦}0.20$. Its price on the stock exchange is $\text{₦}3.60$. Its price-earnings (P/E) ratio is therefore 18 ($\text{₦}3.60/0.20$). Value of Ade Pharmacy = $\text{₦}175,000 \times 18 = \text{₦}3,150,000$

- (ii) Value using Net Asset Approach: $\text{₦}3,000,000$

Comment: using the earnings approach as a basis, the value of the company is $\text{₦}3.15\text{m}$. This could be lower given the fact that it is a private company. Even at this figure, it is only about one third of what the directors are asking for - $\text{₦}10\text{m}$ looks very high. Although the directors said the worst had happened, but how are they sure? So, the $\text{₦}175,000$ p.a might not be sustained.

In addition, how are the directors sure that the $\text{₦}175,000$ profit will be maintained?

This notwithstanding the asset value approach incidentally gives almost the same valuation as the earnings approach. This tends to confirm that the value of Ade Pharmacy Ltd should be in the region of $\text{₦}3\text{m}$. Thus on the basis of both approaches the asking figure of $\text{₦}10\text{m}$ appears to be prohibitive.

In addition the company looks illiquid. The difference between current assets and current liabilities is negative.

- (d) **Advice:** The company is not a suitable candidate for purchase except there were information about the company which were not disclosed in the question such as assets being worth more than their book value. Also there might be signs of early recovery

from general economic meltdown which was wrongly judged by the directors. Moreover there might be possibility of injecting into the business new management talents that would properly take care of marketing of new products, technical and technological problems and problems connected with provision of relevant management information.

CASE STUDY II

Alhaji Hammed is a shareholder of Nizeth Plc which has just made a rights issue of 1,754,557,124 ordinary shares of 50 kobo each on the basis of one (1) ordinary share for every four (4) ordinary shares held as at 31 March, 2009 at ₦12 per share payable in full on acceptance.

The financial adviser to the company is Nizeth Capital and the Joint Issuing Houses are NBF Capital, CIBT Securities and SSESCE Investment and Securities Ltd. Acceptance list opens on May 18, 2009 and closes on June 19, 2009. The rights can be traded on the floor of the Nigerian Stock Exchange during the period of the Rights Issue. The current market price of the share of NIZETH PLC just before the announcement of the issue is ₦15.00. Alhaji Hammed has received a Rights Circular dated April 20, 2009 provisionally allotting to him the number of shares he is entitled to under the rights issue (based on the present number of its shareholding). This figure is indicated in the Acceptance/Renunciation form which is sent along with the Rights circular. The new ordinary shares will rank “pari-passu” with the existing ordinary shares of the company. The provisional allotment letter which is embodied in the rights circular indicates that Alhaji Hammed (as an existing shareholder of the company) may accept all or some of the shares provisionally allotted to him or renounce his rights to all or some of them. There are also instructions in the letter on how the Acceptance/Renunciation form is to be completed.

You are a close friend and confidant of Alhaji Hammed. Based on this, he has decided to discuss with you his ownership interests in Nizeth Plc. He tells you, “I own 16,000 shares in Nizeth Plc and has just received, this document. He also says ‘I don’t know what this document means, I don’t know what to do with it, me I no get time o’

Required:

As a friend of Alhaji Hammed (a manager in JMC Securities and Investments Ltd), how would you respond to the following:

- (a) Explain to Alhaji Hammed (who is just a dealer in motor vehicles the nature of the document?
- (b) Give the meaning of the word ‘pari passu’ in the context of this case.
- (c) The advice in the letter regarding Acceptance has some implications for your friend as an owner of 16,000 ordinary shares in Nizeth Plc. Explain to your friend what these implications are and the effect of each of them on his wealth. (Support your explanation with relevant calculations).
- (d) Which regulatory authority normally approves this type of issue and what is the name given to the market in which new issues of this type are made?
- (e) In this new era of E-rights, how would Alhaji Hammed’s transactions be dealt with assuming he shows interest in the rights?

- (f) Assuming Alhaji Hammed showed very keen interest, after your explanation, and offers to subscribe to more shares than were allotted to him, what should he do?
- (g) What would be your final advice to Alhaji Hammed as a friend?

SUGGESTED SOLUTION

- (a) The document is an important one (not just any other document) that has given Alhaji Hammed some new shares in the company, based on his proportionate interests, at a price which is a little lower than the current market price; The only thing Alhaji Hammed must not do in the circumstance is to reject the offer in its entirety as this might cause the value of his investment in NIZETH PLC to fall as will be shown later.
- (b) It means that the issue would not affect the proportionate interests of each shareholder in the company.
- (c) The implications are the courses of action open to Alhaji Hammed in respect of the rights issue. As listed below, he has FOUR courses of action.
- Take up the rights in full.
 - Sell all the rights.
 - Sell enough rights to provide cash to subscribe for the balance.
 - Do nothing.

ILLUSTRATION

Preliminary calculations	£
4 old shares @ £15	60.00
1 new shares @ £12	12.00
<u>5</u>	<u>72.00</u>

Theoretical Ex-Right Price $\text{£}72/5 = \text{£}14.40$

Value of the Right: $\text{£}14.40 - \text{£}12 = \text{£}2.40$

ALHAJI HAMMED: Holder of 16,000 shares in NIZETH PLC**Option (i) Take up the rights in full**

	£
Value of holding before rights issue (16,000 x 15)	240,000
Value of holdings after issue 20,000 x £14.40	288,000
Less cash used to subscribed to the rights	
4,000 @ £12	48,000
	<u>240,000</u>

Option (ii) Sell all the rights

	£
Value of holdings before right issue	240,000
Value of holding after rights issue	
16,000 x £14.40	230,400
Add cash received from sale of rights	
4000 x £2.40	9,600
	<u>240,000</u>

Option (iii) sell enough to provide cash for the balance □

Proportion to sell is determined by the following formula

$$\frac{\text{Subscription Price}}{\text{Theoretical EX - Rights Prices}} \text{ i.e. } \frac{12}{14.40} = 83.33\%$$

i.e. sell 83.33% of 4000 shares = 3333 shares

Value of holding before Rights issue		240,000
Sell 3333 @ □2.40	□8,000	
To subscribe to 667 @ □12.00	□8,004	
Value of holding after the rights issue		
16,667 @ □14.40		<u>240,000</u>

Option (iv) Do nothing

Value of holding before the Rights Issue	240,000
Value of holding after the Rights Issue	
16,000 @ 14.40	<u>230,400</u>
	<u><u>9,600</u></u>

In each course of action except option (iv), Alhaji Hammed's wealth will not change. It is only where he does nothing that his wealth would in theory, fall by □9,600.

- (d) Securities and Exchange Commission (SEC). New Issues Market, or Primary market.
- (e) If Alhaji Hammed has account with CSCS, share certificates in respect of the shares allotted to him will be sent by electronic transfer to his CSCS account (within 15 working days after allotment. If he does not have an account with CSCS, his certificate will be sent to him by registered post.
- (f) (i) He can buy the additional rights on the floor of the Exchange OR
- (ii) He completes the appropriate space on the Acceptance/Renunciation form.
- (g) **Final Advice:** Alhaji Hammed should approach his stockbroker and discuss formally with him all matters relating to the rights issue.

CASE III

MOON BANK PLC

The current global financial crisis has left many high networth individuals, corporate bodies and even public institutions bankrupt with banks in Nigeria desperately angling for deposits to shore up their balance sheets.- "The Nation - Sunday April 26, 2009".

The above statement sums up the current mood of the country; a nation in a serious economic crisis where the banks are not left out.

The directors of Moon Bank Plc; one of the new and aggressive generation banks (quoted on the Stock Exchange) are particularly worried about the effect of the global economic melt down on the present and future prospects of their bank. They are, therefore contemplating on a merger with a view to rationalizing the combined businesses in the following areas: deposit base, liquidity, capital base, human resources, risk management, branch network, and integrated information technology. After an extensive and thorough search of a number of banks, Moon Bank Plc narrowed the candidates to one - Star Bank Plc (one of the old and conservable generation banks)-quoted on the stock market and having substantial amount of "free cash flows". Moon Bank Plc has made an initial proposal to Star Bank Plc which is to be discussed by the boards of directors of the two banks. The proposal is that Moon Bank Plc will, consequent to the merger, issue ONE of its own shares for every four shares of Star Bank Plc. The merger is expected to produce a synergy which, it is believed, will result in after-tax benefits of N1.2billion.

The most recent summarized financial statements of the two banks for the year ended December 31, 2008 are shown below:

PROFIT AND LOSS ACCOUNTS AND BALANCE SHEETS FOR THE YEAR ENDED DECEMBER 31, 2008

	Moon Bank Plc	Star Bank Plc
	₦' million	₦' million
Profit and loss account for the year		
Gross earnings	80,000	8,000
Profit before tax	10,000	1,000
Taxation	<u>2,000</u>	<u>200</u>
Profit after tax	8,000	800
Dividends	<u>1,200</u>	<u>200</u>
Retained profit for the year	<u><u>6,800</u></u>	<u><u>600</u></u>
Balance sheet as at the year end	₦' million	₦' million
Assets		
Cash and short-term funds	18,000	12,000
Bills discounted	36,000	12,000
Loan and Advances	60,000	14,000
Investments	24,000	8,000
Fixed assets	<u>6,000</u>	<u>2,000</u>
	<u><u>144,000</u></u>	<u><u>48,000</u></u>
Financed by:		
Deposit liabilities	100,000	36,000
Other liabilities	<u>24,000</u>	<u>6,000</u>
Share capital	8,000	4,000
Reserves	<u>12,000</u>	<u>2,000</u>
	<u><u>144,000</u></u>	<u><u>48,000</u></u>

Acceptance and guarantees	100,000	2,000
Pre-bid price-earning (P/E) ratio	20	12
Ordinary shares are of 50k each		

The market believes that after the merger, the P/E ratio of Moon Bank Plc would be maintained.

Required:

- (1) What is the difference between this type of merger and the pre-December 31, 2005 mergers?
- (2) What is that very important human factor, not specifically mentioned, which might have dire consequence on the success or otherwise of the merger?
- (3) What is that condition which must in theory, justify the merger of the two banks?
- (4) Produce relevant calculations to show the financial effects (in terms of value) of the merger on the shareholders of the two banks
- (5) What argument can the directors of Star Bank Plc advance to achieve better terms? What argument can the directors of Moon Bank Plc use to counter Star Bank Plc's position? Could all these be valid?
- (6) Can the information technology integration lead to loss of jobs after the merger?

SUGGESTED SOLUTION

Moon Bank Plc

- (1) The pre-December 2005 merger is Government policy driven while the merger under consideration is synergy driven.
- (2) Differences in cultures of the two organizations.
- (3) The incremental cash flows from the merger, when discounted at a rate consistent with the degree of risk attaching to those cash flows, must be positive.
OR
The reduction in the level of risk connected with Moon Bank's current cash flows must cause the appropriate discount rate for discounting those cash flows to fall, thus increasing the net present value of the existing cash flows of Moon Bank Plc.
- (4) Calculation of Expected Value
Pre-merger price per share of Moon Bank Plc

$$\text{EPS} = 8\text{billion}/16\text{billion}$$

$$= \text{₹}0.50 \text{ per share}$$

$$\text{Value per share} = 0.50 \times 20$$

$$= \text{₹}10$$
Pre-merger price per share of Star Bank Plc

$$\text{EPS} = \text{₹}800,000,000/8,000,000,000$$

$$= \text{₹}0.10 \text{ per share}$$

$$\text{Value per share} = 0.10 \times 12$$

$$= \text{₹}1.20$$

Combined after tax-earnings of the enlarged Moon Bank Plc	■	
Pre-merger earnings – Moon Bank Plc	8,000	
-Star Bank Plc	800	
Synergistic effect	<u>1,200</u>	
Total post-merger earnings	<u>10,000</u>	
Number of shares (m)		
Pre-merger - Moon Bank Plc	16,000	million
Shares issued to shareholders of Star Bank Plc 8000/4million	<u>2,000</u>	million
Total No of Shares in the enlarged Moon Bank Plc	<u>18,000</u>	million

Post-merger EPS 10,000 million/18,000 million = ■0.55 or 56 kobo approx.

At the new P/E ratio, each share is worth $20 \times 0.56 = \text{■}11.20$

Effects	Pre-merger value of of each share	post - merger value of each share
Moon Bank Plc	■10	■11.20
Star Bank Plc	■4.80 (or N1.20)	■11.20 (or N2.80)

In the light of the above, and assuming that share price were the only critical factor, the shareholder of both banks would benefit from the merger. They are therefore expected, all thing remaining the same, to welcome the merger.

- (5) **Star Bank Plc:** Strong liquidity position. Cash balance as per balance sheet is about 33.3% while that of Moon Bank Plc is only 18%. Could be valid because cash is physical (real) although value could be eroded by inflation.

Moon Bank Plc: Strong Assets base and good profitability. This might not be tenable as the assets values are based on book (or accounting) values and therefore not reliable as a measure of performance. Also profits are historical profits There is no reason to believe that this level would be sustained in future.

- (6) **Yes and No**
 Yes: The integrated IT might take over the jobs of many employees
 No: The integrated IT might create new jobs for others.
 However the former is likely to dominate the latter.

CASE STUDY IV

GLOBAL BREWERIES PLC

Global Breweries Plc is a company in the Breweries sector of the economy and quoted on the stock exchange. The company was incorporated many years ago as a private limited liability company. It converted to a public limited company (PLC) in the year 2000 and was listed on the stock exchange in year 2005. The company's manufacturing plant is located at one of the towns in the South West of Nigeria.

The directors of Global Breweries have been looking into the capital expenditure plan of the company for the year 2010. The plan must be ready latest by October 31, 2009 to enable it to be incorporated into the company's MASTER budget for 2010. One critical issue that has been featuring at the various meetings of the capital expenditure committee of the company is the acquisition of a state of the art fully automated manufacturing plant that will be used to replace the existing equipment bought several years ago. The committee is headed by the Chief Executive

himself and has the Finance Director, the Technical Director, Marketing Director and others as members. It is believed that the acquisition of the machine will give the company substantial competitive advantage and long-run profitability. The capital expenditure committee has identified two main problems in connection with the acquisition: (i) the problem of forecasting cash flows into the distant future and (ii) the choice of the capital projects appraisal technique to use and by implication the choice (where necessary) of the discount rate to use in discounting the projects cash flows. While the marketing director and the company accountant will deal with the first problem, the finance director will take care of the second problem once the cash flows are ready. The initial cost would not constitute any problem as prices can be obtained from the overseas manufacturers of the plant. The finance director has called a meeting with his finance manager who incidentally has just returned from overseas seminar where the 'hot' topic of the seminar was Advanced Manufacturing Technology (AMT) projects. At the meeting the finance manager told the finance director that the characteristics of the projects are such that they fit with the characteristics of AMT projects and that they should use Net Present Value (NPV) for appraising the project. The finance director disagreed with him. However, he later told him to go and use both techniques but that he should be prepared to give the committee reasons for the choice of his technique. According to him the company's policy, which has been in operation for many years, is to appraise projects using payback period of 5 years for all projects.

You have the following relevant cash flows for the project provided for you by the company's accountant.

End of year	project cash flow
0	(100)
1	(80)
2	0
3	30
4	40
5	50
6	60
7	70
8	80
9	90
10	100

Required:

- (1) State TWO characteristics of AMT projects
- (2) The manufacturing industry has accused financial managers of being biased against AMT projects. Give TWO areas of capital investment appraisal that might support the allegation of bias against AMT projects.
- (3) Evaluate this project using
 - (i) Payback period and 5 years payback period benchmark.
 - (ii) Net present value technique, assuming 15 per cent shareholders opportunity cost of funds
- (4) Give TWO problems associated with the use of NPV technique in evaluating AMT projects.
- (5) State what action the company can take in the areas of
 - (i) goal congruence; and
 - (ii) management attitude to ensure that the so-called bias against AMT projects is reduced.

SUGGESTED SOLUTION

- (1) (a) Initial amount of investment are usually very high and may be spread say over 2 years or more.
- (b) Cash flows are generated over a very long period of time.
- (2) (a) The use of incorrect appraisal techniques.
- (b) The incorrect use of the right technique.

(3) PROJECT EVALUATION**(i) Payback period**

End of year	Cash Flows ₹m	Cumulative Cash Flow ₹m
0	(100)	(100)
1	(80)	(180)
2	-	(180)
3	30	(150)
4	40	(110)
5	50	(60)
6	60	-
7	70	70

Target payback period 5 years

Project payback period 6 years

Decision: REJECT

(ii) NPV method

End of year	Cash Flows ₹M	Discount Factor 15%	PV ₹M
0	(100)	1.0	(100)
1	(80)	0.870	(69.6)
2	-	0.756	-
3	30	0.658	19.74
4	40	0.572	22.88
5	50	0.497	24.85
6	60	0.432	25.92
7	70	0.376	26.32
8	80	0.327	26.16
9	90	0.284	25.56
10	100	0.247	24.70
		NPV	<u>26.53</u>

- (4) (i) **Inadequate data**
In view of the nature of AMT project, many long-term and valuable benefits might not be captured.
- (ii) **Measurement problem**
Tangible benefits might be incorrectly assessed while measurement of intangible benefits might be highly subjective.

Company's Action required for reduction of bias.

(5) (i) Goal congruence

Top management should ensure that individual managers' objectives are aligned as much as possible with the strategic goal of the company.

(ii) Management attitude

The attitudes of management staff at all levels should not be negative. For example maintaining the 'status quo' or just having the belief that new methods of doing things cannot work should be totally removed from the psyche of managerial staff at all levels.

CASE V

MACKAY Engineering Plc is a medium-sized water engineering company engaged in the provision of boreholes to various communities in nearly all the states of the Federation and Federal Capital Territory (FCT). The company bid for a contract three months ago and has just received a letter of Award for the contract. Consequently the managing Director called a tripartite meeting involving himself, the technical director and the finance director. The following conversation went on among the trio.

Managing Director:

"Congratulations gentlemen. We have received a Letter of Award in respect of the contract we bidden for in January, the state government has awarded the contract to our company for the sum of ₦25million".

Technical Director:

"Sir, this is good news, but we didn't have the special equipment required for the job. It is a fairly big project. The last time I went to TOLT engineering, the price tag on the machine was ₦4.5m – cash and carry"

Managing Director:

"We can acquire the equipment. Once we buy the equipment, it becomes our own"

Finance Director:

"Sir that will not be a problem we still have a line of credit with United Bank for Africa. Our N5m line of credit can still accommodate the cost of the equipment. Fortunately there is a ceiling on interest rate now. Thanks to the CBN's directive in this respect."

Managing Director:

"These banks, no matter what the CBN says, will still ensure that we pay certain unofficial (under the table) charges. They are very clever. We will end up paying through our nose".

Finance Director:

"Sir, if that is the case, there is this leasing company at Oba Akran Avenue Ikeja. We can also talk to them. Their managing director is my friend. I know the company should be able to assist us by way of a leasing facility"

Managing Director:

"Okay, it means we now have some leeway; the option to lease or to buy"

The following day, the finance director contacted the leasing company which has offered the facility of a financial lease for five years. Annual lease payment of ₦1m will be made with payment at the beginning of each year. If the company's line of credit is used, the bank will lend to the company at an effective rate of 20% per annum before tax. The equipment will have a guaranteed salvage value of ₦500,000 after five years. The amount spent in the purchases of the equipment will attract 50 percent initial allowance and 25 percent annual allowance on a reducing

balance basis. If the equipment is eventually leased the salvage value will accrue to the lessee. The company pays tax at the rate of 30 percent. Payment of tax are made 12 months in arrears.

Required

- (1) Is the option really one of lease or buy? What is the implication of your answer for decisions of this type?
- (2) What is 'financial lease'?
- (3) Explain, briefly, the term "line of credit"
- (4) Advise whether the company should "lease or buy" the equipment?

SUGGESTED SOLUTION

- (1) The option is not one of lease or buy. It is about, choosing the cheaper method of financing the equipment. Either to finance through leasing or to borrow from, say, the bank and acquire the asset outright. The implication is that a vital question must be asked. Is leasing an alternative to borrowing? If it is, then the discount rate that should be used for discounting the lease payments is the after-tax cost of borrowing.
- (2) A financial lease is a non-cancellable long-term contract in which the period of the contract coincides with the economic life of the asset being leased.
- (3) An agreement which a company informally reaches with its bank indicating the maximum amount of secured/unsecured credit to which the company could have access at any one time.

(4) Workings

Capital Allowances Year	Initial Allowance 50% ₹'000	Annual Allowance 25% ₹'000
1	2,250	562.50
2		421.87
3		316.38
4		237.28
5		177.96
	₹'000	
Written Down Value in	=	₹534.01
Salvage Value	=	₹500.00
Balancing Change	=	<u>34.01</u>

Buy End of Year	Cost	Capital Allowance @ 30%	Tax Shield	Net Cash flow @ 14%	Discount Factor	PV
	£'000	£'000	£'000	£'000		£'000
0	(4,500)	-	-	(4,500)	1.000	(4500.00)
1		2,812.50	-	-	0.877	
2		421.87	843.75	843.75	0.769	648.84
3		316.38	126.56	126.56	0.675	85.43
4		237.28	94.91	94.91	0.592	56.19
5		177.96	71.18	71.18	0.519	296.44
		34.01*	-	500.00	-	-
6			53.39	63.59	0.456	29.00
			10.20			
					NPV	<u><u>(3,384.10)</u></u>

*Balancing allowance

NPV of cost = £3,384,100

LEASE

End of Year	Lease Payment	Tax Shield @ 30%	Net Cash flow	Discount Factor @ 14%	PV
	£'000	£'000	£'000	£'000	£'000
0	1000	-	(1000)	1.000	(1,000.00)
1	1000	300	(700)	0.877	(613.90)
2	1000	300	(700)	0.769	(538.30)
3	1000	300	(700)	0.675	(472.50)
4	1000	300	(700)	0.592	(414.40)
5	-	300	300	0.519	155.70
			NPV of lease		<u><u>(2,883.40)</u></u>

Advice:

It is cheaper to finance the equipment by lease as against buying it outright. The decision therefore, should be to lease the equipment.

GLOSSARY OF TERMS

Abandonment Decision: This is a decision in the projects evaluation process whereby the value put on a project is the value to be obtained if the projects' assets were to be sold externally.

Adjusted Present Value (ADV): This is the addition of the present value of the operating cash flows of an investment (where solely financed by equity) and the present value of related financial effects.

Agency Costs: Costs that might be incurred in monitoring the activities of Managers to ensure that their actions are in line with the objectives of the shareholders who put them there.

Agency (Theory): This is a theory which tries to explain, in principle, the conduct of managers (as agents) in relation to their shareholders (principals).

Amortisation Table: A table showing the repayment programme of a loan whereby each instalment is a fixed amount and comprises both principal and interest needed to completely redeem the loan at maturity.

Annuity: This is a series of equal amounts of money to be paid or received each year for a specified future period of time. If the payment or receipt is made at the end of each year, it is known as ordinary annuity. If the payment receipt is made at the beginning of each year, it is called annuity due.

Arbitrage: Searching for two similar assets having different prices and buying in the market where the price is low and simultaneously selling in a market where the price is high in order to make short-term riskless profits.

Arbitrage Pricing Theory (APT) This is a theory of asset pricing involving more than one factor and arbitrage efficiency holds.

Asymmetric Information: This is information which the directors have but not made available to the market. If it is negative information, the directors might want to suppress it if they knew it was going to adversely affect them.

Balloon Payment: A payment of debt which is the largest of all the payments and usually the whole capital repayment on maturity.

Bankers' Acceptance: A negotiable time draft drawn on and accepted by a specified bank to be paid at maturity.

Best Efforts Issue: An issue of security in which the Issuing House agrees to use only its best efforts to sell the issuing company's securities.

Beta: A measure of the systematic risk of a share. Usually written as β , it measures the degree of responsiveness of a share's return to a specified percentage change in the market index return. The beta of a portfolio is just the weighted average of the individual share's betas in the portfolio.

Bond: Long-term debt security issued by government or company.

Book Value: Also known as accounting value, this is the original cost of an asset less depreciation to date.

Business Risk: This is the inherent risk arising from the variability of the company's cash flows from its activities.

Call Options: The right to buy a specified quantity of an asset at a price determined now, known as exercise price, during a fixed future period of time. The right lapses if not exercised on or before the expiry date.

Capital-Asset Pricing Model (CAPM): A model that relates the systematic risk of a security to the expected or required return of that security. The model recognises the existence of a risk-free rate (usually the Treasury Bill rate) and that the expected or required return of a security is the sum of the risk-free rate and a premium based on the security's systematic risk.

Capital Budgeting: The process of evaluating all possible investment alternatives whose cash flows are expected to occur beyond one year with a view to finding the preferred alternatives.

Capital Gain (Loss): Also known as capital appreciation (depreciation). It is the excess (or shortfall) of the selling price of a capital asset over (or from) its original cost.

Capitalisation rate: The discount rate that is applied to a stream of expected future cash flows in order to determine their present values. Frequently used to determine the present value of constant perpetual future cash flows.

Capital Market: The market for financial assets whose original maturity periods are usually more than one year. (For example shares and debentures).

Capital Controls: Restrictions on global flows of capital for example, taxes or import quotes.

Capital Flight: Large outflows of investment connected with increased risk in a country

Capital Rationing: A condition whereby an upper limit is put on the total amount of money that could be spent during a particular period.

Capital Structure: The proportion of the total long-term financing of a company representing long-term debt, preference shares and ordinary shares respectively.

Cash Cycle: The period of time from the commitment of cash on purchases to the receipt of cash from debtors minus the credit period taken from suppliers.

Cash discount: A percentage reduction in the sales price allowed by seller (given to the customer) for early settlement of invoices.

Cash discount period: The period of time given to the customer to pay in order to take advantage of cash discount.

Cash dividend: Cash distribution of profits to shareholders.

Cash equivalents: Highly liquid, short-term investments that can readily be converted into cash at little or no loss to the holder.

Certainty Equivalents (CE): A reflection of attitude to risk; it is the amount of cash an individual would require with certainty that will make him to be indifferent when that certain amount is compared with another amount that is being expected with risk, both amount occurring at the same point in time.

Characteristics Line: A line depicting the relationship between an individual security's returns and returns on the market portfolio. Beta is the name given to the slope of this line.

Chartists: Forecasters who use the past patterns of movement in asset prices to predict future movements.

Clearing House Interbank Payment System (CHIPS) An automated clearing system used basically for global payments.

Coefficient of variation: A measure of relative risk, it expresses the relationship between the standard deviation of a distribution and the mean of that distribution.

Commercial Paper: Short-term unsecured promissory notes usually issued by large companies.

Commitment Fee: Usually charged in a revolving credit arrangement, it is a fee charged by the lender for agreeing to make credit available up to a specified amount throughout the duration of the arrangement.

Compound Interest: Interest charge on interest previously earned.

Conversion Price: The price at which ordinary shares will be exchanged for a convertible security. It is the par value of the convertible security divided by its exchange ratio.

Conversion Ratio: The number of ordinary shares into which a convertible security can be converted. It is the par value of the convertible divided by the conversion price.

Conversion Value: The number of ordinary shares into which a convertible security can be converted times the current market price of the company's share.

Convertible Security: A debenture or preference share which can be converted into the ordinary shares of the issuing company at a specified future time at the option of the holder.

Correlation Coefficient: A statistical measure of the linear relationship between two variables for example returns on two securities of two different companies.

Coupon rate: The interest rate stated in the issue of a fixed-interest security. Also known as nominal rate of interest.

Covariance A statistical measure of the degree to which two variables (for example, returns on two securities)

Covenant: A restriction put in a loan agreement by the lender limiting the power of the directors to do certain things. For example adherence to specified liquidity ratio.

Covered Interest Arbitrage: Buying and selling financial assets internationally and using the forward contract to eliminate the uncertainty in future exchange rate so as to take advantage of the interest rate differential.

Crosslisting: The listing of ordinary shares on two or more stock exchanges

Cross rate: The implied third exchange rate where there are three currencies but only two exchange rates.

Currency Option: The right to buy or sell a specified amount of foreign currency at some specified price before a particular date.

Currency Swap: A contract where two counterparties exchange streams of interest payments in different currencies for a specified period of time and exchange principal amounts in the respective currencies (at a predetermined exchange rate) at maturity.

Debt-equity Swaps: An exchange of debt for the debtor's home currency which is then used to

purchase equity shares in the debtor's country.

Deep market A market with many buyers and sellers including the securities bought and sold such that trading occurs at all times.

Derivative Security: A financial contract whose value depends on the value of one or more underlying assets (for example security), interest rates, exchange rates or other indices.

Dilution: A reduction in the proportional interest in a company arising from the issue of new security.

Direct Quote: A method of quoting an exchange rate in which a specified number of units of domestic currency will exchange one unit of foreign currency.

Discounted Cash Flow (DCF): Any technique of capital project evaluation and selection which factors the time value of money into cash flows.

Discount rate (capitalisation rate): Interest rate used in converting future cash flows to their present value equivalents.

Diversified Portfolio: A mix of securities that reduces the investor's risk.

Divestment (divestiture) Selling a portion of a company as a whole.

Dividend-payout ratio: The proportion of the company's earnings that is paid out to shareholders as cash. Normally expressed as dividend per share divided by earnings per share.

Dividend Yield: Expected annual dividend divided by the market price of the share.

Draft: A signed written order written and signed by one party and given to the second party instructing him to pay a specified sum of money to a third party or to himself. These parties are the drawer, the drawee and the payee respectively.

Dutch Auction System: A procedure for buying and selling securities and foreign exchange named after a system used for flower auctions in the Netherlands. Buyers make bids quoting prices at which they want to buy but not quoting below the minimum set price. Allocations of securities or foreign currency will be made at the lowest price that clears the total amount supplied to the market.

Earnings per Share: Profits after tax divided by the number of ordinary shares outstanding.

Economic exposure: Changes in the value of the firm arising from changes in exchange rates.

Economic Order Quantity (EOQ): The order quantity of stock that minimises the total inventory costs of the firm over its planning period.

Economies of Scale: The advantages of size in which the average unit cost reduces as volume increases.

Effective annual interest rate: The nominal rate of interest after adjusting for such factors as number of compounding periods per annum.

Efficient financial markets: A financial market in which all available relevant information is fully and instantaneously reflected in the current prices.

Efficient Portfolio: A portfolio of securities that gives the highest expected return for a given level of risk or the lowest level of risk for a specified level of return.

Electronic Commerce (e-Commerce): The exchange of business information electronically including over the internet.

Electronic Data Interchange (EDI): The movement of business information in a computer-readable format

Electronic Funds Transfer (EFT): The movement of information electronically between two deposit-taking financial institutions resulting in transfer of value (money).

Equity Carve-out: Issue of subsidiary's shares to the public in which the parent company still retains majority interests.

Euro: The name adopted for the single European Currency whose official abbreviation is EUR and symbol is €

Eurobank: A bank that takes deposits and grant loans and advances in foreign currencies.

Eurobond: A bond issued locally, denominated in foreign currency but sold in a country other than the country in which the bond's currency is denominated

Eurocurrency: Deposits of currency outside its country of origin.

Eurodollar: Deposits of US dollars in a bank outside United States.

Exchange Rate: The price of one country's currency in terms of another country's currency.

Exercise Price: The price at which ordinary shares underlying a warrant or call option can be bought over a specified period.

Expected return: The weighted average of all possible returns with the weights being their probabilities of occurrence.

Expected value: The weighted average of all possible values with the weights being their probabilities of occurrences.

Ex-rights date: The first date on which the buyer of shares no longer gets the right to subscribe to additional shares given by the rights issues that is just announced.

Factoring: The sale of debtors accounts to a financial institution or firms (factory) which assumes responsibility for collection.

Financial Electronic Data Interchange (FEDI): Transfer of financial information electronically between a company and its bank, or between banks.

Fisher Effect: The anticipated effect of inflation on interest rate.

Floating rate: A rate of interest linked to a particular index in the economy, for example, linked to movement in the Monetary Policy Rate (MPR)

Floataion Costs: Costs in connection of the issue of securities such as legal fees, accountancy fees, Issuing House fees and so on.

Forward Contract: A contract for the delivery of foreign currency or security at a price determined today, with delivery and settlement at a specified future date.

Futures Contract: A contract for the delivery of foreign currency or financial asset, at a price fixed now, on a specified future rate. Different from forward contract in that they are traded in organised stock exchanges and can therefore be easily transferred.

Going Private: Converting public company back to private company via the buying back of shares by present management and/or outside private investors.

Hedging (Foreign Exchange): Taking action that has the potential of reducing the risk of variations in future prices.

Hedging (Liquidity): a process of financing each asset with a financing instrument of the same maturity.

Hurdle rate: The minimum expected rate of return on a project that will leave the value of the firm unchanged.

IMF Conditionality: Economic adjustments forced on a country by the IMF before such a country could get IMF loan.

Initial Public Offering (IPO): The first issue of ordinary shares of a company to the investing public.

Interest rate risk: Change in the market price of a fixed-interest security arising from changes in interest rate.

Internal rate of return (IRR): The interest rate which discounts the future net cash flows of a project such that the present values of these cash flows are in aggregate, exactly equal to the project's initial investment

Indifference Curve: A line comprising all combinations of expected return and risk that gives an investor equal amount of satisfaction.

Interpolation: A process of estimating an unknown number that lies somewhere between two known numbers

Intrinsic value: This is the true value of a security. What the price of the security "should be" based on the company's fundamentals.

Just-In-Time(JIT): A method of stocks management and control in which stocks are acquired and put into production at the actual time they are needed such that stock levels tend to be zero at all times.

Leveraged Leasing: A lease contract whereby the lessor provides a certain percentage of the cost of the leased asset and a third party provides the balance as loan to the lessor.

Line of Credit: An unofficial arrangement whereby a bank agrees to allow its customer to draw money up to a specified maximum amount as unsecured credit at any point in time.

Marketability (or Liquidity): A situation where substantial volume of securities could be sold in the secondary market within a short period of time at little or no loss.

Negative Pledge: An undertaking by a borrower not to create a lien on any of the assets of the company.

Net Lease: A lease where the lessee maintains and insures the leased assets.

Operating Cycle: The period of time from the commitment of cash on purchases to receipt of cash debtors.

Opportunity Cost: The cost of lost opportunity, that is, that thing that is lost by not taking the next best investment alternative.

Outsourcing: Asking an outside contractor to supply or produce something for the firm instead of doing it in-house.

Oversubscription Privilege: The right to buy, on a pro rata basis, an unsubscribed shares in a rights issue.

Payback period (PBP): The period of time needed for the cumulative expected cash flows from a project to equal the initial cash out flow.

Poison pill: A defensive tactics used by a company to make itself less attractive to a potential acquirer.

Price-earnings ratio: The market price of a company's ordinary share divided by the most recent one year of earnings per share.

Prime rate: short-term interest rate charged by banks to their high network customers with little or no risk.

Probability distribution: A set of possible outcomes of a random variable together with probabilities of occurrence.

Promissory note: A legal promise to pay a sum of money to a lender.

Put Option: The right to sell a specified quantity of an asset at a price determined now, known as the exercise price during a fixed future period of time. The right lapses if not exercised on or before the expiry date.

Re-invoicing Centre: The financial subsidiary of a parent company that buys exported goods from subsidiaries of the company, and resells them to other subsidiaries or other parties outside the group.

Reverse Share Split: A share split in which the number of shares outstanding is reduced.

Revolving credit agreement: A formal legal agreement to allow credit up to some maximum amount over a specified period of time.

Risk aversion: The condition whereby an investor is asking for higher expected return if he is to take on additional risk. All rational investors are assumed to be risk averse.

Sale and Leaseback: The sale of an asset under an existing lease for cash with the agreement to simultaneously lease it back from the buyer.

Security Market Line (SML): A line that depicts the relationship between the expected rates of return of a security (or Portfolio) and the systematic risk of the security (or portfolio) as measured by beta.

Sell-tender offer: An offer by a company to buy back its own shares

Sell-off: The sale of a division of a company or the company as a whole.

Shark repellent: Defensive tactic used by a company to discourage would be takeover bidders.

Society for Worldwide Interbank Financial Telecommunication (SWIFT): The major international financial telecommunications network that transmits international payment instructions as well as other financial messages.

Spin-off: Conversion of a subsidiary to a company in which the shares of the company are issued to the parent company.

Spontaneous financing: Trade credit and accruals arising naturally and spontaneously from transactions in the normal course of business.

Stakeholders: All persons having interests in the prospects of the company. They include shareholders, creditors, customers, employees, suppliers, local communities and government.

Standard deviation: A statistical measure of the deviations from the mean of a distribution.

Straight debenture value: The value of a convertible debenture if the convertible feature were of no value.

Straight debt: Debt that has no conversion feature.

Tax Shield: A tax-deductible expense. Interest, for example is shielded from being taxed in that it reduces the taxable income.

Transaction exposure: Foreign exchange risk arising from the need to settle a particular foreign currency denominated transaction in future.

Translation exposure: Risk arising from the translation of the assets and liabilities of a foreign subsidiary into the parent company's currency.

Triangular arbitrage: An arbitrage involving more than two currencies. Obtain an implied cross rate from two currencies to compare with another, then buying in the market where price is low and selling in the market where price is high.

Underwriting: Figuring a legal agreement to take up those shares not subscribed to by the public in consideration for a sum of money known as underwriting commission.

White Knight: A friendly purchaser who, having been invited by the target company, purchases shares from the hostile bidder or launched a friendly counterbid in order to frustrate the original hostile bidder.

Yield to maturity (YTM): The expected rate of return on debt security if purchased at the current market price and held to maturity. Also known as redemption yield.

Zero Coupon debt instrument: A debt instrument that pays no interest but sells at a price much below its par value and therefore provides return mainly in form of capital appreciation.

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APPENDIX VI

STUDY AND EXAMINATION TECHNIQUES

This appendix contains notes on:

- (a) Using the questions and answers provided in the manual.
- (b) Effective study.
- (c) Examination technique.

6.1 Questions and answers

Introduction

1. Two types of question are provided in this manual:
 - i. Questions set at the end of chapter with answers provided in Appendix I
 - ii. Comprehensive standard examination questions in Appendix II
 - iii. Solution to comprehensive questions in Appendix III
 - iv. Solution to case study questions in Appendix IV

Questions with answers

2. These questions are either:
 - i. questions intended to test the understanding of the points arising out of the particular chapter; or
 - ii. examination questions inserted at a stage where it is considered the student will be able to give a reasonable answer.
3. Most answers are given in outline but some examination answers go a little further in order to provide greater guidance and provide students with the basis for study.
4. Where answers are comprehensive you couldn't be expected to write them in the time allowed. Do not worry if you feel you couldn't write such answers; you are not expected to. But you must grasp the main points or principles involved which will form the basis for good marks in an examination.
5. Do not worry if your answer differs, there is often more than one approach. You must satisfy yourself however, that it is only the approach that differs, and that you haven't missed the fundamental principles.

Using the answers

6. Have a shot at each question yourself before consulting the answer, you will achieve nothing if you don't do this. Write your answer out in full or jot down the main points. Do not hurry to the answer.
7. Look at the answer (in the case of examination answers). Study the particular

area thoroughly making sure of your understanding. Repeat the process outlined in the above after a suitable interval. You must do this-to get any benefit at all. Make sure the main points stick. !

8. Just browsing through the answers will really get you nowhere. You must test yourself by writing down your version of the answer.

6.2 Effective study

Introduction

1. These notes are intended for those who are new to studying for examination subjects, although those who are not may also benefit. They have been written in relation to study involving the reading of text books, and the apply to all subjects. It is often extremely difficult to pick out the important principles such books.

General

2. Study means more than just reading a piece of literature. It means close concentrated reading with a notebook at your side. Unless you're one of a few people don't kid yourself you can absorb material by just one general read through it, you cannot!
3. Read a small area, making notes as you go along. Then ask yourself -what have I just learnt? Write down what you think it was all about. Then look again and you may be surprised to find 'you've missed a key point or points -they must be down in your notebook and eventually in your head.

Compilation of notebook

4. A well compiled NOTEBOOK is a must. Use block capitals or different colour inks to headline the main areas and subdivisions of those areas. Notes made during lectures or private study should not go straight into your NOTEBOOK. Take them on a "rough" paper and write them in your NOTEBOOK as soon as possible after the lecture or study period, thinking about what you are writing. Practise the illustration in the method yourself as man time s as possible.

Memory aids

5. Mnemonics are very useful - if the sequence of points in the text book isn't significant change it, it makes for a better mnemonic.
6. Association of the points with familiar objects which will serve to recall them is also useful.
7. Some people memorise things by saying them over and over out loud, others have to write them down time after time including formulae .
8. Many students have small blank cards and using one side of each card for each study area, put down the main points. They carry the cards everywhere with them and use every opportunity to study them. As they are small they are easily carried. It is surprising how much of your day can be utilised in this way.

Programme

9. Map out a programme for yourself; set targets and achieve them. One thing is certain, studying is not easy but it is not too difficult if you go about it in an orderly purposeful way. Many students fail their examinations through bad preparation. Tackle your studies as you would a project at work, systematically.

Allocate a number of hours each week for each subject. Try fixing specific times for each subject, then keep to them by refusing to let anything keep you from your planned task.

Revision

Revise periodically The nearer the examination gets, the more you should concentrate on the major headlines in your notebook and less with the supporting details.

6.3 Examination technique

First impressions

1. However well prepared you may be, you are still likely to look at the paper on the day and say to yourself, after a quick look at the questions, "There's not much there I can do".
2. The atmosphere of the examination room has something to do with this. Try to blot everything from your mind other than the job in hand. Concentrate hard. If you feel a bit panicky (most people do - despite the apparent looks of serenity around you) grip the table, take a deep breath, and get on with it. Remember things are never as bad as they seem!

Time allocation

3. Allocate each question time appropriate to the number of marks. At the end of the allotted time for a question go on to the next - remember, the first 5 to 10 marks on the new question are more readily picked up than the last 1 or 2 previous question.
4. The temptation will be to say "I 'll write just one more sentence", but before you know where you are you 'll have written several more and probably just managed to scrape another mark, whereas the same time spent on the next question could have earned 5 or 6 marks. TIME ALLOCATION IS IMPORTANT.
5. If you are running out of time write down the main headings first, leaving a few lines between each - at least the examiner will see that you had the overall picture. Then go back putting in as much supporting detail as you can.
6. It is advisable to spend 15 minutes in reading all the questions and then 150 minutes in answering the questions (i.e. one mark is 1.5 minutes (40 marks of multiple choice and short-answers questions should student spend more than 60 minutes). On no account should student spend more than 60 minutes on 40 marks question. The remaining 15 minutes should be spent in reading over and making more points which you might have forgotten in the course of solving the problem.

SUMMARY

First Reading	15 minutes
Multiple Choice	15 minutes
Short-Answer question	45 minutes
Comprehensive question	90 minutes
Reading Over	15 minutes
	180 minutes
	3 hours

If students can train themselves in this direction, it will be of immense value, not only on Management Accounting but also on other subject.

General approach

7. Read the instructions at the top of the paper.
8. Read the question paper once through. Make your choice of questions quickly. Pick the easiest (if one appears so) and get on with it.

Individual questions

9. Read the question again carefully. The question will involve a key principle or set of principles. What are they? It is so easy to make the wrong decision at this stage, so read the question, underlining what appear to be the key words. This should help you. Irrelevancy has been heavily criticised by examiners.
10. Do not rush into action with your pen yet. Jot down on a piece of scrap paper (not on question paper) the main headings you will use in your answer. All this will take time -about 5 minutes or more, but, the careful thought and outline answer represents marks already earned.
11. If the question is set out in a particular sequence, ie:
 - a.
 - b.
 - c. etc.

then answer it in that sequence or you'll have a hostile examiner to cope with.

12. Use the particular terminology used in the question, the examiner can then link the points in your answer to the relevant parts of the question.
13. Assumptions are sometimes required (for example because of the lack of standardisation of terminology in this subject). Having stated your assumptions, make sure that what you write is consistent with them. Do ensure, however, that your assumptions are valid and are not just a device for changing the meaning of the question to suit your knowledge!

Layout of answer

14. Tabulate where appropriate, using block capitals for your main headings and underline subheadings. Underline words or phrases which require emphasis. Use a ruler.

15. Leave a line between your paragraphs and subparagraphs. This makes for a good layout. However, do not write on every other line within paragraphs, or on one side of the paper only -examiners are waste conscious!
16. The use of different colour pens, where appropriate, is useful but don't overdo it. In fact one black and one red felt-tip pen would be sufficient (use the felt-tip pens which have a fine point }.

Charts and diagrams

17. A descriptive heading or title must be given to each diagram (using the one in the question if indicated).
18. Do not squeeze a diagram into a corner -spread it out.
19. Do not clutter your diagram up with too much detail -this defeats the object, which should be clarity.
20. Give a key to the symbols and the different lines. you've used, and again -use a ruler.

End of examination procedure

21. Have a quick look at each answer, checking for grammatical errors and badly formed letters.
22. Ensure each answer sheet has your number on it and don't leave any answer sheet lying on the table.

Conclusion

23. Good technique plays a large part in examination success; this is a fact. Refuse to be panicked, keep your head, and with reasonable preparation, you should make it.
24. Remember - you don't have to score 100% to pass.
25. A final point; once you're in the examination room stay there and make use of every minute at your disposal.
26. Practise your technique when answering the questions set in this manual.
27. Remember that you should not take your telephone to the examination hall or any object that is not permitted.

INDEX

A

Abandonment Decision 107, 110, 493,
Accounting Rate of Return 89, 91, 94, 95, 96,
104, 105, 386, 399
Accruals 459, 500
Acquisition 18, 53, 87, 239, 259, 263,
303, 334, 355, 356, 365, 366, 370, 371,
374, 375, 379, 383, 390, 462, 473,
486, 487, 502
Adjusted Present Value 429, 441, 430, 476,
493
African Development Bank (ADB)
391, 423, 441
Agency Costs 20, 23, 493
Amortisation Table 69, 81, 493
Annuity 69, 74, 76, 77, 78, 79, 80, 82,
109, 111, 117, 449, 451, 493
Arbitrage
183, 223, 224, 225, 228, 293, 298, 406, 407,
424, 463, 493, 495, 500
Arbitrage Pricing Theory 493
Asymmetric Information 493

B

Balance of Payment 420, 421, 422, 441
Balloon Payment 493
Bank Overdraft 151, 152, 166, 306, 309
Best Efforts Issue 493
Beta 149, 209, 214, 275, 292, 493, 494, 499
Beta factor 290, 292, 467
Bond 14, 38, 40, 41, 42, 43, 46, 47, 171,
173, 182, 186, 235, 260, 295, 418, 447,
453, 493
Book Value 95, 169, 493
Book value 94, 113, 131, 169, 170, 204, 215,
54, 363, 480
Business Risk 9, 21, 200, 431, 440, 493

C

Call Options 494
Capital Asset Pricing Model 130, 133, 276, 292
Capital Budgeting 59, 60, 61, 88, 91, 92, 112,
137, 414, 427, 440, 441, 472, 494
Capital Controls 494
Capital Flight 494
Capital Gain (Loss) 494
Capital Market 4, 10, 14, 22, 31, 35, 37, 40,
41, 235, 259, 269, 273, 274, 373, 494, 501
Capital Rationing 107, 114, 122, 494
Capital Structure 195, 200, 201, 212, 213,
214, 215, 217, 218, 414, 437, 466, 494

217, 218, 219, 220, 223, 228, 229, 254, 395,
424, 427, 437, 440, 442, 455, 456
Capitalisation rate 218, 494, 496
Cash Cows 52
Cash Cycle 301, 309, 494
Cash discount 33, 152, 153, 166, 330,
331, 319, 329, 494
Cash Dividend 164, 175, 176, 231, 232,
237, 234, 235, 236, 237, 239, 254,
255, 256, 371, 494
Cash Equivalent 494
Central Bank of Nigeria 38, 44, 46, 47,
154, 389, 406
Certainty Equivalent 137, 138, 139, 148,
149, 150, 281, 387, 399, 494, 138,
281,
Characteristics Line 494
Chartists 295, 494
Clearing House Interbank Payment System
(CHIPS) 64, 495
Coefficient of Variation 147, 495
Commercial Paper 38, 39, 40, 46, 48, 151,
154, 166, 307, 322, 447, 495
Commercial Papers 38, 39, 40, 154, 166,
447
Commitment Fee 154, 495
Compound Interest 69, 70, 76, 77, 83, 84,
495
Conversion Price 160, 161, 162, 163,
183, 453, 495
Conversion Ratio 160, 161, 162, 182, 453,
495
Conversion Value 161, 167, 181, 182, 453,
495
Convertible Security 167, 495
Corporate Governance 25, 26, 27, 28,
32, 33, 470, 471
Correlation 283, 284, 285, 287, 288,
292, 466, 495
Correlation Coefficient 292, 495
Cost of Capital 91, 96, 97, 98, 100, 102,
108, 115, 118, 121, 127, 191, 192, 193,
195, 197, 199, 200, 201, 203, 210, 211, 213,
215, 216, 217, 218, 219, 222, 224,
225, 227, 229, 234, 359, 403, 424,
427, 428, 429, 431, 432, 433, 437,
440, 441, 442, 451, 456, 465
Coupon Rate 41, 42, 171, 172, 175, 181,
185, 229, 467, 495
Covariance 495
Covenant 22, 154, 156, 165, 235, 495
Covered Interest Arbitrage 495
Cross rate 407, 408, 424, 495, 500
Crosslisting 495

Currency Future 419
 Currency Option 418, 419, 477, 495
 Currency Swap 418, 420, 477, 495

D

Debenture Stock 174, 185, 203, 210, 215, 216, 362, 465
 Debt-equity Swaps 495
 Decision Tree 137, 145
 Decision tree 89, 145, 149
 Deep Market 496
 Derivative Security 496
 Dilution 163, 165, 166, 236, 367, 394, 399, 496
 Direct Quote 404, 496
 Discount rate (capitalisation rate) 496
 Discounted Cash Flow (DCF) 5, 91, 96, 360, 375, 496
 Diversification 18, 22, 53, 275, 288, 288, 359, 357, 375, 387, 401, 428, 471
 Divestment 52, 379, 383, 496
 Dividend Decision 231, 240, 398
 Dividend Yield 395, 396, 397, 496
 Dividend-payout ratio 234, 240, 496
 Draft 3, 39, 151, 152, 166, 216, 246, 255, 306, 309, 340, 388, 493, 496
 Dutch Auction System 496

E

Earnings Per Share 9, 21, 156, 163, 366, 396, 400, 474, 480, 496, 496, 499
 Economic Exposure 413, 414, 424, 463, 496
 Economic Order Quantity (EOQ) 346, 469, 496
 Economies of Scale 122, 428, 376, 496
 Effective annual interest rate 496
 Efficient financial market 286, 300, 496, 458
 Efficient Market Hypothesis 269, 276, 295, 298
 Efficient Portfolio 276, 286, 399, 497
 Electronic Commerce (e-Commerce) 62, 497
 Electronic Data Interchange (EDI) 63, 497, 448
 Equity Carve-Out 377, 380, 383, 497
 Euro 25, 418, 421, 441, 442, 497, 502
 Eurobank 497
 Eurocurrency 497
 Eurodollar 418, 497
 Ex-rights date 497
 Exchange Rate 64, 404, 406, 407, 408, 409, 410, 411, 413, 415, 416, 418, 419, 420, 422, 424, 425, 428, 432, 434, 440, 479, 495, 496

Exercise Price 163, 164, 183, 184, 494, 497, 499
 Expected Return 87, 156, 209, 270, 275, 276, 278, 280, 283, 287, 293, 458, 467, 497
 Expected Value 142, 143, 144, 145, 186, 279, 281, 376, 452, 485, 497

F

Factoring 149, 227, 307, 325, 333, 334, 335, 336, 339, 340, 341, 460, 497, 501
 Financial Electronic Data Interchange (FEDI) 64, 497
 Financing Decision 7, 33, 191, 194, 217, 231, 398, 403, 445
 Finite Horizon 111, 112, 137, 138, 148, 451
 Fisher Effect 497, 408
 fixed charge 155, 188
 Floatation Costs 155, 165, 188, 232, 497
 Floating rate 497
 Forward Contract 418, 419, 425, 495, 498
 Futures Contract 419, 477, 498

G

Going Private 379, 381, 383, 384, 498
 Golden Parachute 372

H

Hedging (Foreign Exchange) 498
 Hedging (Liquidity) 498
 Hire Purchase 86
 Hurdle Rate 451, 498

I

IBRD 420, 421, 422
 IDA 238, 420, 421, 422
 IFC 391, 420, 421, 441
 IMF 421, 422, 423, 425, 441, 498
 IMF Conditionality 498
 Indifference Curve 285, 286, 458, 498
 Initial Public Offering (IPO) 380, 498
 Interest Rate Parity 408, 411, 412, 424
 Interest rate risk 498
 interest rate risk 42, 44
 Internal Rate of Return 59, 84, 89, 91, 98, 104, 123, 441, 451, 455, 498
 Intrinsic value 169, 170, 176, 184, 185, 215, 269, 294, 295, 398, 498

Investment Decision 3, 6, 84, 90, 107, 112, 147, 191, 192, 194, 428, 217, 276, 277, 445, 449

J

Just-in-Time (JIT) 343, 350

L

Leading 98, 100, 279, 297, 327, 328, 417, 437, 442, 477

Lease

58, 64, 155, 187, 189, 190, 191, 192, 193, 194, 195, 196, 197, 247, 271, 319, 404, 462, 472, 489, 490, 491, 498, 499

Leveraged Leasing 498

Lessee 187, 189, 190, 193, 195, 196, 197, 454, 490, 499

Lessor 189, 190, 195, 454, 498

Line of Credit 235, 498, 490

M

Management buy-in 377, 391

Management Buy-Out 377, 380, 384, 391, 462

Marketability (or Liquidity) 498

Merger 53, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 367, 368, 369, 370, 372, 373, 375, 376, 377, 379, 380, 382, 383, 384, 428, 461, 472, 473, 474, 475, 484, 485, 486, 502

Money Market 37, 38, 40, 46, 154, 307, 322, 447

Money Market 37, 38, 39, 41, 46, 47, 48,

Mortgage 85

N

NDIC 26, 100, 107, 110, 140, 253, 294, 302, 330, 334, 395, 409, 412, 443, 414, 418, 473, 475, 481, 490, 496, 507

Negative Pledge 498

Net Lease 499

Net Present Value 1, 18, 96, 105, 126, 127, 129,

Nigerian Stock Exchange (NSE)

44, 45, 47, 244, 259, 260, 268, 272, 273, 388, 400, 501

O

Offer for Sale 244, 257, 258, 457

Offer for Subscription 244, 245, 256, 257, 258, 457

Operating Cycle 301, 302, 303, 309, 310, 499

Opportunity Cost 20, 74, 91, 96, 102, 105, 108, 117, 127, 149, 187, 191, 200, 256, 319, 320, 326, 338, 345, 353, 360, 370, 419, 431, 487

Outsourcing 60, 382, 384, 499

P

Payback Period 89, 91, 92, 93, 102, 103, 104, 105, 123, 125, 126, 127, 133, 138, 386, 399, 487, 488

Poison pill 371, 376, 499

Portfolio Theory 282, 289, 298, 299, 300, 458

Preference Share Capital 155, 156, 204, 302, 307, 400

Price-earnings ratio 401, 499

Prime rate 499

Probability Distribution 499

Probability Distribution 145, 278, 452

Profit Maximisation 8, 9, 15, 472

Profitability Index 91, 101, 105, 115, 116, 122, 123, 118, 441

Project finance 155, 196

Promissory note 39, 154, 495, 499

Purchasing Power Parity 408, 409, 410, 424, 425

Put Option 419, 420, 499

R

Random Walk Theory 295, 298

Re-invoicing Centre 499

Restructuring 355, 379, 383

Reverse Share Split 238, 499

Revolving Credit Agreement 499

Right Issue 243, 252, 482

S

Sale and Leaseback 499

Scrip issue 231, 238, 240, 241

Sell-Off 376, 379, 383, 500

Sell-tender offer 499

Sensitivity Analysis 60, 61, 67, 137, 139, 148, 149, 387, 399, 430, 432

Shark repellent 500
Short 461
Simulation 137, 139, 150
Sinking Fund 69, 78, 449
Society for Worldwide Interbank Financial
Telecomm 64, 500
Spin-Off 52, 376, 380, 383, 384, 500
Spontaneous Financing 307, 310, 337, 500
Stakeholders 10, 11, 14, 26, 32, 33, 57, 246,
386, 399, 470, 471, 500
Standard Deviation 89, 137, 143, 144, 145,
278, 292, 466, 495, 500
Straight Debenture 181, 182, 183, 500
straight debenture
Synergy 355, 356, 461, 464, 484, 485

T

Tax Shield 191, 194, 197, 204, 226, 229, 429,
500
Trade Credit 151, 152, 337, 339, 340, 416,
459, 500
Transaction Exposure 413, 500

U

Underwriting 45, 244, 245, 248,
457, 500
Unit Trust 44, 243
Unsystematic Risk 299

V

Venture Capital 390, 391, 392, 393, 400,
462

W

White Knight 371, 376, 500
World Bank 420, 421, 422